

CITY OF PORTLAND, MAINE

PLANNING BOARD



Brandon Mazer, Chair
Maggie Stanley, Vice Chair
Marpheen Chann
Sean Dundon
Bob Dunfey
David Silk
Austin Smith

AGENDA PORTLAND PLANNING BOARD MEETING

The Portland Planning Board will hold a remote meeting on Tuesday, July 14, 2020, 4:30 p.m. This meeting will take place using Zoom.

Virtual meetings are allowed using emergency legislation approved by LD 2167; 1 M.R.S. §403-A, that authorizes cities and towns to conduct meetings online.

Allow your computer to install the free Zoom app to get the best meeting experience.

For public comment, you will need to use the "raise your hand" feature. To raise your hand via the telephone, please hit *9. You will be un-muted by the host when it is time for public comment.

ZOOM MEETING INSTRUCTIONS

You are invited to a Zoom webinar.

When: Jul 14, 2020 04:30 PM Eastern Time (US and Canada)

Topic: Planning Board Workshop and Public Hearing 07/14/2020

Please click the link to join the webinar: <https://us02web.zoom.us/j/86792473527>

Or iPhone one-tap :

US: +13017158592,,86792473527# or +13126266799,,86792473527#

Or Telephone:

Dial(for higher quality, dial a number based on your current location):

**US: +1 301 715 8592 or +1 312 626 6799 or +1 929 205 6099 or +1 253 215 8782 or +1 346 248 7799
or +1 669 900 6833**

Webinar ID: 867 9247 3527

International numbers available: <https://us02web.zoom.us/j/kcU74fEQKA>

For more information on how to use Zoom, please go to:

<https://www.portlandmaine.gov/remotePUD>

Public comments will be taken for each item on the agenda and written comments should be submitted to planningboard@portlandmaine.gov

WORKSHOP - 4:30 PM

- i. Level III Site Plan; 244 Preble Street; City of Portland Public Works Department, Applicant. (estimated time 4:30 – 5:30 p.m.) The Planning Board will hold a remote workshop on a proposed Back Cove South Storage Facility. The proposal is to construct an off-line combined sewer overflow (CSO) storage tank with a capacity of 3.5 million gallons in the Back Cove Park (known as the Preble Street soccer field). The site is in Recreation and Open Space Zone (ROS) and within the Shoreland Overlay zone. The proposal is subject to Portland's site plan and shoreland zoning standards.
- ii. Level III Subdivision; 83 Middle Street; Community Housing of Maine, Applicant. (estimated time 5:30 – 7:00 p.m.) The Planning Board will hold a remote workshop on a proposed five-story, 45,770 square foot mixed use building with 50 affordable residential units and ground-floor commercial space at 83 Middle Street. The subject property is 13,842 square feet in size and is located within the India Street Form Based Code Zone. The proposal is subject to Portland's subdivision and inclusionary zoning standards and a separate application has been submitted for Level II Site Plan approval.

PUBLIC HEARING - 7:00 PM

1. ROLL CALL AND DECLARATION OF QUORUM

2. COMMUNICATION AND REPORTS

3. REPORT OF ATTENDANCE AT THE MEETING HELD ON JUNE 30, 2020

Afternoon Workshop

ReCode: Chann, Dundon, Dunfey, Mazer, Silk, Smith, and Stanley present.

4. REPORTS OF DECISIONS AT THE MEETING HELD ON JUNE 30, 2020

- i. A public hearing was not held at this meeting therefore there are no items to report on.

5. NEW BUSINESS

- i. R-6 to B-2b Zoning Map Amendment; 879 Congress Street; 879 Congress, LLC., Applicant. (estimated time 7:00 p.m.) The Planning Board will hold a remote public hearing to consider a zoning map amendment to rezone 879 Congress Street and vicinity properties from the R-6 Residential to the B-2b Community Business zone to facilitate a five-story residential building with ground-floor commercial space. The subject properties include three parcels totaling 11,790 square feet. The B-2b zone allows for commercial and mixed-use development.

Memorandum
Planning and Urban Development Department
Planning Division



To: Brandon Mazer, Chair, and Members of the Portland Planning Board
From: Christian Roadman, Planner
Date: July 10, 2020
Re: Back Cove Sewer Storage Facility, 244 Preble Street
Project #: PL-000592-2019 CBL: 442 Boo1
Meeting Date: July 14, 2020

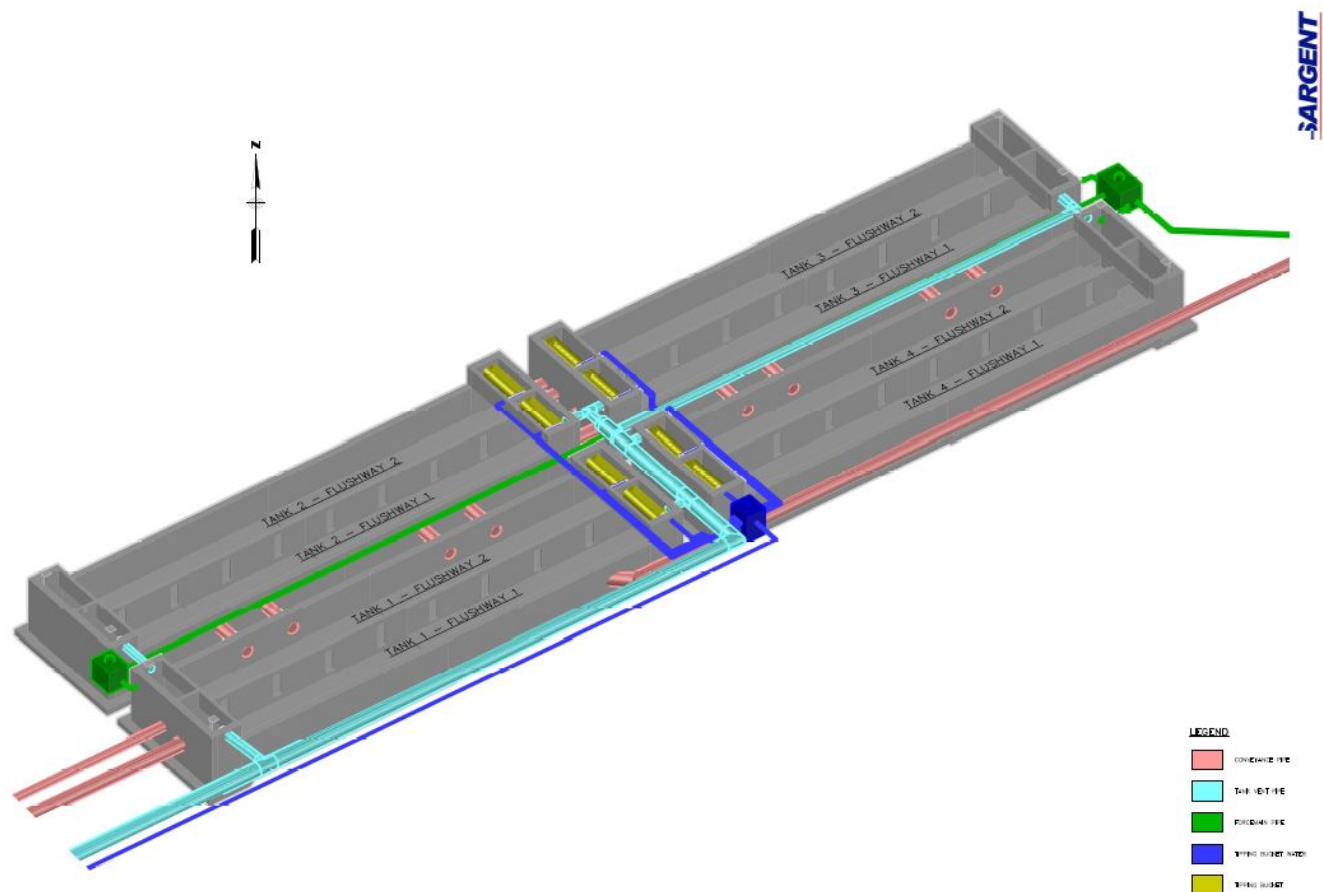


Context of proposed Back Cove sewer storage facility project. Storage tanks will be located beneath a replaced athletic field

I. INTRODUCTION / PROPOSED DEVELOPMENT / EXISTING CONDITIONS

The City of Portland seeks to construct a large underground storage facility for temporary sewage diversion to minimize combined sewer overflow (CSO) events. Composed of four chambers, the facility will have a 3.5 million gallon capacity and would be constructed beneath the Preble Street Athletic field at 244 Preble Street. During large storm events, sewage that otherwise would be forced into the Back Cove will be held in those chambers, then pumped out for appropriate sewer treatment when capacity returns to the system.

The project stems from a consent agreement between the City of Portland and the Maine Department of Environmental Protection (DEP). The proposed facility is anticipated to reduce annual sewage overflows (total, citywide) from 150 million gallons to 18 million gallons, helping to improve the water quality within the Back Cove estuary basin. These and other project details are outlined in an executive summary provided by the Department of Public Works (**Attachment A**). The project is expected to disturb approximately 392,000 feet of land area, which qualifies it for Level III site plan review by the Planning Board.



Plan for the underground sewer storage facility

The site has long-served as a city open space, with athletic fields, parkland, and recreational trail along the Back Cove. Most of the proposed sewer storage facility will be underground. As such, the proposed final condition will exhibit two main differences from the existing condition: the athletic fields will be raised two to three feet (both to prevent flooding and to retain excavated fill on site) and a 522 sf. building will be constructed to house controls and venting related to the facility's operation. Water meters and park lighting controls will also be added to the site. The well-used Back Cove trail is and will remain available (with some diversions) throughout the project.

The site is currently disturbed by preliminary construction activity, primarily related to excavation. The Planning Department authorized this advanced site work (**Attachment 1**) in April, per section 14-532(e)2 of the City's Land Use Cod, which allows for authorization of advanced work for a pending site plan applications. The scale of the project and deadlines of the DEP consent agreement were important aspects in allowing this advanced site work.

The July 14 Planning Board meeting will be the project's first workshop. The Planning Department sent 40 notices for this workshop to the owners of property within 500 feet of the property in question. Legal advertisements ran July 2 and July 3.

Please note that the proposed project is being pursued in a design / build manner, and therefore much of the plans and details are not yet finalized, though the core strategy and infrastructure requirements are settled. This workshop

is anticipated to focus on the overall project scope, as well as design details regarding the proposed building, lighting, and landscape.

Applicant: City of Portland

Consultants: Woodard & Curran, Inc. (civil engineering); Sargent Corporation (construction)

Required Review: Site Plan

Applicable Standards: Section 14-526

II. PROJECT DATA

Existing Zoning	Recreational Open Space
Existing Use	Park with trail and athletic fields
Proposed Use	Park with trail and athletic fields & sewer facility
Site Area	~392,000 sf.

	Existing	Proposed	Net Change
Building Footprint (sf.)	0	~522	+522
Building Floor Area (sf.)	0	~522	+522

III. PUBLIC COMMENT AND NEIGHBORHOOD MEETING

The applicant held a neighborhood meeting on December 4, 2019 (**Attachment L**).

As of the writing of this report, the Planning Department received one public comment (**Attachments PC1**) expressing support for an additional trail leg connection when the trail is reconstructed. DPW is encouraged to accommodate that request with updated plans, and expressed their ability to do so to planning staff.

IV. RIGHT, TITLE, & INTEREST AND FINANCIAL & TECHNICAL CAPACITY

Corporation Counsel attested sufficient City right, title and interest to pursue the proposed project (**Attachment H**). The project will be funded through a State of Maine revolving loan fund (**Attachment G**). The project involves Department of Public Works staff and qualified consultants.

V. ZONING ANALYSIS

	Required	Proposed
Front Yard Minimum (ft.)	25	>25
Rear Yard (ft.)	25	>25
Side Yard (ft.)	12	~13 ft bldg, ~ 8 ft. screened enclosure
Maximum Height (ft)	35	~17
Maximum Lot Coverage (%)	FAR 0.5	.001

The subject property is within the Recreational and Open Space zone (R-OS). Sewage pumping stations are a permitted use in the zone. Also permitted are accessory uses, including structures or buildings with less than 2,500 sf. floor area.

Development in the R-OS zone must meet relevant development standards, addressed below:



Zoning context of proposed Back Cove sewer storage facility project

- a) *All ground areas not used for parking, loading, vehicular or pedestrian areas and not left in their natural state shall be suitably landscaped and designed with quality materials that are consistent with adopted city policy or master plans, and which provide a comfortable, durable, accessible, readily maintainable, and aesthetically pleasing environment.*

The City Arborist consulted with the project team regarding the proposed project, and much of the remaining space will be dedicated to athletic fields / infrastructure, pathways, and Back Cove shoreline, as in the pre-development condition.

- b) *Natural features, such as mature trees and natural surface drainageways, shall be preserved to the greatest possible extent consistent with the uses of the property.*

While the proposed project involves significant disturbed area, it will be returned to park and active recreational use. The Back Cove will remain a key feature of the area context.

- c) *Loading areas shall be screened and parking areas shall be screened and landscaped so as to avoid a large continuous expanse of paved area.*

Not applicable.

- d) *Buildings and structures shall be sited to avoid obstructing significant scenic views presently enjoyed by nearby residents, passersby, and users of the site.*

The proposed building is located to the edge of the site, near the embankment Interstate 295. The trail system will route around the proposed building so that it does not unduly block views from the trail.

- e) *Storage of commodities and equipment shall be completely enclosed within buildings or provided with screening by a fence, wall, or landscaping.*

This standard is achieved via the proposed building and adjacent fenced area.

- f) *The outer perimeter of playfields, play lots, and other active recreational areas shall be screened, or shall be located a reasonable distance from any residential use.*

The athletic fields, as in their current condition, are substantially buffered from residential uses by highway, streets, and other park areas.

- g) *Off street parking is required as provided in division 20 (off-street parking) [of the City's Land Use Code].*

Per Division 20, "off-street parking adequate to serve projected employee and visitor needs shall be provided." A City parking lot adjacent to the area in question, which serves users of the Back Cove trail and amenities, will remain in the post-development condition.

The project required submission of a flood hazard development application and permit, both of which were reviewed and approved by the City's Zoning Administrator (**Attachment I**).

Planning staff confirmed with the Zoning Administrator that a fenced area adjacent to the building and currently proposed within the side yard setback area is allowable (as it is not considered a "structure").

VI. DEVELOPMENT REVIEW

A. SITE PLAN STANDARDS (Section 14-526)

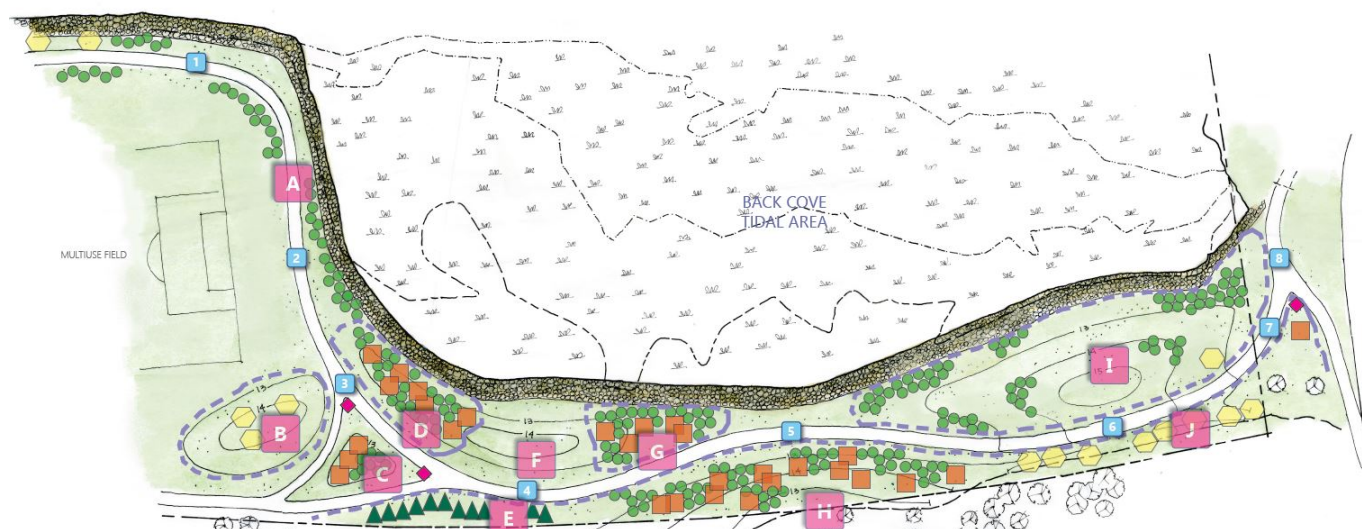
Staff reviewed the proposed development for conformance with the relevant review standards of Portland's site plan ordinance and applicable regulations, and staff comments relative to each standard are below:

a) Transportation Standards

Impact on Surrounding Street Systems and Access and Circulation; Access and Circulation; Public Transit Access; Parking; Transportation Demand Management

The project will involve impact to area street systems, access, and circulation. However, potential road closure timelines have not yet been identified. The Department of Public Works will be coordinating with the Maine Department of Transportation (MDOT) to schedule limited closures impacting nearby streets, including the interstate 295 exit / entrance ramps at Franklin Street. The applicant is expected to share additional information as it is developed.

The above process with MDOT, known as traffic taming, will largely determine the extents and details of necessary construction management procedures. While the Back Cove trail will be redirected, and the project area fenced off, access to and around the Back Cove and trail will be maintained. This is the biggest construction management issue that staff have focused on thus far, but additional attention will be given to broader effects as details emerge.



Sketch of the proposed landscaping approach

b) Environmental Quality Standards

Preservation of Significant Natural Features; Landscaping & Landscape Preservation; Water Quality, Storm Water Management and Erosion Control

The project was reviewed for conformance with relevant stormwater, water quality, and erosion control regulations by a third party civil engineer (**Attachment 2**). They request additional information, specification, and revision regarding erosion control measures, stormwater, and other civil engineering standards and details. Their memo requesting additional information will be shared with the Department of Public Works so that they may pursue revisions.

As noted above, a portion of the site is within the flood zone. The applicant submitted a flood hazard development application (**Attachment I**) approved by the Zoning Administrator.

The applicant provided a draft landscape plan (**Attachment P2**) which maintains the emphasis of much of the site as athletic-oriented and open, while providing denser groups of plantings along the Back Cove trail east of those fields. The City Arborist consulted on the development of the Landscape Plan. Planning staff encourage the applicant to investigate the feasibility of additional landscape screening of the proposed control building, as it is a fairly blank utilitarian structure, as well as the potential for additional plantings south of the athletic fields to add visual interest along the Back Cove trail, without unduly affecting views. Currently, the proposed landscaping plan only addresses the area east of the athletic fields.

c) Public Infrastructure and Community Safety Standards

The applicant has not yet provided an ability to serve letter from the Portland Water District. Engineering staff who issue City sewer capacity letters are involved in the project.

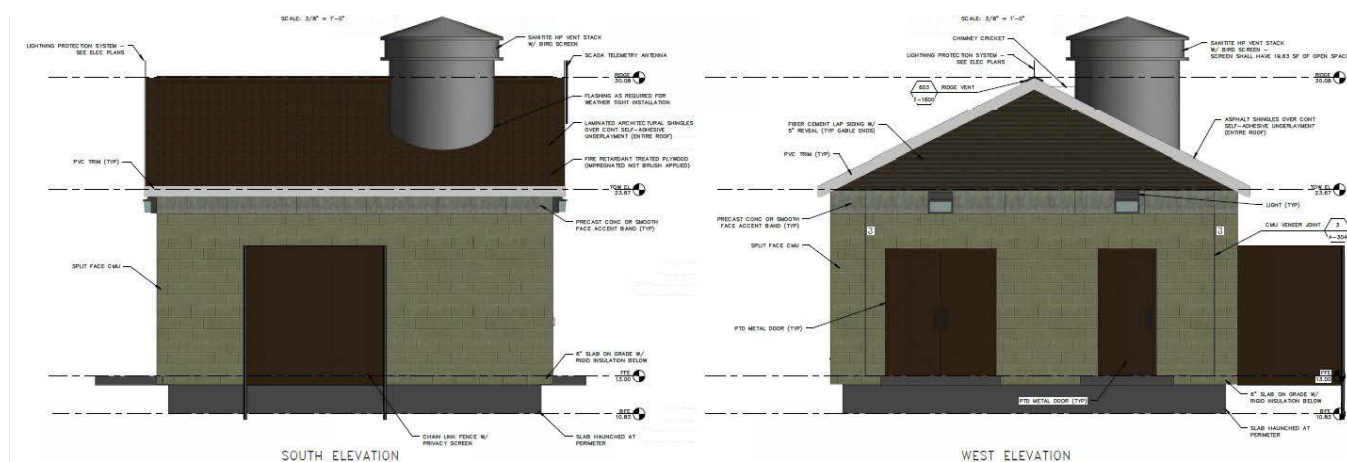
Staff interpret the project as generally conforming to the City's comprehensive plan, based on its expected reductions in environmental impacts from combined sewer overflows, which also supports a healthy and accessible waterfront. Retention and improvements to athletic and recreational facilities help promote an active and healthy public, as well as complete neighborhoods.

d) Site Design Standards

Massing, Ventilation and Wind Impact; Shadows; Snow and Ice Loading; View Corridors; Historic Resources; Exterior Lighting; Noise and Vibration; Signage and Wayfinding; Design Standards

Planning staff seek additional information regarding lighting. Light fixture cutsheets, confirming that lights attached to the proposed control building are full cutoff must be provided. Staff also seek clarity regarding the degree of change to lighting in the Back Cove areas impacted, and whether additional trail or athletic field lighting may be beneficial to include in the project. The Parks Department requested that the Department of Public Works install two pole lights in the project area, but more lighting may be advisable around the building or along the Back Cove trail. Staff seek Planning Board input regarding any preferred lighting approach in addition to these pole lights.

Regarding the design of the proposed control building, the applicant seeks guidance from the Planning Board regarding the most appropriate color scheme and roof style (**Attachment E**).



Two elevations of the proposed buildings, in one of the available color / material schemes

VII. Next Steps

The proposed project is planned by the City, and is still under development as a design / build project. Planning staff anticipate that the project would next move to a public hearing, as more specific plans are developed. Plan revisions addressing the concerns identified above are expected prior to any public hearing and will be coordinated with the Department of Public Works and its consultants.

During the Planning Board workshop, staff ask the Planning Board to particularly consider the proposed landscape, lighting, and building design items highlighted above.

XIII. ATTACHMENTS

Report Attachments

1. Advanced Site Work Approval Letter
2. Consulting Civil Engineer Review Memo

Public Comment

PC1. 6/24/2019

Applicant's Submittals

- A. Project Summary
- B. Cover Letter & CSO Report
- C. Checklist
- D. Construction Management Materials
- E. Building Elevations & Materials
- F. Design Basis Report
- G. Financial Capacity Statement
- H. Right Title & Interest Materials
- I. Permits & Approvals
- J. Site Specifics & General Safety
- K. Site Plan Standards Narrative
- L. MDOT Public Process Certification
- M. Public Information Signage & Fact Sheet

Plans

- P1. Site Plan
- P2. Landscape Plan & Supplementary Materials
- P3. Erosion Control Plans & Details
- P4. CSO Tank Schematic
- P5. Storm Drain
- P6. Force Main
- P7. Conveyance Pipe
- P8. 60% Design Drawing Package
- P9. 60% Design Maintenance Building
- P10. Topographic Surveys



CITY OF PORTLAND
Planning & Urban Development
Christine Grimando, AICP, Director

April 8, 2020

Christopher Branch, Director
Department of Public Works
212 Canco Road, Portland, ME 04101

Owens McCullough
Sebago Technics, Inc.
75 John Roberts Road, Suite 4A
South Portland, ME 04106

Project Name: Back Cove CSO Storage Tank
Project ID: PL-000592-2019
Address: 244 Preble Street CBL: 027 C012001

Applicant: City of Portland Department of Public Works
Planner: Christian Roadman

Chris and Owens:

On April 8, 2020 the Portland Planning Authority approved your request for advanced site work at the above referenced site. Section 14-532(e)2 of the City's Land Use Code allows for authorization of advanced work when a Site Plan application is pending (provided the request is reasonable, time is imperative, and that the work will not compromise any aspect of the ensuing review process). This letter serves as written permission to commence with advanced site work prior to completion of review of the Level III Site Plan application (Project ID: PL-000592-2019). **This letter does not grant any necessary site plan, shoreland zoning, or floodplain development approvals required of your project.**

The approved advance site work is limited to actions outlined in your request dated March 20, 2020. Work shall be done in compliance with the Erosion and Sedimentation

Control Plans, the Construction Plan (Phase I: Mobilization and Site Preparation), and the General Safety Plan, submitted in conjunction with the full Level III Site Plan application currently in review. Approved advanced site work is limited to the following:

- Installation of perimeter safety fencing
- Installation of pedestrian controls
- Traffic control signage
- Mobilization and set up of the project office trailers and restrooms
- Mobilization of project equipment and materials
- Hook-up of temporary power
- Building construction entrances
- Earthwork related to establishing a construction laydown yard
- Site demolition and removals
- Establishing erosion controls
- Topsoil stripping
- Initial fill placement and rip rap armoring along Back Cove
- Initial excavation to elevation 8.0' in required areas

Authorization to begin site work does not indicate approval of any additional clearing or development activity beyond that identified above. If you need to make any modifications to the scope of work, you must submit a revised site plan to Planning and Urban Development for review and approval.

All site activity is expected to conform to current recommended site safety guidance, including minimum social distancing protocols due to ongoing COVID-19 concerns.

Prior to commencing site work, please contact Jodie Keene, Development Review Coordinator, at jkeene@portlandmaine.gov regarding a pre-construction meeting to discuss work schedule, required erosion and sedimentation controls, and other procedures.

Sincerely,

A handwritten signature in black ink, appearing to read 'Christine Grimando', with a stylized flourish at the end.

Christine Grimando, AICP
Director

TO:	Christian Roadman; Planner	DATE:	7/8/2020
FROM:	Michael Guethle, PE; Jan Wiegman, PE	PROJECT NO.:	20209A
SUBJECT:	PL-000592-2019 Level III Site Plan - BCSSC		

Wright-Pierce has reviewed the Master Development Plan Application information provided for the Back Cove South Storage Conduit (BCSSC) with a focus on stormwater management and site utilities. The proposed development is being completed as a design-build project. The project includes sewer and stormwater infrastructure construction, and construction of storage conduits to maximize the amount of combined sewerage treated in regulated rain events. The project will be completed in an area current used for recreation purposes (trails, multi-use field, other recreation), and will be replaced with similar uses.

Documents Reviewed by Wright-Pierce:

- Level III Site Plan application, uploaded May 14, 2020.
- Permitting Plans, dated (most recent) April 16, 2020, uploaded (most recent) May 14, 2020 .

Comments:

- 1) It is understood that several portions of the site application materials are related to civil design, and not all documents were fully evaluated and commented on. In general, the comments provided are related to the City's stormwater management requirements, site stabilization, grading, drainage, and utility connections. Major aspects of the project that are not commented on in this response include the following:
 - a. Structural elements, including structural elements of soils;
 - b. Temporary and permanent support of excavation;

- c. CSO storage conduit design, including the flow rates through the CSO storage basin, mechanical processes, electrical and instrumental systems, and architectural features.
 - d. Please also note the only drawings reviewed were in the 97-page PDF package titled “Back Cove South Storage Facility – 60% Design Submittal”, dated April 2020. Other design files are anticipated to predate this submission.
- 2) Level III Site Plan applications with the City of Portland must submit a stormwater plan pursuant to the regulations of MaineDEP Chapter 500 Stormwater Management Rules. This includes conformance with the Basic, General, and Flooding Standards (Ref: Technical Manual, Section 5. II. Applicability in Portland. C. a.; and Ref: City of Portland Code of Ordinances Sec. 14-526. Site Plan Standards, (b). 3. b.)
 - a. Basic Standard: Per the City’s Technical Manual *Portland Stormwater Management Standards and Maine Dep Chapter 500 Stormwater Management*, an Erosion & Sediment Control management plan, notes, and details per the Chapter 500 Rules must be provided to meet the Basic Standard.
 - i. The applicant has provided information regarding how the Basic Standard will be considered and implemented through the construction, including details and call-outs on proposed plans.
 - ii. Additional information is needed on the proposed riprap slope areas, as one uploaded site/grading plan calls for d₅₀ of 18”, and a detail calls for d₅₀ of 12”.
 - iii. Erosion and sedimentation barriers should be installed in a double-layer between protected resources and development areas. Perimeter erosion and sedimentation control details were provided on the plans, and a detail or notes showing a double-layer of perimeter erosion control with appropriate spacing between BMPs should also be provided.
 - iv. Additional information on inspection, maintenance, and housekeeping for site best management practices is needed.

- b. Flooding Standard and General Standard: The applicant has provided limited information about adherence to, or potential waivers or exceptions from, the Flooding Standard or General Standard. As the project is a Level III site plan, it is our understanding adherence to the Flooding Standard and General Standard are required as referenced in Land Use Code Chapter 14-526 (b) 3 a.
 - i. The limited amount of non-roof impervious area being replaced may allow for the amount of proposed impacts to be further minimized through adherence to the City of Portland's Redevelopment standard. Many portions of the site may be considered "maintenance and restoration" based on DEP definitions.
 - ii. The City and reviewer are open to having a discussion to identify next steps for surface runoff treatment as may be necessary.
- 3) Grading and Drainage
- a. Street details should match minimum thicknesses based on City and MaineDOT standards for each road classification.
 - b. The applicant has provided information for several permit approvals, including Army Corps and MaineDEP NRPA applications. A Maine Construction General Permit may also be required for the project.
 - c. Grading and Drainage should indicate minimum cross-slopes for the roadway.
 - d. Tidal valves may be warranted at the underdrain pipe outlet.
 - e. A restoration plan for opening the facility to the public should be established, incorporating timeframes for allowing sodding and seeding to be exposed to public use.
- 4) Utility Connections
- a. Ability to serve letters have not been provided for utilities impacted by the proposed project. It is appreciated that some utilities may have minimal impacts. The applicant has indicated that ability to serve letters will be submitted to Planning upon receipt.

- b. Additional detailing may be necessary to connect the drinking water fountain to the existing condition.
- c. Catch basins are proposed with 3-foot sumps, and typical drainage and sewer details meet City Standard. No further action necessary.
- d. Some portions of the project are connecting drainage pipes with larger diameters to down-slope pipes with smaller diameters. It is appreciated that this is likely due to permitting constraints and impact minimizations. Typically, e-mail, or otherwise written, confirmation from the Department of Public Works accepting this connection is requested to confirm that this connection is appropriate. Whereas Public Works is the applicant, a statement from the owner indicating acceptance of this condition would be appropriate.



Planning Board Project Summary

Portland Department of Public Works – Water Resources

To: Christian Roadman and the Planning Board

From: Brad Roland, DPW-Water Resources and Owens McCullough, STI

Date: July 8, 2020

Re: Back Cove South Storage Facility (BCSSF) – Summary

The City of Portland is working under an Administrative Consent Agreement with the State of Maine Department of Environmental Protection (DEP) to abate combined sewer overflows (CSOs) in the City. As part of the original 1993 CSO Long Term Control Plan (LTCP) and the updated 2013 CSO Tier III LTCP, the concept for the Back Cove South Storage Facility (BCSSF) was defined. Per the Preliminary Design Report (May 2015), the BCSSF is expected to provide 3.5 million gallons (MG) of storage and reduce annual overflow volume from 150 MG to 18 MG.

In 2015, the City of Portland initiated the design process for the BCSSF. As part of the overall planning process, the City conducted a Business Case Evaluation (BCE) of viable BCSSF alternatives. The BCE was completed in January 2018 and identified a preferred alternative location to meet project objectives. This alternate recognized not only the infrastructure costs but the social and economic benefits, and avoided impacts of a large infrastructure project to the traveling public.

Based on the results of the BCE, the selected alternative was to move forward with design and construction of a 3.5 million gallon (MG) off-line CSO storage facility in Back Cove Park (commonly known as the Preble Street soccer field). The facility will collect and store the initial discharge from CSOs 016, 017, and 018. Annually these three CSOs account for 50% of the City's total CSO volume.

The goal of the project is to intercept the CSO overflows at diversion structures (downstream of the CSO regulators and upstream of the discharge location in Back Cove) and convey them to an off-line storage tank. Pumps in the BCSSF, and a force main, will convey stored overflow to the existing sewer system in Marginal Way.

The City completed preliminary planning and design (Indicative Planning) of the BCSSF with bidding of the project in 2019. This project is a design/ build effort with the successful team of Sargent Corporation and Woodard & Curran being awarded the contract in August of 2019. Sargent mobilized to the site in May and has begun preliminary clearing in preparation of work.

Key aspects of the project:

1. Installation of a 3.5-million-gallon underground storage facility to abate CSO's and thus improving the water quality of Back Cove and Casco Bay.
2. The existing soccer field, park and trail will be raised by 2 to 3 feet to eliminate current flooding issues. This will provide for modest sea level rise and flooding resiliency and accommodate keeping excavated urban fill on the project site as directed by the MDEP.
3. The reconstruction of the existing soccer field will include new irrigation and drainage systems. The field is to be sodded for expediency of re-use.
4. A utility building will be installed onsite which will provide for the following: 1) a meter room for Public Work and Parks Dept water meters. 2). a utility room for the management of the irrigation and parks lighting systems 3). the electrical controls room for the pumps and equipment associated with the operations of the BCSSF and 4). a room dedicated to the vent required to off-gas the underground tank during filling. Architectural plans and color options are provided.
5. The replacement of the urban garden has begun with meetings between the landscape architect and Jeff Tarling, the city's arborist. Preliminary sketches are provided.
6. The City and contractor have begun the process of working with the Maine Dept of Transportation for the placement of sewer, force main and storm drain under I-295 Exit 7 Franklin Street to Marginal Way.
7. The City is obligated to complete the project no later than December 31, 2021 by the MDEP. Construction involving the stripping of soils has begun with the majority of heavy work beginning in August 2020 and continuing through 2021.
8. The Back Cove trail system will be relocated as needed during construction to maintain trail continuity throughout construction. An example is provided.
9. Construction fencing will be installed to separate construction activities from the public using the trail network.
10. Project costs are expected to be approximately \$40 million dollars and funded through the State Revolving Fund loan established for projects of this type.



May 17, 2019

Ms. Barbara Barhydt
Development Review Services Manager
City of Portland
389 Congress Street
Portland, Maine 04101

**Application for Level III – Site Plan Permit
Back Cove South Storage Facility (BCSSF)**

Dear Ms. Barhydt,

On behalf of the City of Portland Public Works Department, we have prepared a Level III – Site Plan application for review and approval for the proposed Back Cove South Storage Facility. The site is located at 244 Preble Street. As you are familiar, the City of Portland is working under an Administrative Consent Agreement with the State of Maine Department of Environmental Protection (DEP) to abate combined sewer overflows (CSOs) in the City. As part of the original 1993 LTCP and the updated 2013 CSO Tier III Long Term Control Plan (LTCP), the concept for the Back Cove South Storage Facility (BCSSF) was defined. Per the Preliminary Design Report (May 2015), the BCSSF is expected to provide 3.5 million gallons (MG) of storage and reduce annual overflow volume from 150 MG to 18 MG.

In 2015, the City of Portland initiated the design process for the BCSSF. As part of the overall planning process, the City conducted a Business Case Evaluation (BCE) of viable BCSSF alternatives. The BCE was completed in January 2018 and identified a preferred alternative to meet project objectives. This alternate recognized not only the infrastructure costs but the socially economic benefits and avoided impacts of a large infrastructure project.

Based on the results of the BCE, the selected alternative was to move forward with design and construction of a 3.5 million gallon (MG) off-line CSO storage tank in Back Cove Park (commonly known as the Preble Street soccer field).

The City has completed preliminary planning and design (Indicative Planning) of the BCSSF for the off-line storage of 3.5 MG of CSO from CSOs 016, 017, and 018. Overflows from the outfalls downstream of the regulators and upstream of the discharge location shall be intercepted at diversion structures and conveyed to an off-line storage tank. Pumps in the BCSSF, and a force main, will convey stored overflow to the existing sewer system in Marginal Way.

The project will not only address CSO's, but will also include a sea level rise resiliency component to elevate the soccer fields and path by approximately 2 to 3 feet in elevation eliminate current flooding of the soccer field/park area and to accommodate modest future sea level rise. This also has the added benefit of keeping excavated urban fill on the project site as part of the tank project.

Key aspects of the project:

1. 3.5-million-gallon underground storage facility to abate CSO's improving water quality.
2. Raise existing soccer field, park and trail by 2 to 3 feet for sea level rise and flooding resiliency and to accommodate keeping excavated urban fill on the project site.
3. Reconstruct the existing soccer field include irrigation system. Field to be sodded for expediency of re-use.
4. Project is being procured by the City through a Design-Build Process. This process has been initiated.
5. The City is obligated to complete the project not later than December 31, 2020 by the regulatory agencies. Construction is expected to start in the late summer of 2019 and be completed by the end of 2020.
6. The Back Cove trail system will be relocated as needed during construction to maintain trail continuity throughout construction.
7. Construction fencing will be installed to separate construction activities from the public using the trail network.
8. Project costs are expected to be approximately \$40 million dollars and funded through the State Revolving Fund loan established for projects of this type.

We look forward to working with you and your staff to permit this project. As you consider the application material, please contact us should you have any questions.

Sincerely,

SEBAGO TECHNICS, INC.

A handwritten signature in black ink, appearing to read "Owens A. McCullough". The signature is fluid and cursive, with the first name "Owens" being more prominent.

Owens A. McCullough, P.E., LEED-AP
Senior Vice President, Strategy and Client Development

OAM:llg



Back Cove South CSO Storage Conduit and Tank Alternatives

Business Case Evaluation Report of Findings

Prepared for:

City of Portland Department of Public Works

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January 9, 2018

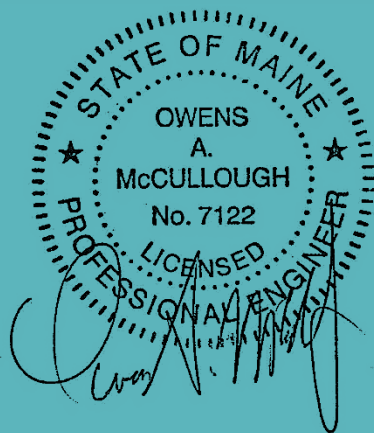


Table of Contents

Executive Summary	4
Introduction.....	9
Alternatives.....	9
Engineering Analysis.....	11
CSO Modeling.....	11
Geotechnical Review of Site Conditions	12
Estimated Construction and Annual O&M Costs and Schedule	13
Economic Analysis	14
Traffic Impacts.....	15
Business Impacts.....	16
Recreation Impacts	17
Field Revenue	18
Recreational Use Value	18
Impacts Not Quantified	19
Economic Assumptions	19
Traffic Assumptions	19
Business Assumptions.....	20
Recreation Assumptions.....	20
Economic Evaluation	21
Results	21
Traffic	22
Business	22
Recreation.....	23
Total	23
Doherty Field Evaluation	24
Field Revenue.....	24
Recreational Use Value.....	24
Doherty Field Results.....	25
References	27
Appendix A – Initial Screening of Alternatives	28
Appendix B – Location and Features of Alternatives	30
Appendix C - Transportation.....	31
Appendix D – Economic Development	33
Appendix E – Marginal Way Property Owners	35

Appendix F – Parks, Recreation, & Facilities37

Attachments:

Opinion of Probable Costs: Alternates 2 ,2a and 3

Alternatives Assessment Graphic

Figures

Figure 1: Back Cove Park	18
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Tables

Table E1: Estimated Construction and Annual O&M Costs and Schedule ⁽¹⁾	6
Table 1: Estimated Construction and Annual O&M Costs and Schedule ⁽¹⁾	14
Table 2: Estimated Revenue Impacts by Business Type and Work Zone.....	17
Table 3: Results for Traffic Analysis (2017\$).....	22
Table 4: Results for Business Analysis (2017\$).....	22
Table 5: Result of Recreation Analysis (2017\$).....	23
Table 6: Result of Impact Analysis (2017\$)	23
Table 7: Net Present Value of Alternatives (2017\$)	24
Table 8. Doherty Field Benefits	25

Executive Summary

The City of Portland and the Portland Water District (PWD) are working under an Administrative Consent Agreement with the State of Maine Department of Environmental Protection (DEP) to abate combined sewer overflows (CSOs) in Portland. As part of the 2013 CSO Tier III Long Term Control Plan (LTCP), the concept for the Back Cove South Storage Facility (BCSSF) was defined. Per the Preliminary Design Report (May 2015), the BCSSF is expected to provide 3.5 million gallons (MG) of storage and reduce annual overflow volume from 150 MG to 18 MG.

In 2015, the City of Portland initiated the design process for the BCSSF. Because of higher than anticipated costs for the selected alternative during that design effort, the City of Portland retained the Sebago Technics, Inc./AECOM (STI/AECOM) Team in 2017 to conduct a Business Case Evaluation (BCE) of viable BCSSF alternatives, which included reevaluation of alternatives previously considered and identification of new alternatives. The BCE provides a framework for evaluating potential alternatives to meet project objectives. This BCE goes beyond typical financial considerations to include triple bottom line elements (economic, social, and environmental) for a more comprehensive analysis.

A comprehensive set of 12 alternatives was evaluated during the initial BCE screening process. The following five alternatives were carried forward for further evaluation:

- 1 **Marginal Way storage conduit:** Construct a linear conduit (12' by 10' maximum size) under Marginal Way between Preble Street and Franklin Street and a 60-inch diameter conduit between Franklin Street and Plowman Street for 3.5 MG of storage. This alternative was designed to a 90 percent level by Wright-Pierce, the consulting engineering firm previously hired to prepare the BCSSF design.
2. **2.5 MG storage tank in Back Cove Park for CSO 017 and High-Level East Marginal Way conduit for CSO 018:** Construct a 2.5MG tank in Back Cove Park for CSO 017 and a shallow 84-inch diameter conduit along Marginal Way to the east of Franklin Street to address CSO 018 (1 MG storage). The Franklin St. Pump Station (FSPS) would remain in service. After review of hydraulic requirements and the vertical alignment for this alternative it was determined that the crossing at Tukey's Bridge would require micro tunneling to avoid undermining the friction piles at the bridge. The alternative also includes a value added 72-inch storm drain outlet to CSO-018 that would replace the existing outlet pipe.
- 2a. **2.5 MG storage tank in Back Cove Park for CSO 017 and Low-Level East Marginal Way conduit for CSO 018:** Construct a 2.5 MG tank in Back Cove Park for CSO 017 and 84-inch diameter deep conduit along Marginal Way to the east of Franklin Street to address CSO 018 (1MG storage). Micro tunneling would be required at Tukey's Bridge to avoid undermining the friction piles at the bridge. The tank will be dewatered through a new force main from the tank to Franklin Street. The alternative also includes a value added 72-inch storm drain outlet to CSO-018 that would replace the existing outlet pipe. The FSPS would be abandoned under this alternative.

3. **3.5 MG tank in Back Cove Park for CSOs 017 and 018:** Construct a 3.5 MG tank in Back Cove Park for CSO 17 and CSO 18. The tank would be dewatered through a new force main from the tank to Franklin Street. The alternative also includes a value added 72-inch storm drain outlet to CSO-018 that would replace the existing outlet pipe. Under this alternative, impacts to Marginal Way would be avoided since construction does not impact Marginal Way other than replacement of the diversion structure at Franklin Street and Marginal Way. The on-ramp to I-295 would be impacted due to the replacement of the deteriorating 72-inch outlet to CSO-018¹.
4. **Expand Franklin Street Pump Station for relocation of CSO 018:** CSO 017 would be controlled via a Preble Street to Franklin Street conduit or Back Cove tank; excess flow above the capacity of the PWD's Northeast PS would be pumped and either (a) stored (in the vicinity of CSO 020) or (b) treated by an excess wet weather treatment facility at the PWD's East End Wastewater Treatment Plant (EEWTP). An infrastructure cost estimate was not completed for this alternative as it was determined not to be viable due to the extent of work that would be required in the vicinity of CSO 020 or at the EEWTP.

Engineering analyses were completed as necessary to assess the five alternatives listed above. Analyses consisted of developing preliminary layouts, modeling CSOs, preliminary geotechnical review, and estimating costs for the alternatives.

The geotechnical review determined that the subsurface soils consist of fill underlain by very soft to soft silt and then very soft to soft clay to a depth of 50 ft. Below 50 ft. the subsurface conditions consist of medium dense to very dense silty sand extending to a depth of 65 ft. As a result, additional design considerations were identified for the storage tanks being considered for Alternatives 2, 2a, and 3. These considerations, which impact the cost of the alternatives, would involve installing the excavation support system with intermediate bracing and extending it below the soft clay and into the dense silty sand layer below.

The construction costs, annual operation and maintenance (O&M) costs, and construction durations were estimated for each alternative (Table E1). Table E1 presents the total estimated construction duration in months, as well as the number of months for each year of the construction schedule. Because the design for Alternative 1 has been advanced through previous efforts, it was anticipated that construction activities could begin in March 2018. Construction activities for the other alternatives were assumed to begin in January 2019. Depending on the project delivery mechanism selected, it may be possible to accelerate the start of construction for the selected alternative.

¹ It should be noted that this value-added improvement was not part of the original Marginal Way Linear Conduit project and therefore would have needed to be included in that project to address this outlet pipe.

Table E1: Estimated Construction and Annual O&M Costs and Schedule ⁽¹⁾

Alternative	Total	2018	2019	2020
Alternative 1 - Rolling Closure				
Duration (months)	16	10	6	0
Construction Cost	\$30,927,000	\$19,329,000	\$11,598,000	\$0
Annual O&M	\$25,000			
Present Value (3% discount rate)	\$30,022,000			
Present Value (7% discount rate)	\$28,414,000			
Alternative 1 – Compressed Lanes				
Duration (months)	24	10	12	2
Construction Cost	\$32,224,000	\$13,427,000	\$16,112,000	\$2,685,000
Annual O&M	\$25,000			
Present Value (3% discount rate)	\$30,981,000			
Present Value (7% discount rate)	\$29,012,000			
Alternative 2				
Duration (months)	12	0	12	0
Construction Cost	\$28,099,000	\$0	\$28,099,000	\$0
Annual O&M	\$120,000			
Present Value (3% discount rate)	\$28,042,000			
Present Value (7% discount rate)	\$25,597,000			
Alternative 2a				
Duration (months)	12	0	12	0
Construction Cost	\$27,180,000	\$0	\$27,180,000	\$0
Annual O&M	\$60,000			
Present Value (3% discount rate)	\$26,398,000			
Present Value (7% discount rate)	\$24,267,000			
Alternative 3				
Duration (months)	12	0	12	0
Construction Cost	\$24,262,000	\$0	\$24,262,000	\$0
Annual O&M	\$110,000			
Present Value (3% discount rate)	\$24,295,000			
Present Value (7% discount rate)	\$22,158,000			

(1) Construction costs were completed and based on the Wright-Pierce estimates completed in September 2016.

Notes: Costs have not been escalated to mid-point of construction. Values rounded to the nearest thousand.

Construction of the alternatives could result in economic, social, and/or environmental impacts. These impacts were identified, monetized, and incorporated into the BCE. Three primary areas of impacts were identified for evaluation in the economic analysis:

- Impacts to traffic along Marginal Way
- Impacts to businesses located along Marginal Way
- Impacts to recreational use of Back Cove Park

Construction along Marginal Way would impact traffic in the area, increasing congestion, resulting in detours, and thus increasing travel times and vehicle miles traveled (VMT). To evaluate the potential traffic impacts from the construction, the cost of increased travel time and VMT were estimated. For Alternative 1, two scenarios (rolling closure and compressed lanes) were developed to capture the impacts of different construction approaches along Marginal Way between Preble Street and Franklin Street.

Construction along Marginal Way would affect traffic flows, and thus would impact the businesses along Marginal Way. A portion of customers that frequent the business establishments along Marginal Way may go there less often, or switch to a different establishment because of reduced accessibility during the period of construction. This would result in lost revenue for the businesses along Marginal Way.

Construction of storage tanks in Back Cove Park would impact use of the recreation facilities at the park and the users of the park. In particular, construction activities would require the temporary closure of the Preble Street multi-use field. The impacts were estimated for loss of field revenue and loss of recreational experience. It is assumed that the Back Cove Trail would remain open during any construction activities impacting Back Cove Park.

Table E2 provides the results of the traffic, business, and recreation impacts in 2017 dollars, using both 7 percent and 3 percent discount rates. Alternative 1 - Rolling Closure and Alternative 1 - Compressed Lanes have the highest impacts among the alternatives, mainly driven by impacts to businesses. Alternative 3 has the lowest impacts, as there are no traffic or business impacts projected for this alternative.

Table E2: Result of Impact Analysis (2017\$)

Alternative	Traffic Impacts	Business Impacts	Recreation Impacts	Total
7% Discount Rate				
Alt. 1 - Rolling Closure	-\$2,165,000	-\$13,577,000	\$0	-\$15,742,000
Alt. 1 - Compressed Lanes	-\$3,561,000	-\$8,173,000	\$0	-\$11,734,000
Alternative 2	\$0	-\$2,580,000	-\$195,000	-\$2,775,000
Alternative 2A	\$0	-\$2,580,000	-\$195,000	-\$2,775,000
Alternative 3	\$0	\$0	-\$195,000	-\$195,000
3% Discount Rate				
Alt. 1 - Rolling Closure	-\$2,249,000	-\$14,126,000	\$0	-\$16,375,000
Alt. 1 - Compressed Lanes	-\$3,722,000	-\$8,620,000	\$0	-\$12,342,000
Alternative 2	\$0	-\$2,784,000	-\$214,000	-\$2,998,000
Alternative 2A	\$0	-\$2,784,000	-\$214,000	-\$2,998,000
Alternative 3	\$0	\$0	-\$214,000	-\$214,000

Note: Values rounded to the nearest thousand dollars

The BCE was formulated as a cost-effectiveness analysis, which identifies the least-cost alternative to achieve a specific objective. The total costs are calculated by adding the construction and O&M costs to the monetized impacts of the alternatives. The net present value (NPV) was then estimated to compare the alternatives. Table E3 provides the NPV of each alternative, which combines the cost analysis and the impact analysis. As shown in the table, Alternative 3 has the lowest NPV (least negative), indicating that it is the least-cost alternative to complete the BCSSF. Alternative 1 - Rolling Closure is the highest-cost alternative.

Table E3: Net Present Value of Alternatives (2017\$)

Alternative	7% Discount			3% Discount		
	Costs	Impacts	Net Present Value	Costs	Impacts	Net Present Value
Alt. 1 - Rolling Closure	-\$28,414,000	-\$15,742,000	-\$44,156,000	-\$30,022,000	-\$16,375,000	-\$46,397,000
Alt. 1 - Compressed Lanes	-\$29,012,000	-\$11,734,000	-\$40,746,000	-\$30,981,000	-\$12,342,000	-\$43,323,000
Alternative 2	-\$25,597,000	-\$2,775,000	-\$28,372,000	-\$28,042,000	-\$2,998,000	-\$31,040,000
Alternative 2A	-\$24,267,000	-\$2,775,000	-\$27,042,000	-\$26,398,000	-\$2,998,000	-\$29,396,000
Alternative 3	-\$22,158,000	-\$195,000	-\$22,353,000	-\$24,295,000	-\$214,000	-\$24,509,000

Note: Values rounded to the nearest thousand dollars

Based on the results of the BCE, it is recommended that the City of Portland move forward with design and construction of Alternative 3. In addition to being the lowest cost alternative, Alternative 3 focuses future O&M activities to one facility, which would be easier to manage, inspect, and maintain. In addition, Alternative 3 would avoid any potential impacts to traffic and businesses along Marginal Way.

Introduction

The City of Portland and the Portland Water District (PWD) are working under an Administrative Consent Agreement with the State of Maine Department of Environmental Protection (DEP) to abate combined sewer overflows (CSOs) in Portland. As part of the 2013 CSO Tier III Long Term Control Plan (LTCP), the concept for the Back Cove South Storage Facility (BCSSF) was defined. Per the Preliminary Design Report (May 2015), the BCSSF is expected to provide 3.5 million gallons (MG) of storage and reduce annual overflow volume from 150 MG to 18 MG.

In 2015, the City of Portland initiated the design process for the BCSSF. The design focused on a linear conduit storage project located under Marginal Way. Due to geotechnical considerations and the presence of existing infrastructure, the design required micro-tunneling near the Tukey's Bridge (I-295) abutments. Upon completion of the 60 percent and 90 percent design of the project, cost assessments suggested the project cost would be in excess of \$30 million dollars which exceeded the original planned budget from the LTCP. As a result, the City of Portland determined it was appropriate to conduct an alternatives assessment not only focused on infrastructure costs but also on the socio-economic and environmental impacts of the as-designed project and alternatives.

The City of Portland retained the Sebago Technics, Inc./AECOM (STI/AECOM) Team to conduct a Business Case Evaluation (BCE) for the BCSSF including evaluation of design alternatives. The BCE provides a framework for evaluating potential alternatives to meet project objectives. This BCE goes beyond typical financial considerations to include triple bottom line elements (economic, social, and environmental) for a more comprehensive analysis.

Alternatives

A comprehensive set of alternatives was evaluated during the initial BCE screening process. Twelve alternatives were reviewed, evaluated and discussed with the City during meetings on March 18 and May 8, 2017. In collaboration with the City, the twelve alternatives were narrowed down to five for further consideration. The alternatives evaluated during the initial screening process, and whether each was carried forward for further consideration or set aside, is presented in Appendix A.

Five alternatives were carried forward for further consideration. The alternatives were renumbered for clarity and the descriptions refined as the study progressed. The following provides the refined descriptions of the alternatives (refer to Appendix B for figure showing the locations and features of the alternatives):

- 1 **Marginal Way storage conduit:** Construct a linear conduit (12' by 10' maximum size) under Marginal Way between Preble Street and Franklin Street and a 60-inch diameter conduit between Franklin Street and Plowman Street for 3.5 MG of storage. This alternative was designed to a 90 percent level by Wright-Pierce, the consulting engineering firm previously hired to prepare the BCSSF design.

- 2. 2.5 MG storage tank in Back Cove Park for CSO 017 and High-Level East Marginal Way conduit for CSO 018:** Construct a 2.5MG tank in Back Cove Park for CSO 017 and a shallow 84-inch diameter conduit along Marginal Way to the east of Franklin Street to address CSO 018 (1 MG storage). The Franklin St. Pump Station (FSPS) would remain in service. After review of hydraulic requirements and the vertical alignment for this alternative it was determined that the crossing at Tukey's Bridge would require micro tunneling to avoid undermining the friction piles at the bridge. The alternative also includes a value added 72-inch storm drain outlet to CSO-018 that would replace the existing outlet pipe.
- 2a. 2.5 MG storage tank in Back Cove Park for CSO 017 and Low-Level East Marginal Way conduit for CSO 018:** Construct a 2.5 MG tank in Back Cove Park for CSO 017 and 84-inch diameter deep conduit along Marginal Way to the east of Franklin Street to address CSO 018 (1MG storage). Micro tunneling would be required at Tukey's Bridge to avoid undermining the friction piles at the bridge. The tank will be dewatered through a new force main from the tank to Franklin Street. The alternative also includes a value added 72-inch storm drain outlet to CSO-018 that would replace the existing outlet pipe. The FSPS would be abandoned under this alternative.
- 3. 3.5 MG tank in Back Cove Park for CSOs 017 and 018:** Construct a 3.5 MG tank in Back Cove Park for CSO 17 and CSO 18. The tank would be dewatered through a new force main from the tank to Franklin Street. The alternative also includes a value added 72-inch storm drain outlet to CSO-018 that would replace the existing outlet pipe. Under this alternative, impacts to Marginal Way would be avoided since construction does not impact Marginal Way other than replacement of the diversion structure at Franklin Street and Marginal Way. The on-ramp to I-295 would be impacted due to the replacement of the deteriorating 72-inch outlet to CSO-018².
- 4. Expand Franklin Street Pump Station for relocation of CSO 018:** CSO 017 would be controlled via a Preble Street to Franklin Street conduit or Back Cove tank; excess flow above the capacity of the PWD's Northeast PS would be pumped and either (a) stored (in the vicinity of CSO 020) or (b) treated by an excess wet weather treatment facility at the PWD's East End Wastewater Treatment Plant (EEWTP). An infrastructure cost estimate was not completed for this alternative as it was determined not to be viable due to the extent of work that would be required in the vicinity of CSO 020 or at the EEWTP.

Alternative 1 would involve constructing a large conduit under Marginal Way, which would impact vehicle traffic and businesses during the construction period. During evaluation of the alternatives, two scenarios (rolling closure and compressed lanes) were developed to capture the impacts of different construction approaches along Marginal Way between Preble Street and Franklin Street. Marginal Way between Franklin and Plowman Streets would also be impacted during construction by closing a lane and creating one-way traffic flow to serve the businesses.

Rolling Closure Scenario

The Rolling Closure Scenario would close Marginal Way in sections as the construction activities in the work zone progress between Preble and Franklin Streets (refer to the figure in

² It should be noted that this value-added improvement was not part of the original Marginal Way Linear Conduit project and therefore would have needed to be included in that project to address this outlet pipe.

Appendix B for the location of roads referenced in the report). It is anticipated that construction activities in the work zone would completely close that portion of Marginal Way to traffic. The work zone is anticipated to extend approximately one third of the distance of the route (e.g., Preble to Chestnut, Chestnut to halfway to Franklin, and from halfway to Franklin to Franklin Street). For businesses adjacent to the work zone, traffic would have the ability to access their business through secondary entrances. There would be open traffic conditions (normal traffic flow) in the non-work zone portion of Marginal Way. The work zone portion that is totally closed would have an impact on adjacent businesses, and it is also anticipated that businesses in the non-work zone portion would also see reduced business due to the construction activities along Marginal Way.

Compressed Lanes Scenario

The Compressed Lanes Scenario would keep two lanes open (one in each direction) along Marginal Way between Preble and Franklin Streets during construction. Construction activities in the work zone would take place along one edge of the roadway while the traffic lanes would be located along the other edge of the roadway. This would require that the traffic lanes in the work zone be compressed to the minimal width allowed and there would be no center turning lane. The work zone is anticipated to extend approximately one third of the distance of the route (e.g., Preble to Chestnut, Chestnut to halfway to Franklin, and from halfway to Franklin to Franklin Street) and to progress along the route with the construction activities. There would be open traffic conditions in the non-work zone portion of Marginal Way. There may be short-term closures of Marginal Way for certain construction activities. It is anticipated that businesses would see reduced business in both the work zone and non-work zone due to construction activities. The Compressed Lanes Scenario was included in the 90 percent design documents completed by Wright-Pierce. For the portion of Marginal Way between Franklin Street and Plowman Street, a one-way traffic loop was anticipated, using Anderson and Fox Streets. Each scenario is anticipated to have different impacts to traffic and businesses. While the Rolling Closure Scenario would have a greater impact to traffic, the duration of construction for the Compressed Lanes Scenario would be longer. The two traffic scenarios discussed above were only considered for Alternative 1.

Engineering Analysis

Engineering analyses were completed as necessary to assess the five alternatives listed above. Analyses consisted of developing preliminary layouts, modeling CSOs, preliminary geotechnical review, and providing opinions of costs for the alternatives.

CSO Modeling

Wright-Pierce provided the InfoSWMM model to the City of Portland for use during the BCE. The model was used “as-provided” for alternative review/analysis for sewer separation and changes to FSPS. It was assumed that the sewer separation within the model for Phase 1 and portions of Phase 2 was included in the model per the Wright-Pierce report “Separation and Green Projects for the Back Cove South Storage Conduit”, November 2014.

The Team reviewed the existing InfoSWMM model to confirm its representation of Alternative 1 and Phase 1 and Phase 2 sewer separation. The model was also converted to PCSWMM and the model results were confirmed to be the same as the InfoSWMM results following conversion. Model runs were completed for the 1-inch design storm and a larger August 1963 storm, which was 3.2 inches of rainfall depth over 32 hours with a peak hour intensity of 0.64 inches per hour.

Alternative 4 would convert the FSPS to handle dry and wet weather flow. This would re-locate CSO 018 overflows to the vicinity of CSO 020 or to the EEWTP. This alternative required use of the collection system model for analysis. Analysis included review of model results with a free discharge at the FSPS under existing conditions for both the 1-inch and August 1963 storm events. The model results indicated that the overflow volume at CSO 017 would decrease, but this decrease was off-set by an increase in overflow volume at CSO 018. The more significant finding was the magnitude of peak flow increase at the FSPS. Peak flow was predicted to increase from 10 to 15 MGD for the 1-inch and August storms, respectively, to 25 to 31 MGD for the same two storms. This increase in peak flow, on the order of 15 MGD, would require upgrading the pump station at a cost in excess of \$6M. The cost of upgrading the FSPS would be a cost premium over the cost of the storage alternatives. In addition to the capital cost of the pump station upgrade, there would be increased O&M cost and increased risk due to potential pump failure during a storm. This alternative would also require construction remote from CSO 018, (for storage or treatment at or near the EEWTP). Construction at an additional location (at or near the EEWTP) would further increase costs. As a result of these issues, Alternative 4 was not considered further in the BCE.

Based on discussions with the City, the impact of Phase 1 (and Phase 2) sewer separation was evaluated with the collection system model. Phase 1 sewer separation covers approximately 121 acres and Phase 2 sewer separation approximately 65 acres. The model results indicated about a 10 percent reduction in volume due to Phase 1 sewer separation and an additional 5 percent reduction due to Phase 2 sewer separation. Additional sewer separation, beyond the requirements of the LTCP, was not evaluated as the model results for Phase 1 and Phase 2 separation did not suggest that further sewer separation would be a cost-effective way to meet CSO reduction requirements.

Geotechnical Review of Site Conditions

Based on an existing nearby boring, the subsurface soils consist of fill underlain by very soft to soft silt and then very soft to soft clay to a depth of 50 ft. Below 50 ft. the subsurface conditions consist of medium dense to very dense silty sand extending to a depth of 65 ft.

The storage tank considered for Alternative 3 is estimated to be 250 feet by 150 feet in plan with the bottom of the tank extending 30 to 35 feet below grade including foundation bedding. The storage tanks for Alternatives 2 and 2a would have a smaller footprint but with a similar tank depth.

Based on the above information, the following considerations were discussed with S.W. Cole during this BCE, and would need to be explored further during preliminary and final design of the storage tank:

- Excavation support system for the excavation requiring an intermediate bracing system as a form of ground anchors/tie backs. Due to the soft soils within the top 50 ft., the ground anchors should be installed at 45 degrees from the horizontal and installed in the dense silty sand layer below the soft clay.

- Basal stability of very soft to soft clay during excavation. When the excavation reaches the bottom in soft clay, there could be potential for basal instability of soft clay soil heaving upward inside the excavation. This can be remedied by longer sheet pile installed below the soft clay and into the dense silty sand layer (added depth of sheet piles).
- Dewatering is likely due to the expected depth of groundwater, proximity to Back Cove and depth below sea level.
- Shallow ground treatment at the tank foundation level may be required due to the very soft nature of soils at and below the excavation level.
- Due to high groundwater level, tie-down ground anchors or other suitable means would be needed to overcome the buoyancy and flotation of the tank.
- The storage tank should be located a minimum of 100 feet from I-295.
 - The tank is planned to be located below the existing soccer field and situated to accommodate the tank dimensions while maintaining at least a 100-foot setback from I-295 fill slope. This is expected to avoid the potential of undermining the slope and creating instability of the embankment.
 - The excavated materials (pending environmental testing) may be suitable for general fills to elevate the finish grade of the soccer field, which would address sea level rise vulnerability.
 - Depending on the alternative, the tank would accommodate between 2.5 million gallons and 3.5 million gallons of CSO storage.

Estimated Construction and Annual O&M Costs and Schedule

The construction costs, annual operation and maintenance (O&M) costs, and construction durations were estimated for each alternative (Table 1). The table presents the total estimated construction duration in months, as well as the number of months for each year of the construction schedule. Because the design for Alternative 1 has been advanced through previous efforts, it was assumed that construction activities could begin in March 2018. Construction activities for the other alternatives were assumed for the cost analysis to begin in January 2019. Depending on the project delivery mechanism selected, it may be possible to accelerate the start of construction for the other alternatives.

The Alternative 1 construction costs were based upon the cost estimate prepared by Wright-Pierce at 90 percent design for the Marginal Way linear conduit project (September 2016). Costs for Alternatives 2, 2a and 3 were derived as part of this BCE assessment. Cost data used in the estimates took into consideration the routing of each alternative, general conditions, comparative unit costs, and general cost information from recent City of Portland bids, MDOT bids and general knowledge of the project area.

Annual O&M costs for the storage conduits include typical costs associated with labor for inspections and cleaning. Annual O&M costs for the storage tanks include costs associated with utilities (mainly electricity) and labor for inspections and maintenance.

Table 2: Estimated Construction and Annual O&M Costs and Schedule ⁽¹⁾

Alternative	Total	2018	2019	2020
Alternative 1 - Rolling Closure				
Duration (months)	16	10	6	0
Construction Cost	\$30,927,000	\$19,329,000	\$11,598,000	\$0
Annual O&M	\$25,000			
Present Value (3% discount rate)	\$30,022,000			
Present Value (7% discount rate)	\$28,414,000			
Alternative 1 – Compressed Lanes				
Duration (months)	24	10	12	2
Construction Cost	\$32,224,000	\$13,427,000	\$16,112,000	\$2,685,000
Annual O&M	\$25,000			
Present Value (3% discount rate)	\$30,981,000			
Present Value (7% discount rate)	\$29,012,000			
Alternative 2				
Duration (months)	12	0	12	0
Construction Cost	\$28,099,000	\$0	\$28,099,000	\$0
Annual O&M	\$120,000			
Present Value (3% discount rate)	\$28,042,000			
Present Value (7% discount rate)	\$25,597,000			
Alternative 2a				
Duration (months)	12	0	12	0
Construction Cost	\$27,180,000	\$0	\$27,180,000	\$0
Annual O&M	\$60,000			
Present Value (3% discount rate)	\$26,398,000			
Present Value (7% discount rate)	\$24,267,000			
Alternative 3				
Duration (months)	12	0	12	0
Construction Cost	\$24,262,000	\$0	\$24,262,000	\$0
Annual O&M	\$110,000			
Present Value (3% discount rate)	\$24,295,000			
Present Value (7% discount rate)	\$22,158,000			

1 Construction costs were completed and based on the Wright-Pierce estimates completed in September 2016.

Notes: Costs have not been escalated to mid-point of construction. Values rounded to the nearest thousand dollars

Economic Analysis

Following review of the alternatives, three primary areas of impacts were identified for evaluation in the economic analysis:

- Impacts to traffic along Marginal Way
- Impacts to businesses located along Marginal Way
- Impacts to recreational use of Back Cove Park

While there may be other impacts of implementing the alternatives, these are the ones that were considered to have a significant effect on the outcome of the analysis. Other impacts that were

considered include temporary loss of parking at Back Cove Park, temporary loss of parking at the Marginal Way Park and Ride, and environmental impacts from increased traffic delays during construction. The economic approach to each primary area of impact is described in the following sections.

Traffic Impacts

Construction along Marginal Way would impact traffic in the area, increasing congestion, resulting in detours, and thus increasing travel times and vehicle miles traveled (VMT). To evaluate the potential traffic impacts from the construction, the cost of increased travel time and VMT were estimated.

First, 2016 average annual daily traffic (AADT) on Marginal Way and adjacent streets was obtained from Maine Department of Transportation's (DOT's) Annual Traffic Count Report (Maine Department of Transportation, 2016). As fewer customers/clients would frequent the business establishments along Marginal Way during the period of construction, it is expected that vehicular traffic in the area would decline. To account for this in the traffic impact calculations, traffic along Marginal Way was split into through traffic and terminal traffic. As AADT was not broken down by through or terminal traffic, through traffic was estimated using AADT for Marginal Way and the surrounding streets. The remaining traffic was assumed to be terminal traffic, and was assumed to be equivalent to the customers/clients frequenting the establishments along Marginal Way. Traffic counts were split equally in both directions. Because information on customer counts for the establishments along Marginal Way was not available, the revenue of retail, restaurant, and gym properties was used as a proxy for customer counts. Office properties were excluded from this calculation as they have fewer customers and higher revenue per customer, and are therefore outliers that skew the average. The average weighted percentage in reduction in revenue was assumed to be equivalent to the percentage reduction in customer visits. Using this assumption, terminal traffic was reduced to reflect the decreased business activity during the construction period.

Additional VMT and travel time incurred by detouring vehicles was obtained using Google Maps by comparing travel times and distances under normal conditions, and then under a detour scenario with traffic. Under the Rolling Closure Scenario, it was assumed that all traffic would detour to Somerset Street. The difference in the length of detour and non-detour routes was used as the additional VMT incurred by each detouring vehicle. This was then multiplied by the estimated AADT to obtain the total daily VMT incurred from detouring. Total daily VMT incurred was multiplied by the auto operating cost per mile (AAA, 2017) to obtain the total daily auto operating cost incurred.

To calculate the motorist delay costs incurred under the Rolling Closure Scenario, travel times with a detour and heavy traffic and without a detour and normal traffic were sourced from Google Maps, the difference was multiplied by AADT on Marginal Way and then by the average auto occupancy, set at 1.39, per 2017 TIGER and INFRA BCA guidance (U.S. Department of Transportation, 2017) to obtain total delay time incurred by both motorists and passengers. Delay was also estimated for motorists that would normally be using Somerset Street and would experience longer travel times due to congestion. This estimated delay, obtained using Google Maps, was summed with detour delay. The resulting delay time was then converted to hours and multiplied by the value of time (\$14.36 in 2017\$) for all purposes for local travel, sourced from 2017 TIGER and INFRA BCA guidance.

A meeting was held on June 16, 2017 with the City of Portland and Department of Transportation to discuss the approach. Notes from the meeting are in Appendix C. It was recommended that the Team contact Portland Area Comprehensive Transportation System (PACTS) to discuss recent traffic modeling that has occurred near Marginal Way. Our Team attempted numerous times to engage PACTS, but the PACTS contact was not available to discuss the traffic modeling.

Business Impacts

Construction along Marginal Way would affect traffic flows, and thus would impact the businesses along Marginal Way. A portion of customers that frequent the business establishments along Marginal Way may go there less often, or switch to a different establishment because of reduced accessibility during the period of construction. This would result in lost revenue for the businesses along Marginal Way.

To estimate the potential loss of revenue to businesses along Marginal Way, businesses along the proposed construction area were identified. Then, square footage for the properties was obtained through the Portland Assessor's Office database (Portland Maine's Assessor's Office, 2017). Annual revenue per square foot was estimated for each business from publicly available information. Annual reports and industry research reports were used to estimate revenue for chains owned by publicly traded companies, and information on industry peers was used to estimate revenue for smaller, privately owned establishments. Annual revenue per square foot was then multiplied by the square footage of the respective establishment to estimate the total annual revenue. Where revenue per square foot was unavailable, revenue per location was estimated using publicly available information. Annual revenue for each establishment was converted to monthly revenue.

After the revenues were estimated, the reduction in revenue from construction activities was estimated. The impacts to the revenue of a particular business were estimated based on the type of business and whether the business was inside of the work zone or not.

The loss of revenue varied based on the type of business that was impacted. General public businesses (e.g. grocery store, restaurants, retail stores) would be anticipated to have the greatest percent loss of revenue because there are many other options for customers within the Portland area. However, office related businesses (e.g., health care, law firm) would receive less of an impact because customers/clients go to the establishments for a particular purpose and often have to schedule an appointment in advance. The estimated revenue reduction percentages varied by the availability of other options in the area.

Because construction would be completed in segments that would move along Marginal Way, measurable impacts can be expected for the entire duration of construction. Revenue loss percent estimates were developed for both the time work zone areas fall in front of the business, as well as when they do not. This resulted in two separate estimates for each business:

- Percent of revenue lost while inside work zone – percent of revenue loss when construction activities are occurring directly in front of a business.
- Percent of revenue lost while outside work zone – percent of revenue loss when construction activities are not occurring directly in front of a business, but along the same stretch of Marginal Way.

Table 2 provides the estimated reduction in revenues by business type and work zone.

Table 3: Estimated Revenue Impacts by Business Type and Work Zone

Business Type	Rolling Closure Scenario		Compressed Lanes Scenario	
	Inside Work Zone	Outside Work Zone	Inside Work Zone	Outside Work Zone
Restaurant	70%	23%	23%	7%
General Retail / Public	40% - 50%	13% - 17%	13% - 17%	4% - 5%
Specific Retail	10% - 30%	10% - 13%	10% - 13%	2% - 3%
General Medical	5% - 10%	0%	0%	0%
Specific Office	5%	0%	0%	0%

The following meetings were held in an effort to engage local business and City officials.

1. A meeting was held with the City of Portland, Department of Economic Development on May 17, 2017 to discuss impacts to businesses along Marginal Way. It was requested that the Team not contact individual businesses, but work through the property owners along Marginal Way. Notes from the meeting are in Appendix D.
2. A meeting was also held with the property owners along Marginal Way on June 15, 2017 to discuss the impacts to the businesses. The property owners were asked to verify the monthly revenue estimates and provide input to help refine the potential revenue lost for each business (meeting notes are available in Appendix E). In general, the property owners concurred with the revenue estimates and potential revenue losses.

The estimated monthly revenue for each business was multiplied by the estimated percent revenue loss to estimate the monthly revenue loss during the construction period. The monthly revenue loss estimates for businesses in each of the segments were then aggregated to obtain the estimated monthly revenue loss for each segment while inside and outside of the work zone. The duration of construction for each work zone type, measured in months, was obtained from the construction schedule and applied to each segment's monthly revenue loss estimate while in the work zone.

Recreation Impacts

Construction of storage tanks in Back Cove Park would impact use of the recreation facilities at the park and the users of the park. A meeting was held with the City of Portland, Department of Parks, Recreation and Facilities on May 12, 2017 to discuss impact to recreation at Back Cove Park (Figure 1). Notes from the meeting are in Appendix F.

Back Cove Park includes the Back Cove Trail, Preble Street multi-use field, a small field area ("baby Preble"), and natural and maintained landscaping. According to the Department of Parks, Recreation and Facilities, the Preble Street multi-use field is the most heavily used field in the city. The baby Preble area is used as a secondary field when the full-size field is being used and as a gathering and set-up area for events.

Back Cove Trail circles Back Cove and is heavily used by the public for walking, running, and biking. The trail has about 323,000 annual users.

Some of the alternatives that were considered would require the temporary closure of Preble Street multi-use field during construction activities. The impacts were estimated for loss of field

revenue and loss of recreational experience. It is assumed that the Back Cove Trail would remain open during any construction activities impacting Back Cove Park.

Construction of Doherty Field was considered as a replacement for the Preble Street multi-use field during the construction period. The economic analysis of Doherty Field as a replacement was considered as a separate economic analysis and is presented following the evaluation of the alternatives.

Figure 1: Back Cove Park



Field Revenue

The Preble Street multi-use field is scheduled for 970 hours of use annually (reserved/permitted) comprised of 570 hours of public use and 400 hours of use by Portland Public High School soccer and lacrosse teams. It is approximated that half of the public reservations are City residents and the other half are non-residents. If an alternative field were not constructed, such as Doherty Field, it is expected that the Portland Public High School reservations would displace public reservations on an alternative field and the public reservations would not transfer to another field. As a result, there would be a loss of public reservations at both the Preble Street multi-use field and the nearest alternative field.

The lost revenue of 970 hours annually was split equally between residential and non-residential users. Residents pay \$30 per hour and non-residents pay \$60 per hour to reserve the Preble Street multi-use field.

Recreational Use Value

In addition to the loss of revenue, there would also be a value for the loss of use. The unit day value (UDV) method was used to provide an approximation of the total value of foregone

recreational opportunity to potential users. The UDV method uses a simulated market value for projected foregone use. The simulated value represents the user's average willingness to pay for a day of recreation activity at the Preble Street multi-use field based on the recreation experience, availability of opportunity, carrying capacity, accessibility, and environmental quality. The UDV per user of \$5.20 was based on general recreation field assessment values from the U.S. Army Corps of Engineers for the 2017 fiscal year (USACE, 2016).

It is assumed that for sports practices on the fields there are 20 people using the field and for games there are 75 people (including players, officials, and spectators). It is assumed that 50 hours of the public reservations are for games and the remaining hours are for practice.

The estimates of the number of users were combined with the selected UDV to derive an estimate of annual recreation benefits foregone. Since the field revenue also captures a portion of each user's value for the recreation, the annual recreation benefits foregone is the difference between the use value and annual field revenue.

Impacts Not Quantified

Alternatives effecting Back Cove Park would also have impacts beyond those identified with the Preble Street multi-use field. Construction activities may cause additional impacts that were not quantified for inclusion in the economic analysis, including:

- Some parking spaces would be unavailable during construction.
- Some recreational users may be required to travel further in order to use an alternative sports field.
- There may be scheduling conflicts with available field times at the alternative fields.
- Some events may need to be moved or cancelled.
- The baby Preble area would not be available for use.
- Excavated soil would be used to elevate the fields, which would reduce occasional flooding and field closures when sports activities resume.

Economic Assumptions

The economic analysis takes into consideration many assumptions and estimates to quantify and monetize the impacts. The following sections describe the assumptions that were used. The assumptions are based on engineering estimates and general economic practice.

Traffic Assumptions

Several assumptions were used to estimate the traffic impacts:

- Marginal Way between Preble Street and Franklin Street
 - o Detouring traffic would use Somerset Street
 - o Compressed Lanes Scenario
 - The work zone would be divided into three sections
 - Construction activities in each section would last four months
 - o Rolling Closure Scenario

- The work zone would be divided into three sections
- Construction activities in each section would last two months
- Marginal Way east of Franklin Street
 - One traffic lane would remain open
 - Traffic would be one-way
 - Traffic would exit the area through side streets
 - The work zone would be divided into four sections
 - Work zone sections would go from west to east
 - Construction activities in each section would last between 2 and 3 months, depending on the section
 - Construction activities would not cause detour or delay impacts to motorists
 - No traffic impacts were estimated for other roads or intersections (although there could be construction activities at the intersections of Marginal Way and Preble Street and at Marginal Way and Franklin Street)

Business Assumptions

The assumptions for the business impacts are primarily based on the traffic impacts. The following are additional assumptions:

- Revenue to businesses would return to pre-construction levels immediately following construction activities (although residual impacts are anticipated)
- Marginal Way east of Franklin Street
 - All of the businesses to the east of the work zone would be impacted, even if construction activities were not occurring in front of the business
 - Businesses to the west of the work zone would not be impacted by construction activities (i.e., business would return to pre-construction levels as soon as the work zone passed their business)
- No business would close as a result of the construction activities (although some businesses that operate on a narrow profit margin, or would be significantly impacted, may close)
- The impacts were based on businesses identified in May 2017 (although businesses are anticipated to change prior to implementation of a project)

Recreation Assumptions

For any alternative affecting Preble Street multi-use field, the analysis assumed the field would be closed for two years. One year would be related to the construction of the alternative and the other year would be for rebuilding the field.

The following assumptions were made related to the use of the field:

- Field use by schools would have priority over public use, so public use would be displaced at other fields in Portland
- During practices, 20 people would use the field
- During games, 75 people (including players, officials, and spectators) would use the field
- The high school would use the field for practices
- Since schools have priority, 970 hours of public use would be impacted
 - o The public would have 50 games (one hour each) per year, with the remaining as practices
 - o Of the use by the public, half would be Portland residents (\$30/hour) and half non-residents (\$60/hour)

Economic Evaluation

The economic analysis included several assumptions related to the evaluation of the alternatives:

- The impacts and costs are expressed in constant dollars, which avoids forecasting future inflation and escalating future values for benefits and costs accordingly.
- All costs and benefits are in constant 2017 dollars
- Economic impacts were evaluated using two discount rates
 - o 7 percent discount rate – typically used when evaluating projects for Federal grant programs
 - o 3 percent discount rate – better reflects interest rates in recent years
 - o Values discounted to 2018 as the base year of analysis
- A 20-year period of analysis was used, starting in 2018

Results

A BCE is essentially a benefit-cost analysis of alternatives that is used to estimate if the benefits of an alternative are greater than the costs. However, a variation has been used to evaluate the results of the BCSSF alternative analysis. Since the BCSSF must be built to comply with the Administrative Consent Agreement with the State of Maine Department of Environmental Protection, the BCE does not evaluate the environmental benefits associated with abating CSOs in Portland (i.e., all of the alternatives would have the same impact). In addition, since action must be taken, there is no without-project alternative (no-action alternative) to compare the impacts. As a result, the BCE for this analysis has been formulated as a cost-effectiveness analysis (as opposed to a benefit-cost analysis), which identifies the least-cost alternative to achieve a specific objective.

The total costs are calculated by adding the construction and O&M costs to the monetized impacts of the alternatives to estimate the net present value (NPV). The NPV is a useful way to

compare the overall dollar value of an alternative's expected costs and impacts (benefits or negative benefits).

Traffic

Table 3 provides the result of the traffic analysis for Alternative 1, which is the only alternative that impacts traffic, in 2017 dollars, using both 7 percent and 3 percent discounting. While the Rolling Closure Scenario closes entire sections of the road and requires all cars to detour, the Compressed Lanes Scenario, which keeps the road partially open, results in greater traffic impacts because of its longer duration.

Table 4: Results for Traffic Analysis (2017\$)

Alternative	7% Discount Rate			3% Discount Rate		
	2018	2019	Total	2018	2019	Total
Alternative 1 - Rolling Closure						
Vehicle Operating Costs	\$112,000	\$0	\$112,000	\$117,000	\$0	\$117,000
Travel Time Costs	\$2,052,000	\$0	\$2,052,000	\$2,132,000	\$0	\$2,132,000
Total Traffic Impacts	\$2,165,000	\$0	\$2,165,000	\$2,249,000	\$0	\$2,249,000
Alternative 1 – Compressed Lanes						
Vehicle Operating Costs	\$115,000	\$22,000	\$137,000	\$120,000	\$23,000	\$143,000
Travel Time Costs	\$2,885,000	\$539,000	\$3,424,000	\$2,997,000	\$582,000	\$3,579,000
Total Traffic Impacts	\$3,000,000	\$561,000	\$3,561,000	\$3,117,000	\$605,000	\$3,722,000

Note: Values rounded to the nearest thousand dollars

Business

Table 4 provides the results of the business analysis, in 2017 dollars, using both 7 percent and 3 percent discounting. Alternative 1 results in the greatest business impacts, as it affects businesses along Marginal Way, with the greatest impact between Franklin and Preble Streets, while the other alternatives only affect businesses past Franklin Street.

Table 5: Results for Business Analysis (2017\$)

Alternative	7% Discount Rate			3% Discount Rate		
	2018	2019	Total	2018	2019	Total
Alt. 1 - Rolling Closure	\$13,044,000	\$533,000	\$13,577,000	\$13,551,000	\$575,000	\$14,126,000
Alt. 1 - Compressed Lanes	\$4,972,000	\$3,201,000	\$8,173,000	\$5,165,000	\$3,454,000	\$8,620,000
Alternative 2	\$0	\$2,580,000	\$2,580,000	\$0	\$2,784,000	\$2,784,000
Alternative 2A	\$0	\$2,580,000	\$2,580,000	\$0	\$2,784,000	\$2,784,000
Alternative 3	\$0	\$0	\$0	\$0	\$0	\$0

Note: Values rounded to the nearest thousand dollars

Recreation

Table 5 provides the results of the recreation analysis for Alternatives 2, 2A, and 3, as they are the only alternatives that would impact the fields. Results are shown in 2017 dollars, using both 7 percent and 3 percent discounting.

Table 6: Result of Recreation Analysis (2017\$)

Alternative	7% Discount Rate			3% Discount Rate		
	Field Revenue	Lost Use	Total	Field Revenue	Lost Use	Total
Alternative 2	\$43,000	\$151,000	\$195,000	\$48,000	\$166,000	\$214,000
Alternative 2A	\$43,000	\$151,000	\$195,000	\$48,000	\$166,000	\$214,000
Alternative 3	\$43,000	\$151,000	\$195,000	\$48,000	\$166,000	\$214,000

Note: Values rounded to the nearest thousand dollars

Total

Table 6 combines the traffic, business, and recreation impacts, in 2017 dollars, using both 7 percent and 3 percent discount rate. Alternative 1 - Rolling Closure and Alternative 1 - Compressed Lanes have the highest impacts among the alternatives, mainly driven by impacts to businesses. Alternative 3 has the lowest impacts, as there are no traffic or business impacts projected for this alternative.

Table 7: Result of Impact Analysis (2017\$)

Alternative	Traffic Impacts	Business Impacts	Recreation Impacts	Total
7% Discount Rate				
Alt. 1 - Rolling Closure	-\$2,165,000	-\$13,577,000	\$0	-\$15,742,000
Alt. 1 - Compressed Lanes	-\$3,561,000	-\$8,173,000	\$0	-\$11,734,000
Alternative 2	\$0	-\$2,580,000	-\$195,000	-\$2,775,000
Alternative 2A	\$0	-\$2,580,000	-\$195,000	-\$2,775,000
Alternative 3	\$0	\$0	-\$195,000	-\$195,000
3% Discount Rate				
Alt. 1 - Rolling Closure	-\$2,249,000	-\$14,126,000	\$0	-\$16,375,000
Alt. 1 - Compressed Lanes	-\$3,722,000	-\$8,620,000	\$0	-\$12,342,000
Alternative 2	\$0	-\$2,784,000	-\$214,000	-\$2,998,000
Alternative 2A	\$0	-\$2,784,000	-\$214,000	-\$2,998,000
Alternative 3	\$0	\$0	-\$214,000	-\$214,000

Note: Values rounded to the nearest thousand dollars

Table 7 provides the NPV of each alternative, which combines the cost analysis and the impact analysis. As shown in the table, Alternative 3 has the lowest NPV (least negative), indicating that it is the least-cost alternative to complete the BCSSF. Alternative 1 - Rolling Closure is the highest-cost alternative.

Table 8: Net Present Value of Alternatives (2017\$)

Alternative	7% Discount			3% Discount		
	Costs	Impacts	Net Present Value	Costs	Impacts	Net Present Value
Alt. 1 - Rolling Closure	-\$28,414,000	-\$15,742,000	-\$44,156,000	-\$30,022,000	-\$16,375,000	-\$46,397,000
Alt. 1 - Compressed Lanes	-\$29,012,000	-\$11,734,000	-\$40,746,000	-\$30,981,000	-\$12,342,000	-\$43,323,000
Alternative 2	-\$25,597,000	-\$2,775,000	-\$28,372,000	-\$28,042,000	-\$2,998,000	-\$31,040,000
Alternative 2A	-\$24,267,000	-\$2,775,000	-\$27,042,000	-\$26,398,000	-\$2,998,000	-\$29,396,000
Alternative 3	-\$22,158,000	-\$195,000	-\$22,353,000	-\$24,295,000	-\$214,000	-\$24,509,000

Note: Values rounded to the nearest thousand dollars

Based on the results of the BCE, it is recommended that the City of Portland move forward with design and construction of Alternative 3. In addition to being the lowest cost alternative, Alternative 3 focuses future O&M activities to one facility, which would be easier to manage, inspect, and maintain. In addition, it would avoid any potential impacts to traffic and businesses along Marginal Way.

Doherty Field Evaluation

A separate BCE was conducted for the construction of a new multi-use field (Doherty Field) as replacement for the loss of the Preble Street multi-use field during construction of Alternatives 2, 2a, and 3. It is expected that the Doherty Field would be constructed in 2018 and would be ready for use in 2019. The estimated cost of field construction is \$350,000 and annual operation and maintenance costs are estimated to be \$35,000.

Field Revenue

If the Doherty field were constructed, it is assumed that the reservations that are expected during the construction period at the Preble Street multi-use field would transfer to the Doherty Field. Therefore, the same assumptions were used for estimating the potential revenue at Doherty Field as when estimating the potential revenue losses at the Preble Street multi-use field.

Following reconstruction of Preble Street multi-use field, it is assumed that Doherty Field would attract half the number of public reservations as the Preble Street multi-use field. The annual field revenue would be about \$13,000 under these assumptions.

Recreational Use Value

Based on the average number of days with precipitation and the season, there are about 162 days that the Doherty Field may be used for recreation purposes. The season is expected to run from April to November each year. The recreational use would be transferred from the Preble Street multi-use field during the construction and field restoration period. Therefore, the same

assumptions were used for estimating the potential revenue at Doherty Field as when estimating the potential revenue losses at the Preble Street multi-use field.

Following reconstruction of Preble Street multi-use field, it is assumed that public reservations at Doherty Field would be half of Preble Street. It is assumed that there would be 235 hours of practice and 50 hours of games. The same assumptions for the number of users per practice and game were used as Preble Street. The estimated number of users was multiplied by the selected UDV (\$5.20) to estimate annual recreation benefits.

Doherty Field Results

These results for the economic analysis of Doherty Field provide independent analysis for the addition of Doherty Field and were not combined with the Preble Street multi-use field results. The benefits for Doherty Field, assuming it is used as a replacement field during the construction and field restoration of the Preble Street multi-use field, are displayed in Table 8.

Table 9. Doherty Field Benefits

Calendar Year	Number of Users	Transferred Revenue	New Field Revenue	Use Value (above rental)	Total Benefits
2019		\$44,000		\$86,000	\$130,000
2020		\$44,000		\$86,000	\$130,000
2021	8,450		\$13,000	\$31,000	\$44,000
2022	8,450		\$13,000	\$31,000	\$44,000
2023	8,450		\$13,000	\$31,000	\$44,000
2024	8,450		\$13,000	\$31,000	\$44,000
2025	8,450		\$13,000	\$31,000	\$44,000
2026	8,450		\$13,000	\$31,000	\$44,000
2027	8,450		\$13,000	\$31,000	\$44,000
2028	8,450		\$13,000	\$31,000	\$44,000
2029	8,450		\$13,000	\$31,000	\$44,000
TOTAL		\$88,000	\$117,000	\$451,000	\$656,000

The economic analysis of Doherty Field considered both the benefits and costs for a 10-year period following construction of the field. Table 9 provided the NPV of the analysis. The economic analysis indicated a negative NPV and a benefit-cost ratio of 0.8, indicating that constructing Doherty Field as a replacement would not be cost effective.

Table 9. Doherty Field Results

Calendar Year	Project Year	Total Project Costs	Total Project Benefits	Discounted Net Benefits	
				7%	3%
2018	1	\$350,000	\$0	-\$327,000	-\$340,000
2019	2	\$35,000	\$130,000	\$83,000	\$89,000
2020	3	\$35,000	\$130,000	\$77,000	\$86,000
2021	4	\$35,000	\$44,000	\$7,000	\$8,000
2022	5	\$35,000	\$44,000	\$6,000	\$8,000

Calendar	Project	Total Project	Total Project	Discounted Net Benefits	
2023	6	\$35,000	\$44,000	\$6,000	\$7,000
2024	7	\$35,000	\$44,000	\$6,000	\$7,000
2025	8	\$35,000	\$44,000	\$5,000	\$7,000
2026	9	\$35,000	\$44,000	\$5,000	\$7,000
2027	10	\$35,000	\$44,000	\$5,000	\$7,000
2028	11	\$35,000	\$44,000	\$4,000	\$6,000
2029	12	\$35,000	\$44,000	\$4,000	\$6,000
TOTAL		\$735,000	\$656,000	-\$119,000	-\$102,000

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Appendix A – Initial Screening of Alternatives

Preliminary Assessment/Conclusions Wright-Pierce Alternatives Analysis Technical Memorandum, dated March 18, 2014 (Rev. 05/08/2017)			
Alt. No.	Description	Remarks	Disposition (Pending May 3rd Workshop)
1	Single Conduit along Bayside Trail for both outfalls	Could be considered a Modified Placeholder (Alt. 5); however City requested that it be removed from further consideration.	Drop from further consideration due to constructability issues.
2	Tank (shallow) in Kennedy Park for both outfalls	Requires conveyance from CSO 017 and influent pumping	Drop from further consideration due to CSO 017 conveyance and influent pumping requirements.
3	Tank (shallow) in Marginal Way Park & Ride for both outfalls	Requires conveyance from CSO 017	Drop from further consideration due to CSO 017 conveyance requirement.
4	Double Conduit along Marginal Way between CSO 018 and NEPS for both outfalls	Requires conveyance from CSO 017	Drop from further consideration due to CSO 017 conveyance requirement.
5	Single Conduit along Marginal Way	Placeholder from LTCP	Carry forward.
6	Single Conduit along Marginal Way and Somerset St.	As with Alt. 1, could be considered a Modified Placeholder (Alt. 5); however, City requested that it be removed from further consideration.	Drop from further consideration due to Midtown project and Somerset St. reconstruction.
7A	Tank in Back Cove Park (CSO 017 only)	2.5 MG tank requires dewatering pumping; conduit required between Franklin St. and Northeast PS for CSO 018 to be consistent with the other alternatives	Carry forward as reconstituted Alt. 7A to include deep tank in Back Cove Park for CSO 017 plus approx. shallow 84-in. diameter conduit along lower Marginal Way to address CSO 018; Franklin St. PS remains in service. DOT concerns with I-295 bridges need to be addressed.
7B	Tank in Back Cove Park (CSO 017 only)	2.5 MG tank requires dewatering pumping; conduit required between Franklin St. and	Carry forward as reconstituted Alt. 7B to include deep tank in Back Cove Park for CSO

		Northeast PS for CSO 018 to be consistent with the other alternatives	017 plus approx. 84-in. diameter deep conduit along lower Marginal Way to address CSO 018; Franklin St. PS is abandoned and possibly repurposed as a stormwater PS. DOT concerns with I-295 bridges need to be addressed.
7C	Tank in Back Cove Park (CSO 017 and CSO 018)	3.5 MG tank requires dewatering pumping; conduit required to divert CSO 018 outfall to tank.	Carry forward as reconstituted Alt. 7C to include deep tank in Back Cove Park for both CSOs.

Possible Additional Alternatives for BCE
(All except Alt. 10B dropped from further consideration at the May 3, 2017 Workshop)

Alt. No.	Description	Remarks
8	Partial (targeted) Sewer Separation	Over and beyond the \$10M worth of separation/GI; would require regulatory approval to reduce from the targeted 3.5 MG of storage. Not considered a stand-alone alt.
9	Full Sewer Separation	Would require (a) private inflow removal and (b) regulatory approval to switch from targeted 3.5 MG of storage.
10A	Convert Franklin St. PS to Dry and Wet Weather Station for CSOs 017 and 018	Requires conveyance from CSO 017; excess flow above capacity of the Northeast PS would need to be (a) stored (in the vicinity of CSO 020) or (b) treated at a HRC facility at the East End WWTP (a future phase LTCP project).
10B	Convert Franklin St. PS to Dry and Wet Weather Station for CSO 018	Carry forward; CSO 017 would be controlled via a Preble to Franklin St. conduit or Back Cove tank; excess flow above capacity of the Northeast PS would need to be (a) stored (in the vicinity of CSO 020) or (b) treated at a HRC facility at the East End WWTP (a future phase LTCP project).
11	Extend 96" Along Marginal Way	Similar to Placeholder (Alt. 5) but smaller pipe; could be used in conjunction with Alt. 10A.
12	Remove 72" Franklin St. Storm Drain	Removing this inflow could impact storage requirements and/or performance of a 3.5 MG conduit in the same manner as Partial Separation (Alt. 8). Not considered a stand-alone alt. but ties into Alternative 7C which is carried forward.

Appendix B – Location and Features of Alternatives

Refer to attached PDF file for the location and features of the alternatives.

Appendix C - Transportation

Discussion Notes

Department: Department of Transportation
Subject: Discussion of impacts to traffic related to BCSSF alternatives.
Date: June 16, 2017
Participants: Bruce Hyman, Transportation Program Manager
Tom Eric, TY Lin
Jason Weiss, AECOM
Andrew Komendantov, AECOM (via conference call line)

Notes

- Purpose of study and meeting were explained
 - STI/AECOM conducting a business case evaluation of BCSSF
 - STI/AECOM working to be as comprehensive as possible
 - Requested feedback on transportation impacts
- Basic descriptions of alternatives were provided to property owners
- Other alternatives
 - Can storage be built under Somerset Street?
 - Somerset will be torn-up during construction of the Midtown project, so it may make sense to take advantage of that opportunity of the road being torn-up to include CSO storage (as opposed to constructing it under Marginal Way)
 - It is not clear when/if Midtown project will occur (permit good until spring 2018)
 - Basically, were all options considered?
- Impacts along Marginal Way were discussed
 - Closure could last 12-18 month
 - Both lanes would be closed
 - There would be no impacts following construction (i.e., no long-term impacts)
 - One alternative would close Marginal Way between Preble Street and Franklin Street, another alternative could partially close Marginal Way between Franklin Street and Plowman Street
- Closure of Marginal Way during construction
 - The Wright-Pierce report had at least one lane of traffic remaining open along Marginal Way.
 - Why are we assuming a total closure?
 - It appears like we are dooming that alternative from the start.
- Improvements along Marginal Way are being planned in accordance with Bayside Master Plan
- Mitigation measures

- What additional traffic mitigation measures are being considered (e.g., increasing length of turn lanes from Franklin Street to Somerset to handle increased traffic, will another parking location be built for the loss of the park and ride).
- Traffic
 - Tom can provide modeling results and/or model which provide high level traffic flows
 - Portland Area Comprehensive Transportation System (PACTS) may have detailed modeling for the Marginal Way area
 - PACTS may be able to model impacts of closure to Marginal Way, but it would be high-level
 - Contact Kevin Hooper (207-878-5790) at PACTS
 - Doing detailed traffic analyses is beyond scope of this study
- Bruce would like a description of the alternatives
 - Bruce has a project near the treatment plant going out to bid soon.
 - Worried that some of the alternatives may interfere with project (why spend \$120k on a project that could get torn-up in a year)
 - If there is a potential for interference, Bruce may delay the bid until BCE is complete.

Appendix D – Economic Development

Discussion Notes

Department: Department of Economic Development
Subject: Discuss impacts to businesses along Marginal Way related to BCSSF alternatives
Date: May 17, 2017
Participants: Greg Mitchell, Economic Development Department
Owens McCullough, Sebago Technics
Jason Weiss, AECOM

Notes:

- Development along Marginal Way
 - Land adjacent to Marginal Way between Preble Street and Franklin Street is primary owned by seven property owners
 - Greg has a good relationship with the property owners
 - Property owners are collegial group (i.e., they get along and have open discussions)
 - Greg meets with the property owners periodically
 - Sebago/AECOM should talk with property owners before talking to any of the tenants/businesses along Marginal Way
 - Greg will arrange for a meeting in mid-June with the property owners and Sebago/AECOM
- Thoughts on impacts of closing Marginal Way
 - Greg thinks the impacts to the local businesses would be significant
 - Marginal Way is used by many visitors to Portland, so he thinks that disruptions may also leave a negative first impression
 - Office type businesses (e.g., medical offices) would not be as impacted as general public type of businesses (e.g., grocery store)
 - Access could be provided to most of the businesses from side roads, although it would be far less convenient and businesses would lose customers
 - Business located on Marginal Way east of Franklin would be impacted much less because of the access from side roads and the type of the businesses
 - Greg does not have any data that could be used to estimate the potential impacts to business revenue
- Midtown Project
 - Midtown Project would be mixed use development along Somerset Street between Preble Street and Franklin Street
 - Would result in heavy traffic congestion in the area during construction

- Construction was scheduled to occur at the same time as the previous Marginal Way BCSSF alternative (i.e., that would have been bad)
 - Progress on Midtown project has been stalled and not sure when it will resume
- Traffic studies
 - A lot of traffic studies have already been completed in the area surrounding Marginal Way
 - Sebago/AECOM should talk with Bruce Hyman at the City of Portland regarding traffic studies that have been completed
- Reconstruction of Marginal Way
 - Marginal Way currently does not meet the standards described by the Complete Street concept
 - During reconstruction of Marginal Way (if the alternative is built), the higher standards of Complete Streets would need to be met

Appendix E – Marginal Way Property Owners

Discussion Notes

Department: Department of Economic Development

Subject: Discussion with property owners along Marginal Way related to BCSSF

Date: June 14, 2017

Participants: Chris Branch, Director, Department of Public Works
Ben Keller, Atlantic Bayside Trust
Brent Noyes, Noyes Moving and Storage
Josh Benthien, Northland
Matt Milbier, Fore River Management
Jason Weiss, AECOM
Kate Mignone, AECOM (via conference call line)
Andrea Bohmholdt, AECOM (via conference call line)
Andrew Komendantov, AECOM (via conference call line)

Notes

- Purpose of the study and meeting were explained
 - STI/AECOM conducting a business case evaluation of BCSSF
 - STI/AECOM working to be as comprehensive as possible
 - Requested feedback from property owners on potential impacts
- Basic descriptions of alternatives were provided to property owners
- Impacts along Marginal Way were discussed (inputs provided by Chris Branch)
 - Closure could last 12-18 month
 - Both lanes would be closed
 - There would be no impacts following construction (i.e., no long-term impacts)
 - One alternative would close Marginal Way between Preble Street and Franklin Street, another alternative could partially close Marginal Way between Franklin Street and Plowman Street
 - The earliest the project would commence would be next summer
- Discussed potential impacts to businesses that should be considered, including:
 - Loss of revenue
 - Temporary and permanent loss of customer base (Walgreens is expected to have a longer-term loss)
 - Additional costs to send and receive products
 - Temporary loss of utilities

- o Signage to provide directions to customers
 - o Additional cleaning costs
- Discussed potential impacts to property owners that should be considered, including:
 - o On-site mitigation for access
 - o Potential loss of tenant and inability to lease vacant facilities
 - o Signage to provide directions to customers
- Review of revenue impact spreadsheet (developed for discussion purposes)
 - o In general, owners concurred with the revenue estimates were reasonable
 - o In general, owners concurred with the revenue reduction estimates were reasonable
- Previous Napa site being redeveloped, portions of the property are already leased, but not all
 - o Owner asked to provide what business type they think will occupy that space
- Student housing/apartments
 - o Closure of Marginal Way would create limited access to the facility
 - o Building is owned by a national company (not present at meeting)
- Any confidential information sent to STI/AECOM can remain confidential, but any confidential information sent to the City of Portland is subject to FOIA
- Property owners were asked if STI/AECOM could contact tenants directly for information
- Next Steps
 - o Owners will be sent a copy of the revenue spreadsheet to review and make adjustments
 - o All input from owners requested by end of month

Appendix F – Parks, Recreation, & Facilities

Discussion Notes

Department: Department of Parks, Recreation & Facilities
Subject: Discuss potential impacts to Back Cove Park from BCSSF alternatives
Date: May 12, 2017
Participants: Sally Deluca, Director, Department of Parks, Recreation & Facilities
Ethan Hipple, Director of Parks Division
Jason Weiss, AECOM

Notes

- Site amenities
 - Preble Street Multi-use Field
 - Baby Preble area (small area just west of the soccer field)
 - Back Cove Trail
 - Gardens (we did not discuss these)
- The long-term vulnerability of the site is an issue
 - Periodic high water floods fields with salt-water, which is expected to get worse
 - Long-term plans call for raising field and installing turf
 - Site very popular, so there are no plans to abandon fields
- Preble Street Multi-use Field
 - receives 600-700 hours of use per year (recommended use is 300-400 hours per year)
 - most heavily used field in the City
 - practice field for Portland Public High School soccer and lacrosse teams
 - field is reserved by both public (e.g., schools) and community/private groups (e.g., sports clubs)
- Baby Preble Area
 - Used as a secondary field when full size field is being used
 - Used as a gathering and set-up area for events
 - Site heavily used
- Back Cove Trail
 - Trail used for walking, running, and biking
 - Used continuously for 5k running events
 - Most used public amenity in City (as ranked by public surveys)
 - Needs trail to be continuous for 5k events
- Potential impacts during construction period

- Loss of trail would cause major concerns/issues with public (i.e., trail needs to be kept open)
 - Already a shortage of field space within Portland, so a replacement field would be needed
 - Loss of revenue - revenue is generated from field use fees by schools and public
 - Schools get priority for field use, therefore the public would be displaced if school use was spread to other fields in Portland
 - Loss of parking lot for staging activities (parking lot is often full due to events)
- Doherty Field is a potential replacement for the loss of the Preble field. There are plans to convert the old Doherty site into sport fields. While the site is available and plans have been made, there is currently no funding to construct the field. It would cost an estimated \$350k-\$500k to construct Doherty Field.
- Can marsh area in the north-east section of site be used for CSO storage tanks?
- Site constraints following construction
 - Tank access (e.g. manhole covers) could not be on fields
 - Since both fields (Preble and baby Preble) are used for field-related activities, they would both need to be flat to allow continued use
 - Grading would need to drain water and not induce ponding or flooding of other fields
- Parks and Rec Department would like to be kept in the loop on project
 - Need to plan for disruption to fields
 - Would like to see excavated dirt used to raise Preble Street Field
 - Looking for a win-win solution
- Ethan will provide:
 - Trial use numbers
 - Use of fields
 - Revenue generated from fields
 - Potential cost to construct Doherty field

Attachments – Opinion of Costs and BCE Alternatives Graphic

Alternate No. 2
2.5 Million Gallon Tank
84" In-Line (Shallow)

**Engineers Opinion of Potential Costs
Alternative 2 BCE - BCSSC, Portland
FOR
CITY OF PORTLAND**

Project NO.: 17025
By: OAM
Date: 12-22-17

Prepared by: Sebago Technics, Inc.

			BCE-BSSC - Alternate 2		
Item No.	Item Description	Unit	Quantity	Unit Price	Total Price
201.1100	CLEARING	LS	1	\$50,000.00	\$50,000.00
202.1500	REMOVE & DISPOSE OF EXISTING MANHOLE OR CATCH BASIN	EA	12	\$700.00	\$8,400.00
202.1610	REMOVE & DISPOSE OF EXISTING SEWER & STORM PIPE (<30")	LF	900	\$30.00	\$27,000.00
202.2020	REMOVE PAVEMENT SURFACE	SY	2,000	\$15.00	\$30,000.00
203.2000	COMMON EXCAVATION (Conduit/Pipe Excavation Included in Pipe Pay Item)	CY	25,000	\$17.00	\$425,000.00
203.2100	ROCK EXCAVATION	CY	150	\$100.00	\$15,000.00
	GEOTEXTILE AND CRUSHED STONE BASE - TANK	CY	2,500	\$30.00	\$75,000.00
203.2400	COMMON BORROW	CY	500	\$30.00	\$15,000.00
203.2500	GRANULAR BORROW	CY	9,500	\$30.00	\$285,000.00
203.2800	TEST PIT EXCAVATION	VF	150	\$85.00	\$12,750.00
203.3000	CONTAMINATED EXCAVATION & DISPOAL (Assumed Quantity - Allowance)	CY	7,300	\$70.00	\$511,000.00
203.3100	CRUSHED STONE FILL (OVERDEPTH)	CY	1,000	\$45.00	\$45,000.00
203.3200	3/8" STONE DUST FOR PEDESTRIAN TRAIL	CY	1,000	\$35.00	\$35,000.00
203.4000	REBUILD SOCCER FIELD AND PLAY AREA	LS	1	\$400,000.00	\$400,000.00
206.0610	STR. EARTH EXCAVATION, DRAINAGE & MINOR STRUCTURES (Overdepth)	CY	750	\$32.00	\$24,000.00
304.0900	AGGREGATE BASE COURSE CRUSHED - TYPE "B"	CY	1,000	\$30.00	\$30,000.00
304.1000	AGGREGATE SUBBASE COURSE - GRAVEL, TYPE "D" GRAVEL	CY	2,500	\$26.00	\$65,000.00
403.2070	HMA, 19MM (PAVING FOR TRENCH IN PIPE ITEMS)	T	500	\$120.00	\$60,000.00
403.2080	HMA, 12.5 MM (PAVING FOR TRENCHES IN PIPE ITEMS)	T	150	\$120.00	\$18,000.00
502.5600	CONCRETE FILL	CY	250	\$150.00	\$37,500.00
534.7100	2.5 MILLION GALLON CONCRETE TANK - CONCRETE	CY	4,400	\$800.00	\$3,520,000.00
	DEWATERING - 12 MONTHS	DAY	360	\$1,800.00	\$648,000.00
	SHORING	SF	14,500	\$45.00	\$652,500.00
534.7200	10'x16' PRE-CAST DIVERSION STRUCTURE	EA	2	\$250,000.00	\$500,000.00
534.7900	PRECAST CONCRETE BUILDING	EA	1	\$120,000.00	\$120,000.00
603.1400	8" DEWATERING FORCE MAIN	LF	1,500	\$375.00	\$562,500.00
603.1400	8" DIAMETER PVC PIPE (All Depths)	LF	200	\$60.00	\$12,000.00
603.1591	12" DIAMETER PVC PIPE (All Depths)	LF	500	\$70.00	\$35,000.00
603.1691	15" DIAMETER PIPE (All Depths)	LF	500	\$75.00	\$37,500.00
603.1791	18" DIAMETER PIPE (All Depths)	LF	100	\$80.00	\$8,000.00
603.2191	36" DIAMETER SEWER PIPE (All Depths)	LF	190	\$350.00	\$66,500.00
603.5000	72" DIAMETER SEWER PIPE (All Depths)	LF	725	\$725.00	\$525,625.00
603.5001	84" DIAMETER SEWER PIPE (All Depths)	LF	3,600	\$900.00	\$3,240,000.00

Alternate No. 2
2.5 Million Gallon Tank
84" In-Line (Shallow)

Engineers Opinion of Potential Costs
Alternative 2 BCE - BCSSC, Portland
FOR
CITY OF PORTLAND

Project NO.: 17025
By: OAM
Date: 12-22-17

Prepared by: Sebago Technics, Inc.

603.5003	60" DIAMETER SEWER PIPE - MIRCOTUNNELING	LS	1	\$4,400,000.00	\$4,400,000.00
604.1300	4' DIAMETER CATCH BASIN TYPE "E"	EA	25	\$4,500.00	\$112,500.00
604.1500	4' DIAMETER SEWER OR DRAIN MANHOLE TYPE "A"	EA	10	\$4,500.00	\$45,000.00
604.1520	6' DIAMETER MANHOLE TYPE "A"	EA	18	\$6,500.00	\$117,000.00
604.1530	6' DIAMETER MAG METER MANHOLE	EA	2	\$8,000.00	\$16,000.00
604.1600	ALTERING MANHOLE	EA	15	\$1,500.00	\$22,500.00
604.1800	ADJUSTING CATCH BASIN TO GRADE	EA	20	\$750.00	\$15,000.00
604.1900	WINTERIZATION	EA	25	\$500.00	\$12,500.00
605.0900	6" UNDERDRAIN	LF	500	\$45.00	\$22,500.00
607.1750	INSTALL TEMPORARY CHAIN LINK SAFETY FENCE	LF	1,000	\$15.00	\$15,000.00
608.0700	CONCRETE PEDESTRIAN RAMP	EA	6	\$2,000.00	\$12,000.00
608.2500	HOT BITUMINOUS CONCRETE SIDEWALK (Allowance)	SY	50	\$85.00	\$4,250.00
608.2600	HOT BITUMINOUS CONCRETE DRIVEWAY	SY	300	\$90.00	\$27,000.00
608.2600	DETECTABLE WARNING SURFACE	SF	50	\$50.00	\$2,500.00
609.3400	TYPE 5 GRANITE CURB - STRAIGHT	LF	4,000	\$30.00	\$120,000.00
609.3500	TYPE 5 GRANITE CURB - CIRCULAR	LF	500	\$36.00	\$18,000.00
609.2370	GRANITE 7' TIPDOWN - STRAIGHT	EA	10	\$400.00	\$4,000.00
609.2371	GRANITE 7' TIPDOWN - CIRCULAR	EA	6	\$425.00	\$2,550.00
610.0800	RIPRAP, D50 SIZE 6 INCH	CY	50	\$50.00	\$2,500.00
610.1600	RIPRAP, D50 SIZE 24 INCH	CY	50	\$85.00	\$4,250.00
613.3191	EROSION CONTROL BLANKET ON SLOPES	SY	300	\$5.00	\$1,500.00
614.1400	MASONRY PLUG	EA	10	\$750.00	\$7,500.00
615.0700	LOAM - 4 INCH DEPTH	CY	500	\$50.00	\$25,000.00
618.1300	SEEDING METHOD NUMBER 1, "PARK MIXTURE"	UN	225	\$65.00	\$14,625.00
621.0000	LANDSCAPING	LS	1	\$25,000.00	\$25,000.00
618.2500	APPLIED WATER FOR SEEDING	GAL.	10,000	\$1.00	\$10,000.00
619.1200	MULCH	UN	400	\$40.00	\$16,000.00
621.8000	PLANTING ESTABLISHMENT PERIOD	LS	1	\$10,000.00	\$10,000.00
623.0090	REMOVE & RESET MONUMENT	EA	1	\$750.00	\$750.00
626.1330	ELECTRICAL, INSTRUMENTATION AND CONTROLS AND PUMP, FLUSH GAT	LS	1	\$1,600,000.00	\$1,600,000.00
627.7110	WHITE OR YELLOW PAINT PVMT MRK LINE	LF	1,600	\$0.75	\$1,200.00
250.0000	WHITE OR YELLOW PVMT AND CURB MARK	SF	466	\$3.50	\$1,631.00
629.0500	HAND LABOR, STRAIGHT TIME	HR	40	\$36.00	\$1,440.00
629.0600	MASON, STRAIGHT TIME	HR	40	\$42.00	\$1,680.00
631.1050	AIR TOOL AND COMPRESSOR (INC. OPERATOR)	HR	40	\$45.00	\$1,800.00

Alternate No. 2
2.5 Million Gallon Tank
84" In-Line (Shallow)

**Engineers Opinion of Potential Costs
Alternative 2 BCE - BCSSC, Portland
FOR
CITY OF PORTLAND**

Project NO.: 17025
By: OAM
Date: 12-22-17

Prepared by: Sebago Technics, Inc.

631.1200	ALL PURPOSE EXCAVATOR (INC. OPERATOR)	HR	40	\$125.00	\$5,000.00
631.1300	BULLDOZER (INC. OPERATOR)	HR	40	\$95.00	\$3,800.00
631.1710	TRUCK, SMALL, (INC. OPERATOR)	HR	40	\$55.00	\$2,200.00
631.2200	FRONT END LOADER (INC. OPERATOR)	HR	40	\$100.00	\$4,000.00
631.3600	FOREMAN, STRAIGHT TIME	HR	40	\$50.00	\$2,000.00
632.0450	8" INSERT-A-TEE PIPE SANITARY CONNECTION	EA	6	\$1,250.00	\$7,500.00
632.0451	12" INSERT-A-TEE PIPE STORM CONNECTION	EA	6	\$1,500.00	\$9,000.00
632.0452	15" INSERT-A-TEE PIPE STORM CONNECTION	EA	6	\$1,500.00	\$9,000.00
632.0453	24" INSERT-A-TEE PIPE STORM CONNECTION	EA	1	\$1,500.00	\$1,500.00
633.0700	4" OR 6" SEWER LATERALS	LF	100	\$50.00	\$5,000.00
637.0710	DUST CONTROL	LS	1	\$5,000.00	\$5,000.00
645.1060	DEMOUNT & REINSTALL REGULATORY WARN, CONF., AND ROUTE SIGN	LS	1	\$5,000.00	\$5,000.00
652.3800	FLAGGERS	DAY	250	\$500.00	\$125,000.00
652.3900	WORK ZONE TRAFFIC CONTROL	LS	1	\$540,000.00	\$540,000.00
652.4100	PORTABLE CHANGEABLE MESSAGE SIGN	EA	5	\$5,000.00	\$25,000.00
654.0800	TRENCH DENSITY TEST	EA	200	\$100.00	\$20,000.00
654.0900	ROADWAY DENSITY TEST	EA	50	\$110.00	\$5,500.00
656.7500	TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	LS	1	\$80,000.00	\$80,000.00
670.1000	INSTALL TIDE FLEX & THIMBLE	EA	2	\$60,000.00	\$120,000.00
672.3000	HYDRAULIC SLIDE GATE & EQUIPMENT	EA	2	\$60,000.00	\$120,000.00
671.4000	HYDRAULIC POWER UNIT & EQUIPMENT	EA	1	\$80,000.00	\$80,000.00
673.1000	VENTILATION STACK AND PIPING	EA	4	\$25,000.00	\$100,000.00
	ALLOWANCE FOR UTILITY RELOCATES	LS	1	\$100,000.00	\$100,000.00
	MOBILIZATION & GENERAL CONDITIONS	LS	1	\$375,000.00	\$375,000.00
	SUB TOTAL				\$20,538,951.00
	20% CONTINGENCY				\$4,107,790.20
	SUB TOTAL				\$24,646,741.20
	FRANKLIN STREET PUMP STATION IMPROVEMENT				\$1,000,000.00
	NPRA AND CITY PERMITTING				\$75,000.00
	ENGINEERING (8%)				\$1,971,739.30
	CONSTRUCTION AND REDESIGN COSTS				\$27,693,480.50
	CONSTRUCTION ADMINISTRATION AND INSPECTION	HR	4,200	\$75.00	\$315,000.00
	ALLOWANCE FOR ENVIRONMENTAL TESTING	LS	1	\$15,000.00	\$15,000.00
	ENGINEERING SUPPORT DURING CONSTRUCTION	LS	1	\$75,000.00	\$75,000.00
	OPINION OF TOTAL PROJECT COST				\$28,098,480.50

Alternate No. 2A
2.5 Million Gallon Tank
84" In-Line (DEEP)

**Engineers Opinion of Potential Costs
Alternative 2A BCE - BCSSC, Portland
FOR
CITY OF PORTLAND**

Project NO.: 17025
By: OAM
Date: 12/22/17

Prepared by: Sebago Technics, Inc.

			BCE-BSSC - Alternate 2A		
Item No.	Item Description	Unit	Quantity	Unit Price	Total Price
201.1100	CLEARING	LS	1	\$50,000.00	\$50,000.00
202.1500	REMOVE & DISPOSE OF EXISTING MANHOLE OR CATCH BASIN	EA	12	\$700.00	\$8,400.00
202.1610	REMOVE & DISPOSE OF EXISTING SEWER & STORM PIPE (<30")	LF	900	\$30.00	\$27,000.00
202.2020	REMOVE PAVEMENT SURFACE	SY	2,000	\$15.00	\$30,000.00
203.2000	COMMON EXCAVATION (Conduit/Pipe Excavation Included in Pipe Pay Item)	CY	25,000	\$17.00	\$425,000.00
203.2100	ROCK EXCAVATION	CY	150	\$100.00	\$15,000.00
	GEOTEXTILE AND CRUSHED STONE BASE - TANK	CY	2,500	\$30.00	\$75,000.00
203.2400	COMMON BORROW	CY	500	\$30.00	\$15,000.00
203.2500	GRANULAR BORROW	CY	9,500	\$30.00	\$285,000.00
203.2800	TEST PIT EXCAVATION	VF	150	\$85.00	\$12,750.00
203.3000	CONTAMINATED EXCAVATION & DISPOAL (Assumed Quantity - Allowance)	CY	7,300	\$70.00	\$511,000.00
203.3100	CRUSHED STONE FILL (OVERDEPTH)	CY	1,000	\$48.00	\$48,000.00
203.3200	3/8" STONE DUST FOR PEDESTRIAN TRAIL	CY	1,000	\$35.00	\$35,000.00
203.4000	REBUILD SOCCER FIELD AND PLAY AREA	LS	1	\$400,000.00	\$400,000.00
206.0610	STR. EARTH EXCAVATION, DRAINAGE & MINOR STRUCTURES (Overdepth)	CY	750	\$32.00	\$24,000.00
304.0900	AGGREGATE BASE COURSE CRUSHED - TYPE "B"	CY	1,000	\$30.00	\$30,000.00
304.1000	AGGREGATE SUBBASE COURSE - GRAVEL, TYPE "D" GRAVEL	CY	2,500	\$26.00	\$65,000.00
403.2070	HMA, 19MM (PAVING FOR TRENCH IN PIPE ITEMS)	T	500	\$120.00	\$60,000.00
403.2080	HMA, 12.5 MM (PAVING FOR TRENCHES IN PIPE ITEMS)	T	150	\$120.00	\$18,000.00
502.5600	CONCRETE FILL	CY	250	\$150.00	\$37,500.00
534.7100	2.5 MILLION GALLON CONCRETE TANK - CONCRETE	CY	4,400	\$800.00	\$3,520,000.00
	DEWATERING - 12 MONTHS	DAY	360	\$1,800.00	\$648,000.00
	SHORING	SF	14,500	\$45.00	\$652,500.00
534.7200	10'x16' PRE-CAST DIVERSION STRUCTURE	EA	2	\$250,000.00	\$500,000.00
534.7900	PRECAST CONCRETE BUILDING	EA	1	\$120,000.00	\$120,000.00
603.1400	8" DEWATERING FORCE MAIN	LF	1,500	\$375.00	\$562,500.00
603.1400	8" DIAMETER PVC PIPE (All Depths)	LF	200	\$60.00	\$12,000.00
603.1591	12" DIAMETER PVC PIPE (All Depths)	LF	500	\$70.00	\$35,000.00
603.1691	15" DIAMETER PIPE (All Depths)	LF	500	\$75.00	\$37,500.00
603.1791	18" DIAMETER PIPE (All Depths)	LF	100	\$80.00	\$8,000.00
603.2191	36" DIAMETER SEWER PIPE (All Depths)	LF	190	\$350.00	\$66,500.00
603.5000	72" DIAMETER SEWER PIPE (All Depths)	LF	725	\$725.00	\$525,625.00
603.5001	84" DIAMETER SEWER PIPE (All Depths)	LF	3,600	\$900.00	\$3,240,000.00

Alternate No. 2A
2.5 Million Gallon Tank
84" In-Line (DEEP)

**Engineers Opinion of Potential Costs
Alternative 2A BCE - BCSSC, Portland
FOR
CITY OF PORTLAND**

Project NO.: 17025
By: OAM
Date: 12/22/17

Prepared by: Sebago Technics, Inc.

603.5002	60" DIAMETER SEWER PIPE - MIRCOTUNNELING	LS	1	\$4,400,000.00	\$4,400,000.00
604.1300	4' DIAMETER CATCH BASIN TYPE "E"	EA	25	\$4,500.00	\$112,500.00
604.1500	4' DIAMETER SEWER OR DRAIN MANHOLE TYPE "A"	EA	10	\$4,500.00	\$45,000.00
604.1520	6' DIAMETER MANHOLE TYPE "A"	EA	18	\$6,500.00	\$117,000.00
604.1530	6' DIAMETER MAG METER MANHOLE	EA	2	\$8,000.00	\$16,000.00
604.1600	ALTERING MANHOLE	EA	15	\$1,500.00	\$22,500.00
604.1800	ADJUSTING CATCH BASIN TO GRADE	EA	20	\$750.00	\$15,000.00
604.1900	WINTERIZATION	EA	25	\$500.00	\$12,500.00
605.0900	6" UNDERDRAIN	LF	500	\$45.00	\$22,500.00
607.1750	INSTALL TEMPORARY CHAIN LINK SAFETY FENCE	LF	1,000	\$15.00	\$15,000.00
608.0700	CONCRETE PEDESTRIAN RAMP	EA	6	\$2,000.00	\$12,000.00
608.2500	HOT BITUMINOUS CONCRETE SIDEWALK (Allowance)	SY	50	\$85.00	\$4,250.00
608.2600	HOT BITUMINOUS CONCRETE DRIVEWAY	SY	300	\$90.00	\$27,000.00
608.2600	DETECTABLE WARNING SURFACE	SF	50	\$50.00	\$2,500.00
609.3400	TYPE 5 GRANITE CURB - STRAIGHT	LF	4,000	\$30.00	\$120,000.00
609.3500	TYPE 5 GRANITE CURB - CIRCULAR	LF	500	\$36.00	\$18,000.00
609.2370	GRANITE 7' TIPDOWN - STRAIGHT	EA	10	\$400.00	\$4,000.00
609.2371	GRANITE 7' TIPDOWN - CIRCULAR	EA	6	\$425.00	\$2,550.00
610.0800	RIPRAP, D50 SIZE 6 INCH	CY	50	\$50.00	\$2,500.00
610.1600	RIPRAP, D50 SIZE 24 INCH	CY	50	\$85.00	\$4,250.00
613.3191	EROSION CONTROL BLANKET ON SLOPES	SY	300	\$5.00	\$1,500.00
614.1400	MASONRY PLUG	EA	10	\$750.00	\$7,500.00
615.0700	LOAM - 4 INCH DEPTH	CY	500	\$50.00	\$25,000.00
618.1300	SEEDING METHOD NUMBER 1, "PARK MIXTURE"	UN	225	\$65.00	\$14,625.00
621.0000	LANDSCAPING	LS	1	\$25,000.00	\$25,000.00
618.2500	APPLIED WATER FOR SEEDING	GAL.	10,000	\$1.00	\$10,000.00
619.1200	MULCH	UN	400	\$40.00	\$16,000.00
621.8000	PLANTING ESTABLISHMENT PERIOD	LS	1	\$10,000.00	\$10,000.00
623.0090	REMOVE & RESET MONUMENT	EA	1	\$750.00	\$750.00
626.1330	ELECTRICAL, INSTRUMENTATION AND CONTROLS AND PUMP, FLUSH GAT	LS	1	\$1,600,000.00	\$1,600,000.00
627.7110	WHITE OR YELLOW PAINT PVMT MRK LINE	LF	1,600	\$0.75	\$1,200.00
250.0000	WHITE OR YELLOW PVMT AND CURB MARK	SF	466	\$3.50	\$1,631.00
629.0500	HAND LABOR, STRAIGHT TIME	HR	40	\$36.00	\$1,440.00
629.0600	MASON, STRAIGHT TIME	HR	40	\$42.00	\$1,680.00
631.1050	AIR TOOL AND COMPRESSOR (INC. OPERATOR)	HR	40	\$45.00	\$1,800.00

Alternate No. 2A
2.5 Million Gallon Tank
84" In-Line (DEEP)

**Engineers Opinion of Potential Costs
Alternative 2A BCE - BCSSC, Portland
FOR
CITY OF PORTLAND**

Project NO.: 17025
By: OAM
Date: 12/22/17

Prepared by: Sebago Technics, Inc.

631.1200	ALL PURPOSE EXCAVATOR (INC. OPERATOR)	HR	40	\$125.00	\$5,000.00
631.1300	BULLDOZER (INC. OPERATOR)	HR	40	\$95.00	\$3,800.00
631.1710	TRUCK, SMALL, (INC. OPERATOR)	HR	40	\$55.00	\$2,200.00
631.2200	FRONT END LOADER (INC. OPERATOR)	HR	40	\$100.00	\$4,000.00
631.3600	FOREMAN, STRAIGHT TIME	HR	40	\$50.00	\$2,000.00
632.0450	8" INSERT-A-TEE PIPE SANITARY CONNECTION	EA	6	\$1,250.00	\$7,500.00
632.0451	12" INSERT-A-TEE PIPE STORM CONNECTION	EA	6	\$1,500.00	\$9,000.00
632.0452	15" INSERT-A-TEE PIPE STORM CONNECTION	EA	6	\$1,500.00	\$9,000.00
632.0453	24" INSERT-A-TEE PIPE STORM CONNECTION	EA	1	\$1,500.00	\$1,500.00
633.0700	4" OR 6" SEWER LATERALS	LF	100	\$50.00	\$5,000.00
637.0710	DUST CONTROL	LS	1	\$5,000.00	\$5,000.00
645.1060	DEMOUNT & REINSTALL REGULATORY WARN, CONF., AND ROUTE SIGN	LS	1	\$5,000.00	\$5,000.00
652.3800	FLAGGERS	DAY	250	\$500.00	\$125,000.00
652.3900	WORK ZONE TRAFFIC CONTROL	LS	1	\$540,000.00	\$540,000.00
652.4100	PORTABLE CHANGEABLE MESSAGE SIGN	EA	5	\$5,000.00	\$25,000.00
654.0800	TRENCH DENSITY TEST	EA	200	\$100.00	\$20,000.00
654.0900	ROADWAY DENSITY TEST	EA	50	\$110.00	\$5,500.00
656.7500	TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	LS	1	\$80,000.00	\$80,000.00
670.1000	INSTALL TIDE FLEX & THIMBLE	EA	2	\$60,000.00	\$120,000.00
672.3000	HYDRAULIC SLIDE GATE & EQUIPMENT	EA	2	\$60,000.00	\$120,000.00
671.4000	HYDRAULIC POWER UNIT & EQUIPMENT	EA	1	\$80,000.00	\$80,000.00
673.1000	VENTILATION STACK AND PIPING	EA	4	\$40,000.00	\$160,000.00
	ALLOWANCE FOR UTILITY RELOCATES	LS	1	\$100,000.00	\$100,000.00
	MOBILIZATION & GENERAL CONDITIONS	LS	1	\$375,000.00	\$375,000.00
SUB TOTAL					\$20,601,951.00
20% CONTINGENCY					\$4,120,390.20
SUB TOTAL					\$24,722,341.20
NPRA AND CITY PERMITTING					\$75,000.00
ENGINEERING (8%)					\$1,977,787.30
CONSTRUCTION AND REDESIGN COSTS					\$26,775,128.50
CONSTRUCTION ADMINISTRATION AND INSPECTION		HR	4,200	\$75.00	\$315,000.00
ALLOWANCE FOR ENVIRONMENTAL TESTING		LS	1	\$15,000.00	\$15,000.00
ENGINEERING SUPPORT DURING CONSTRUCTION		LS	1	\$75,000.00	\$75,000.00
OPINION OF TOTAL PROJECT COST					\$27,180,128.50

			BCE-BSSC - Alternate 3		
Item No.	Item Description	Unit	Quantity	Unit Price	Total Price
201.1100	CLEARING	LS	1	\$50,000.00	\$50,000.00
202.1500	REMOVE & DISPOSE OF EXISTING MANHOLE OR CATCH BASIN	EA	10	\$1,000.00	\$10,000.00
202.1610	REMOVE & DISPOSE OF EXISTING SEWER & STORM PIPE (<30")	LF	900	\$50.00	\$45,000.00
202.2020	REMOVE PAVEMENT SURFACE	SY	3,500	\$15.00	\$52,500.00
203.2000	COMMON EXCAVATION (Conduit/Pipe Excavation Included in Pipe Pay Item)	CY	35,000	\$18.00	\$630,000.00
203.2100	ROCK EXCAVATION	CY	500	\$100.00	\$50,000.00
	GEOTEXTILE AND CRUSHED STONE BASE - TANK	CY	2,900	\$40.00	\$116,000.00
203.2400	COMMON BORROW	CY	1,000	\$30.00	\$30,000.00
203.2500	GRANULAR BORROW	CY	10,000	\$30.00	\$300,000.00
203.2800	TEST PIT EXCAVATION	VF	150	\$85.00	\$12,750.00
203.3000	CONTAMINATED EXCAVATION & DISPOAL (Assumed Quantity - Allowance)	CY	8,800	\$100.00	\$880,000.00
203.3100	CRUSHED STONE FILL (OVERDEPTH)	CY	1,000	\$48.00	\$48,000.00
203.3200	3/8" STONE DUST FOR PEDESTRIAN TRAIL	CY	1,000	\$35.00	\$35,000.00
203.4000	REBUILD SOCCER FIELD AND PLAY AREA	LS	1	\$400,000.00	\$400,000.00
206.0610	STR. EARTH EXCAVATION, DRAINAGE & MINOR STRUCTURES (Overdepth)	CY	750	\$32.00	\$24,000.00
304.0900	AGGREGATE BASE COURSE CRUSHED - TYPE "B"	CY	1,000	\$30.00	\$30,000.00
304.1000	AGGREGATE SUBBASE COURSE - GRAVEL, TYPE "D" GRAVEL	CY	2,500	\$26.00	\$65,000.00
403.2070	HMA, 19MM (PAVING FOR TRENCH IN PIPE ITEMS)	T	700	\$120.00	\$84,000.00
403.2080	HMA, 12.5 MM (PAVING FOR TRENCHES IN PIPE ITEMS)	T	300	\$120.00	\$36,000.00
502.5600	CONCRETE FILL	CY	250	\$150.00	\$37,500.00
534.7100	3.5 MILLION GALLON CONCRETE TANK - CONCRETE	CY	5,700	\$850.00	\$4,845,000.00
	DEWATERING - 12 MONTHS	DAY	360	\$1,800.00	\$648,000.00
	SHORING	SF	18,000	\$45.00	\$810,000.00
534.7200	PRE-CAST DIVERSION STRUCTURE	EA	2	\$250,000.00	\$500,000.00
534.7900	PRECAST CONCRETE BUILDING	EA	1	\$120,000.00	\$120,000.00
603.1400	8" DEWATERING FORCE MAIN	LF	1,500	\$350.00	\$525,000.00
603.1400	8" DIAMETER PVC PIPE (All Depths)	LF	200	\$80.00	\$16,000.00
603.1591	12" DIAMETER PVC PIPE (All Depths)	LF	500	\$105.00	\$52,500.00
603.1691	15" DIAMETER PIPE (All Depths)	LF	500	\$80.00	\$40,000.00
603.1791	18" DIAMETER PIPE (All Depths)	LF	100	\$105.00	\$10,500.00
603.2191	36" DIAMETER RCP SEWER PIPE (All Depths)	LF	190	\$350.00	\$66,500.00
603.2192	48" DIAMETER RCP SEWER PIPE (All Depths)	LF	100	\$400.00	\$40,000.00
603.5000	72" DIAMETER RCP SEWER PIPE (All Depths) CSO Tank	LF	1,700	\$850.00	\$1,445,000.00
603.5000	72" DIAMETER RCP SEWER PIPE (All Depths) New Overflow to CSO 018	LF	725	\$850.00	\$616,250.00
604.1300	4' DIAMETER CATCH BASIN TYPE "E"	EA	8	\$4,500.00	\$36,000.00
604.1500	4' DIAMETER SEWER OR DRAIN MANHOLE TYPE "A"	EA	4	\$4,500.00	\$18,000.00
604.1520	6' DIAMETER MANHOLE TYPE "A"	EA	4	\$12,000.00	\$48,000.00
604.1530	8' DIAMETER MANHOLE	EA	5	\$15,000.00	\$75,000.00
604.1540	6' DIAMETER MAG METER MANHOLE	EA	2	\$8,000.00	\$16,000.00
604.1600	ALTERING MANHOLE	EA	8	\$1,500.00	\$12,000.00
604.1800	ADJUSTING CATCH BASIN TO GRADE	EA	10	\$750.00	\$7,500.00
604.1900	WINTERIZATION	EA	10	\$500.00	\$5,000.00
605.0900	6" UNDERDRAIN	LF	500	\$45.00	\$22,500.00
607.1750	INSTALL TEMPORARY CHAIN LINK SAFETY FENCE	LF	1,000	\$15.00	\$15,000.00
608.0700	CONCRETE PEDESTRIAN RAMP	EA	6	\$2,000.00	\$12,000.00
608.2500	HOT BITUMINOUS CONCRETE SIDEWALK (Allowance)	SY	250	\$85.00	\$21,250.00
608.2600	HOT BITUMINOUS CONCRETE DRIVEWAY	SY	300	\$90.00	\$27,000.00
608.2600	DETECTABLE WARNING SURFACE	SF	50	\$50.00	\$2,500.00
609.3400	TYPE 5 GRANITE CURB - STRAIGHT	LF	1,500	\$35.00	\$52,500.00
609.3500	TYPE 5 GRANITE CURB - CIRCULAR	LF	50	\$40.00	\$2,000.00
609.2370	GRANITE 7' TIPDOWN - STRAIGHT	EA	10	\$400.00	\$4,000.00
609.2371	GRANITE 7' TIPDOWN - CIRCULAR	EA	6	\$425.00	\$2,550.00
610.0800	RIPRAP, D50 SIZE 6 INCH	CY	50	\$50.00	\$2,500.00
610.1600	RIPRAP, D50 SIZE 24 INCH	CY	50	\$85.00	\$4,250.00
613.3191	EROSION CONTROL BLANKET ON SLOPES	SY	300	\$5.00	\$1,500.00
614.1400	MASONRY PLUG	EA	10	\$750.00	\$7,500.00
615.0700	LOAM - 4 INCH DEPTH	CY	500	\$50.00	\$25,000.00
618.1300	SEEDING METHOD NUMBER 1, "PARK MIXTURE"	UN	225	\$65.00	\$14,625.00
621.0000	LANDSCAPING	LS	1	\$50,000.00	\$50,000.00
618.2500	APPLIED WATER FOR SEEDING	GAL.	10,000	\$1.00	\$10,000.00
619.1200	MULCH	UN	400	\$40.00	\$16,000.00
621.8000	PLANTING ESTABLISHMENT PERIOD	LS	1	\$50,000.00	\$50,000.00
623.0090	REMOVE & RESET MONUMENT	EA	1	\$750.00	\$750.00
626.1330	ELECTRICAL, INSTRUMENTATION AND CONTROLS AND PUMP, FLUSH GAT	LS	1	\$2,000,000.00	\$2,000,000.00

**Engineers Opinion of Potential Costs
Alternative 3 BCE - BCSSC, Portland
FOR
CITY OF PORTLAND**

Project NO.: 17025
By: OAM
Date: 12/12/17

Prepared by: Sebago Technics, Inc.

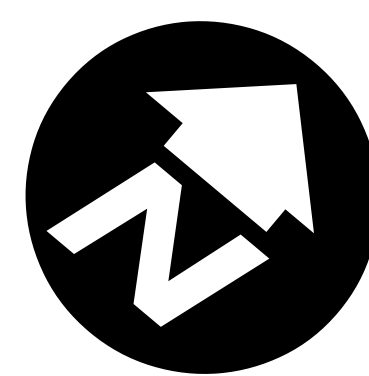
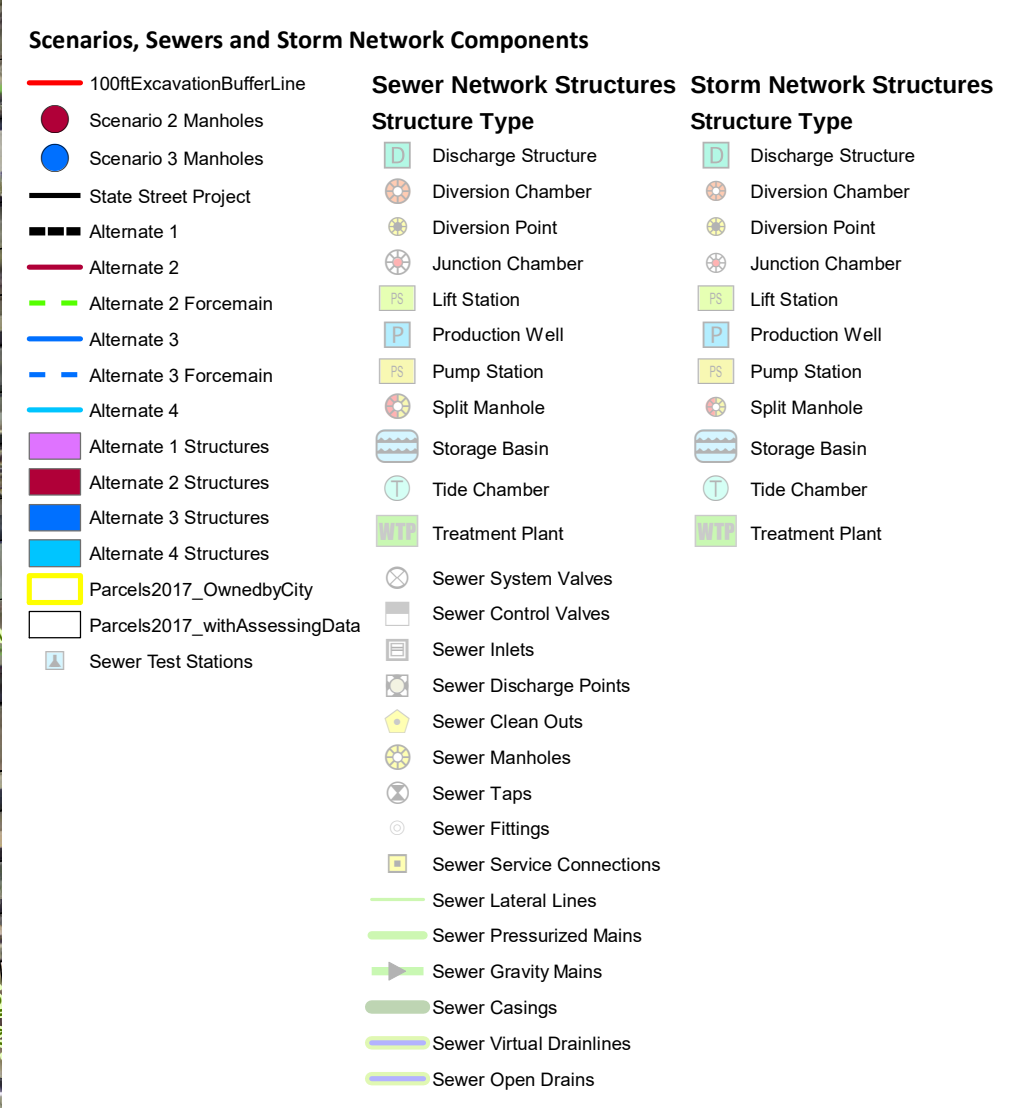
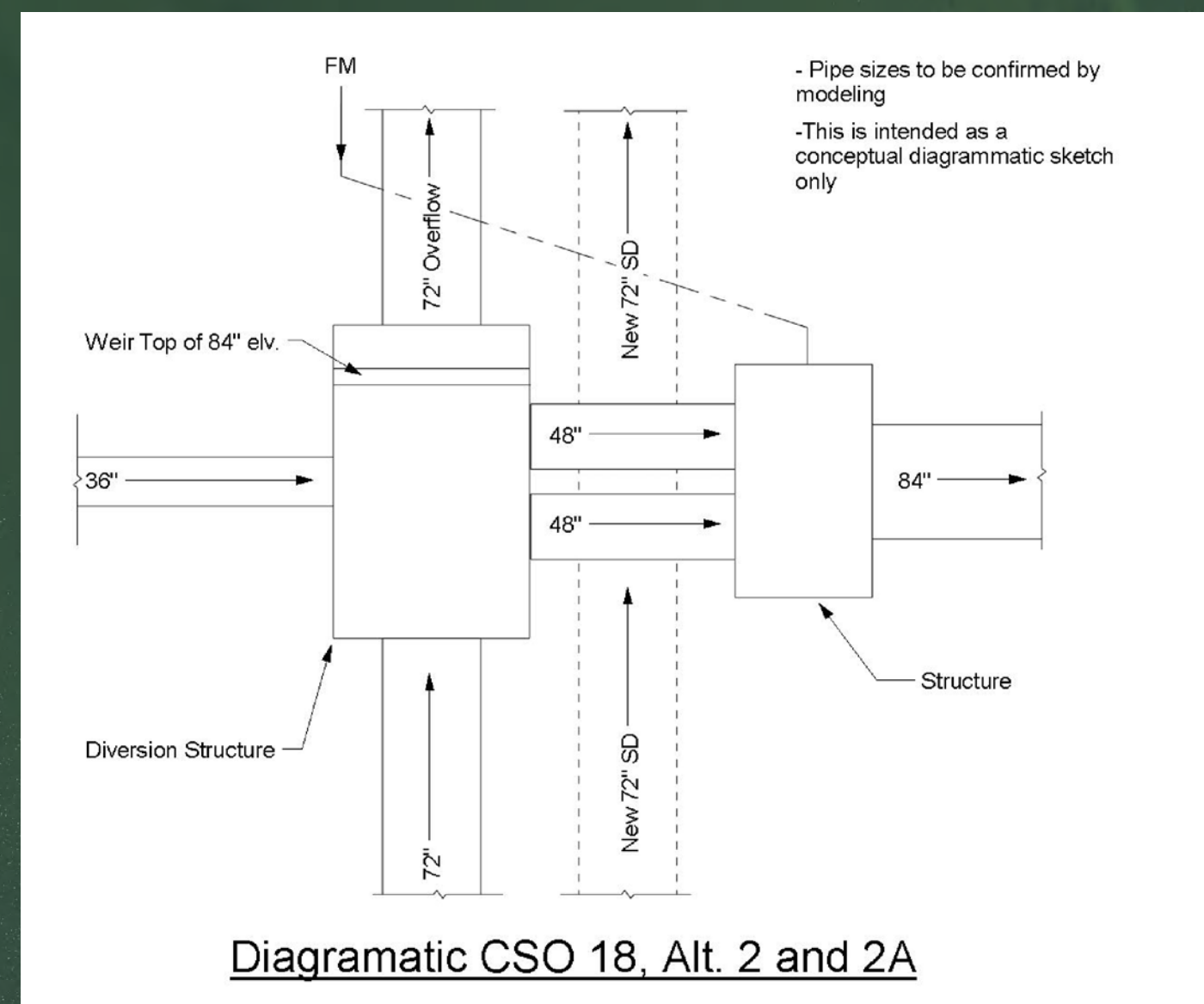
627.7110	WHITE OR YELLOW PAINT PVMT MRK LINE	LF	1,600	\$0.75	\$1,200.00
250.0000	WHITE OR YELLOW PVMT AND CURB MARK	SF	466	\$3.50	\$1,631.00
629.0500	HAND LABOR, STRAIGHT TIME	HR	40	\$36.00	\$1,440.00
629.0600	MASON, STRAIGHT TIME	HR	40	\$42.00	\$1,680.00
631.1050	AIR TOOL AND COMPRESSOR (INC. OPERATOR)	HR	40	\$45.00	\$1,800.00
631.1200	ALL PURPOSE EXCAVATOR (INC. OPERATOR)	HR	40	\$125.00	\$5,000.00
631.1300	BULLDOZER (INC. OPERATOR)	HR	40	\$95.00	\$3,800.00
631.1710	TRUCK, SMALL, (INC. OPERATOR)	HR	40	\$55.00	\$2,200.00
631.2200	FRONT END LOADER (INC. OPERATOR)	HR	40	\$100.00	\$4,000.00
631.3600	FOREMAN, STRAIGHT TIME	HR	40	\$50.00	\$2,000.00
632.0450	8" INSERT-A-TEE PIPE SANITARY CONNECTION	EA	6	\$1,250.00	\$7,500.00
632.0451	12" INSERT-A-TEE PIPE STORM CONNECTION	EA	6	\$1,500.00	\$9,000.00
632.0452	15" INSERT-A-TEE PIPE STORM CONNECTION	EA	6	\$1,500.00	\$9,000.00
632.0453	24" INSERT-A-TEE PIPE STORM CONNECTION	EA	1	\$1,500.00	\$1,500.00
633.0700	4" OR 6" SEWER LATERALS	LF	200	\$60.00	\$12,000.00
637.0710	DUST CONTROL	LS	1	\$20,000.00	\$20,000.00
645.1060	DEMOUNT & REINSTALL REGULATORY WARN, CONF., AND ROUTE SIGN	LS	1	\$5,000.00	\$5,000.00
652.3800	FLAGGERS	DAY	250	\$500.00	\$125,000.00
652.3900	WORK ZONE TRAFFIC CONTROL	LS	1	\$180,000.00	\$180,000.00
652.4100	PORTABLE CHANGEABLE MESSAGE SIGN	EA	5	\$5,000.00	\$25,000.00
654.0800	TRENCH DENSITY TEST	EA	200	\$100.00	\$20,000.00
654.0900	ROADWAY DENSITY TEST	EA	50	\$110.00	\$5,500.00
656.7500	TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	LS	1	\$80,000.00	\$80,000.00
670.1000	INSTALL TIDE FLEX & THIMBLE	EA	2	\$60,000.00	\$120,000.00
672.3000	HYDRAULIC SLIDE GATE & EQUIPMENT	EA	2	\$60,000.00	\$120,000.00
671.4000	HYDRAULIC POWER UNIT & EQUIPMENT	EA	1	\$80,000.00	\$80,000.00
673.1000	VENTILATION STACK AND PIPING	EA	4	\$50,000.00	\$200,000.00
	ALLOWANCE FOR UTILITY RELOCATES	LS	1	\$100,000.00	\$100,000.00
	MOBILIZATION & GENERAL CONDITIONS	LS	1	\$500,000.00	\$500,000.00

SUB TOTAL					\$16,875,676.00
25% CONTINGENCY					\$4,218,919.00
SUB TOTAL					\$21,094,595.00
FRANKLIN STREET PUMP STATION IMPROVEMENTS & MISC.					\$1,000,000.00
NPRA AND CITY PERMITTING					\$75,000.00
ENGINEERING (8%)					\$1,687,567.60
CONSTRUCTION AND REDSIGN COSTS					\$23,857,162.60
CONSTRUCTION ADMINISTRATION AND INSPECTION	HR	4200	\$75.00		\$315,000.00
ALLOWANCE FOR ENVIRONMENTAL TESTING	LS	1	\$15,000.00		\$15,000.00
ENGINEERING SUPPORT DURING CONSTRUCTION	LS	1	\$75,000.00		\$75,000.00
OPINION OF TOTAL PROJECT COST					\$24,262,162.60

SEBAGO
TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

AECOM



DATA SOURCES

2017 ORTHOIMAGERY
2017 PARCEL MAPPING
2006 LIDAR DERIVED CONTOURS
2017 CITY UTILITY DATA

[illegible]

SEBAGO
TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE
250 Coddard Rd. - Suite B
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775 John Roberts Rd. - Suite 1A
South Portland, ME 04106

**BUSINESS CASE EVALUATION - ALTERNATIVES ASSESSMENT
OF:
BACK COVE SOUTH CONDUIT STORAGE PROJECT**

FOR:
CITY OF PORTLAND, MAINE

DATE	SCALE
12-12-2017	1" = 150'
SHEET 1 OF 1	

17025 Worksheet2 MXD



LEVEL II and LEVEL III APPLICATION SUBMISSION CHECKLIST

Please submit each document as a separate PDF file.

Please confirm by electronically checking the boxes to the left

General Application Documents

Checklist	Items to be Provided
Yes ☒ NA ☐ Plan ☐	PROJECT DESCRIPTION Cover Letter with detailed project description
Yes ☐ NA ☒ Plan ☐	COMPLETED CHECKLIST – LEVEL III APPLICATION
Yes ☒ NA ☐ Plan ☐	RIGHT, TITLE AND INTEREST Deeds, leases, or purchase and sales agreements
Yes ☐ NA ☒ Plan ☐	EVIDENCE OF STATE OR FEDERAL APPROVALS , if applicable Permits or letters of non-jurisdiction, if applicable
Yes ☐ NA ☒ Plan ☐	ZONING ASSESSMENT Table listing required and proposed uses and dimensional standards Zoning Assessment Table
Yes ☐ NA ☐ Plan ☒	EXISTING &/OR PROPOSED EASEMENTS OR COVENANTS , if applicable Evidence of existing easements and any proposed easements
Yes ☐ NA ☒ Plan ☐	WAIVER REQUESTS Written request for waiver describing request and reason. Waiver Table
Yes ☒ NA ☐ Plan ☐	FINANCIAL CAPABILITY Letter or evidence from a financial institution or third party verifying financial capacity to undertake project
Yes ☐ NA ☒ Plan ☐	TECHNICAL CAPABILITY Evidence of technical capability of applicant and consultants – resumes and/or examples of past projects

LEVEL II AND LEVEL III SITE PLAN STANDARDS AND SUBMISSION CHECKLIST

Provide assessment of compliance with standards and include supplemental documentation, as applicable.

Please submit each document as a separate PDF file.

TRANSPORTATION

Check list	Assess/Provide/Document:
Yes NA Plan ☐ ☒ ☐	Transportation Analysis- Traffic Impact (14-526 (a) 1) - Provisions for pedestrian, bicycle, vehicle, and loading circulation and incremental volume of traffic impacts - Traffic Impact Study (Technical Manual, Section 1) if applicable
Yes NA Plan ☐ ☒ ☐	Access and Circulation (14-526 (a) 2 a) - Access and internal circulation, addressing ADA access - Access and egress impacts on traffic flows - Description and use of drive-up features, if applicable
Yes NA Plan ☐ ☒ ☐	Loading and Servicing (14-526 (a) 2 b) - Loading and servicing needs, route and travel way geometrics for deliveries - Turning templates for delivery vehicles, if applicable
Yes NA Plan ☐ ☒ ☐	Sidewalks (14-526 (a) 2 c) - Sidewalks and condition along street frontages and internal walkways - Engineered details for ADA ramps and public sidewalk details meeting sidewalk materials policy and ADA ramp construction details as applicable (Technical Manual, Section 1)
Yes NA Plan ☐ ☒ ☐	Public Transit (14-526 (a) 3), if applicable - Existing available transit services - Proposed site plan design details, such as easement, pad base, and shelter
Yes NA Plan ☐ ☒ ☐	Off-Street Parking: Vehicle & Motorcycle/Scooter) (14-526 (a) 4 a and c) - Expected parking demand, proposed parking supply, ADA parking, and applicable Zoning Requirements - Address Technical Manual standards (Section 1) for curb cut separation and parking lot layout and locate on site plan
Yes NA Plan ☐ ☒ ☐	Bicycle Parking (14-526 (a) 4 b) - Address bicycle parking requirements and identify locations on-site - Construction details for bike racks (Technical Manual, Section 1)
Yes NA Plan ☒ ☐ ☒	Snow Storage (14-526 (a) 4 d) Management plan for snow removal and locate snow storage areas on plan
Yes NA Plan ☐ ☒ ☐	Traffic Demand Management (TDM) (14-526 (a) 5), if applicable Develop TDM with Trip Reduction Targets and Strategies

ENVIRONMENTAL AND LANDSCAPE FEATURES			
Check list			Assess/Provide/Document:
Yes	NA	Plan	Preservation of Significant Natural Features (14-526 (b) 1), if applicable • Trees, plants, habitats listed on State or Federal list of endangered or threatened • High and moderate value waterfowl and wading habitat • Aquifers on Casco Bay Islands • Waterbodies (including wetlands, watercourses, significant vernal pools and floodplains) • Proposed preservation areas and protection measures • Documentation from environmental consultants, determinations from applicable state agencies
Yes	NA	Plan	Landscaping and Landscape Preservation (14-526 (b) 2 a) • Preservation of trees and preservation within required zoning setbacks (Technical Manual, Section 4) • Protection measures of existing vegetation during construction • Protection measures within Shoreland Zone, if applicable
Yes	NA	Plan	Site Landscaping (14-526 (b) 2 b) • Screening and buffering of service areas and between non-residential and residential uses • Planting plans with plant schedule and sizes (Technical Manual, Section 4)
Yes	NA	Plan	Parking Lot Landscaping (14-526 (b) 2 b ii), if applicable • Landscaped islands within parking areas (Technical Manual, Section 4)
Yes	NA	Plan	Street Trees (14-526 (b) 2 b iii) • Existing Heritage or Feature Trees on site and measures to preserve • Identify street trees on the plan meeting the site plan and Technical Manual standards (Section 4) or identify alternative measures, if applicable
ENVIRONMENTAL AND STORMWATER			
Check list			Assess/Provide/Document:
Yes	NA	Plan	Water Quality, Stormwater Management and Erosion Control (14-526 (b) 3 a) • Stormwater report in compliance with Section 5 of Technical Manual and DEP Chapter 500 stormwater for basic, general and flooding standards, as applicable • Erosion control plan and measures • Evidence of compliance with Urban Impaired Stream Standards pursuant to DEP Chapter 500 stormwater, as applicable • Subsurface sanitary sewage disposal and groundwater protection

PUBLIC INFRASTRUCTURE AND SAFETY	
Check list Yes NA Plan ☐ ☒ ☐	Assess/Provide/Document: Consistency with City Master Plans (14-526 (c) 1) - Identify consistency with master plans - Proposed easements, rights and improvements to connect or continue off-premises public infrastructure, as applicable
Check list Yes NA Plan ☐ ☒ ☐	Public Safety and Fire Prevention (14-526 (c)) - Address Crime Prevention through Environmental Design (CPTED) (Technical Manual, Section 3) - Emergency vehicle access - Address consistency with public safety standards (Technical Manual, Section 3) - Submit a code summary referring NFPA 1 and all Fire Department standards (Technical Manual, Section 3) – Fire Checklist
Check list Yes NA Plan ☐ ☒ ☐	Availability and Adequacy of Public Utilities (14-526 (c) 3) (Technical Manual, Sections 2 & 9) - Electrical services, including providing underground services - Identify existing and proposed connections for public utilities and required public utility upgrades - Sewer line connections are required, if there is a main within 200 feet - Proposed solid waste management facilities on-site and management for the site - Written evidence of the ability to serve from utility companies, as applicable
SITE DESIGN	
Check list Yes NA Plan ☐ ☒ ☐	Assess/Provide/Document: Massing, Ventilations and Wind Impact (14-526 (d) 1) - Wind and ventilation impacts on adjoining structures and/or adjacent public spaces. Wind study, if applicable - Bulk, location or height impacts on adjoining structures - Identify and locate HVAC equipment and venting away from public spaces and residential properties - Identify screening and manufacturing specifications for noise, if applicable
Check list Yes NA Plan ☐ ☒ ☐	Shadows (14-526 (d) 2), if applicable Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
Check list Yes NA Plan ☐ ☒ ☐	Snow and Ice Loading (14-526 (d) 3) Building design to prevent snow and ice from loading or falling onto adjacent properties or public ways
Check list Yes NA Plan ☐ ☒ ☐	View Corridors (14-526 (d) 4), if applicable Protection of designated view corridors (Portland Design Manual, Appendix 1)

Yes NA Plan ☐ ☒ ☐	Historic Resources (14-526 (d) 5), if applicable - Identify developments within Historic Districts or affecting Designated Landmarks - Certificate of Appropriateness or other evidence - Identify Developments within 100 feet of Historic Districts or affecting Designated Landmarks. Advisory HP review may be required - Address preservation and documentation of Archaeological Resources
Yes NA Plan ☐ ☒ ☐	Exterior Lighting (14-526 (d) 6) - Cut sheets of on-site light fixtures and any architectural or specialty lights (Technical Manual, Section 12) - Engineered details for any lights proposed in street right-of-way (Technical Manual, Section 10)
Yes NA Plan ☐ ☒ ☐	Noise and Vibration (14-526 (d) 7) Evidence of noise levels for equipment, such as equipment specifications, to demonstrate consistency with zoning requirements
Yes NA Plan ☐ ☒ ☐	Signage and Wayfinding (14-526 (d) 8), if applicable - Signage plan showing the location, dimensions, height and setback of all existing and proposed signs. Signs in Historic Districts are reviewed by Historic Preservation staff - Proposed commercial and directional signage on site
Yes NA Plan ☐ ☒ ☐	Zone Related Design Standards (14-526 (d) 5) - Address Historic Preservation Design Review, if applicable - Address any applicable design review standards by zone - Address submission requirements from Design Manual, page 1, addressing neighborhood context - Description of exterior materials, color, finish, and samples
Construction Management Plan	
Check list Yes NA Plan ☒ ☐ ☒	Construction Management Plan Construction Management Document and Plan

Level II and Level III Site Plan Checklist Please upload the following drawings with the listed details into e-Plan as separate pdfs.	
☒	RECENT BOUNDARY SURVEY (stamped by Maine Licensed Surveyor)
Must be in compliance with Technical Manual, Section 13	
SITE PLAN(s) (stamped by Maine Licensed Engineer) including:	
☒	Existing Conditions • Approximate location of structures on abutting property • Topography • Locate water courses • Delineate wetlands • Zone lines
☒	Proposed Site Plan • Ground floor area, and grade elevations for all buildings
☒	Access, Circulation, and Parking • Streets and intersections adjacent to site , any proposed geometric modifications • Location, dimensions and materials of all existing and proposed driveways, vehicle, bicycle, & pedestrian access ways with corresponding curb lines • Engineered specifications/ cross-sections for proposed driveways, sidewalks & paved areas • Location and dimensions of proposed loading areas • Existing and proposed transit infrastructure with dimensions/ engineering specifications • Location of vehicle and bicycle parking with dimensions and engineering specifications
☒	Site Considerations • Identify snow storage areas • Location of fire hydrants • Location of solid waste management facilities
☒	UTILITY PLAN including:
• Existing utilities on site and within public streets • Location, sizing, and directional flows of all existing and proposed utilities • Location and dimensions of off-premises public or publicly accessible infrastructure adjacent to site • Electric utility infrastructure	

☒	GRADING and DRAINAGE PLAN including:
	• Existing grades and drainage • Proposed grades • Proposed stormwater management meeting Technical Manual (Section 5) standards • Location and proposed alteration of a water course • Preservation or alteration of wetlands
☒	EROSION CONTROL
	• Must be in compliance with Technical Manual, Section 5
☐	LANDSCAPE PLAN including:
	• Existing vegetation to be preserved and preservation measures • Proposed landscaping and buffers • Planting schedule
☐	RECORDING PLAT , if applicable
	• IF SUBDIVISION: Must be in compliance with requirements of Section 14-496 (b)
☐	ARCHITECTURAL PLANS & RENDERINGS including:
	• Exterior building elevations, color renderings, illustrations of all sides • Location and dimensions of all existing & proposed HVAC & mechanical equipment, all proposed screening • Provide context drawings, if applicable (Design Manual, page 1) • Floor plans

**Construction Management Plan
General Template**
City of Portland Public Works
Back Cove CSO - 244 Preble Street

Construction Management Plans shall depict the overall planning, coordination, and control of a construction site, including phases as applicable, from beginning to completion. The City's goal for a construction management plan is to support a safe construction site and protect the public safety, accessibility (including preserving accessible pedestrian, bicycle, and vehicular modes of transport throughout the city), and welfare during construction. In addition, the construction management plan shall minimize construction impacts in their duration and magnitude to the surrounding area and develop an effective communication process for resolving concerns and conflicts.

The Construction Management Plan will be submitted as part of the Site Plan Review and it shall address the construction logistics for a project. The Construction Management Plan shall include the following submissions: 1) a construction management site plan, 2) a construction schedule (time frame); and 3) a written narrative addressing the categories below.

A. Construction Management Principles

The following narrative provides an overview of the construction management principles that the applicant and contractor has identified to minimize impacts from the construction, such as noise, vibrations, ground movement, truck traffic, and other construction related factors to the surrounding building and communities.

B. Development Review of Construction Management Plan

Applicant and contractor shall submit a construction management plan that provides a comprehensive logistics and safety program for the construction project, which will be reviewed and approved as part of the site plan review process. Minimizing impacts to areas surrounding the building/construction site will be primary considerations in the process.

The Planning Authority and the Department of Public Works have the right to seek revisions to an approved Construction Management Plan or require a condition of approval that states an applicant shall coordinate a project's construction schedule with the timing of nearby construction activity, in order to avoid cumulative impacts on a neighborhood. Such a condition may involve a delay in commencement of construction, if necessary.

The following details define the intended approach to the successful management of the project construction and the construction management plan will address the general conditions contained below.

C. Performance Guarantees, Inspection Fees, Preconstruction Meeting, and Permits

Prior to scheduling a preconstruction meeting and the issuance of any city required permits, applicant and contractor shall meet all of the requirements contained in Section 14-530. Development review fees and post approval requirements and 14-532. General requirements and enforcement of Portland's Land Use Code.

Other permits, as applicable, include

1. **Street Opening and Street Occupancy Permits:** Construction activity in the public right-of-way are controlled by Chapter 25 and sewer and stormwater system connections are controlled by Chapters 24 and 32 of the Land Use Code. All required permits shall be obtained through the Department of Public Works and the requests shall conform with the approved construction management plan.
2. **Blasting:** Blasting, if required, shall conform with all measures of Article VIII. Regulation of Explosives in the Land Use Code and Section 3.7 Standards for Blasting and Regulation of Explosives in Portland's Technical Manual.
3. **Building Code:** Employ the best practices, as applicable, of Chapter 33 Safeguards During Construction, from the 2009 International Building Code.

D. Construction Administration and Communication

Applicant and Contractor will work diligently to implement a communication strategy as outlined below. The communication strategy is intended to ensure that all construction operations are performed in accordance with all agreements, ordinances and special permits applicable to this project. The Construction Manager will work closely with adjacent abutters, businesses and all parties informed, as far in advance as possible, of scheduled work, particularly work anticipated to cause significant noise, vibrations, or dust. The final construction management plan shall provide for the following:

1. Contact Person and contact information for the [applicant and contractor] and who is available 24 hours
2. Construction Signage posted on the site with Contact Information for Contractor
3. Describe any additional communication strategies
4. All construction site signage is temporary and shall be removed at project completion.

E. Construction Schedule

1. The contractor shall submit a schedule or time line for the construction project, including any Phasing.
2. Hours of Construction. Construction may occur during the daytime hours as defined in Section 17-18. Construction Activities for Building permit (Attachment 1) and Section 25-129. Noise, dust and debris (Attachment 2).
3. Extended Hours or Night Work: Pursuant to Section 17-18, this section not apply to emergency utility work or "Situations where the public works authority or the office of building inspections determines that the construction activity is of a unique character which cannot reasonably be completed or performed during the permitted hours and which is not of a recurring nature, provided that prior to engaging in such activity the contractor or his representatives gives notice of the time and scope of such proposed activity, the notice to be given in a manner approved by the public works authority."
4. Material Deliveries: Schedule and designated location for delivery of materials and boxed goods.

F. Security & Public Safety

1. The Construction Management Plan will depict all proposed fencing or other barriers and access gates (with Knox locking devices) with the intent of separating pedestrian and vehicle circulation from the construction site.

2. Structures undergoing construction, alteration, or demolition operations, including those in underground locations, shall comply with NFPA 1 Chapter 16. *Safeguarding Construction, Alteration, and Demolition Operations*.
3. Fire Safety Program. An overall construction or demolition fire safety program shall be developed. Essential items to be emphasized include the following:
 - o Good Housekeeping
 - o On-site security
 - o Installation of new fire protection systems as construction progresses
 - o Preservation of existing systems during demolition
 - o Organization and training of an on-site fire brigade
 - o Development of a pre-fire plan with the local fire department
 - o Rapid communication
 - o Consideration of special hazards resulting from previous occupancies
 - o Protection of existing structures and equipment from exposure fires resulting from construction, alteration, and demolition operations
4. Blasting, if required, shall conform with all measures of Article VIII. Regulation of Explosives in the Land Use Code and Section 3.7 Standards for Blasting and Regulation of Explosives in Portland's Technical Manual.
5. Any proposed temporary security lighting shall be shown on CMP and all fixtures shall be full cutoffs.

G. Construction Permitting and Traffic Control Plans

1. Construction Activity in Public Streets: Construction activity in the public right-of-way is controlled by Chapter 25 Article VII of the City Code of Ordinances. Required licenses and permits, restrictions on activity, and fees & area are outlined in that Chapter. Rules and Regulations for Excavation Activity are available through the Street Opening Clerk at the Department of Public Works. At no time can construction activity including delivery vehicles close or block streets or affect public safety access without prior notice and approval of the Department of Public Works.
2. Sewer and Stormwater: Sewer and stormwater water system connections are controlled by Chapters 24 and 32 of the City Code of Ordinance. Required permits for new connections and/or abandonment of existing connections are available through the Street Opening Clerk at the Department of Public Works. Rules and Regulations for these utility systems are available through the City Engineer's office of the Department of Public Works and in Section II of the Technical Manual.
3. Traffic Control Plans: Construction activity that impacts the existing public street system must be controlled to protect the safety of the construction workers and all modes of the traveling public. Projects are required to submit a satisfactory 'maintenance of traffic' (MOT) plan prior to any site plan, subdivision, or street opening permit approval. MOT plans may be required for projects that have impacts on local streets.

Maintenance of Traffic (MOT) plans shall provide for the safe passage of the public through or along the construction work zone. On a case-by-case basis, applicants may be allowed to close a street and/or detour a mode of traffic when absolutely necessary for safety. MOT plans shall employ the appropriate techniques and devices as called

for the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD). In addition:

- Construction speed signing may be used as needed to slow traffic
- Traffic Control signs shall not be placed where they are an obstruction to bicycles or pedestrians.
- In some situations, flaggers may be required.
- Police details may be required at lighted intersections and may be requested by the City's transportation engineer or his designee.

All existing modes of travel in work zone area shall be accommodated if impacted by the activity. The safe passage of pedestrians, bicyclists, transit providers, and motorists are of equal importance when planning out the work zone; no pre-existing travel mode may be eliminated without the express approval of the Department of Public Works. The MOT should also address on-street parking impacts, including deliveries and parking for adjoining businesses and property owners, analysis of roadway capacity or diversion capacity if street closure or change to roadway capacity is required, and coordination with other on-going or future construction or utility projects in the vicinity.

- Traffic control of bicycle and pedestrian facilities or routes through work zones shall be maintained until the bicycle and pedestrian facilities or routes are ready for safe operation. Traffic control will not be removed to allow auto travel at the expense of bicycle and pedestrians.
- Barrier systems utilized to separate the construction activity from the public street and /or sidewalk shall not inhibit sight distances, particularly for visibility of pedestrians and bicyclists.
- ADA compliance shall be maintained.

Use of public parking spaces or the blockage of any portion of sidewalk for the purpose of construction activity shall require an occupancy permit and appropriate fee as assessed by the Department of Public Works.

H. Site Management and Controls

The final Construction Management Plan will address maintaining the site in a safe condition and will include the following:

1. Regular trash and debris removal
2. Street cleaning and damage controls
3. Dust controls- The construction shall comply with Portland's requirements under Section 25-129 on Noise, dust and debris (Attachment 2).
4. Noise: The construction shall comply with Portland's requirements under Section 17-18 of the City Code (Attachment 1) and Section 25-129 on Noise, dust and debris (Attachment 2).
5. Rodent Control will be provided, if applicable, by a professional exterminator and consistent with Chapter 22 of the City Code.
6. Snow Removal: Pursuant to Section 25-173 Contractors to ensure a safe means of travel within the work zone.
 - 1) Snow/ice removal or commence automatically from (1" of snow and up) or Ice

- 2) Remove snow as needed within the work zone, including parking spaces & not to block any driveways or sight lines with the piles of snow.
- 3) Clear all walks & ramps with the work zone
- 4) Sand or Salt as needed
- 5) Clear all basin or drainage to help snow melt
- 6) This would include Monday-Friday Sat/Sunday/Holidays

I. Erosion Control and Preservation of Trees

1. The contractor shall install all erosion and sedimentation controls as depicted on the approved erosion and sedimentation control plan prior to the pre-construction meeting for inspection by the City. The contractor shall regularly inspect the control measures, no less than weekly and after significant storm events, and maintain any installed temporary or permanent stormwater management systems in working order. The contractor shall document all inspection activities and corrective actions and be prepared to provide these documents for inspection by the City, Maine Department of Environmental Protection, or the U.S. Environmental Protection Agency upon request.
2. The contractor shall maintain all tree and landscaping preservation measures as depicted on the landscaping plan (Exhibit) within the area of construction.
3. The storage of materials shall be identified and avoid being located under/near trees.

J. Construction Staging Area

1. The Construction Management Plan shall depict location of the material staging areas, the location on onsite temporary construction trailers, the location on onsite truck delivery holding areas, the location onsite truck washing stations, masonry mixing stations, the general location of the construction security fence and the general location of temporary construction dumpsters. An open storage area shall be shown on the plan.
2. Delivery Truck Holding Areas On-Site: The delivery holding area shall be shown on the plan and shall not be blocked during construction. On days when the construction activities require multiple truck deliveries, these deliveries will be carefully scheduled so that there is always adequate on-site area for the holding of the trucks until they can be unloaded. Once at the site all vehicles will be brought within the fence line and will make every attempt to avoid queueing on public streets.
3. Delivery Truck Holding Areas Off-Site: In the event that adequate on-site area for holding of trucks is not available, an off-site marshalling area will be utilized for trucking. The designated off-site location will be identified in the construction management plan.

K. Parking During Construction

1. Construction Parking: Adequate parking for construction workers shall be provided on site or arrangements for off-street parking at an off-site location shall be provided. The parking arrangements shall be included in the construction management plan.
2. Parking: Where existing facilities are remaining in operation during construction, the construction management plan shall identify how the parking for employees and others shall be managed.
3. Truck Routes and Volumes: The Construction Management Plan shall address the designated truck routes and expected truck volumes.

L. Special Measures as Necessary

For construction work that will take place over a long period (e.g. 12 months or more), involve major demolition/ deep excavation/ piling and/or special construction techniques, or are located near sensitive uses (e.g. medical care facilities, schools), the Construction Management Plan should provide details and demonstrate that all appropriate special measures have been taken to avoid, minimize, or possibly compensate for potential impacts. This may include taking baseline measurements before construction, such as arranging to photograph the foundations of nearby properties upon consent of the owners, in order to assess any future impacts of vibration, noise, etc.

Submittal

Job: 39703
PORTLAND- BCS STORAGE FACILITY
244 Preble St.
Portland, ME 04101

Spec Section No: General 2
Submittal No: 2
Revision No: 0
Sent Date: 3/20/2020

Spec Section Title: Construction Plan - Phase 1 - Mob and Site Prep.
Submittal Title: Construction Plan - Phase 1 - Mobilization and Site Prep.

Contractor:
SARGENT CORPORATION

Other:
Portland Public Works
Bradley Roland

SHOP DRAWING / SUBMITTAL REVIEW

☒ REVIEWED ☐ REVIEWED WITH CHANGES NOTED
☐ REVISE AND RESUBMIT ☐ REJECTED

SUBMITTAL WAS REVIEWED FOR DESIGN CONFORMITY AND GENERAL CONFORMANCE TO CONTRACT DOCUMENTS ONLY. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING DIMENSIONS AT JOBSITE FOR TOLERANCE, CLEARANCE, QUANTITIES, FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF HIS WORK WITH OTHER TRADES AND FULL COMPLIANCE WITH CONTRACT DOCUMENTS

By: GJA Date: 3-20-20

Sargent Corporation

Architect's Stamp

Engineer's Stamp



Excellence for Generations.

AN EMPLOYEE OWNED COMPANY

**Construction Plan
Phase 1 – Mobilization and Site Preparation**

For:

**City of Portland
Portland Public Works - Water Resources
Back Cove South Storage Facility
244 Preble St.
Portland, ME 04101**

Rev. 0 – March 20, 2020

Prepared by: Glenn J. Adams, P.E.
Sargent Corporation
Design-Build Project Manager

Introduction

This construction plan is for the phase 1 work activities for the Back Cove South Storage Facility project (BCSSF). The intent of this plan is to provide an overview of these activities and provide other key project information. Subsequent construction plans will be developed for future phases of work. In phase 1, we anticipate the following mobilization and site preparation activities:

- Installation of perimeter safety fencing
- Installation of pedestrian controls
- Traffic control signage
- Mobilization and set up of the project office trailers and restrooms
- Mobilization of project equipment and materials
- Hook-up of temporary power
- Building construction entrances
- Earthwork related to establishing a construction laydown yard
- Site demolition and removals
- Establishing erosion controls
- Topsoil stripping
- Initial fill placement and rip rap armoring along Back Cove
- Initial excavation to elevation 8.0' in required areas

This construction plan is separated into the following sections:

- Project contacts – firms and individuals
- Key roles and responsibilities
- Meetings and communication
- Safety and health
- Quality management
- Communications with utility companies, regulatory agencies and outside inspectors
- Equipment and systems testing plan
- Special inspections
- Dust, noise, and light control
- Spill containment procedure
- Traffic control plan
- Role of design builder's geotechnical / soils / design engineer / surveyor during construction
- Appendix A – Project organization and communication chart
- Appendix B – Resumes of key personnel
- Appendix C – Phase 1A and 1B traffic and pedestrian control plan

Design-Build Team Contacts

Sargent Corporation Design-Build Project Manager

Glenn Adams, P.E. (207) 215-2055 gadams@sargent-corp.com

Sargent Corporation - Project Superintendent:

Ian McCarthy (207) 478-0010 imccarthy@sargent-corp.com

Sargent Corporation - Construction Quality Coordinator:

TBD

Sargent Corporation - Southern Maine Regional Operations Manager:

Doug Morrison, P.E. (207) 478-3401 dmorrison@sargent-corp.com

Woodard & Curran - Design Manager:

Megan McDevitt, P.E. (207) 558-3785 mmcdevitt@woodardcurran.com

Terracon - Geotechnical Engineer:

Carl Thunberg, P.E. (603) 206-1197 carl.thunberg@terracon.com

HB Fleming - Project Engineer:

Dave, Gifford, P.E. (207) 799-8514 dave@hbfleming.com

Design-Build Team Roles & Responsibilities

Sargent Corporation is the design builder and is responsible for the design and construction of the project. At this time, Sargent plans to self-perform all site development and excavation activities including pipe and precast structure installation. Major subcontractors and material suppliers are listed in the project organization and communication chart, located in **Appendix A**. Resumes of key project personnel are located in **Appendix B**.

Glenn Adams is the design-build project manager for Sargent and will be located on site full time. He is in charge of managing the design and construction of the project and is the primary contact for Sargent Corporation. All official communications are to be routed through him. Other major functions of this role include the management of all subcontractors and material suppliers. The construction quality coordinator will report directly to him.

Ian McCarthy is the project superintendent for Sargent. He is in charge of all day-to-day construction activities on the project and will be located on site full-time. Ian also serves as the chief safety officer on the site. He will handle all safety reporting, site inspections, and be responsible for the implementation and supervision of all pedestrian and traffic controls. All foremen, operators, drivers, laborers, and subcontractors report to him.

Doug Morrison is the southern Maine regional operations manager for Sargent. He is in charge of the overall construction means and methods on the project and controls the labor and equipment resources allocated to the project. Doug will have at least a weekly presence on site, but is in communication with Glenn and Ian on a daily basis.

Woodard & Curran is the engineer of record for the project. They are a design subcontractor to Sargent and are in charge of the civil / site, environmental, structural, architectural, electrical, instrumentation and controls and SCADA design elements.

Megan McDevitt is the design manager for Woodard & Curran. She serves as the primary point of contact for Woodard & Curran and is in charge of all the internal design disciplines. Megan works out of the Portland, ME office.

Terracon is the geotechnical engineer for the project. They are in charge of all geotechnical elements for the project and are a design subcontractor to Sargent. Terracon will also be responsible for the construction materials testing on the project. Laboratory testing will be completed at their Manchester, NH office.

Carl Thunberg is the geotechnical department manager for Terracon's Manchester, NH office. He is the primary contact for Terracon and supervises other geotechnical engineers and lab technicians who are working on the project.

HB Fleming is the designer and constructor of the support of excavation (SOE) system on the project, and is a subcontractor to Sargent. They are located in South Portland, ME and specialize in SOE work, designing many of their systems in-house. HB Fleming will also be responsible for the procurement and transportation of the SOE materials.

Dave Gifford is the project manager for HB Fleming. He is an owner of the company and is also the engineer of record for the SOE system on this project. Dave works out of the South Portland, ME office and will be on site as-needed.

Meetings and Communication

Currently, the City, their advisors, and the design build team are meeting on a bi-weekly basis. These meetings started in August of 2019, and with several exceptions have occurred on a continual basis. The intent of the design builder is to continue these bi-weekly project meetings, moving them from the City of Portland office to the field office once it is set up. Special meetings will be held as-needed and all meetings have call-in options available. The option to switch to weekly meetings once major construction starts is always available.

The design build team, in agreement with the City and their advisors has elected to use Procore software to share project documents and other important communications. Procore will be used for all design submissions, RFI's, submittals and meeting minutes.

The primary contacts for each member of the design build team are mentioned above. All project communications will be sent to or at least CC Glenn Adams. He will distribute accordingly. The primary contact for the City of Portland is Brad Roland, and the primary contact for the Sebago Technics (City Advisor) is Owens McCullough. They are to be copied on all official project correspondence and will distribute it accordingly. To date, project communication has gone well in the opinion of the design builder and the methods currently being used, including e-mail and phone calls will continue to be used.

Safety and Health

Sargent Corporation's Site-Specific Health and Safety Plan (SS HASP) has been submitted separately from this construction plan. The SS HASP is a living document and will be updated throughout the project as needed. Sargent Corporation's 2020 Health and Safety plan has also been submitted separately from this construction plan. General safety information is included below.

Sargent's project superintendent Ian McCarthy will serve as the design builder's safety officer and has the authority to make changes to the SS HASP as site conditions require. He is in charge of all site safety elements, including our own crews, all site visits and all subcontractors and material suppliers. Ian is responsible for all safety inspections, safe work observations, and investigations, and will work with Sargent's safety director, Adam Kasprzak, and field safety specialist, Arthur Herbst to address any issues.

Site safety will be promoted through Tuesday morning toolbox talks and daily plan-of-the-day (POD) meetings. All on-site project personnel, including subcontractors, are required to sign-in and participate in these important meetings.

As is standard on all Sargent Corporation projects, the minimum following PPE is required at all times, including by visitors:

- Hard hat
- Hi-visibility vest
- Safety glasses
- Safety toe boots
- Long pants
- T-shirt with sleeves

Hearing protection and other PPE will be provided for use as required.

Due to the location of this project, one area of specific concern is the safety of the general public using the Back Cove Trail system and sidewalks along Exit 7 and Preble St. This is addressed in the pedestrian and traffic control section of this plan.

Quality Management

The quality management plan will developed when design is advanced further and will be included in a future revision of this document. The design builder will assign a Construction Quality Coordinator (CQC) to the project in the upcoming weeks. This person will report directly to Glenn Adams, who is serving as the Design Build Project Manager and Quality Manger (QM). Any quality documentation or issues will be handled directly by Glenn Adams until the CQC is assigned.

Communications with Utility Companies, Regulatory Agencies, and Outside Inspectors

At this time communication has occurred or is in progress with numerous utilities, regulatory agencies, and outside inspectors. Either the City of Portland, the City Advisors, or the design build team has communicated with the following:

- City of Portland Planning & Urban Development Department
 - Permitting
- City of Portland Parks, Recreation & Facilities Department
 - Coordination for irrigation, site power, and water usage
- Federal Aviation Administration (FAA)
 - Determination of No Hazard to Air Navigation for Temporary Structure
- Maine Department of Transportation (MDOT)
 - Right-of-way access, geotechnical review, traffic control
- Maine Department of Environmental Protection (MDEP)
 - Permitting
- Army Corps of Engineers (ACOE)
 - Permitting
- Maine Department of Marine Resources (MDMR)
 - Permitting
- Maine Department of Inland Fisheries and Wildlife (MDIFW)
 - Permitting
- Central Maine Power (CMP)
 - Site electric service
- Portland Water District (PWD)
 - Site water service

Equipment and Systems Testing Plan

The equipment and systems testing plan will developed when design is advanced further and will be included in a future revision of this plan.

Special Inspections

The only special inspections anticipated during this phase of the project would be from the City of Portland, the City Advisors, or regulatory agencies. As with any construction project, there is always the chance that OSHA will visit the project site. The design build team is prepared for any such visit. In later phases of the project, we anticipate inspections from the private utilities as well as city building, plumbing, and electrical inspectors.

Dust, Noise, and Light Control

Sargent will provide all necessary labor, equipment, and materials to control dust on site. For dust control during this phase of the project, we plan to use wet sweeping methods utilizing a water truck and ride-on sweeper. Dust (specifically Silica) is currently an emphasis program for OSHA and our supervisors (project superintendent and all foremen) are aware of the proper methods to control dust. Silica exposure is specifically addressed in section X, subsection 5 of the General Health and Safety Plan that was submitted separately from this plan.

Sargent Corporation will comply with all applicable Federal, State, and City noise ordinances, regulations, standards and requirements. Sargent will work to minimize noise cause by project operations by use of silencers, specialized mufflers, and other sound attenuating devices. During this early mobilization and site preparation phase of the project, no night work is planned. For hearing protection information, please see the General Health and Safety Plan that was submitted separately.

Similar to what is mentioned above, during this phase of the project no night work is planned. Light control will be addressed at a later date in an update to this construction plan.

Spill Containment Procedure

As the majority of the project area is directly adjacent to Back Cove, spill prevention and control is of the utmost importance.

Sargent Corporation's Spill Prevention & Control plan is located in the Health and Safety Plan, Section IX, subsection 6.0 "Oil and Fuel Spills". This plan has been submitted separately, however, the critical components including emergency contact numbers have been included below.

6.0 OIL & FUEL SPILLS

6.1 *Reporting Requirements.*

6.1.1 *The **U. S. Environmental Protection Agency** (EPA) requires a telephone report to the National Response Center at 800-424-8802 for any oil spill that causes a film or “sheen” on a navigable surface water body or its adjoining shoreline.*

6.1.2 *The state of **Maine** requires that each oil, gasoline, and diesel fuel spill shall be reported to the Department of Environmental Protection (DEP) within two hours after the spill.*

6.1.2.1 *There is no minimum quantity for this requirement.*

6.1.2.2 *Under Maine law, a person responsible for an oil spill is exempt from civil enforcement penalties so long as the discharge is reported within two hours of its discovery and is promptly cleaned up to the DEP’s satisfaction.*

6.1.2.3 *The contacts and call numbers for oil spill reporting in Maine are:*

a. Emergency Spill Statewide	800-482-0777
b. Augusta Area	207-287-3901
c. Bangor Area	207-941-4570
d. Portland Area	207-822-6300
e. Presque Isle Area	207-764-0477

6.2 **Cleanup Requirements.**

6.2.1 *All petroleum spills must be immediately cleaned up and removed from project sites.*

6.2.2 *In general, a small and localized spill should be cleaned up and taken to an approved landfill for disposal. In Maine, oil contaminated soils, absorbent pads, and other cleanup waste materials are classified as “non-hazardous special wastes”.*

6.2.3 *Larger quantities of contaminated soils may be recycled at a paving plant or other approved facility.*

6.2.4 *Your state environmental agency reporting contact will provide guidance in the most cost effective and environmentally safe means to dispose of oil contaminated soils.*

Other key requirements related to spill containment are as follows:

- At all times the project site have at least two large pre-packaged drum-type spill kits on site, as well as at least five portable spill kits for smaller spills.
- Storage of all petroleum products is to be per OSHA section 1926.152 flammable liquids.
- All fueling of equipment is to take place at least 100’ from water resources and catch basins or other structures leading to water resources.
- Minor equipment maintenance (lasting up to 10 hours) will take place on site.
- Major equipment maintenance (lasting more than 10 hours) will be evaluated on a case-by-case basis by the design builder and any necessary subcontractors or material suppliers.

Pedestrian and Traffic Control Plan

The phase 1A and 1B pedestrian and traffic control plan is located in [Appendix C](#) of this report. It has also been submitted directly to the city's online permitting platform for review by city transportation engineers. Impacts to vehicle traffic during this project phase will be minimal. Of significant concern are the impacts to the pedestrian traffic utilizing the Back Cove Trail. Sargent Corporation will direct pedestrian traffic around and through our work site without incident. In order to accomplish this, we will utilize some of the same tactics used on past projects that were adjacent to the Back Cove Trail. These tactics include the use of temporary construction fencing, routine inspection and maintenance of pathways, temporary walkways and work area crossings, as well as appropriate levels of construction signage and field monitoring. During construction, the project site will be enclosed by temporary construction fencing. This fence will keep the general public separated from construction activity and will have a limited number of access points.

Pedestrian traffic will normally be routed to the existing pathway gives that leaves the greatest distance between the public and our work area. This path location will be changed as necessary as the work progresses on the project. We will utilize existing trail sections to the fullest extent possible, and when necessary, construct temporary trail sections out of similar materials with reasonable grade changes to continue to allow for foot, bicycle and wheelchair access. Our crews will monitor existing and temporary trail conditions on a daily basis and will address quality issues as needed. We will also effectively sign and direct the general public around our work site to the greatest extent possible. This will be done using a combination of construction signage, barricades, cones, barrels, and other warning devices. In certain circumstances we may also need to use project employees as trail flaggers, spotters, or guides.

Role of Design Builder's Geotechnical / Soils / Design Engineer / Surveyor during Construction

The design builder's design subcontractors will continue to have active roles in the project after the completion of the design phase. Woodard & Curran will provide construction engineering services throughout the course of the project, including documents review, inspection of construction, meeting participation, preparation of record drawings, and preparation of O&M / maintenance manuals. Terracon will provide construction inspection services as well as construction materials testing services throughout the entire project. Sargent Corporation will utilize our in-house field engineering staff to provide survey services for the duration of the project.

Appendix A

Project Organization and Communication Chart



Design-BUILDER
SARGENT CORPORATION
Glenn Adams, PE
Design-Build Project Manager

Design Team Subcontractors

Lead Geotechnical Engineer
TERRACON
Carl Thunberg, PE
Geotechnical Manager

Design Manager
WOODARD & CURRAN
Megan McDevitt, PE

Quality Control

Construction Quality Coordinator
TBD

Construction Team

General Contractor
SARGENT CORPORATION
Glenn Adams, PE
Construction Manager

Southern Maine Regional Operations Manager
SARGENT CORPORATION
Doug Morrison, PE

Field Safety Specialist
Arthur Herbest

General Contractor
SARGENT CORPORATION
Construction Superintendent & Safety Officer
Ian McCarthy

Lead Pipeline Engineer
Jason Kreil, PE
Technical Manager

Lead Structural Engineer
Scott Hawk, PE, SE
Technical Manager

Lead Instrumentation & Control Engineer
Kevin Mesick, PE
Project Manager

Lead Environmental
Jedd Steinglass
Project Manager

MAJOR SUBCONTRACTORS

CIP Concrete Tank - NS Giles
Excavation Shoring and Support - HB Fleming
Electrical - Moulison
Building - TBD
HMA Paving - TBD
Landscaping - TBD
Irrigation - Thirsty Turf
Instrumentation & Controls - W&C
SCADA - W&C

MAJOR MATERIAL SUPPLIERS

Tipping Buckets - AFT
Precast Concrete Structures - ACI
Pipe & Fittings - EJP
Tideflex Valves - NE3
Chopper Pumps - Vaughn Pump

SELF-PERFORM WORK FOREMEN - TBD

BACK COVE SOUTH STORAGE FACILITY Project Organization and Communication Chart



Appendix B

Resumes of Key Project Personnel

GLENN J. ADAMS, P.E.
SENIOR PROJECT MANAGER

ACADEMIC AND PROFESSIONAL QUALIFICATIONS:

Bachelor of Science in Construction Management – University of Maine – 2004
Registered P.E. (Civil) in the State of Maine – License #12998
Drinon & Associates – Leadership Coaching Program – 2018
FMI – Emerging Managers Institute – 2014
AGC Maine – Construction Leadership Institute – 2009

EXPERIENCE:

Mr. Adams has worked for Sargent Corporation for over 16 years. He has held the positions of Senior Project Manager, Regional Operations Manager, Project Manager, Field Engineer and Foreman, and on occasion has worked as a Project Supervisor and Estimator. During this time he has provided leadership for, managed, and worked on a wide variety of projects including: highway construction, building site work, airport construction, landfill construction, water/wastewater utilities, CSO storage systems, wind power access, electrical substations, dam removals and rehabilitations, and athletic complex construction. As the Southern Maine Regional Operations Manager, Mr. Adams was directly responsible for the safety, quality and management of up to \$50 million worth of contracts in Maine and New Hampshire, as well as providing leadership for up to 100 employees at any one time.

RELEVANT EXPERIENCE:

Current Senior Project Manager – Sargent Corporation

2016 – 2018 Operations Manager – Southern Maine Region – Sargent Corporation

2012 – 2016 Project Manager – Southern Maine Region – Sargent Corporation

2005 – 2012 Field Engineer / Estimator / Project Supervisor – Sargent Corporation

2004 – 2005 Field Foreman – Sargent & Sargent

2001 – 2003 Summer Intern – Bridgecorp

SPECIFIC PROJECT EXPERIENCE:

- Preble St. Sewer Separation – City of Portland – Portland, ME
- Baxter Boulevard North Storage Conduit – City of Portland – Portland, ME

- Portland Jetport Apron Construction – City of Portland – Portland, ME
- Capisic Pond Enhancements Project – City of Portland – Portland, ME
- Warren Avenue Bridge Replacement Site work – Reed & Reed – Portland, ME
- Exit 53 Toll Plaza Reconstruction – Maine Turnpike Authority – Falmouth, ME
- Springs Dam Nature-Like Fishway – Brookfield – Saco, ME
- Landfill Expansion, Phase 2 – Ecomaine – Westbrook, ME
- Waste Water Treatment Facility, Phase 1 – Town of Oxford – Oxford, ME
- Area C Sewer and Pump Station Project – Town of Oxford – Oxford, ME
- Area A Sewer and Pump Station Project – Town of Oxford – Oxford, ME
- Gorham Dam Rehabilitation – Brookfield Renewable – Gorham, NH
- Route 201 Reconstruction – MDOT – Hallowell, ME
- S256 Underground Transmission Line – Central Maine Power – Lewiston, ME
- Club Motorsports Road Course Project – Club Motorsports – Tamworth, NH
- Route 236 Sewer Extensions Project – Town of Kittery – Kittery, ME
- Maine General Medical Center Site Work – Maine General Health – Augusta, ME
- Kibby Mountain Wind Power Project – TransCanada – Kibby Twp., ME
- Mars Hill Wind Power Project – UPC Wind – Mars Hill, ME

PROJECT AWARDS:

- 2019 AGC of Maine Build Maine Award – Rt. 27 Reconstruction – Town of Boothbay – Boothbay, ME (Regional Operations Manager) – Engineer: Sebago Technics
- 2017 AGC of Maine Build Maine Award – Capisic Pond Enhancements Project – City of Portland – Portland, ME (Regional Operations Manager) – Engineer: Woodard & Curran
- 2017 AGC of Maine Build Maine Award – Area C Wastewater and Pump Stations – Town of Oxford – Oxford, ME (Regional Operations Manager) – Engineer: Woodard & Curran
- 2013 AGC of Maine Build Maine Award – Baxter Boulevard North Storage Conduit – City of Portland – Portland, ME (Project Manager) – Engineer: Sebago Technics

INDUSTRY INVOLVEMENT:

- Maine Better Transportation Association (MBTA) Membership Committee Chairman (2019, 2020)
- University of Maine – Industrial Advisory Committee – Construction Engineering Technology Program (2017 – Current)

IAN MCCARTHY **SUPERINTENDENT**

YEARS OF SERVICE (2002-PRESENT)

Mr. McCarthy has over 17 years of experience in underground utilities, water and sewer drainage. He also has experience in fast track site projects, landfills and road construction. He has worked as a Laborer, Foreman and Project Manager.

PAST COMPLETED PROJECTS

Highway

Falmouth, ME –Route One Infrastructure - Renovation of 600 lf of 30" storm drain, 125 lf of 15" storm drain, miscellaneous structures and connections. Roadway was rebuilt after completion of the storm drain system with new base and sub base gravels as well as surface pavement and curbing.

Claremont, NH – Draper's Corner Reconstruction – 9,500 cy of excavation to embankment; 163 lf of 6' X 8' box culverts; 2,800 lf of storm drain; 33 drainage structures; 500 lf sewer pipe; 800 lf ductile iron waterline; 5,000 cy road gravel; 2,200 tons of pavement, guardrail, sidewalk, granite curb and miscellaneous erosion control

Groton, NH – Upper Bridge Replacement – Project consisted of removing existing bridge and all its components entirely. A new precast concrete bridge with wingwalls installed in its place.

Landfill

Bethlehem, NH – NCES Landfill Stage V – Two year project with a 4 acre cell constructed in 2015 and a 3 acre cell being completed in 2016. Project involved 80,000 cy of excavation, construction of a new access road and gas piping within the existing landfill.

Lebanon, NH – Gas Wells – Installation of gas wells and gas collection piping on the existing phases of the landfill.

Scarborough, ME – Ecomaine- Phase 2 West Construction –New landfill cell including 10,000 cy of excavation; 8,000 cy low perm soil; 6,000 linear feet of HDPE piping

IAN MCCARTHY, PROJECT MANAGER

Old Town, ME – Juniper Ridge Landfill – Cell 7 Construction – Landfill cell including 15,000 cy of excavation; 14,000 cy of borrow placement; 10,000 cy of drainage and placement; 1,500 linear feet underdrain piping; 22,000 cy low perm clay placement, geomembrane liner system; 11 cy leachate collection sand and leachate collection piping

Old Town, ME – Juniper Ridge Landfill – Cell 5 Construction – Landfill cell including 92,000 cy excavation; 33,000 cy of low perm clay; leachate collection sump and pump station; 4,000 linear feet HDPE piping

Hampden, ME – Pine Tree Landfill – Phase VII Cell Construction - Landfill cell including 60,000 cy of excavation; 16,000 cy of low perm clay barrier; 2,000 linear feet HDPE piping

Hampden, ME – Pine Tree Landfill – Phase VII Cover – 12 acre landfill cover including 48,000 cy of clay material; 19,000 ft of HDPE piping.

Lebanon, NH – Solid Waste Disposal Facility – 133,000 cy excavation; new leachate collection system and modifications for existing system; primary and secondary liner system; leachate collection pump house; storm drainage; roadway construction and restoration

Sitework

Boothbay, ME – Country Club – Sitework for the reconstruction of the Boothbay Harbor Country Club. Project included construction of a new clubhouse, main entrance, access road, tennis pavilion, and villas.

Hampden, ME – Hampden Academy – 80,000 cy of unsuitable material excavated from building footprint and replaced with 80,000 cy structural fill. 4,000 ft of water line and over 23,000 ft of storm drain and underdrain piping with 50 drainage structures, 2,000 lf of 6"-12" sewer pipe. Construction of running track and baseball field.

Turner, ME – Hannaford – Site preloaded with 33,000 cy of surcharge gravel due to site being saturated with water. 2,097 wick drains were installed.

Brewer, ME – PreK- 8 School – Demolition of existing school; 27,000 sf of retaining walls; field and track area; 75,000 cy excavation; installation of storm, sewer and water distribution pipeline.

Holderness, NH – Substation – 48,000 cy excavation; clearing, stripping of topsoil; installation of erosion control; installation of storm water collection system

Lebanon, NH – Dartmouth Hitchcock Medical Center - 23,000 cy excavation; timber lag walls and sheeting/shoring; 3 parking lots; storm collection systems, site lighting; sidewalks; water and sewer services; landscaping

IAN MCCARTHY, PROJECT MANAGER

Orono, ME – University of Maine AEWG Wood Composite Building – Sheet pile cofferdam system; storm drainage collection system; sewer and water services; parking and sidewalks

Utility

Lebanon, NH – Combined Sewer Separation – Contract No. 10 – Project encompassed all or portions of seven streets including full depth pavement reconstruction, sewer utilities, water utilities, storm drainage utilities, pavement overlays and retaining walls. Project included installation of over 6,000' of drainage pipe and 49 drainage structures, 4,500' of sewer main and 19 sewer manholes, and 5,000' of watermain.

Windpower

Carthage, ME – Saddleback Wind Farm – Project consisted of construction of approximately 1.5 miles of access roads with an additional 1.5 miles of ridgeline access roads and crane paths. Drilling blasting and excavation of approximately 80,000 cy of bedrock to produce the required aggregates for the new road construction. Backfill and excavation along with drainage and electrical distribution for 12 wind turbines and foundations.

Dam

West Swanzey, NH – Dam Removal – Removal of the Homestead Woolen Mill dam and restoration of the Ashuelot River.

CERTIFICATIONS / TRAINING / EXPERIENCE

Basic and Advanced Erosion Control Practices

Confined Space Training

First Aid and CPR

Pipe Fusion



DOUG MORRISON, P.E.
SOUTHERN MAINE OPERATIONS MANAGER

Education & Training:

Bachelor of Science in Mech. Engineering – University of Maine, Orono 2004
LEED AP Certified
Professional Engineer – Civil Engineering

Overview

Doug Morrison has been with Sargent Corporation for 17 years and has done two internships with the company throughout his tenure at college. Recently, Doug has taken over as the Southern Maine Operations Manager. Prior to this role, Doug served as the Special Projects Manager tackling numerous large projects to integrate throughout the organization and General Manager of the company's new asphalt manufacturing facility. Other roles served for the company were Mid Atlantic Regional Manager, project engineer and project manager on large scale projects ranging from airports, schools, hospitals, shopping centers, pump stations, utility projects, landfills and treatment facilities.

Mr. Morrison works collaboratively with the operations team on a daily basis, planning, strategizing and ensuring projects are scheduled, planned, and all requirements are met to ensure projects stay on track. He brings to the team a diverse background of management and engineering of all civil market segments.

Relevant Experience

Southern Maine Operations Manager – 2019 – Present

Special Projects Manager – 2018 – Present

- Collaboratively working on new ERP software upgrades
- Instituting company wide equipment telematics integration
- Managing various construction projects

Asphalt Operations Manager – 2016 to 2018

- Designed, procured, and constructed new Asphalt Plant
- Estimated all paving and aggregate sales
- Coordinated all scheduling of hot mix sales
- Coordinated all trucking of aggregates and hot mix
- Managed QC division to ensure mix quality

Mid Atlantic Regional Manager – 2012 to 2016

- Charlottesville Airport Runway 21 Phase 3 & 4
- Manassas Regional Airport Runway 34R Extension

- Hilltop Village Center
- Staffordboro Commuter Parking Lot
- Glatfelter Paper Landfill Closure
- Embrey Mill Park Athletic fields
- More available if needed.

Project Manager – 2006 to 2012

- Granite Reliable Wind Power
- Spruce Mountain Wind Power
- Oxford Casino
- Dexter Airport Obstruction Removal Project
- Colby College Athletic Fields Reconstruction
- Jackman Port of Entry Sitework
- Dexter School Sitework;
- Southwest Harbor Water Treatment Facility Upgrades
- More available if needed.

Project Engineer – 2002 to 2006

- Shaw's Grocery Store of Stratham, New Hampshire
- Old Town Elementary School
- Walmart Distribution Center in Lewiston, ME

Carl W. Thunberg, P.E.

GEOTECHNICAL DEPARTMENT MANAGER

PROFESSIONAL EXPERIENCE

Mr. Thunberg is a senior geotechnical engineer and Geotechnical Department Manager for Terracon Consultants. He has broad experience in geotechnical analysis, design, and construction. His areas of expertise include deep and shallow foundation design and ground improvement methods for bridges, roadways, energy infrastructure projects, buildings, dams, slopes, retaining walls, landfills, and geotechnical aspects of environmental projects, including Superfund sites. Mr. Thunberg has a reputation for professionalism, quality, practicality, teamwork, and an ability to manage projects to successful technical and financial outcomes.

Mr. Thunberg has extensive knowledge and competency of soil mechanics and geotechnical analytical methods by hand and computer. He has demonstrated experience in planning and executing multiple large-scale subsurface exploration programs for transportation, energy, and environmental projects alike.

PROJECT EXPERIENCE BUILDINGS

Portland Sports Complex – Portland, Maine

Mr. Thunberg performed geotechnical design services for a new indoor soccer facility to be constructed over soft, normally consolidated Presumpscot clay. Using a combination of lightweight fill and geofoam, Mr. Thunberg designed a foundation preparation plan with minimal net loading and allowed for spread footing construction instead of pre-loading or deep driven piles, resulting in considerable savings to the owner.

Sable Lodge Senior Living Community – Portland, Maine

Mr. Thunberg managed a geotechnical investigation and performed geotechnical analyses for this new three-story senior center with a footprint area of 60,000 square feet. The borings and soil laboratory results indicated variable subsurface conditions with portions of the building to be supported on granular soils and portions supported on normally consolidated Presumpscot clay, with the potential for differential settlement. Terracon designed and monitored a pre-load program with wick drains to pre-consolidate the clay to mitigate differential settlements. Settlement platforms and piezometers were installed to monitor pore water pressures during the pre-load period. Wick drain spacing was selected to reach a target 60 day pre-load period. Construction was completed in 2017.

Costco Wholesale Fuel Facility – Colchester, Vermont

Mr. Thunberg oversaw the geotechnical investigation for this fuel facility consisting of several 30,000 gallon underground fuel tanks to be installed in extra sensitive lacustrine clays. Mr. Thunberg prepared geotechnical analyses to support deep excavations in clay. During construction, Mr. Thunberg was on-site to monitor sheet pile installation, mud-mat placement, and construction de-watering. Construction was completed in 2017.

Capital Commons – Concord, New Hampshire

Mr. Thunberg was responsible for performing subsurface explorations and foundation design for the six-story building downtown. The project involved undermining the adjacent Endicott Hotel building by one story below grade requiring jet grouting for underpinning. Braced excavations were required around the perimeter of the site on three sides in order to construct the below grade floors. Performed construction observation during construction to inspect subgrades and monitor underpinning operations.



EDUCATION

Bachelor of Science, Civil Engineering, University of New Hampshire, 1996

Bachelor of Science, Hydrology, University of New Hampshire, 1985

REGISTRATIONS

Professional Engineer: NH 9402, MA 50956, ME 13482, VT 100817, NY 93626, CT 30656

CERTIFICATIONS

40-Hour HAZWOPER

NETTCP Driven Pile Inspector

U.S. DOT and Federal Highway Administration LRFD for Highway Bridge Substructures and Retaining Walls

ASCE Finite Elements in Geotechnical Engineering

University of Florida Analysis and Design of Deep Foundations

New Hampshire Society of Professional Engineers – Past President

WORK HISTORY

Terracon Consultants, Inc., Senior Geotechnical Engineer, 2013-Present

John Turner Consulting, Inc. Geotechnical Department Manager, 2012-2013

Nobis Engineering, Inc., Senior Project Manager, 1999-2011

Geotechnical Services, Inc., Project Manager, 1996-1999

Heynen Teale Engineers, Staff and Field Engineer, 1989-1996

CARL W. THUNBERG, P.E. (continued)

TRANSPORTATION

Manchester Airport Access Road – Bedford, Litchfield, Londonderry, and Merrimack, New Hampshire

Mr. Thunberg served as project manager on two miles of new limited access highway, two major interchanges, and nine bridges. Major bridges included a secant pile supported bridge carrying the existing F.E. Everett Turnpike over the Access Road, six-span bridge carrying the Access Road over the Merrimack River. The filed exploration program included over 500 soil borings, including 15,000 feet of soil borings and 2,000 feet of rock coring.

Queen City Bridge over Interstate 293 – Manchester, New Hampshire

Mr. Thunberg served as project manager in charge of overseeing subsurface explorations and directed a geotechnical evaluation for this bridge widening project. Prepared recommendations for the type and capacity of driven H-pile foundations for the new bridge piers and prepared recommendations for vibration monitoring. During construction, supervised field technical personnel documenting pile driving and vibration monitoring activities.

Route 121 Reconstruction – Rockingham and Grafton, Vermont

Mr. Thunberg was the project manager coordinating a subsurface exploration program for this three-mile section of roadway with steep side slopes. Performed slope stability analyses and pavement designs. He assisted the prime contractor with retaining wall designs, earthwork recommendations, and erosion control.

Western Ave. Over Contoocook River – Henniker, New Hampshire

Mr. Thunberg was the project manager for geotechnical investigation for this replacement bridge to carry Western Avenue over the Contoocook River in Henniker, New Hampshire. Site challenges included difficult drilling access and advancing borings through a glaciofluvial deposit consisting of very dense cobbles and boulders. Bedrock ranged from approximately 42 to greater than 50 feet deep. Design challenges included cofferdam and foundation seal considerations to satisfy scour depth, and maintain a stable excavation bottom during construction.

ENERGY

Number Nine Mountain Wind – Aroostook County, Maine

Mr. Thunberg was the project manager for geotechnical investigations for this 135 wind turbine generator wind farm, including 75 miles of access roads, an electrical substation, and transmission line structures. Our services included test borings with rock core at each wind turbine generator, soil borings along roadways, soil and rock testing, falling weight deflectometer testing, surface seismic testing, electrical resistivity testing, and geotechnical analysis for foundations, roadways, and earthwork.

Maine Power Reliability Program Lewiston Loop – Lewiston & Norway, Maine

Mr. Thunberg was the project manager for three substation projects in Lewiston and Norway, Maine. The MPRP Lewiston Loop project consists of new and re-built transmission lines and upgrades to existing electrical substations and construction of a new substation. The Middle Street Substation is planned to be constructed between the Pan Am Railroad and the Canal Street Parking Garage. The substation will include 115kV transformers, breakers, switchgear and a control house. Upgrades to the Lewiston Lower and Norway Substations will include new switchgear to enhance electrical safety and new 115/34.5 kV transformers, breakers, and control house upgrades. Services included test borings at proposed structure locations near energized substation components, soil laboratory testing, geotechnical analyses, and preparation of separate geotechnical engineering reports for each site.

Eversource Woburn to Wakefield 345kV Line – Woburn, Winchester, Stoneham, & Wakefield, Massachusetts

Mr. Thunberg is the geotechnical project manager for this new 8-mile 345kV underground transmission line connecting substations in Woburn and Wakefield, Massachusetts. The majority of the alignment follows existing city streets. Terracon's scope included test borings at proposed jack and bore crossings, proposed electrical manhole structures, and at open trench cuts. Much of work needed to be performed at night due to traffic. Communication with multiple stakeholders, including Eversource, National Grid, MWRA water & sewer and municipal utilities, and landowners has been an essential component. To date, we have drilled over 80 borings in city streets with no safety incidents. Separate geotechnical reports were prepared for each town, including dewatering estimates, bedrock quantity estimates, HDD recommendations, and earthwork/trenching recommendations.

CARL W. THUNBERG, P.E. (continued)

ENVIRONMENTAL

New Bedford Harbor Superfund Site – New Bedford, Massachusetts

As a subcontractor to Foster Wheeler Environmental Corporation under the US Army Corp of Engineers New England Total Environmental Restoration Contract (TERC), Mr. Thunberg served as Quality Control Officer for this large-scale geotechnical investigation. The geotechnical investigation program included on-shore and offshore test borings and monitoring wells with extensive in-situ testing and soil laboratory testing. Mr. Thunberg was responsible for verifying that the final deliverable exploration logs accurately reflected the conditions encountered in the field and checking the rig geologist's visual soil classifications for conformance with the applicable ASTM standards.

Burgess Brothers Superfund Site – Bennington, Vermont

As a subcontractor to Tetra Tech NUS, Inc. under the USEPA Region I Response Action Contract, Mr. Thunberg was technical lead for the hydrogeological and sampling/analytical program. He reviewed the PRP contractor's technical submittals for merit and conformance with the terms of the Record of Decision and with EPA policies and guidance documents. Managed split sampling activities and prepared Quality Assurance Project Plan (QAPP) in support of split sampling. He Performed air sampling for this project using passivated summa canisters.

Nyanza Chemical Waste Dump Superfund Site – Ashland, Massachusetts

Mr. Thunberg supervised the installation of 42 sub-slab depressurization systems in residential homes in response to vapor intrusion from groundwater contaminated with chlorinated solvents. Lead agency was EPA and administrated by the U.S. Army Corps of Engineers. Project required close coordination with sub contactors, homeowners, EPA, USACE, MA-DEP and the Town of Ashland. Mr. Thunberg served as the on-site QC manager performing full-time inspection, reviewed contractor invoices, negotiated change-orders, and performed final acceptance inspections.

DAMS

Tory Pines Dam – Franconia, New Hampshire

Mr. Thunberg designed emergency repairs to this dam, which was in imminent danger of collapse. The repairs involved total reconstruction of the central portion of the embankment. The design was completed and construction began within two weeks. No specifications were prepared for the job due to the emergency nature of the repairs. In lieu of technical specification, Mr. Thunberg was on site full time during construction to direct the work.

Paradise Pond Dam – Northampton, Massachusetts

Mr. Thunberg supervised the installation of piezometers through the dam foundation, performed stability analyses, and designed rock anchors to increase the stability of the dam. Incidental to the rock anchor work, he designed a collapsible flashboard system to increase spillway capacity. During construction, Mr. Thunberg performed construction monitoring including logging the rock anchor installation, verifying bonded lengths, grout volumes and pressures and load testing.

Lake Sagamore Dam – Carmel, New York

Mr. Thunberg performed a hydrologic and hydraulic analysis of the watershed and spillway in order to increase the spillway capacity of this dam. The most feasible alternative was to raise the dam. Mr. Thunberg prepared the embankment grading plans and specifications for raising the dam. Mr. Thunberg performed periodic inspection during construction to verify compliance with the intent of the design.

Sawyer Lake Dam – Gilford, New Hampshire

Mr. Thunberg performed a hydrologic analysis to develop the 100-year storm inflow hydrograph. The inflow hydrograph was used as an input parameter for a dam breach analysis using the NWS DAMBRK model. After completing the dam breach analysis, prepared an Emergency Action Plan to evacuate downstream residents.

Lake Snow Dam – Indian Lake, New York

Mr. Thunberg performed hydrologic and hydraulic analyses for this dam to determine spillway adequacy. He also performed a stability analysis for two spillway sections. Both of these analyses were preliminary to designing major rehabilitation designs for the dam. The rehabilitation involved demolition of the severely scaled concrete gate structure in the center of the dam and replacement with a new reinforced concrete gate structure. The total duration of the design spanned nearly a year, part-time. Mr. Thunberg performed weekly inspections and at critical phases of construction.



MEGAN MCDEVITT, PE

DESIGN PROJECT MANAGER

Professional Profile

Megan is a Licensed Professional Engineer with 12 years of experience in civil/site design for municipal and private clients. Megan's experience includes roadway reconstruction, utility infrastructure, landfill closure, transfer station design, stream restoration and asset management projects. Megan's responsibilities include stormwater modeling, state and local permitting, cost estimating and construction oversight.

Related Experience

City of Portland, ME – Dorothy/Dibiase/Hicks Sewer Separation. Engineer involved with stormwater modeling, cost estimating, and development of plans and specifications for a residential neighborhood combined sewer separation project. Project included approximately 2,200 linear feet of new separated storm sewer, sanitary sewer, and roadway reconstruction.

City of Portland, ME – Carlyle/Canco/Walton Sewer Separation. Engineer involved with stormwater modeling, cost estimating, and development of plans and specifications for a residential and industrial neighborhood combined sewer separation project. Project included approximately 2,700 linear feet of new separated storm sewer, sanitary sewer, and roadway reconstruction.

City of Portland, ME – West Side Interceptor Sewer Replacement. Engineer involved in permitting and design for removing and replacing 5,600 linear feet of combined sewer that runs cross-country from Lucas Street to Congress Street in Portland. Responsibilities include NRPA permitting, development of specifications and plans, structural design for pipe thru-crossings, and cost estimating. Project includes replacement of sanitary sewer, erosion control and sedimentation design, gravel access road design and drainage improvements.

City of Portland, ME – Read/Bay Street Sewer Separation. Engineer involved with stormwater modeling, cost estimating, and development of plans and specifications for a residential and industrial neighborhood combined sewer separation project. Project included approximately 5,500 linear feet of new separated storm sewer, sanitary sewer, roadway reconstruction and stormwater treatment systems.

City of Portland, ME – Ray Street Sewer Separation. Engineer involved with stormwater modeling, cost estimating, and development of plans and specifications for a residential neighborhood combined sewer separation project. Project included approximately 5,500 linear feet of new separated storm sewer, sanitary sewer, roadway reconstruction and stormwater outfall. Responsibilities included performing a cost analysis for alternative designs.

City of Portland, ME – Mellen Street Sewer Separation. Engineer involved with the development of specifications and plans for a combined sewer separation project. Project involved designing approximately 1,400 lf of new storm drain and drainage structures to separate an existing combined sewer system in Portland, as well as replacement of water service to Deering Oaks Pond. Project included stormwater modeling, storm-

Education

- Bachelors, Civil Engineering, University of Maine

Registrations

- Registered Professional Engineer - ME, #13019

Professional Associations

- Structural Engineers Association of Maine

Office Location

- Portland
-

water treatment system, outfall, and water service.

City of Auburn, ME – South Main Street Roadway Reconstruction. Responsible for the development of construction plans and specifications for the multiple phases of locally administered and municipally-funded South Main Street Roadway Reconstruction Project. Responsibilities included preparation of construction documents, coordination with MaineDOT and client communication. This project included improvements to 1.5 miles of the existing roadway, sidewalks, curbing and stormwater infrastructure.

City of Auburn, ME – Riverside Drive Roadway Reconstruction. Project Engineer responsible for the development of construction plans and specifications for the locally administered Riverside Drive Roadway Reconstruction Project. Responsibilities included preparation of construction documents, coordination with MaineDOT and client communication. This project included improvements to 0.5 miles of the existing roadway, sidewalks, curbing and stormwater infrastructure and 1.3 miles of roadway pavement overlay.

City of Auburn, ME – Towle Neighborhood Reconstruction. Engineer involved in the development of the specifications and the construction cost estimate for the Towle Neighborhood Reconstruction project. This project included full depth reconstruction of five different roadways, new storm drains, road resurfacing, granite curbing and sidewalks.

City of Auburn, ME – 2011 Neighborhood Reconstruction. Engineer involved with the development of construction plans for the 2011 Neighborhood Reconstruction Project. Responsibilities included preparation of construction documents (including plans, profiles, cross sections and details) and development of construction cost estimate. This project included upgrades to the existing storm drain system and reconstruction of the existing streets and sidewalks.

City of Auburn, ME – 2010 Neighborhood Reconstruction. Engineer responsible for stormwater modeling for the 2010 Neighborhood Reconstruction Project. Responsibilities included developing a HydroCAD model to check capacity of the existing storm drain and size the proposed infrastructure. This project included the construction of new storm drain infrastructure and reconstruction of the existing streets (i.e., road and new curb).

City of Auburn, ME – Main Street Sidewalk. Engineer responsible for developing construction cost estimate for the Main Street Sidewalk Project. This project included the construction of a new sidewalk, esplanade, landscaping, lighting, and adjustments to the existing storm drain infrastructure.

City of Ellsworth, ME – WWTF Design. Engineer participating in the design of a new wastewater treatment facility. Responsibilities include development of architectural and structural plans and specifications for a new insulated concrete form Operations Building, reinforced CMU Process Building and perforated metal screen wall Blower Building.

City of Lowell, MA – Power and Controls Upgrade. Engineer responsible for design of a new electrical room addition to the existing Influent Pump Station and retrofits to an existing building. Responsibilities include development of architectural and structural plans and specifications for a new 875 square-foot reinforced CMU building addition and renovations to existing Electrical Services Building.

City of Saco, ME – Process Building and Garage. Engineer responsible for architectural design of both new process building and garage. Responsibilities include development of plans and specifications for all doors, hardware and architectural finishes of two new buildings.

Raytheon Systems Company, Sudbury, MA – WWTP Upgrades. Engineer responsible for design of a new process building. Responsibilities include development of architectural and structural plans and specifications for a new 576 square-foot pre-engineered metal process building. Project included a reinforced CMU process building bid alternate design. During construction, responsibilities included review of submittals.

Town of Billerica, MA – WWTF Tertiary System Upgrades. Engineer responsible for review of all structural and architectural submittals during construction. Project includes installation of the proprietary CoMag process, a pump station capable of pumping the 16.5 MGD peak flow, gravity thickeners, dedicated waste activated sludge pumps, chemical storage and feed systems, and a plant wide SCADA system.

Paris Utility District, South Paris, ME – Phase I WWTF Upgrade. Engineer responsible for performing site inspections and review of all structural and architectural submittals during construction. Project included upgrade of the headworks building as well as installation of new screening and grit removal facilities.



JASON KREIL, PE

LEAD PIPELINE ENGINEER

Professional Profile

Jason has 15 years of experience providing environmental consulting services to municipalities. He has worked on the planning, design, and construction phases of a range of projects from large-scale sewer collection systems to smaller infrastructure and site assessments. His wastewater experience includes design, evaluation, permitting, rehabilitation and construction of wastewater collection systems, gravity and low-pressure sewer systems, wastewater and stormwater pumping stations and sewer capital improvement planning. His wastewater experience also includes combined sewer overflow (CSO) studies, sewer system evaluation studies (SSES) and inflow and infiltration (I/I) studies.

Related Experience

Town of Bedford, NY – Bedford Hills-Katonah Business Sewer District. Project Manager for design of the Bedford-Hills Katonah Business Sewer District. The project will provide sewers for 123 parcels in Bedford through a combination of more than five miles of low pressure, gravity, and force main sewers, including three submersible pump stations. Design approval and permitting required from NYCDEP, Westchester County Department of Health, NYSDEC, NYSDOT, and Metro-North Railroad. Total estimated construction cost of \$16 million will receive funding from NYCDEP and Westchester County.

City of Rye – Central Avenue Pump Station. Technical contributor/support to design team for the proposed wastewater pumping station and force main. The City evaluated several options to repair a limited access sewer system choosing to abandon the section and construct a new packaged pump station upstream and redirect flow to another location in the wastewater collection system. The project is currently in design.

Town of Hull, MA – PS1/PS3 Force Main Testing and Evaluation Memorandum. Technical Lead for coordination of excavation location to expose potential weak point and perform ultrasonic thickness testing and visual inspection of the PS1 8-inch ductile iron force main and PS3 14-inch ductile iron force main. Reviewed these results and addition to the CCTV inspection completed under previous projects to provide recommendations for rehabilitation. PS 1 force main to be renewed by approximately 2,200 LF insitu CIPP lining. PS 3 force main to have last portion insitu CIPP lined to rehabilitate hydrogen sulfide damage, with the remainder of the pipe to be monitored. Rehabilitation to be completed in 2019 with SRF funding.

Town of Hull, MA – PS3 Emergency Piping and Force Main Repair. Technical Lead for design of emergency repairs to wet pit/dry pit pumping station designed for up to 1,700 GPM. Repairs included replacement of failed force main isolation valve, pump station bypass connection, all interior discharge piping, suction piping and valves, concrete repairs to pump bases, reinstallation of pump number 2, and wastewater bypass. CCTV inspection of portions of 4,600 LF ductile iron force main.

Education

- Masters, Civil & Environmental Engineering, Northeastern University
- Bachelors, Civil & Environmental Engineering, Northeastern University

Training

- 10-hour Construction Safety and Health
- Confined Space Training

Registrations

- Registered Professional Engineer - MA

Professional Associations

- New England Water Environment Association
- Water Environment Federation

Technical Expertise

- Sewer/Pump Station Design
- Infiltration/Inflow Analysis
- Hydraulic Modeling
- Combined Sewer Overflow – Control Plan & Mitigation

Specialized Training

- NASSCO PACP, MACP, LACP Certified – U-1210-11833

Office Location

- Portland
-

Town of Tewksbury, MA – Andover Street Force Main Replacement Project.

Technical reviewer/support to design team for the existing wastewater force main evaluation and proposed replacement recommendation for 5,500 LF, 8-inch ductile iron force main. Provided technical support during project design and construction services phase of new 10-inch polyvinyl chloride force main.

City of Salem, MA – Canal Flood

Mitigation Project. Process Engineering lead for the design of the wet pit/dry pit pumping station and force main component of the \$20M flood mitigation project. The project includes installation of large diameter storm drainage collection and conveyance systems, 11,000 GPM (16 MGD) pump station with associated 1,300-foot force main and 4 MG storage facility.

City of Monmouth, IL – Long-term CSO Control Plan Phase 1 – Screw Pump Replacement.

Technical Manager for design for replacement of City's existing CSO conveyance pumps including upgrading two Archimedes screw pumps to a total flow of 80 MGD, new cast in place structure, power and controls, connection to SCADA, 250 feet of 60-inch sewer pipe, electrical distribution upgrades to existing site and operation upgrades to storm water treatment clarifiers and chlorine contact tank.

City of Lawrence, MA – Package Pump Station Upgrades.

Technical Reviewer of design for replacement of two pump stations with new precast submersible pump stations rated for 65 to 200 GPM. Stations used integral valve vaults to min-

imize footprint on very tight sites. Designs included custom control panels with radio telemetry, a standby generator on one site, landscaping to minimize visual impacts, and careful attention to constructability and ease of O&M.

Town of Warren, RI – Campbell Street Sewer Replacement.

Project Engineer for design of replacement of a failing 12-inch vitrified clay sanitary sewer main and sewer services with backflow prevention valves. Coordinated with RIDEM and Bristol County Water Authority for work around 24-inch DI raw water main including use of PVC pressure pipe and application of higher pipe testing standards.

Town of Billerica, MA – Sewer Contract

36. Project Engineer for design of 6-mile sewer extension project which includes a new 485-gpm submersible pump station, upgrade of an existing pump station to 785-gpm, water main replacement, sidewalk replacement, roadway and drainage improvements. This project is part of a multi-year sewer collection system expansion effort and included several areas requiring easements and resource area crossing.

Town of Billerica, MA – Sewer Contract

35. Project Engineer for design of 6-mile sewer extension project which included one stream crossing, water main replacement, sidewalk replacement, and roadway improvements. This project is part of a multi-year sewer collection system expansion effort and included several areas requiring easements and wetland crossings.

Town of Tyngsborough, MA – Phase 1 West Sewer Project. Project Engineer for design of 3.5-mile sewer extension project. Design included two new pump stations and upgrades to an existing pump station.

Town of North Andover, MA – Rea's Pond Pump Station Upgrades.

Project Engineer for design and permitting for 950 gpm flooded suction pumping station upgrade. Pump Station required substantial pumping and storage capacity upgrade to reduce risk of overflows as the pump station is sited adjacent to the Town's surface water supply. Designed new pump station with high and low flow pumps to optimizing daily pumping and meet the demand of wet weather flows. Performed analysis to determine general condition of the existing force main for reuse with new pump station.

Town of North Andover, MA – Sutton Road Sewer Upgrades.

Project Engineer for design and construction of 1,100 feet of sewer replacement. Gravity sewers were upsized to accommodate increase in flows from future upgrade of upstream pumping station to prevent potential overflows for water supply protection.



SCOTT HAWK, PE, SE

LEAD STRUCTURAL ENGINEER

Professional Profile

Scott has 18 years structural engineering experience including six years consulting in educational, institutional, retail, medical, and commercial building design. His work experience includes the design of new building structures, facility reviews for code compliance, modifications to existing structures, condition assessments and evaluations of existing buildings, and the reinforcement of existing structures.

Related Experience

Delta Air Lines, Atlanta, GA – Multi-phase WWTF Upgrade. Lead Structural Engineer for design/build project for a multi-phase upgrade program at the Delta Air Lines Technical Operations Center industrial wastewater treatment facility. The design, procurement and construction included a new biological treatment aeration tank system with ancillary pump stations and blower replacements; a new above ground secondary clarifier; and infrastructure upgrades to electrical systems, HVAC, lighting, and instrumentation and controls. The design/build contract value was \$5.5 MM.

Synagro, Woonsocket, RI – Mercury Emissions Control Technology Design/Build Project. Lead Structural Engineer for the Synagro design/build project. The project provided overall project management, project controls, schedule, permitting, engineering, procurement of equipment, construction, and commissioning to install a multi-vessel mercury scrubber system to remove mercury from the flue gas path of the municipal sludge incinerator operated by Synagro. The system consists of new interconnecting ductwork, fabric filter, booster fan, natural gas fired heater, and all associated process controls. The site posed several complications and real estate constraints ultimately requiring relocation of existing equipment, roof demolition and renovation, and the construction of steel equipment platforms. The project had an accelerated schedule of 10 months from contract signing to operation. The design/build contract value was \$5.4 MM.

Procter & Gamble, Greensboro, NC – Design/Build Wastewater Pretreatment Plant. Lead Structural Engineer for the design and construction of a new industrial wastewater pretreatment plant that uses equalization, physical-chemical treatment, dissolved air flotation, and sludge dewatering by centrifuge. The project included conceptual design, pilot studies, alternative evaluations, 30% design, long-lead equipment selection and procurement, detailed design including 3D CAD, bidding, engineering services during construction, and startup and commissioning. The project included a new civil site development, a new pre-engineered building and concrete process tankage, pretreatment process unit operations, and supporting equipment. The project used several fast-track methods to speed construction including: preconstructed and factory tested skid mounted process equipment designed for minimal field installation and streamlined commissioning and startup; a preconstructed modular pipe rack system preloaded with piping shipped to site for erection; and modular interior architectural room construction. The design/build contract value was \$6.5 MM.

Confidential Gold Mining Co., CO – Process Water Treatment. Lead Structural Engineer responsible for the design of a Treatment Building, Concrete Treatment tanks, and 1500 feet of pipe bridges and 6,000 feet of large piping support systems for a

Education

- Bachelors, Civil Engineering, Pennsylvania State University

Registrations

- Licensed Structural Engineer
- Registered Professional Engineer - ME, 11298
- Confined Space Certified
- OSHA 10-Hour Construction Safety

Professional Associations

- American Institute of Steel Construction (AISC)
- Structural Engineers Association of Maine

Office Location

- Colorado
-

29-MGD plant that treats process water generated by mining. The drawings were developed using 3D CAD software, which integrated piping, mechanical, structural, and electrical work. The team procured over \$10M of equipment for the Owner including pre-engineered metal building system and internal bridge crane system.

Upper Montgomery Joint Authority, PA – WWTP Improvements. Lead Structural Engineer responsible design of upgrades for the 2.5 MGD UMJA WWTP including new Screening Building over existing Headworks Channels; new two-story Operations Building; and new Filter Building. Project also included the design of the following concrete tanks: aeration tanks, secondary clarifiers, flocc tanks, chlorine contact tanks, post aeration tanks, parshall flume, and splitter boxes. Project design and bidding complete with construction underway

Town of Nantucket, MA – Surfside WWTF Upgrades. Lead Structural Engineer responsible for the 4.0 MGD ADF / 7.0 MGD PHF replacement of grinders with new Duperon screen, washpress (construction complete) and installation of a new building over the existing outside headworks with odor control. Project design and bidding complete with construction underway.

City of Portland, ME – Mellen Street Sewer Separation. Structural engineer involved with the design of a concrete pavement support pad for unloading the City's vacuum truck. The concrete pavement extended below the brick sidewalk to allow the heavily loaded vacuum truck to travel across the brick sidewalk to the unloading station at Deering Oaks Park.

City of Lowell, MA – Power and Controls Upgrade. Lead structural engineer responsible for design of a new electrical room building addition to an existing Influent Pump Station, that was supported on ledge. The electrical room building addition was supported with concrete caissons and grade beams to prevent differential building settlement.

Town of Billerica, MA – WWTF Tertiary System Upgrades. Structural engineer responsible for the design of a 68,000-gallon tertiary reaction tank supported by a mat foundation. A geotechnical investigation discovered a layer of weak, liquefiable, soil under the proposed tank that could not be removed. The geotechnical engineer's recommended solution was to support the tank on deep foundations or to perform ground improvements to stiffen the soil. Structural 3-D modeling software was utilized to design a cheaper, conventional tank mat foundation that would safely support the tank on the existing soils.

Paris Utility District, South Paris, ME – Phase II WWTF Upgrade. Structural Engineer completed comprehensive structural inspections of facility. Inspected existing concrete tankage and quantified all concrete repairs needed to extend the service life of the existing tanks. Wrote detailed concrete tank repair specifications and completed tank repair and modification drawings as required to upgrade the facility to treat an annual average daily flow of 0.65 MGD.

Town of Freeport, ME – Control Building Upgrade. Lead Structural Engineer and architect responsible for renovations and additions to an existing control building. Existing building modifications included new commercial grade aluminum windows and new partition walls. Project included designs for a single-wythe split face CMU addition with an electrical room, generator room, and garage. Provided structural inspections during construction and final architectural punch list inspections.



KEVIN MESICK, PE

LEAD I&C ENGINEER

Professional Profile

Kevin has over eight years of experience involving SCADA system programming, implementation and support dealing primarily with the water and wastewater industries. His experience includes PLC programming using RSLogix5, RSLogix500, RSLogix5000/Studio5000, Siemens TIA Portal and OIT/HMI programming using FactoryTalk SE/ME, RSView32, Proficy iFix, Wonderware In-Touch, Siemens TIA Portal, Automation Direct C-More and Inductive Automation's Ignition.

Related Experience

City of Portland, ME – Wastewater SCADA Upgrades. Relocation of SCADA radio master telemetry panel to new operations offices. Coordination of radio path study, optimizations and implementation of additional radio repeater site to accommodate the new location. Upgraded SCADA computers to two rack mount server class machines with UPS Backup, Ethernet/Fiber switching and software upgrades. Migrated from RSView32 to FactoryTalk SE applications, providing a new, streamlined layout.

City of Dover, NH – Control Systems. Programming, implementation, commissioning and ongoing support of SCADA control systems for both water and wastewater treatment. VueWorks CMMS integration with SCADA iFix.

City of Saco, ME – Control Systems and RTU Upgrades. Programming and ongoing support of SCADA control systems for the wastewater treatment plant and over two dozen remote pump stations. Migration of RSView32 legacy software to FactoryTalk SE applications. Conversion of all remote stations from licensed frequency radio communications to Verizon Private Network cellular communications utilizing various Allen-Bradley PLCs over serial to ethernet variable Modbus addressing. Cellular signal quality/strength testing and optimization.

Portland Water District, Portland, ME – Control Systems. Implementation and service following detailed PWD standards for Northeast pump station and East End Wastewater Treatment Plant. Detailed upgrades to PLC programming and multiple SCADA HMI nodes for improved operation and reliability.

Portland Water District (PWD), Portland, ME – Westbrook Wastewater Treatment Plant (WWTP) Controls Upgrade. Upgrade of an obsolete PLC-5 system to the SLC-5/05 platform including new and extensive PWD standard PLC programming, streamlined process cutover, all new HMI process and control screens, Portland Water District system-wide communications with multiple processors and treatment plants, and fully redundant SCADA server configuration. Coordinated and conducted the factory acceptance testing, site acceptance testing and complete operator training. Programming and site acceptance testing of a Global OIT for backup plant control.

Portland Water District (PWD), Portland, ME – EEWTP Aeration Upgrade.

Programming and integration of an upgraded aeration control system that included aeration blowers, dissolved oxygen control valves, mixers, nitrified recycle pumps and HVAC systems. Partnered with Hazen and Sawyer to develop the control system and integrate

Education

- Bachelors, Electrical Engineering Technology, University of Maine

Registrations

- Registered Professional Engineer - ME, #14087
- Bloodborne Pathogens, ME
- CPR, ME, 136160
- Electrical Safety Training, OSHA, Level I, ME, 36-003292842
- First Aid, ME, 916464
- HMI Certification, Intellution, ME

Professional Associations

- Institute of Electrical and Electronic Engineers

Specialized Training

- NFPA 70E Electrical Safety Awareness (Arc Flash) training

Office Location

- Portland, ME
-

with the existing plant system controls and iFix SCADA system.

City of Concord, NH – WWTP. PLC programming, implementation, HMI/OIT design and start-up for multiple remote pump stations communicating via ethernet radio telemetry. Integration of remote stations with existing RSView32 HMI nodes and with upgraded GE iFix node. HMI conversion and programming of iFix SCADA nodes to replace existing RSView32 platform. Ongoing support and maintenance of city SCADA and control systems. Support for Hach WIMS and iFix integration.

Town of Exeter, NH – GWTP Start-up. Start-up and integration of a new groundwater fed treatment facility to enhance the town's treatment capacity. Start-up and testing of three well sites on licensed frequency radio, tied in with the existing surface water plant and groundwater filter control system. Allen-Bradley PLC programming, HMI design, network monitoring and advanced alarming capabilities that allow minimal on-site personnel for operation.

City of Portland, ME – Wastewater SCADA Implementation and Controls. Programming, implementation, HMI/OIT design and start-up for 11 remote pump stations and additional radio repeater sites for the City of Portland Department of Public Works, communicating via licensed frequency radio telemetry. Comprehensive HMI design and programming for prima-

ry and backup SCADA nodes at DPW building. Support and troubleshooting for all locations including Franklin, Riverside, Curtis and others. System updates, assessments and assistance with control equipment replacements.

Kennebec Sanitary Treatment District, Waterville, ME – Wastewater SCADA Upgrades and Reporting. Sophisticated automatic reporting of plant data including: Daily/hourly flows of treatment plant, remote pump stations and equipment runtimes, all updated daily or in real time to provide detailed usage information needed for plant maintenance and state reporting. HMI/PLC programming for radio telemetry pump stations. Preventative maintenance and support of SCADA and control systems. Consolidation of business and SCADA networks with IT support for additional security and systems monitoring.

Town of Seabrook, NH – WTP SCADA Implementation and Controls. Programming, implementation, HMI design and start-up for new 1.0 MGD water treatment facility. Included integrating multiple wells, operational flow setpoints and pump controls for chemical pumps and various other systems in the plant. Included converting multiple Wonderware HMI screens to current project and creating dozens of new operator interface screens. Preventative maintenance and support of SCADA and control systems.

Paris Utility District, South Paris, ME – HMI/OIT Design and Controls. Programming, implementation, HMI/OIT design and start-up for 7 remote pumps stations for the PUD WWTP. Continued maintenance and support of SCADA and control systems on both water and wastewater treatment. Review of control system to provide a list of troubleshooting, repairs and maintenance required over time to allow staff to develop budget plans and proactively handle plant needs.

Town of Kennebunkport, ME – WWTP Upgrades and SCADA Implementation. Upgraded aging SCADA system with new iFix-based HMI design & control. OIT design, PLC programming and start-up for new plant screening & aeration systems. Designed XL Reporter-based reporting package for various plant data automatic report generation.

ECT2, Various Locations – Control Systems. Programming, factory testing and integration of process treatment skid systems for groundwater treatment emerging contaminants. Siemens TIA Portal PLC/HMI programming. Development of customized and advanced Siemens PLC library blocks to enhance programming efficiency and capability. Emailed alarm notifications of live process conditions and SSL VPN secure remote access, monitoring and control.



JEDD STEINGLASS, LSP

LEAD ENVIRONMENTAL

Professional Profile

Jedd specializes in environmental assessment and remediation design. For over 19 years, he has provided project management and technical expertise for the redevelopment of commercial, industrial, and institutional properties throughout New England, including adaptive re-use scenarios. His technical, programmatic, and funding acquisition and management capabilities have contributed to the success of several EPA-funded brownfields assessment and cleanup projects. In addition, he has developed extensive utility-service experience and has worked as a primary environmental response consultant for a multinational electrical and natural gas utility. Jedd's work also focuses on the proper characterization, management, and disposal of hazardous building materials, including asbestos, lead, and PCBs. Finally, Jedd has served as the environmental lead on a multitude of urban redevelopment efforts, effectively managing the challenges posed by contamination and urban fill within the budget and schedule constraints of each project.

Related Experience

Maine Medical Center, Portland, ME – Structured Parking Facility Construction, Preconstruction Assessment and Urban Fill Management. Designed and managed the investigation of a former rail depot in order to properly assess soil and groundwater that would be impacted during a planned large-scale construction effort. Evaluated potential risk to site workers and future users, and developed a comprehensive set of procedures to be employed during construction to manage this risk. Conducted the characterization of excess urban fill soils that could not be reused during the project and facilitated acceptance of these materials at an appropriate receiving facility. Also negotiated the reuse of less contaminated materials at a non-residential facility. Currently managing the performance of construction-phase services and the documentation of the completed activities to achieve closure.

Greater Portland Council of Governments, Portland, ME -- East Bayside Brownfields Development, Environmental Assessment, VRAP Application, and Soil Management Planning. Served as the Program Manager for the development of a comprehensive US EPA-funded Brownfields assessment of a vacant property in the industrial Bayside area of Portland. Developed a conceptual site model and an investigation work scope that was focused on the proposed development. Prepared a site-specific quality assurance project plan and facilitated approval of this plan by US EPA and Maine DEP. Managed the investigation of environmental conditions and prepared an investigation report that discussed findings relative to the potential for risk to human health under the construction worker and residential exposure scenarios. This information enabled the evaluation of risk to workers during site development and the assessment of conditions that could be experienced by future site users. Produced a Remedial Action Plan to facilitate the removal of a limited area of hazardous soil so that construction could proceed. Prepared an application to the Maine DEP Voluntary Response Action Program and developed a Soil Management Plan that described the activities that the construction team followed to manage potential human health risk and regulatory liability during redevelopment. Facilitated the approval of the Soil Management Plan by Maine DEP and

Education

- Bachelors, Geology, Colgate University

Registrations

- Massachusetts Licensed Hazardous Waste Site Cleanup Professional (LSP)

Specialized Training

- 2008 Utility Solid Waste Advisory Group Advanced PCB Training
-

documented the performance of appropriate environmental management measures during the completion of construction activities. Following the successful management of pre-existing environmental conditions, the resulting development will provide high quality workforce housing for Bayside.

City of Portland, ME -- Various Properties Considered for Acquisition, High-level Environmental Risk Reviews.

The City of Portland relies on Woodard & Curran to evaluate risks before they proceed with property acquisitions, all of which have the potential to create exposure to environmental liability. For each project, a review of public records and environmental databases was conducted. Based on this information, high-level summaries of site histories, findings, potential concerns, and recommendations were developed. These basic documents allow the City to quickly and cost effectively evaluate whether they may proceed with the acquisition, if more detailed environmental assessment is warranted, or if the opportunity should be abandoned.

Former Electronics Manufacturing Facility, Standish, ME – Brownfields Assessment. Acted as the Project Manager and Technical Lead for the performance of EPA funded Brownfields assessment activities to investigate soil, groundwater, sediment, and soil vapor at this former industrial facility. Developed the investigation scope and prepared project quality assurance plans for approval by the Maine DEP and US EPA. Managed the performance of field activities and evaluated the implications of collected data relative to the conceptual site model and regulatory guidelines. The outcome of this work assisted the former owner in the fulfillment of their RCRA post closure requirements. This project also allowed the property to be subdivided and redeveloped by the new owner, providing skilled labor and professional opportunities for the area.

Webster School, Auburn, ME – PCB Remediation and Adaptive Reuse.

Provided project management services, designed the site characterization approach, and collected the data necessary to receive a risk-based PCB cleanup approval from US EPA Region 1. Entered the project into the Maine DEP's voluntary response action program to secure liability protections for the owner/developer and project investors. Developed specifications, established contracts with qualified firms, and managed cleanup performance. Conducted verification sampling to ensure that remediation goals were achieved and prepared closeout documentation. This work allowed a beautiful historic structure to be reused to provide safe and affordable housing, meeting space, and an early education facility for the community.

Commercial Office Building, Portland, ME – PCB Alternative Disposal and Continued Use. Managed the characterization of very high concentration window caulking, performance of a risk-based pilot study, remediation design and approval, and cleanup performance. This project was initiated during an active window replacement effort, which relied on state and federal historic tax credits. The work was subject to an aggressive and in-progress construction timeline. As removal of all impacted media would not be feasible, developed an alternative approach to remove the source material and maintain remaining adjacent materials under a long-term management plan. This plan was approved by the EPA and resulted in an estimated cost savings of \$400,000 while maintaining tax credit eligibility.

Former Aeronautics Manufacturing Facility, Sanford, ME – Brownfields Cleanup and Construction Management.

Following the completion of environmental assessment work, served as the project manager for the performance of cleanup activities. Also, acted as the construction manager for the implementation of engineering controls and the construction of a parking facility. Administered multiple funding sources including EPA Brownfields grants, Brownfields revolving loan fund subgrants from two different programs, and a Brownfields loan. This project removed contaminated media, effectively managed exposure to any remaining contaminants, and provided parking to serve an adjacent newly redeveloped former mill building.

South Portland High School, South Portland, ME – PCB Characterization and Disposal. Following a competitive selection process, performed as the project manager for this site. Interpreted initial limited data provided by others to design an appropriate assessment approach. Used statistically defensible sampling strategy to minimize the volume of regulated materials while ensuring adequate characterization and protecting owner liability. Coordinated remediation scope and schedule to match the existing construction project and rapidly received EPA cleanup plan approval. Enabled the project to proceed with a budget that was significantly lower than anticipated at the initial discovery of PCBs.

Appendix C

Phase 1A and 1B Traffic and Pedestrian Control Plans

Legend

Back Cove Park

Sargent Corporation - City of Portland - Back Cove South Storage Facility
Pedestrian and Traffic Control Plan - Phase 1A - Mobilization and Site Preparation
General Notes:

1. Activities for Phase 1A include: installation of temporary fence; mobilization of office trailers, temporary power hookup, installation of erosion controls, installation of construction entrances, placing road signs, placing pedestrian signs, construction of the laydown yard, mobilizing and staging of equipment and materials.
2. Public vehicular traffic impacts during this phase will be minimal. Construction vehicles will use the two entrances as shown and trucks entering signs will be placed as shown.
3. Signage will be placed around the project site to direct pedestrians around the site in a safe manner. If construction activities require a brief stoppage on the trail, a project representative will act as an escort to the pedestrian traffic.

Trucks entering sign

Construction gate

Office trailers

Pedestrian directional signage

Construction Laydown Yard

Construction gate

Pedestrian directional signage

Trucks entering sign

Temporary construction fence

Back Cove Trail

Franklin Street Connector Path



300 ft

Legend

Back Cove Park

Sargent Corporation - City of Portland - Back Cove South Storage Facility
Pedestrian and Traffic Control Plan - Phase 1B - Continued site preparation / Preliminary Earthwork
General Notes:

1. Activities for Phase 1B include: installation and re-routing of temporary fence; continued installation of erosion controls, placing pedestrian signs, continued mobilizing and staging of equipment and materials, topsoil stripping, initial site excavation in sheeting area to elevation 8.0', Back Cove perimeter earthwork and rip-rap placement, continued site removals / demolition.
2. Public vehicular traffic impacts during this phase will be minimal. Construction vehicles will use the two entrances as shown and trucks entering signs will be placed as shown.
3. Signage will be placed around the project site to direct pedestrians around the site in a safe manner. If construction activities require a brief stoppage on the trail, a project representative will act as an escort to the pedestrian traffic.

Trucks entering sign

Construction gate

Pedestrian directional signage

Office trailers

Shoreline Work Area

Construction Laydown Yard

Construction gate

Temporary construction fence

Pedestrian directional signage

Pedestrian directional signage

Trucks entering sign

Pedestrian directional signage

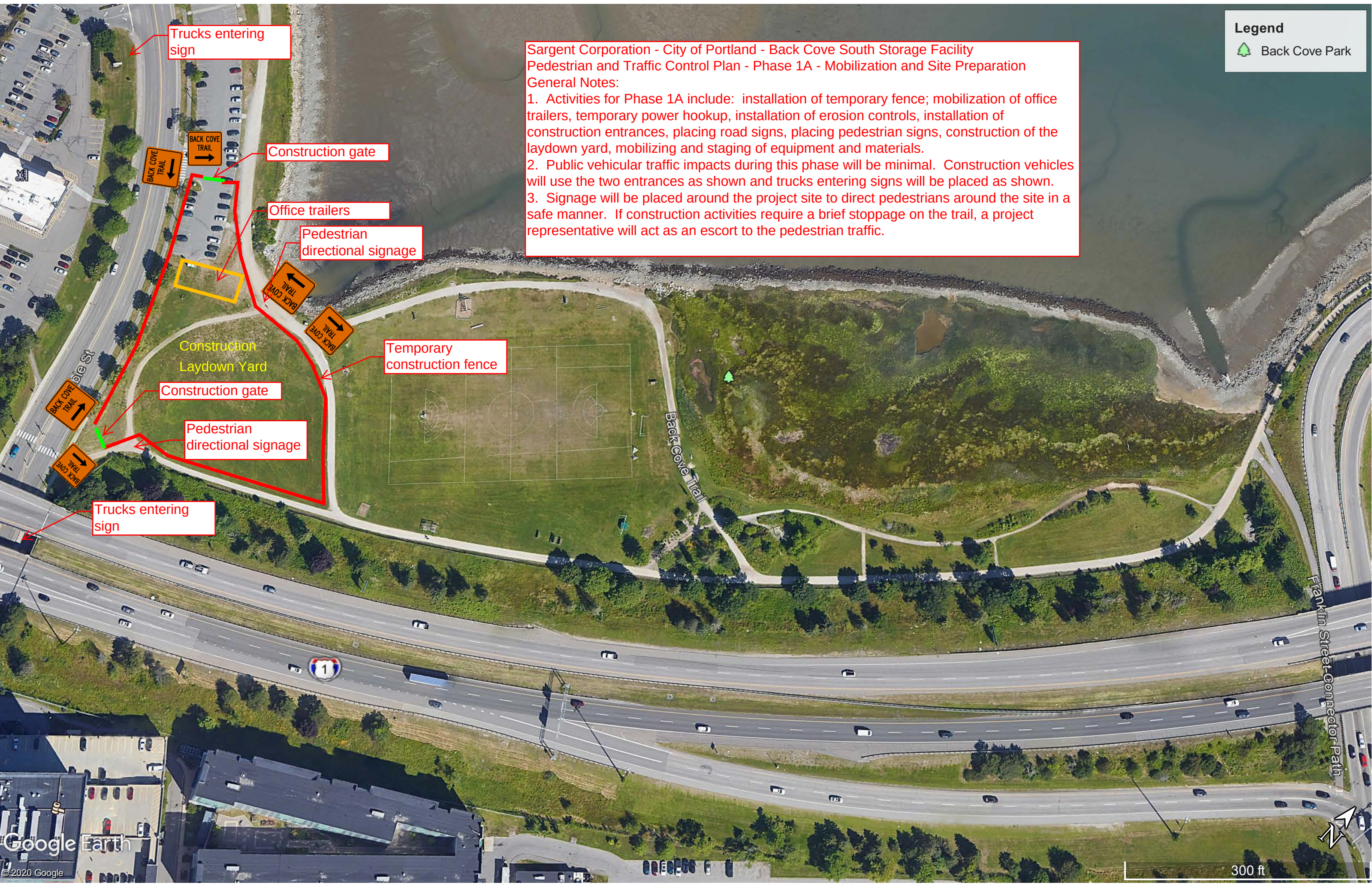
Legend

 Back Cove Park

Sargent Corporation - City of Portland - Back Cove South Storage Facility
Pedestrian and Traffic Control Plan - Phase 1A - Mobilization and Site Preparation

General Notes:

1. Activities for Phase 1A include: installation of temporary fence; mobilization of office trailers, temporary power hookup, installation of erosion controls, installation of construction entrances, placing road signs, placing pedestrian signs, construction of the laydown yard, mobilizing and staging of equipment and materials.
2. Public vehicular traffic impacts during this phase will be minimal. Construction vehicles will use the two entrances as shown and trucks entering signs will be placed as shown.
3. Signage will be placed around the project site to direct pedestrians around the site in a safe manner. If construction activities require a brief stoppage on the trail, a project representative will act as an escort to the pedestrian traffic.



Legend

Back Cove Park

Sargent Corporation - City of Portland - Back Cove South Storage Facility
Pedestrian and Traffic Control Plan - Phase 1B - Continued site preparation / Preliminary Earthwork
General Notes:
1. Activities for Phase 1B include: installation and re-routing of temporary fence; continued installation of erosion controls, placing pedestrian signs, continued mobilizing and staging of equipment and materials, topsoil stripping, initial site excavation in sheeting area to elevation 8.0', Back Cove perimeter earthwork and rip-rap placement, continued site removals / demolition.
2. Public vehicular traffic impacts during this phase will be minimal. Construction vehicles will use the two entrances as shown and trucks entering signs will be placed as shown.
3. Signage will be placed around the project site to direct pedestrians around the site in a safe manner. If construction activities require a brief stoppage on the trail, a project representative will act as an escort to the pedestrian traffic.

Trucks entering sign

Construction gate

BACK COVE TRAIL

Pedestrian directional signage

BACK COVE TRAIL

Office trailers

Shoreline Work Area

Construction Laydown Yard

Construction gate

Temporary construction fence

Pedestrian directional signage

BACK COVE TRAIL

Pedestrian directional signage

BACK COVE TRAIL

Trucks entering sign

BACK COVE TRAIL

BACK COVE TRAIL

Franklin Street Connector Path

**BACK COVE
TRAIL**



**BACK COVE
TRAIL**



**BACK COVE
TRAIL**



1

2

3

4

5

6

A

B

C

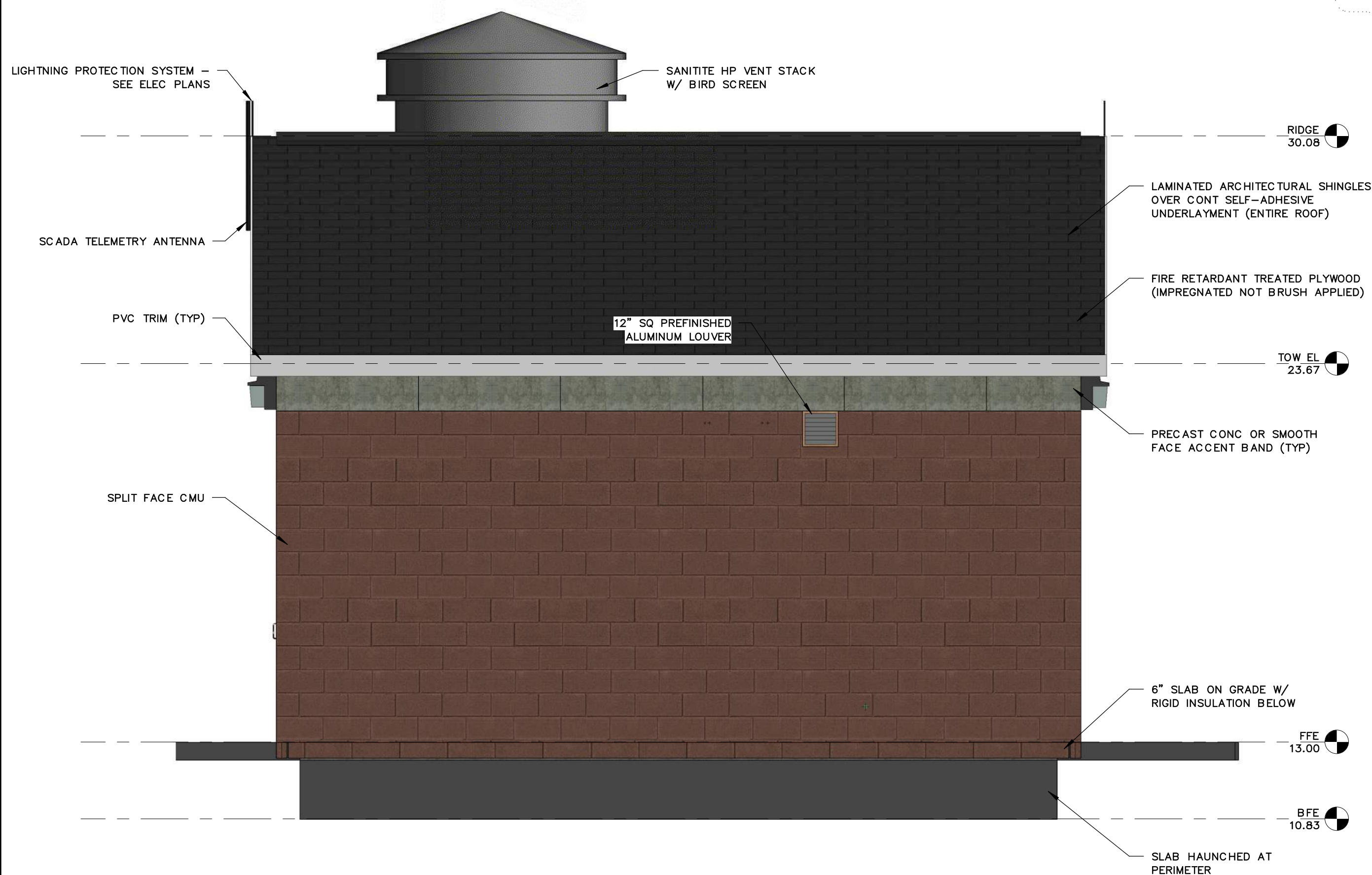
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A

B

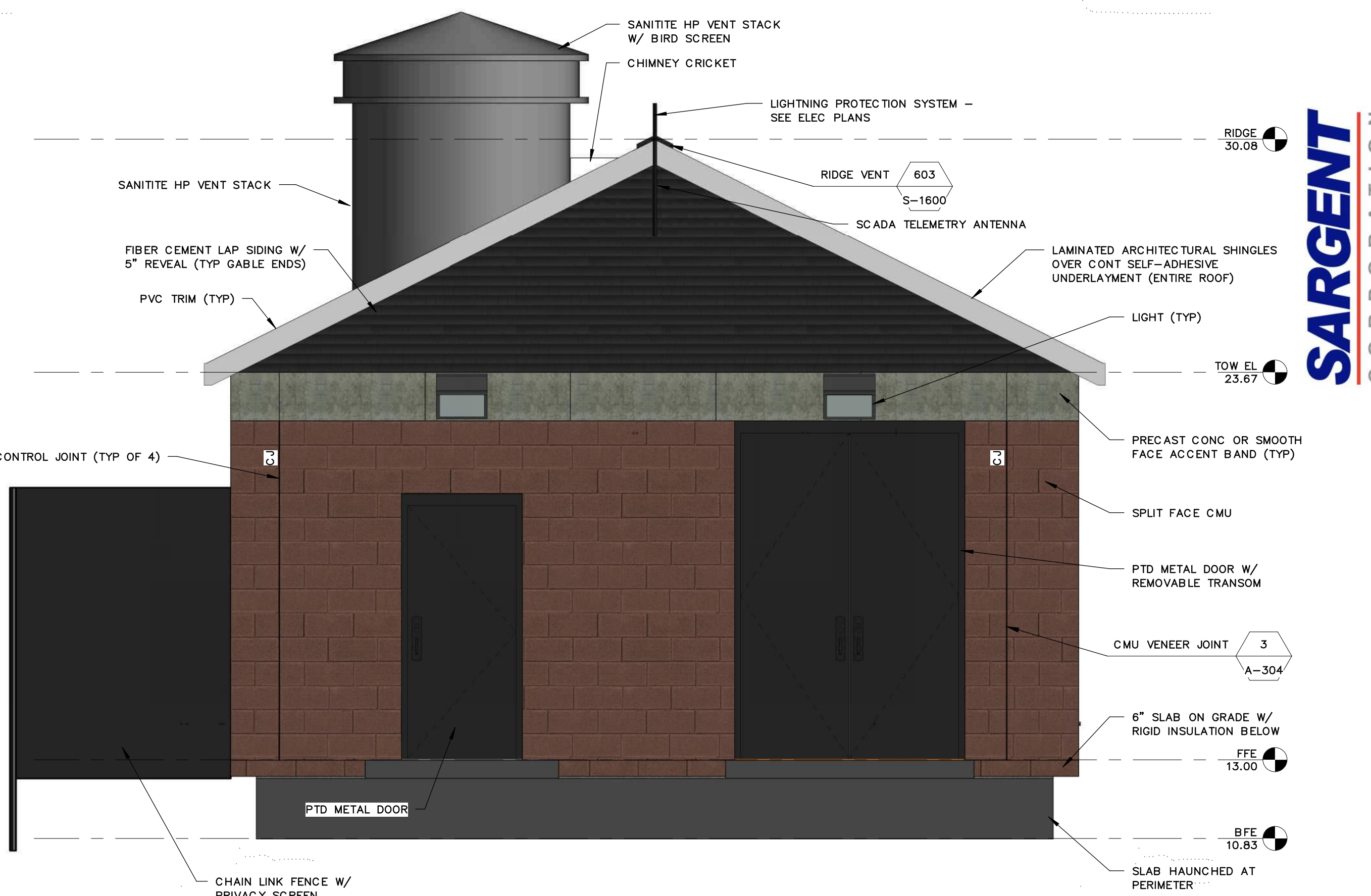
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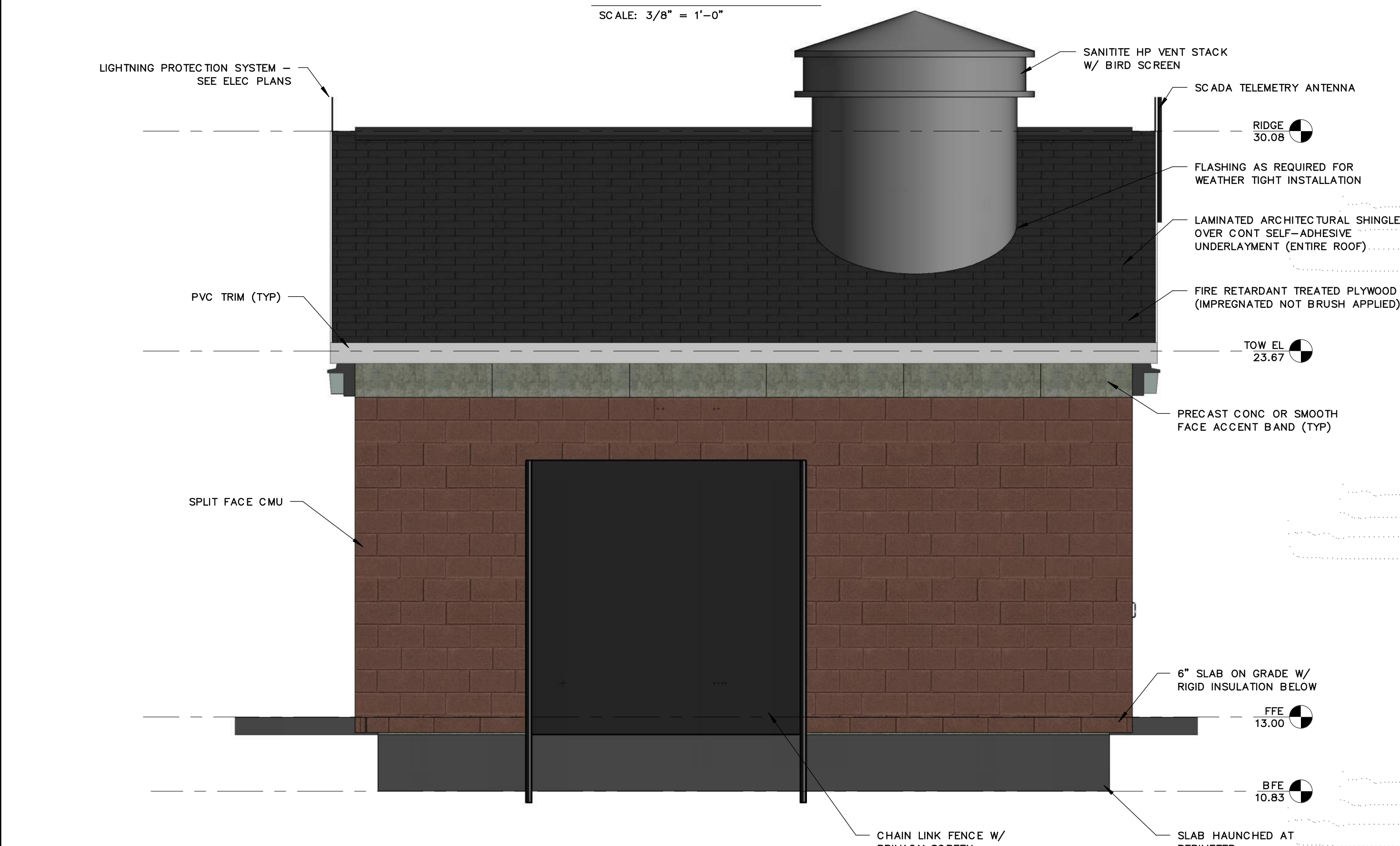
NORTH ELEVATION

SCALE: 3/8" = 1'-0"



EAST ELEVATION

SCALE: 3/8" = 1'-0"



SOUTH ELEVATION

SCALE: 3/8" = 1'-0"



WEST ELEVATION

SCALE: 3/8" = 1'-0"

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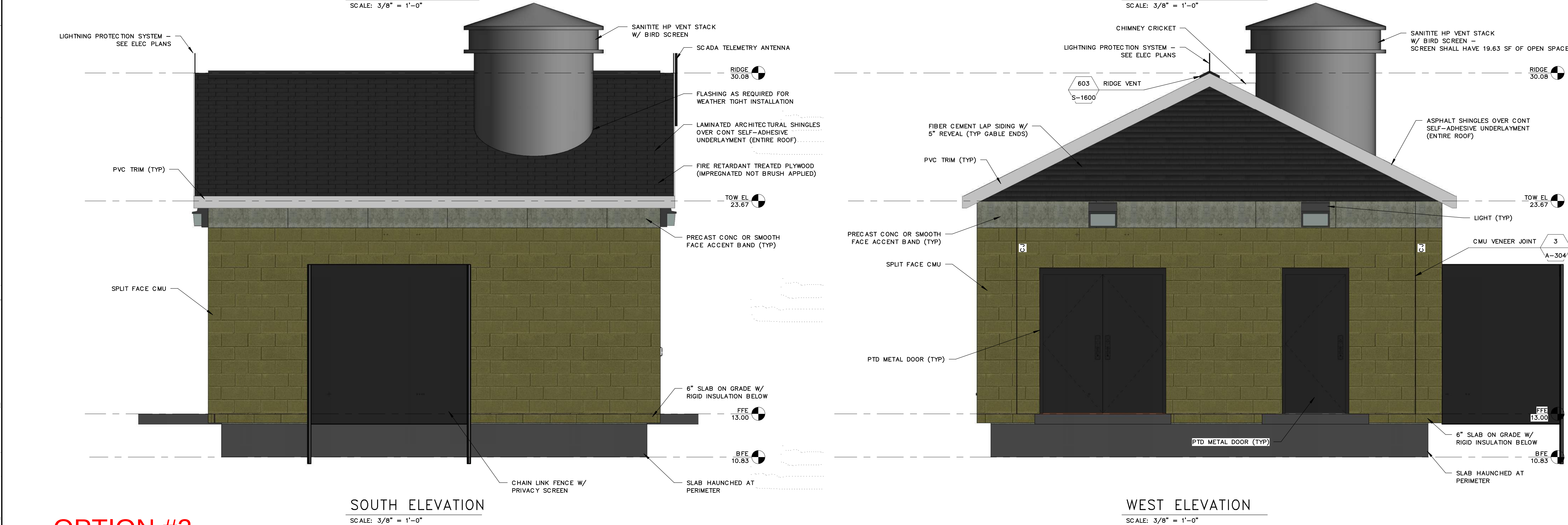
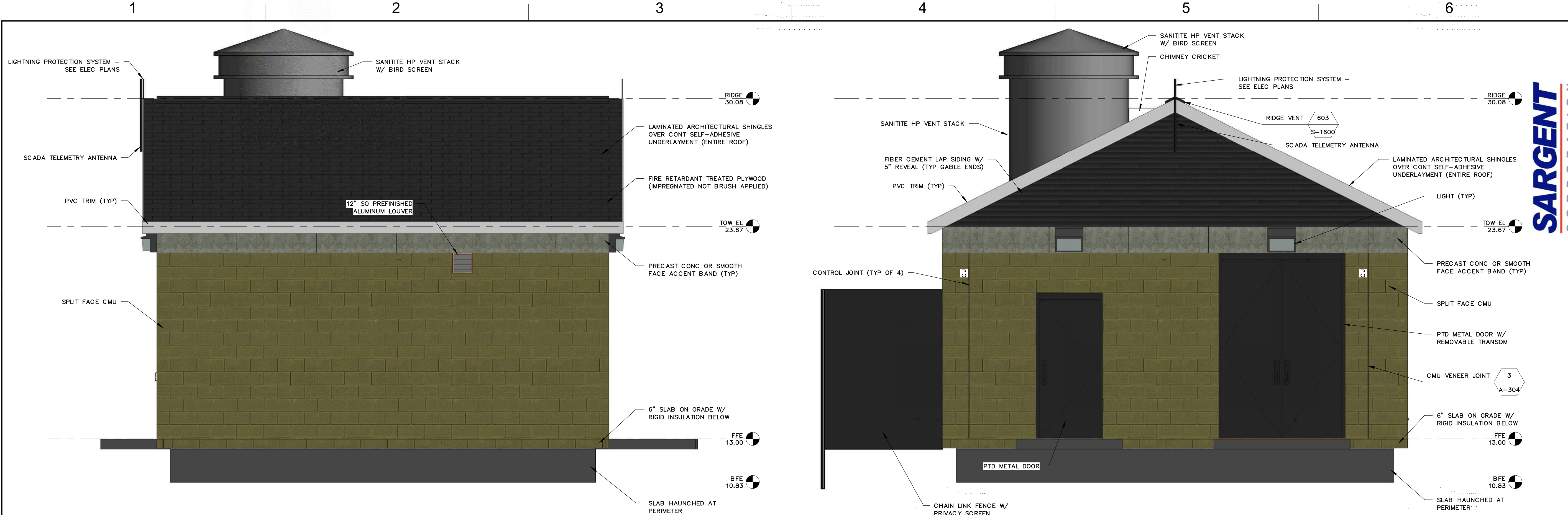
ELECTRICAL MAINTENANCE BUILDING
ELEVATIONS

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO: 0232069.00
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OPTION #2

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BACK COVE SOUTH STORAGE FACILITY		JOB NO: 0232069.00 DATE: APRIL 2020 SCALE: AS NOTED SHEET: 36 OF 104	
A-302			

Option	Shingles	Siding	CMU Veneer
1	Pewter Gray	Age Pewter	Durham Red
2	Pewter Gray	Age Pewter	Sebago Earth
3	Barkwood	Timber Bark	Casco Stone

Notes:

1. Shingles colors based on Timberline HD Shingles.
2. CMU Veneer colors based on Gagne & Son.
3. Siding colors based on James Hardie Fiber Cement Siding.

Timberline HD® Shingles

Made to protect your home. Your story. And those of over 50 million of your fellow Americans!



TIMBERLINE HD®
LIFETIME HIGH DEFINITION SHINGLES

Timberline HD® Shingles Provide These Unique Benefits:

Great Value

Architecturally stylish but practically priced

Dimensional Look

Features GAF proprietary color blends and enhanced shadow effect for a genuine wood-shake look

Highest Roofing Fire Rating

UL Class A, Listed to ANSI/UL 790

High Performance

Designed with Advanced Protection® Shingle Technology, which reduces the use of natural resources while providing excellent protection for your home (visit gaf.com/APS/ to learn more)

Stays in Place

Dura Grip™ Adhesive seals each shingle tightly and reduces the risk of shingle blow-off. Shingles warranted to withstand winds up to 130 mph (209 km/h)¹

StainGuard® Protection

Helps ensure the beauty of your roof against unsightly blue-green algae²

Peace of Mind

Lifetime Ltd. transferable warranty with Smart Choice® Protection (non-prorated material and installation labor coverage) for the first ten years³

Perfect Finishing Touch

For the best look, use Timbertex® Premium Ridge Cap Shingles or Ridglass® Premium Ridge Cap Shingles⁴

¹This wind speed coverage requires special installation; see *GAF Shingle & Accessory Ltd. Warranty* for details.

²StainGuard® Protection applies only to shingles with StainGuard®-labeled packaging. See *GAF Shingle & Accessory Ltd. Warranty* for complete coverage and restrictions.

³See *GAF Shingle & Accessory Ltd. Warranty* for complete coverage and restrictions. The word "Lifetime" refers to the length of coverage provided by the *GAF Shingle & Accessory Ltd. Warranty* and means as long as the original individual owner(s) of a single-family detached residence (or the second owner(s) in certain circumstances) owns the property where the shingles are installed. For owners/structures not meeting the above criteria, Lifetime coverage is not applicable.

⁴These products are not available in all areas. See www.gaf.com/ridgecapavailability for details.

Colors & Availability

Regional Availability

Northeast, Southeast, Southwest,
West, and Central Areas

Copper Canyon

Patriot Red

Driftwood

Pewter Gray

Fox Hollow Gray

Shakewood

Barkwood

Golden Amber

Slate

Birchwood

Hickory

Sunset Brick

Biscayne Blue

Hunter Green

Weathered Wood

Canadian Driftwood

sold in Canada only

Mission Brown

White

Charcoal

Oyster Gray

Williamsburg Slate

Applicable Standards & Protocols

- UL Listed to ANSI/UL 790 Class A
- Miami-Dade County Product Control approved
- State of Florida approved
- UL 997 modified to 110 mph
- Classified by UL in accordance with ICC-ES AC438
- Meets ASTM D7158, Class H
- Meets ASTM D3161, Class F
- Meets ASTM D3018, Type 1
- Meets ASTM D3462¹
- ICC-ES Evaluation Reports ESR-1475 and ESR-3267

- Texas Department of Insurance listed
- CSA A123.5²
- ENERGY STAR® Certified (White Only) (U.S. Only)
- Rated by the CRRC
- Can be used to comply with Title 24 cool roof requirements
- Meets the cool roof requirements of the Los Angeles Green Building Code (Birchwood, Copper Canyon, Golden Amber, and White Only)

Product/System Specifics³

- Fiberglass Asphalt Construction
- Dimensions (approx.): 13 1/4" x 39 3/8" (337 x 1,000 mm)

- Exposure: 5 5/8" (143 mm)
- Bundles/Square: 3
- Pieces/Square: 64
- StainGuard® Protection: Yes⁴
- Hip/Ridge: Timbertex®; Seal-A-Ridge®; Z® Ridge; Ridglass®
- Starter: Pro-Start® & WeatherBlocker™

Installation

Detailed installation instructions are provided on the inside of each bundle wrapper of Timberline HD® Shingles. Installation instructions may also be obtained at gaf.com.

¹Periodically tested by independent and internal labs to ensure compliance with ASTM D3462 at time of manufacture.

²Refers to shingles sold in Canada only.

³Refer to complete published installation instructions.

⁴StainGuard® Protection applies only to shingles with StainGuard®-labeled packaging. See *GAF Shingle & Accessory Ltd. Warranty* for complete coverage and restrictions.

Note: It is difficult to reproduce the color clarity and actual color blends of these products. Before selecting your color, please ask to see several full-size shingles.



SELECT CEDARMILL®

Khaki Brown

Thickness	5/16 in.			
Length	12 ft. planks			
Width	5.25 in.	6.25 in.	7.25 in.	8.25 in.
Exposure	4 in.	5 in.	6 in.	7 in.
ColorPlus Pcs./Pallet	324	280	252	210
Prime Pcs./Pallet	360	308	252	230
Pcs./Sq.	25.0	20.0	16.7	14.3

Available Colors



View all HardiePlank Lap Siding Products



Masonry Colors



NATURAL



CRESCENT BROWN #1



PENDLETON #2



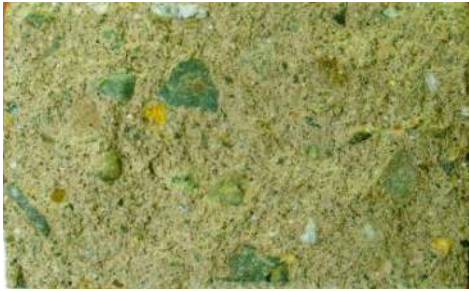
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SEBAGO EARTH #4F



CUMBERLAND #5P



CASCO STONE #6P



PINE POINT BEIGE #7G



ACADIA GRAY #8D



DURHAM RED #9E



GREAT EAGLE BROWN #10C



GREAT DIAMOND #11C



DUCKTRAP #12A



ECHO LAKE GRAY #13



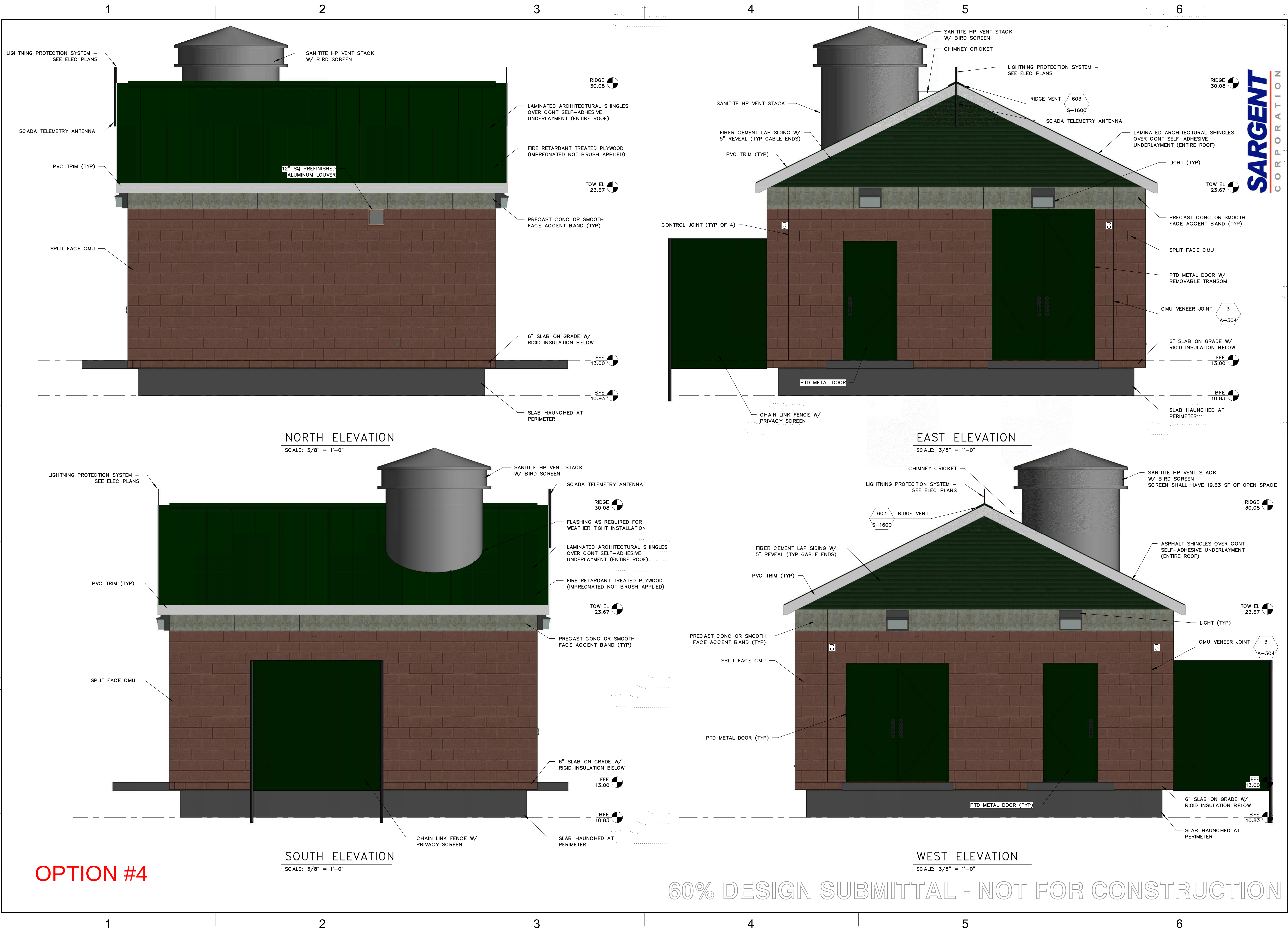
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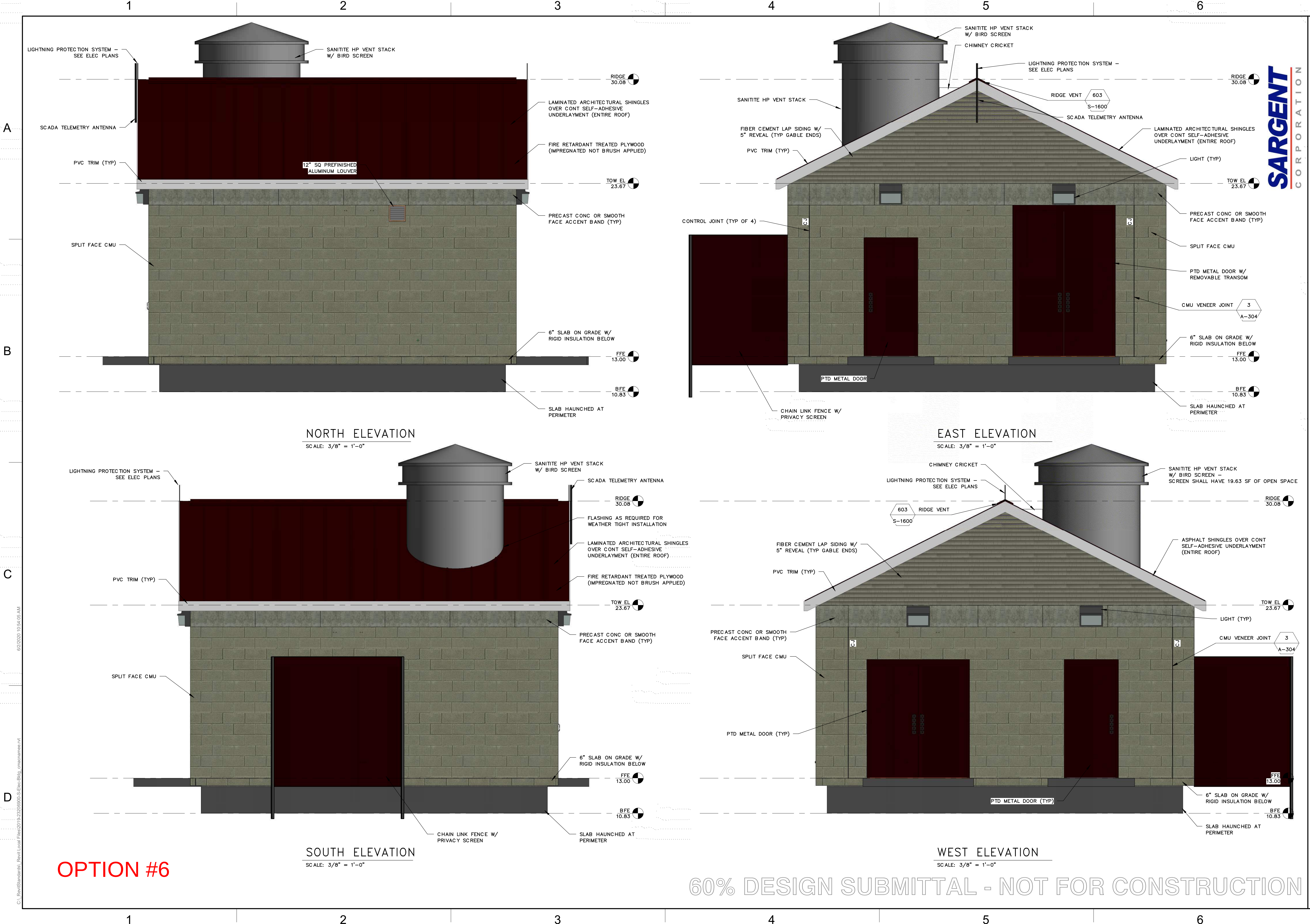
RUBY RED #15



SCARBOROUGH RED #16



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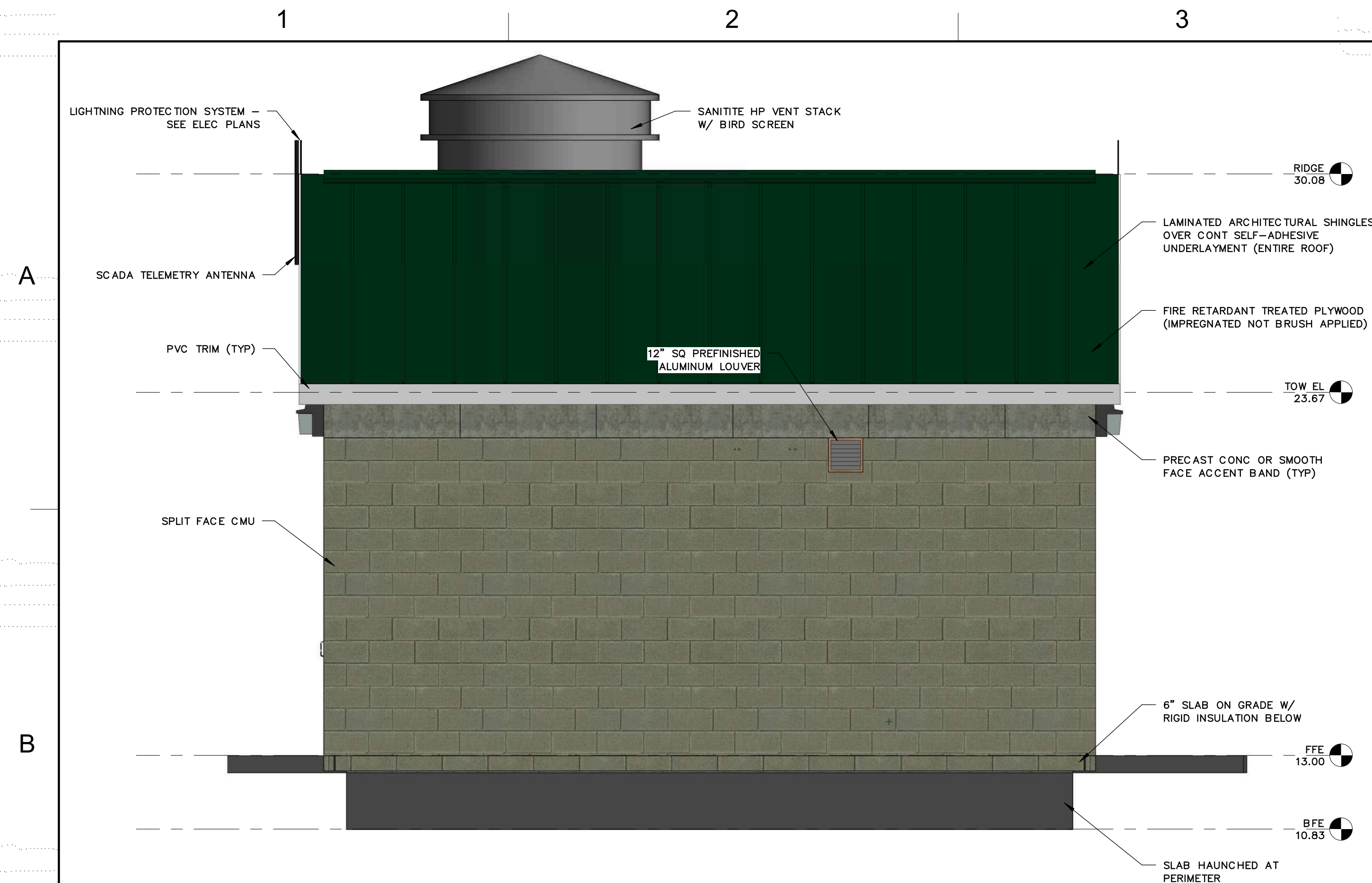
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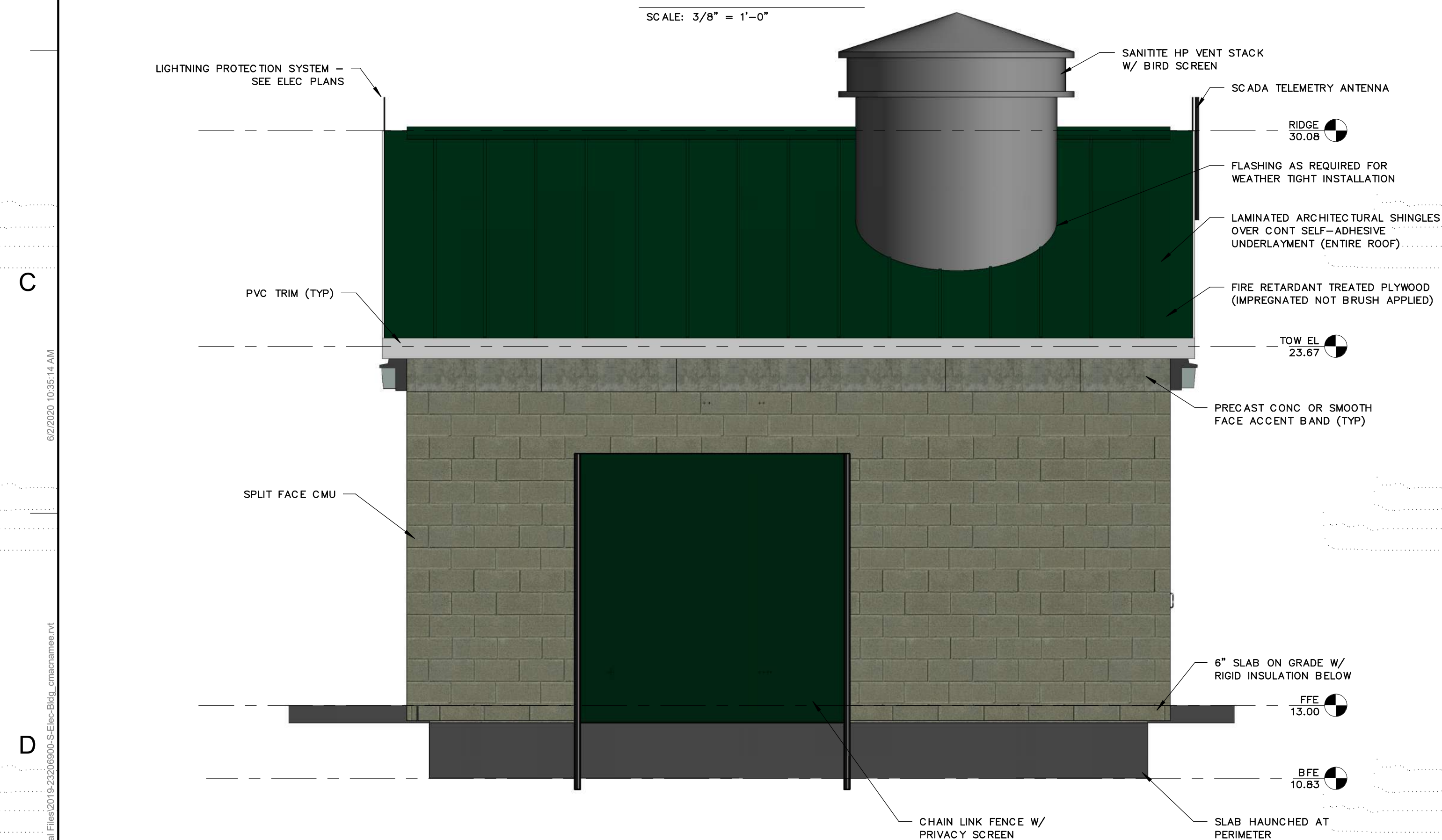
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NORTH ELEVATION

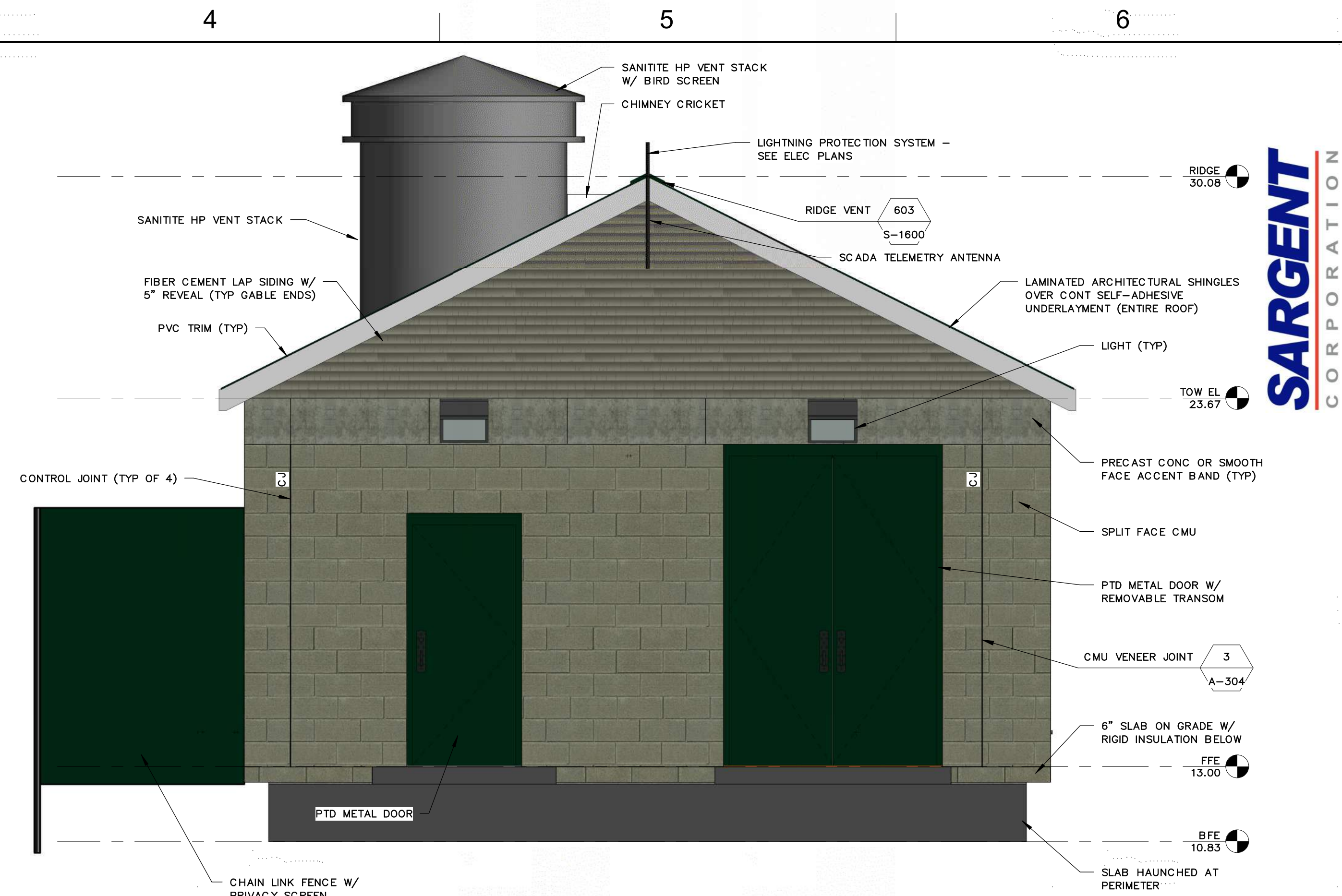
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SOUTH ELEVATION

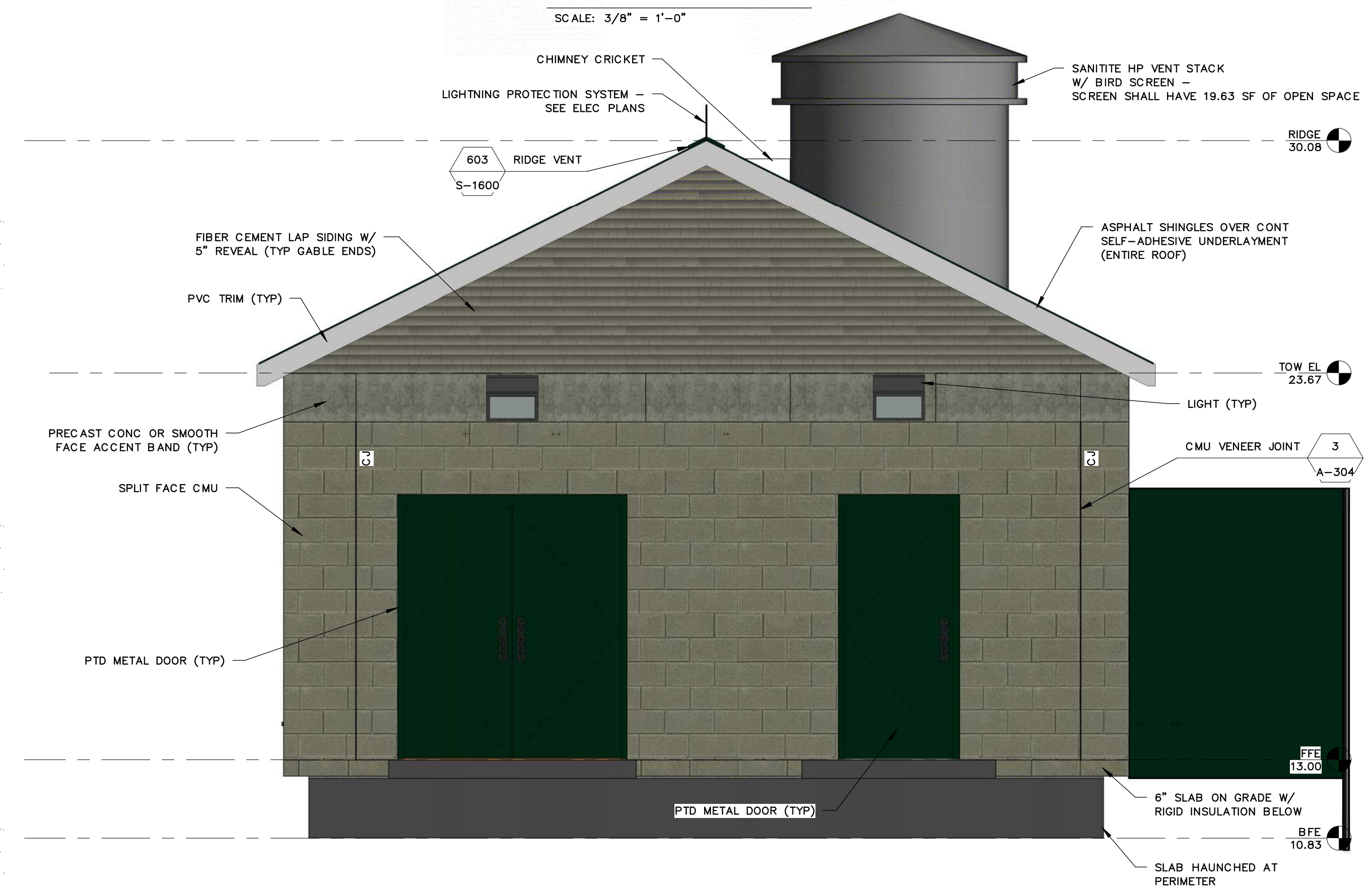
SCALE: 3/8" = 1'-0"

OPTION #7



EAST ELEVATION

SCALE: $3/8" = 1'-0"$



WEST ELEVATION

SCALE: $3/8" = 1'-0"$

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Option	Standing Seam	Siding	CMU Veneer
4	Forest Green	Mountain Sage	Durham Red
5	Dark Gray	Night Gray	Great Diamond
6	Colonial Red	Sandstone Beige	Casco Stone
7	Forest Green	Sandstone Beige	Casco Stone

Notes:

1. Standing Seam colors based on Everlast Roofing.
2. CMU Veneer colors based on Gagne & Son.
3. Siding colors based on James Hardie Fiber Cement Siding.

EVERSEAM®

EVERSEAM®

From agricultural buildings to commercial properties, metal roofing offers the strength and durability needed for long-lasting results. But have you ever considered metal roof products for residential use? The Everseam® profile from Everlast Roofing, Inc., will fit your home with high-quality, pre-painted roof panels with an attractive style that enhances the appearance of your property. With a variety of colors to choose from, you will find the perfect shade to elevate your curb appeal with Everseam®.

SUPERIOR STRENGTH

The Everseam® is 20" (+/- 1/4") wide with a 1 1/2" high seam. The integral locking seam is held in place by concealed metal clips, and is installed over a waterproof solid substrate. The absence of exposed fasteners and the weather-tight side lap, allow for applications on roof pitches as low as a 3:12. The Everseam® durability and aesthetic appearance make it an **ideal choice for residential roofing applications.**



24 GAUGE COLOR OPTIONS



Matte Black



Dark Gray



Forest
Green



Burgundy



Gallery Blue



Burnished
Slate



Colonial Red



Mansard
Brown



26 GAUGE COLOR OPTIONS



Bone White



Cityscape



Forest
Green



Dark Bronze



Sandstone



Dark Gray



Colonial Red



Everseam™ Is A High-Quality Roof Panel With An Attractive Style
That Enhances The Appearance Of Your Property.



SELECT CEDARMILL®

Khaki Brown

Thickness	5/16 in.			
Length	12 ft. planks			
Width	5.25 in.	6.25 in.	7.25 in.	8.25 in.
Exposure	4 in.	5 in.	6 in.	7 in.
ColorPlus Pcs./Pallet	324	280	252	210
Prime Pcs./Pallet	360	308	252	230
Pcs./Sq.	25.0	20.0	16.7	14.3

Available Colors



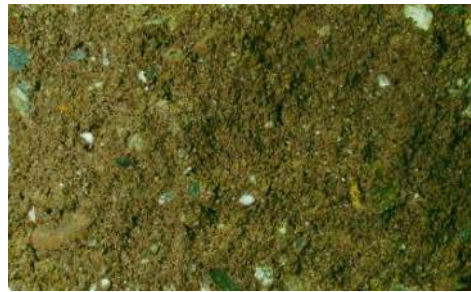
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Masonry Colors



NATURAL



CRESCENT BROWN #1



PENDLETON #2



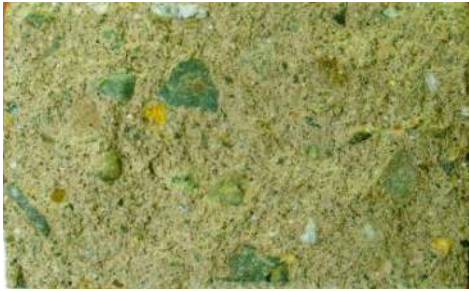
STUEBEN YELLOW #3



SEBAGO EARTH #4F



CUMBERLAND #5P



CASCO STONE #6P



PINE POINT BEIGE #7G



ACADIA GRAY #8D



DURHAM RED #9E



GREAT EAGLE BROWN #10C



GREAT DIAMOND #11C



DUCKTRAP #12A



ECHO LAKE GRAY #13



WINDJAMMER GRAY #14



RUBY RED #15



SCARBOROUGH RED #16



BACK COVE SOUTH STORAGE FACILITY

BASIS OF DESIGN REPORT

DRAFT



SARGENT
CORPORATION

**WOODARD
& CURRAN**

Terracon

City of Portland, Maine
February 11, 2020

TABLE OF CONTENTS

SECTION	PAGE NO.
1. INTRODUCTION.....	1-1
1.1 Project Purpose and Goal	1-1
1.2 Project Design-Build Team	1-1
1.3 Project Overview	1-1
1.4 Deviations from Request for Proposal	1-5
2. PROJECT DATA AND INFORMATION	2-1
2.1 Source of Information	2-1
2.1.1 RFP	2-1
2.1.2 Record Drawings	2-1
2.1.3 Existing Conditions Survey	2-2
2.2 Field Evaluations	2-2
2.2.1 Additional Field Survey	2-2
2.2.1.1 CSO 16 Regulator Structure	2-3
2.2.1.2 CSO 17 Regulator Structure	2-4
2.2.1.3 CSO 18 Regulator Structure	2-4
2.2.2 Geotechnical Investigations	2-6
2.2.3 Environmental Sampling	2-6
2.2.4 Structural Evaluation of Regulator Structures	2-6
3. HYDRAULIC ANALYSIS	3-1
3.1 Hydraulic Analysis Approach	3-1
3.2 Existing Combined Sewer Overflow System	3-1
3.3 Diversion Structures	3-2
3.4 CSO Conveyance Piping	3-3
3.5 Storage Tank Design and Maximum Water Level	3-4
4. SITE CIVIL	4-1
4.1 Design Overview	4-1
4.2 Design Standards, Codes and References	4-1
4.3 Erosion and Sedimentation Controls	4-2
4.4 Utilities	4-2
4.5 Yard Piping	4-2
4.5.1 Backflow Prevention Devices	4-3
4.6 Project Area Restoration	4-3
4.6.1 Site Grading and Surface Finishes	4-3
4.6.2 Roadways	4-4
4.6.3 Back Cove Trail	4-4
4.6.4 Athletic Field Underdrain	4-4
4.6.5 Finish Surface and Landscaping	4-5
5. ARCHITECTURAL	5-1
5.1 Design Overview	5-1
5.2 Design Standards, Codes and References	5-1

5.2.1	2015 International Building Code (as Amended by MUBEC).....	5-2
5.2.2	State of Maine Energy Code.....	5-2
5.2.3	National Electrical Code	5-3
5.2.4	Hazard Area Classifications Based on NFPA 820 Fire Protection.....	5-3
5.3	Electrical Maintenance Building Materials of Construction and Finishes.....	5-5
6.	STRUCTURAL.....	6-1
6.1	Design Overview	6-1
6.2	Design Standards, Codes and References	6-1
6.3	Design Considerations	6-2
6.3.1	Service Life of Storage and Diversion Structures	6-2
6.3.2	Design Criteria	6-2
6.3.3	Primary Design Loads	6-3
6.3.4	Serviceability Requirements	6-5
6.3.5	Global Stability Requirements.....	6-6
6.3.5.1	Flotation and Buoyancy	6-6
6.3.5.2	Sliding Resistance	6-6
6.3.6	Watertightness and Crack Repair	6-6
6.3.6.1	Polyurethane Crack Injection.....	6-6
6.3.6.2	Crystalline Waterproofing Surface Coating.....	6-7
6.3.7	Structural Materials.....	6-7
6.3.7.1	Cast-in-place Concrete (Environmental Structures)	6-7
6.3.7.2	Cast-in-place Concrete (Electrical Maintenance Building).....	6-8
6.3.7.3	Precast Concrete.....	6-8
6.3.7.4	Masonry.....	6-8
6.3.7.5	Aluminum	6-8
6.3.7.6	Structural Steel	6-8
6.3.7.7	Shop-Fabricated Wood Trusses.....	6-9
6.3.7.8	Wood Framing.....	6-9
6.3.7.9	Geotechnical	6-9
6.4	Structural Analysis Methodology	6-9
6.5	Storage Tanks	6-9
6.5.1	Design Considerations.....	6-9
6.5.2	Excavation and Shoring.....	6-10
6.5.3	Base Slab	6-10
6.5.4	Walls.....	6-10
6.5.5	Covers	6-10
6.6	CSO Diversion Structures 16, 17 and 18.....	6-11
6.7	Electrical Maintenance Building.....	6-11
6.7.1	Design Considerations.....	6-11
6.7.2	Service Life of Electrical Maintenance Building	6-11
7.	MECHANICAL PROCESS.....	7-1
7.1	Design Overview	7-1
7.2	Design Standards, Codes and References	7-1
7.3	Tank Dewatering Pumping System	7-2
7.3.1	Design Criteria.....	7-2
7.3.2	Pump Selection.....	7-3
7.3.3	Pump Operation Strategy	7-5

7.3.4	Tank Dewatering Forcemain Material Selection	7-5
7.3.5	Cleanouts and Venting for the Tank Dewatering Forcemain	7-5
7.3.6	Valves	7-5
7.3.7	Valve Vaults	7-6
7.4	Stop Logs and Guides	7-6
7.5	Tipping Bucket Requirements	7-7
7.5.1	Tipping Bucket Grease Points	7-7
7.5.2	Tank and Pump Sump Design Criteria	7-8
7.6	Tank Venting Requirements	7-8
7.6.1	Future Storage Tank Odor Control	7-9
8.	HEATING, VENTILATION AND AIR CONDITIONING (HVAC)	8-1
8.1	Design Overview	8-1
8.2	Design Standards, Codes and References	8-1
8.3	Design Conditions and Ventilation Rates	8-1
8.4	Heating and Cooling	8-2
9.	PLUMBING	9-1
9.1	Design Overview	9-1
9.2	Design Standards, Codes and References	9-1
9.3	Utility Connection	9-1
9.4	Tipping Buckets Feed Line	9-1
9.5	Field Irrigation	9-2
9.6	Drinking Fountain and Spigots	9-2
10.	ELECTRICAL	10-1
10.1	Design Overview	10-1
10.2	Design Standards, Codes and References	10-1
10.3	Utility Connection	10-1
10.4	Electrical Distribution System	10-2
10.5	Standby Power	10-2
10.6	Grounding System	10-3
10.7	Materials of Construction	10-3
10.8	Site Electrical	10-3
10.9	Lighting	10-4
10.10	Lightning Protection	10-4
10.11	Building Fire Detection	10-4
10.12	Electrical System Studies	10-4
10.13	Electrical System Testing and Startup	10-4
11.	INSTRUMENTATION AND CONTROLS	11-1
11.1	Design Overview	11-1
11.2	Design Standards, Codes and References	11-1
11.3	City of Portland Existing SCADA System Overview	11-1
11.4	BCSSF Instrumentation and Controls	11-2
11.4.1	SCADA System Needs	11-5
11.4.2	Communication Strategy	11-5
11.4.3	Security and Protection	11-5

12.	PROJECT IMPLEMENTATION	12-1
12.1	Permitting	12-1
12.2	Project Coordination	12-2
12.3	Project Schedule	12-2
12.4	Project Design Submittals	12-2
12.5	Construction Methodology and Sequencing	12-3
12.5.1	General Construction Requirements	12-3
12.5.1.1	Trail Maintenance and Access	12-3
12.5.1.2	Traffic Limitations & Control	12-3
12.5.1.3	Spill Prevention & Control	12-5
12.5.1.4	Health & Safety Requirements	12-5
12.5.2	Construction Methods and Techniques	12-7
12.5.2.1	Temporary Utilities	12-7
12.5.2.2	Staging and Stockpiling	12-7
12.5.2.3	Clearing and Grubbing	12-8
12.5.2.4	Excavation and Backfill	12-8
12.5.2.5	Dewatering	12-8
12.5.2.6	Excavation Support	12-9
12.5.2.7	Site Maintenance	12-10
12.5.3	Environmental Review During Construction	12-10
12.5.4	Construction Documentation	12-11

TABLES

Table 1-1:	Deviations and Clarifications Relative to the RFP
Table 2-1:	Reference Drawings for the Back Cove South Storage Facility Project
Table 2-2:	CSO Regulator Weir and Outfall Elevation Data
Table 2-3:	CSO 18 Pipe Elevations
Table 3-1:	Highest Peak Flow in Typical Year by CSO Outfall (Source: RFP, Table 3-1)
Table 3-2:	Maximum Peak Flows by CSO Outfall (Source: RFP, Table 3-2)
Table 3-3:	Existing CSO Data Summary
Table 3-4:	Proposed Diversion Structure Information
Table 3-5:	Proposed Conveyance & Tank Connection Piping Information
Table 3-6:	Comparison of CSO Outfall Capacity: Existing vs Proposed
Table 4-1:	Civil Site Design Standards and References
Table 4-2:	Existing and Proposed Back Cove Park Utilities
Table 4-3:	Yard Piping Materials
Table 4-4:	Backflow Prevention Device Schedule
Table 4-5:	Back Cove Park Surface Restoration Schedule
Table 4-6:	Roadway Pavement Restoration Schedule
Table 5-1:	Architectural Building Codes and Design Standards
Table 5-2:	Architectural Code Summary
Table 5-3:	ASHRAE 90.1 Thermal Envelope Requirements for Climate Zone 6A
Table 5-4:	NFPA-820 Hazard Area Classifications
Table 5-5:	Interior Finish Schedule
Table 5-6:	Exterior Finish Schedule
Table 6-1:	Structural Building Codes and Design Standards
Table 6-2:	Minimum Structural Design Criteria Summary
Table 6-3:	Key Geotechnical Parameters
Table 7-1:	Mechanical Process Codes and Design Standards
Table 7-2:	Tank Dewatering Pump Design Criteria
Table 7-3:	Tank Dewatering Forcemain Material Schedule
Table 7-4:	Stop Logs Basis of Design
Table 7-5:	Tipping Bucket Selection
Table 7-6:	Tank and Pump Sump Design Criteria
Table 7-7:	Tank Vent Design Criteria
Table 8-1:	HVAC Codes and Design Standards
Table 8-2:	Outdoor Design Criteria
Table 8-3:	Indoor Design Criteria
Table 9-1:	Plumbing Codes and Design Standards
Table 9-2:	Tipping Bucket Fill Water Criteria
Table 9-3:	Irrigation System Design Criteria
Table 9-4:	Drinking Fountain and Spigot Design Criteria
Table 10-1:	Electrical Codes and Design Standards
Table 10-2:	Electrical Materials of Construction
Table 11-1:	Instrumentation and Controls Codes and Design Standards
Table 12-1:	BCSSF Permitting Responsibility
Table 12-2:	Project Design and City Department Coordination
Table 12-3:	BCSSF Project Emergency and Safety Contact List

FIGURES

Figure 1-1:	Back Cove South Storage RFP Indicative Plan (Source: RFP)
Figure 1-2:	Proposed Back Cove South Storage Tanks Layout
Figure 1-3:	Back Cove South Storage Facility Key Plan
Figure 2-1:	CSO 16B Regulator Structure Weir
Figure 2-2:	CSO 17 Regulator Structure Weir
Figure 2-3:	CSO 18 Regulator Structure Weir
Figure 3-1:	Tank Storage vs. CSO Flow at Highest Peak Flow in Typical Year by CSO Outfall (RFP Table 3-1)
Figure 3-2:	Typical Tank & Water Level Schematic (RFP Table 3-2 at MHHW)
Figure 4-1:	Proposed Athletic Field Underdrain System
Figure 5-1:	Example of Building Construction Materials - Photo 1
Figure 5-2:	Example of Building Construction Materials - Photo 2
Figure 7-1:	Tank Dewatering Pump and System Curves
Figure 11-1:	Existing SCADA Network Architecture
Figure 11-1:	Instrumentation Loop Sheet
Figure 12-1:	Example Erosion Control Inspection Form

APPENDICES

Appendix A:	Geotechnical Engineering Report
Appendix B:	Limited Subsurface Investigation Report
Appendix C:	CSO Regulator Structural Assessment Memorandum
Appendix D:	Back Cove South Storage Facility Hydraulic Analysis Technical Memorandum
Appendix E:	Equipment List, Information and Drawings
Appendix F:	Design Calculations
Appendix G:	Project Schedule
Appendix H:	Technical Specifications Table of Contents
Appendix I:	Drawing List (Drawings Bound Separately)
Appendix J:	Sargent Corporation Health & Safety Plan
Appendix K:	CSO Storage Tanks Excavation Support Design

1. INTRODUCTION

This report defines the basis of design for the proposed Back Cove South Storage Facility project in Portland, Maine.

1.1 Project Purpose and Goal

The City of Portland, Maine (City) is operating under an Administrative Consent Agreement with the Maine Department of Environmental Protection (Maine DEP) to abate combined sewer overflows (CSOs). In 1993, the City initiated a Long-Term Control Plan (LTCP) focused on sewer separation projects. When the City updated the LTCP in 2013, green infrastructure and sewer separation were supplemented with the focus on implementing storage facilities, which would capture the first inch of rainfall, store the combined sewer runoff and then send it to the Portland Water District (PWD) Wastewater Treatment Plant (WWTP) for treatment. The first inch of rainfall is considered the 'first flush' and typically contains 80-percent of the storm volume and 90-percent of the pollutants.

As part of the 2013 LTCP, the concept of the Back Cove South Storage Facility (BCSSF) project was identified and per the May 2015 Preliminary Design Report, the project was further defined to reduce CSOs into Back Cove by intercepting flow from existing CSO outfalls and sending it to a new 3.5 million-gallon (MG) offline CSO storage facility. The City's goal is to reduce the annual overflow volume from CSO outfalls 16, 17, and 18 from 150 MG to approximately 18 MG.

1.2 Project Design-Build Team

In October 2018, the City of Portland issued Request for Proposals (RFP) No. 19039 seeking Design-Build proposals for the Back Cove South Storage Facility project. The Design-Build team led by Sargent Corporation (Sargent) was awarded the project. Sargent is responsible for construction sequencing, methodology and overall management of the design team, which consists of the following:

- Woodard & Curran - the Engineer-of-Record and responsible for the overall project design including site/civil, environmental, structural, hydraulic/conveyance, mechanical, electrical, plumbing and instrumentation and controls.
- Terracon - responsible for the geotechnical considerations and pre-design exploratory aspects of the project. In addition, Terracon will provide construction materials testing and construction oversight during the project.
- H.B. Fleming, Inc. - responsible for designing and installing the support of excavation for construction of the large storage tanks.

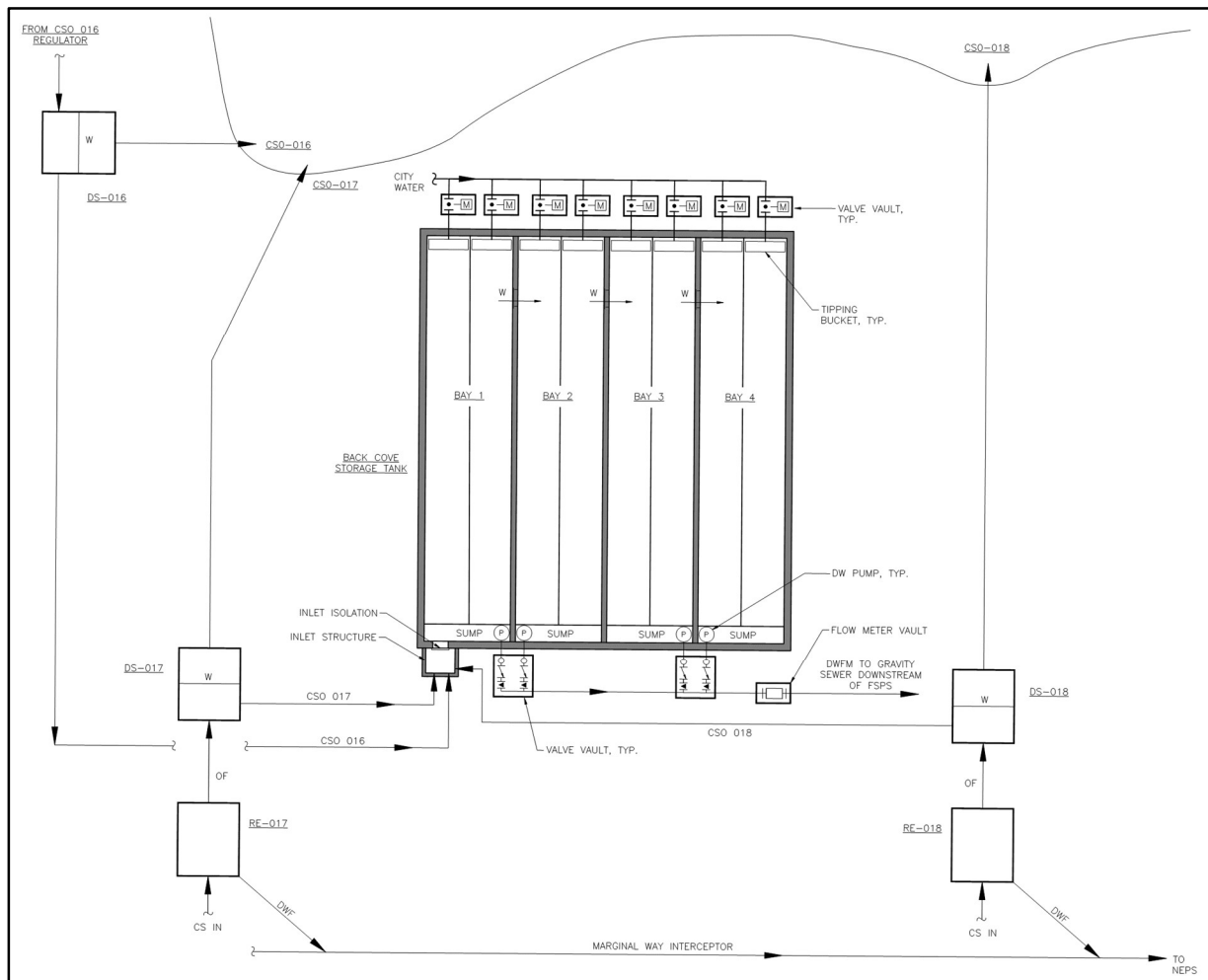
1.3 Project Overview

Volume 2 of the RFP detailed the required scope of the BCSSF project, which includes planning, engineering, design, permitting, construction, testing, start-up, and commissioning of off-line storage of 3.5 MG of CSO from CSOs 16, 17, and 18. Overflows from CSOs 16, 17, and 18 will be intercepted at new diversion structures, located downstream of the existing regulators and upstream of the discharge locations, and conveyed to the new off-line storage tank. Pumps in the storage tank and a forcemain will then convey the stored overflows to the existing gravity sewer system in Marginal Way. Per the RFP and as shown on Figure 1-1, the BCSSF must consist of the following major components:

- Diversions structures to intercept flow from CSOs 16, 17, and 18 and redirect it to the proposed CSO Storage Tank located beneath Back Cove Park;

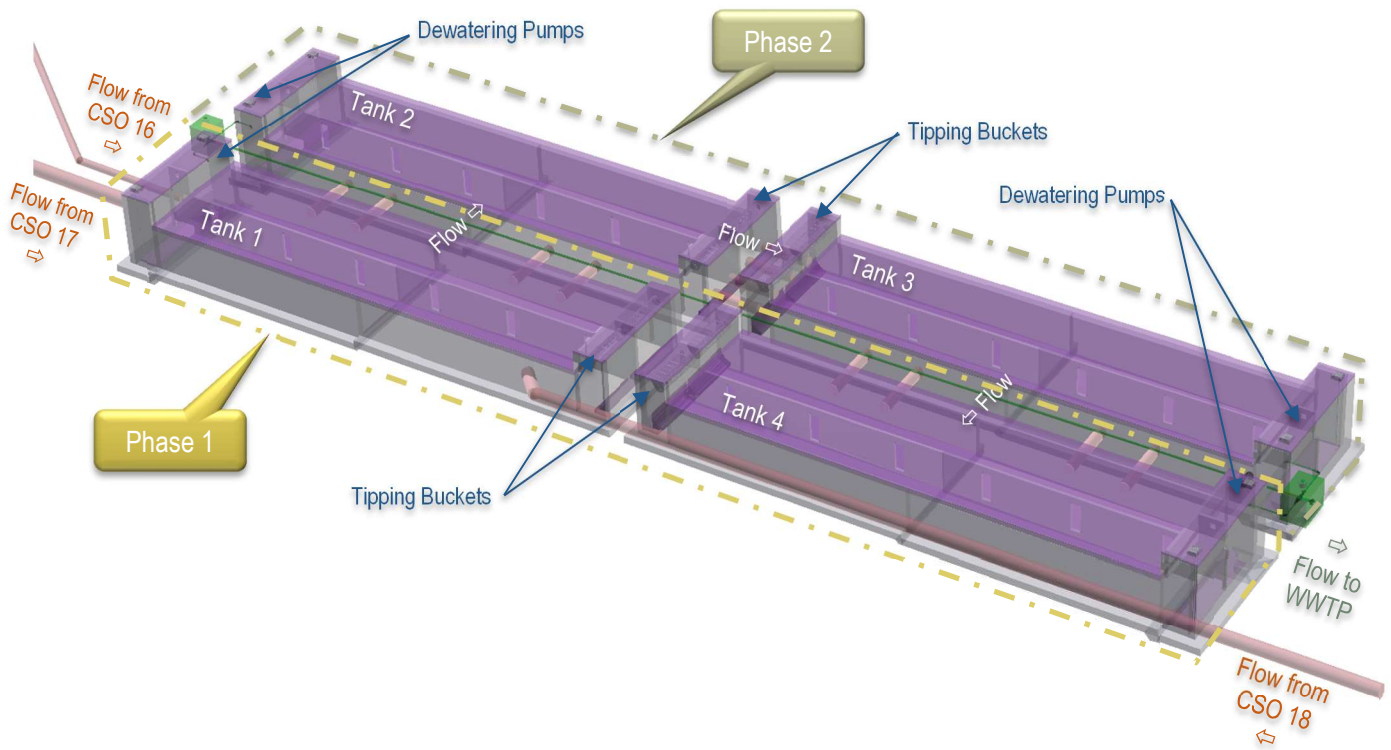
- Conveyance piping sized to convey the highest peak flows for the typical year for each CSO via gravity to the CSO Storage Tank;
- An inlet structure that combines flows from each CSO conveyance piping and directs flow into the CSO Storage Tank;
- A cast-in-place concrete CSO Storage Tank sized to hold 3.5 MG of overflow prior to activating a CSO;
- Submersible chopper pumps located within the tank sumps and a forcemain sized to dewater the tank within 24 hours after the completion of the storm event;
- An automated sediment flushing system for post-storm cleaning of the tank consisting of tipping bucket flushing mechanisms filled with potable water;
- A new Electrical Maintenance Building to house the CSO Storage Tank process equipment; and
- Restoration of Back Cove Park including replacing the existing multi-purpose natural grass field and raising surface grades to reduce flooding frequency of the field.

Figure 1-1: Back Cove South Storage RFP Indicative Plan (Source: RFP)



The Design-Build team proposes an alternate layout from the RFP. In lieu of a single, large cast-in-place concrete tank, the BCSSF will consist of four smaller, separate cast-in-place concrete storage tanks interconnected with piping sized to pass the design flows provided in Table 3-2 in Volume 2 of the RFP. Additionally, the proposed CSO conveyance piping will discharge directly into Tank 1 in lieu of a dedicated inlet structure, and methods of isolating flow from the CSO storage tanks during maintenance will be provided upstream at each diversion structure. The proposed layout of the CSO storage tanks is provided in Figure 1-2.

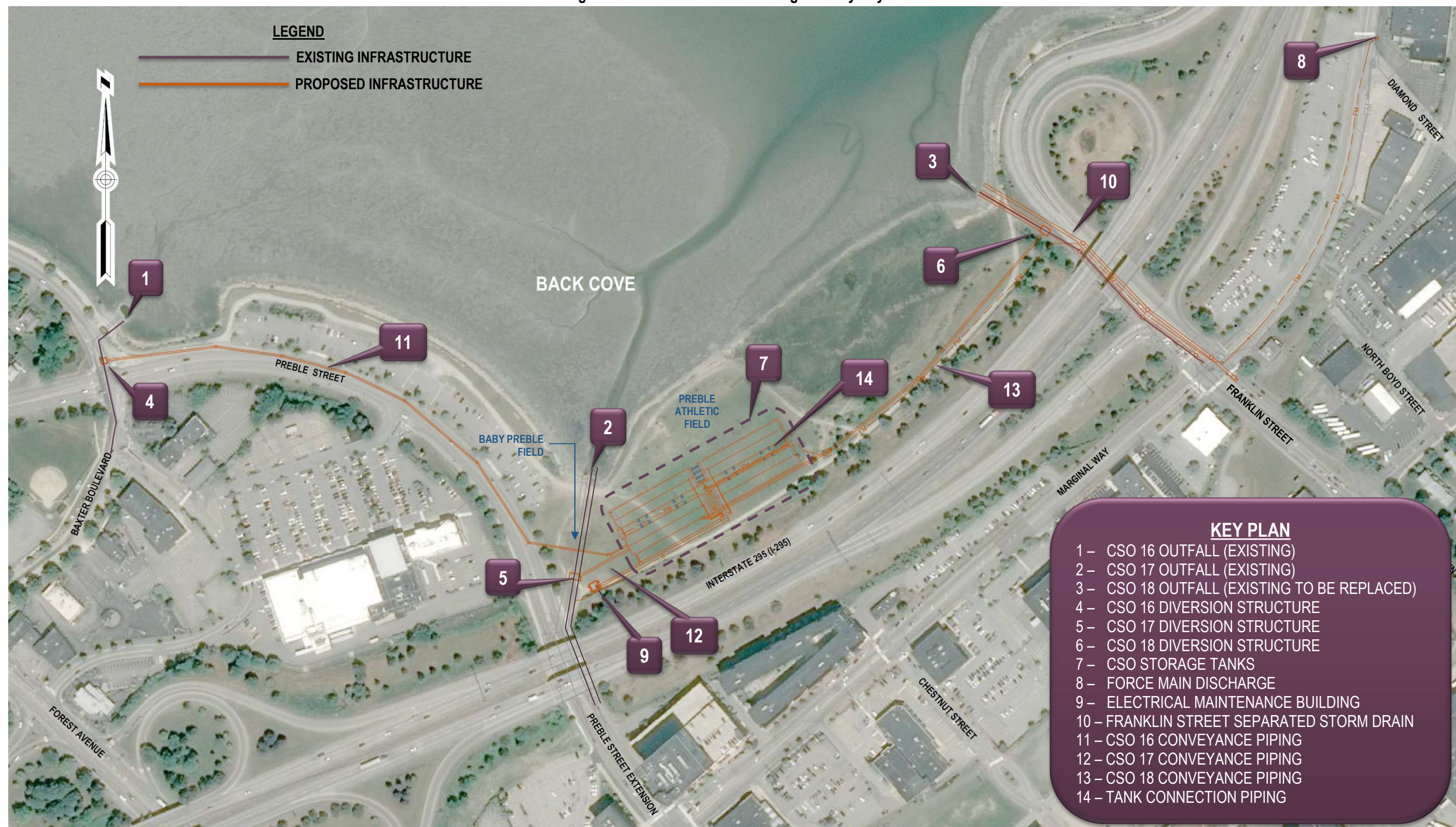
Figure 1-2: Proposed Back Cove South Storage Tanks Layout



The four storage tanks of the BCSSF will be rotated 90 degrees and elongated from those shown on the Indicative Plans. The tipping bucket end of each tank will be located in the center of the proposed layout, directly beneath the playing field. Maintenance access via removable precast concrete planks for the tipping buckets will be buried a minimum of 18-inches below grade. At-grade access hatches for the dewatering pumps in the tank sumps will be located at the opposite ends of the tanks from the tipping buckets and outside the limits of the playing field.

The location of the proposed storage tanks on the site has been shifted from the Indicative Plans closer to Interstate 295 (I-295). This revised location places more of the excavation in the upper sandy soils, which is a more favorable subsurface condition. The storage tanks will be constructed in two phases with the tanks located closest to I-295 (Tank 1 and Tank 4) constructed first, and the tanks located closest to Back Cove (Tank 2 and Tank 3) constructed second. Figure 1-3 provides an aerial overview of the entire proposed BCSSF site including diversion structures, storage tanks, conveyancing piping, forcemain and Electrical Maintenance Building.

Figure 1-3: Back Cove South Storage Facility Key Plan



1.4 Deviations from Request for Proposal

Table 1-1 identifies and provides explanation or clarification for proposed deviations from the BCSSF design described in the RFP.

Table 1-1: Deviations and Clarifications Relative to the RFP

Section of RFP 19039	RFP Requirement	Deviation/Clarification
RFP Volume 2 Table 2-3 Item 4	Table 2-3 Item 4 requires all concrete floors to be sloped to provide positive draining to an appropriate drain for liquids likely to be on the floor with no puddling allowed.	The building floor will not be sloped because drains are not required in the Electrical Maintenance Building
RFP Volume 2 Table 2-3 Item 5	Table 2-3 Item 5 requires that any floor surface used as walkways and subject to being wet from normal or abnormal operation are to be grooved or scarified to reduce risk of slipping on the floor.	No interior floors will be grooved or scarified. Exterior concrete pads will be broom finished.
RFP Volume 2 Table 2-3 Item 10	Table 2-3 Item 10 requires that walkways to protect the roof are to be provided between a roof access point and any equipment located on the roof.	No walkways will be provided on the roof as it is a sloped roof with architectural asphalt shingles without any mounted equipment.
RFP Volume 2 Table 2-3 Item 34 Indicative Plans	Table 2-3 Item 34 requires a bypass line for control valves or instruments.	Per previous discussions and in accordance with the indicative plans, a bypass line will not be provided for the tank dewatering forcemain flowmeter. Refer to RFI #05: Control Valve and Instrument Bypass.
RFP Volume 2 Section 2.7.3	Table 2-2 indicates a minimum service life for structures of 75 years.	The ACI 350 structural concrete standard specified by RFP Section 4.5.3.4 for design of the storage tanks and diversion structures indicates that design per that standard should provide adequate safety and serviceability for 50 to 60 years.
RFP Volume 2 Section 3.1.4	Section 3.1.4 states the water level in the storage tank may increase above the storage tank design water level as necessary to pass the flows set forth in Table 3-2 to the existing CSO outfalls. This higher water level in the storage tank shall be defined as the storage tank maximum water level. All project components (e.g., storage tank, conveyance piping, diversion structures, etc.) shall be designed for the storage tank maximum water level, and the 0.25 ft. freeboard requirement pertaining to CSO weirs shall be met when the storage tank maximum water level is experienced.	As confirmed during Owner's Progress Meeting #4, actuated valves are not required; therefore, the maximum water level in the tanks will be a function of the tide level in Back Cove and cannot be defined. The tanks and all other project components are designed for the water level to rise to the top of the chimneys. The 0.25 ft. freeboard requirement cannot be met during Table 3-2 flows; e.g., for CSO 018, the reported regulator weir elevation is -4.33, and Mean Lower Low Water (MLLW) is -4.51, meaning that in order to convey Table 3-2 flows from the regulator structure to Back Cove, even at low tide, the water surface elevation must be above the regulator structure weir.

Section of RFP 19039	RFP Requirement	Deviation/Clarification
RFP Volume 2 Section 3.1.6	Section 3.1.6 states the storage tank shall include an influent structure to receive flow from the conveyance piping from the CSO 016, 017, 018 Diversion Structures and shall admit flow to bay #1 of the storage tank. The inlet structure shall be capable of providing positive flow isolation between the conveyance piping from the diversion structures and the storage tank." Section 3.1.6 states fixed weirs shall be provided between storage bays. The maximum allowable head on the fixed weir shall be 1.0 foot when the influent rate is at maximum based on concurrent peak flows from three CSOs (refer to Table 3-2).	The response to RFI #1 on October 14 indicated that elimination of the inlet structure is acceptable, provided that positive isolation of the tank is included in the design. Stop logs in a seating head configuration are proposed in each CSO diversion structure. The proposed storage tank layout utilizes pipe connections between tanks. Tank connections are designed to pass concurrent peak flows from the three CSOs by gravity and to fill tanks sequentially during a storm event. The fixed weir head requirement is not applicable to the proposed configuration.
RFP Volume 2 Section 3.1.7	Section 3.1.7 requires grease points for tipping buckets fitted with stainless steel extension tubing brought to an elevation accessible from grade and located beneath hatch covers. These hatch covers shall be located outside the soccer field area of play to the extent feasible and when not shall be buried a minimum of 6 and a maximum of 12 inches below grade.	The tipping buckets do not require regular greasing, and remote grease points are not recommended per the approved equipment manufacturer, Grande. Refer to Section 7.6 Tipping Bucket Requirements and Appendix E – Vendor Equipment Drawings, which includes Grande's certification of the bearing performance.
RFP Volume 2 Section 4.3.4	Section 4.3.4 requires three spigots be provided at the garden area.	Per RFI #13, two spigots will be provided in the garden area.
RFP Volume 2 Section 4.4.2	Section 4.4.2 requires that the design criteria shall adhere to the American with Disabilities Act Accessibility Guidelines (ADAAG).	This standard is not applicable as per IBC 2015, Utility Group buildings are not required to comply with ICC A117.1 accessibility requirements.
RFP Volume 2 Section 4.4.3	Section 4.4.3 requires all final design submittals be stamped by a Professional Architect registered in the State of Maine.	Per RFI #3, an engineer's stamp is acceptable for the Electrical Maintenance Building.
RFP Volume 2 Section 4.4.3.1	Section 4.4.3.1 and the Indicative Drawings require portable toilet bays connected to the Electrical Maintenance Building.	The portable toilets bays have been removed from the project per Clients recommendations.
RFP Volume 2 Section 4.4.3.1	Section 4.4.3.1 requires PVC trim to be used	Painted Poly Ash Trim is proposed in lieu of PVC trim due to its durability, stability, and positive feedback from contractors on many similar projects regarding workability.

Section of RFP 19039	RFP Requirement	Deviation/Clarification
RFP Volume 2 Section 4.4.3.2	Section 4.4.3.2 specifies an anodized finish for aluminum items such as guard rails.	Mill aluminum is proposed as it will provide sufficient durability. Anodized rails will be provided where hand-contact is expected such as at ladder rails.
RFP Volume 2 Section 4.4.3.2	Section 4.4.3.2 requires a desk and chair to be provided in the electrical portion of the Electrical Maintenance Building.	Per RFI #2, no desk and chair will be provided.
RFP Volume 2 Section 4.5.3.1	Section 4.5.3.1 requires seismic loads due to lateral earth pressure shall be developed in accordance with the geotechnical report	ASCE 7-10 Section 11.8.3 states that dynamic lateral earth pressure is only required to be developed for Seismic Design Categories D – F. The Seismic Design Category for this project is C, therefore, dynamic lateral earth pressures will not be developed and applied to the buried concrete structures.
RFP Volume 2 Section 4.5.3.1	Section 4.5.3.1 gives a minimum uniform surcharge of 3 feet of soil to develop lateral pressures representing vehicular traffic “or as determined using accepted engineering practice”.	Lateral pressures due to vehicular loads on storage tank exterior walls below the flushway covers will be based on HL-93 vertical loads reduced due to the distributing effect of fill overlying the flushway covers in accordance with AASHTO Section 3.6.1.2.6. This will result in lower lateral pressures than the 3-foot soil surcharge below the flushway covers.
RFP Volume 2 Section 4.5.3.2	Section 4.5.3.2 indicates that mechanical equipment subject to vibration should be anchored with cast-in anchors.	Dynamic loads on the tipping bucket mounts are not considered to be subject to vibrations detrimental to the use of post-installed adhesive anchors. Therefore, the tipping buckets are proposed to be mounted using post-installed stainless-steel adhesive anchors.
RFP Volume 2 Section 4.6.2.4	Section 4.6.2.4 indicates that stainless steel is required for buried water piping less than 4” in diameter.	PVC is proposed for the small diameter buried water piping, as it is expected to have a superior service life in this application relative to stainless steel in a saltwater environment and conforms to the standards of Portland Water District.
RFP Volume 2 Section 4.7.13	Section 4.7.13 requires seismic restraints for mechanical equipment.	Per ASCE 7 Section 13.1.4, mechanical and electrical components in Seismic Design Categories A, B and C are exempt from the seismic restraint requirement provided the Component Importance Factor is 1.0. Per ASCE 7 Section 13.1.3, the Component Importance Factor is 1.0 for all mechanical and electrical equipment in this project. Therefore, seismic restraints are not required per Code and not proposed.

Section of RFP 19039	RFP Requirement	Deviation/Clarification
RFP Volume 2 Section 4.8.1	Section 4.8.1 requires above grade RIO panels be provide at diversion structures 16 and 18.	In lieu of above grade RIO control panels at diversion structures 16 and 18, 4-20mA loop powered devices hardwired directly to the Electrical Room via underground conduit and junction boxes as necessary is proposed. Given the proximity to general public and potential for flooding, the elimination of these RIO control panels provides a simpler operational approach and a more aesthetic final product.
RFP Volume 2 Section 4.10.16	Section 4.10.16 indicates that VFDs up to 30HP shall be provided with 5% impedance line reactors.	Based upon preliminary review of harmonics and coordination with the manufacturer, it is proposed the 3% line reactors be utilized in combination with an active harmonic filter.
RFP Volume 2 Section 4.10.18	Section 4.10.18 notes that rigid galvanized steel conduits shall be used for instrumentation, communication, I/O, and data highway cable circuits within a concrete encased ductbank system.	It is proposed that Schedule 40 PVC conduit be utilized for all power, communications, and controls raceways within concrete encasement. All power, controls, and communications cable will be separated by a minimum of 1'-0" within ductbanks. All underground analog communications wiring will be individually twisted and fully shielded.
RFP Volume 2 Section 4.10.18	Section 4.10.18 describes underground electrical and controls being concrete encased.	It is proposed that in certain locations out of roadways, within the field, that a 3" concrete cap above sand-encased Schedule 80 PVC be utilized in lieu of overall encasement. These locations will be identified on the electrical site plan drawings.
RFP Volume 2 Section 4.10.21	Section 4.10.21 describes the requirements for a stand-alone security system with UL Commercial Grade A Local Burglar, Grade B and Grade C Central Station Burglar Listing.	It is proposed that door switches and hatch intrusion switches being provided are tied into the SCADA system in lieu of a stand-alone security system. This approach is more consistent with other City of Portland Wastewater Facilities.
Appendix A Indicative Plans	The Indicative Drawings show a circular pipe penetrating through the roof of the Electrical Maintenance Building to act as a Vent Stack.	The above grade section of the Vent Stack is proposed to transition from pipe to clay brick to improve aesthetics and provide a means to seal the penetration with traditional construction methods.
Appendix F Reference Irrigation Specification Section	The Reference Irrigation Specification requires the irrigation system shall provide 150 gallons per minute and irrigation system heads shall have a minimum cover radius of 80'	To match existing irrigation systems at other City of Portland facilities and therefore standardize spare parts and maintenance, the proposed irrigation system will be designed for a capacity of 75 gallons per minute and a head minimum cover radius of 55' to 60'.

2. PROJECT DATA AND INFORMATION

This section summarizes the sources of the data and information utilized for the project design and the additional field investigations conducted by the Design-Build Team.

2.1 Source of Information

2.1.1 RFP

The design of this project is based on the requirements outlined in the Fixed-Price Design-Build Procurement Request for Proposals (RFP) for Back Cove South Storage Facility (RFP No. 19039), dated October 18, 2018, issued by the City of Portland in October 2018. The RFP was prepared by City's advisory team (Sebago Technics, Inc., AECOM, and S.W. Cole Engineering) and consisted of the following three volumes:

- RFP Volume 1 – Proposal Requirements and Evaluation
- RFP Volume 2 – Design and Construction Requirements
- RFP Volume 3 – Draft Contract

Volume 2 of the RFP outlines the design and construction requirements for the BCSSF project, including indicative design plans and documents provided in the following RFP attachments:

- RFP Appendix A - Indicative Drawings, prepared by Sebago Technics, Inc. and AECOM
- RFP Appendix B - Geotechnical Data Report, prepared
- RFP Appendix C - Phase I Environmental Site Assessment
- RFP Appendix D - Referenced Mechanical Specification Sections
- RFP Appendix E - Referenced Environmental Letters and Maine DOT Taming Memorandum Section
- RFP Appendix F - Referenced Irrigation Specification Section

In addition to the RFP, nine addenda were issued by the City. Proposed design deviations from the RFP have been previously identified in Table 1-4 and are explained throughout the subsequent sections of this report.

2.1.2 Record Drawings

Table 2-1 provides a list of the existing drawings provided by the City and utilized as existing conditions in the design for this project.

Table 2-1: Reference Drawings for the Back Cove South Storage Facility Project

Year	Drawing Title/Plan Set	Design Firm	Sheet Count
June 1963	Preble St. Overflow and Tidegate Structure Plans and Pile Layout	Metcalf and Eddy, Engineers	1 Sheet
March 1964	Franklin Street Interceptor and Tidegate Structure	Metcalf and Eddy, Engineers	1 Sheet

Year	Drawing Title/Plan Set	Design Firm	Sheet Count
August 1970	Maine Federal Aid Interstate Project No I-295-3(37)49 Plan	Maine State Highway Commission	36 Sheets
August 1973	Bank Road Connection and Diversion Structure	CDM, Inc.	1 Sheet
January 2012	S. Portland to Portland, Cumberland County Interstate 295 Northbound Bridge Rehabilitation Project	State of Maine Department of Transportation	6 Sheets
April 2017	State Street Infrastructure Improvements	Gorrill-Palmer	66 Sheets
February 2018	Bedford Street Sewer Separation Project & Portland Water District Main Replacement	Sebago Technics	46 Sheets
January 2019	Preble St/Kennebec St/Somerset St Sewer Separation	Gorrill-Palmer	47 Sheets

2.1.3 Existing Conditions Survey

In 2014, the City of Portland performed a field survey along approximately 6,200 linear feet of Marginal Way, from Forest Avenue to Sewage Plant Road. In June 2018, Sebago Technics, Inc. performed a field survey of the BCSSF area including Preble Street, Back Cove Park, and Franklin Street. Both surveys were conducted utilizing the State Plane Coordinate System NAD83 (Horizontal Datum) and Portland City Datum (National Geodetic Vertical Datum of 1929 + 0.02 feet) and identified topography information, surface features and utilities. The 2018 survey also included wetland delineation performed by a Sebago Technics, Inc. Certified Soil Scientist in May 2018. Copies of the 2014 and 2018 surveys were provided by the City of Portland to the Design-Build team in AutoCAD format. The information from these surveys has informed design thus far and will continue to be incorporated into the construction drawings as detailed design continues. All elevations referenced throughout this report are in City Datum.

2.2 Field Evaluations

2.2.1 Additional Field Survey

From October 7 to October 25, 2019, Sargent collected additional survey data in the project area in support of the design development. Elevation and pipe size data was collected for CSO 16, 17, and 18, including confirmation of the elevation of CSO regulator structure weirs and CSO outfall pipes.

Additional field survey was conducted to confirm existing conditions, primarily to verify the existing conditions hydraulic model and establish that the proposed design will capture 3.5 MG of CSO volume prior to initiation of an overflow event while not adversely impacting the hydraulic grade line of each CSO upstream of the respective regulator structures during design flows. Additional data was also collected along Preble Street to identify utility crossing locations related to the proposed CSO 16 conveyance piping. Drainage structures within Preble Park were surveyed to confirm options for future field and underdrain tie-ins. Additional survey will be collected in Preble Park and Franklin Street during subsequent phases of work as needed.

The outfall elevations recorded by Sargent during the additional field survey were generally consistent with the indicative plan existing condition survey. Where deviations occur between the RFP and the field data, the most recent

data collected by Sargent during the field survey will be utilized during design. A summary of key elevational data collected is included in Tables 2-2 and 2-3.

Table 2-2: CSO Regulator Weir and Outfall Elevation Data

CSO	RFP Addendum #8 Regulator Weir Elevation	2019 Field Survey Regulator Weir Elevation	Indicative Plans Outfall Elevation	2019 Field Survey Outfall Elevation
16	16A (Forest Ave & Bedford St): 11.28 16B (Bank Street): 6.24	11.18 8.02	Not provided	-1.78
17	-2.53	-2.05	-4.21 (west) -3.99 (east)	-4.41 -4.64
18	-4.33	-3.17	-5.37	-5.21

2.2.1.1 CSO 16 Regulator Structure

The CSO 16B regulator structure appears to have been modified, accounting for the 1.78-foot difference between the information in Addendum #8 and the field survey. The photo in Figure 2-1 below depicts assumed modifications to the weir based on the observation of newer concrete masonry units over the original clay brick masonry.

Figure 2-1: CSO 16B Regulator Structure Weir



2.2.1.2 CSO 17 Regulator Structure

Upon inspection, the CSO 17 regulator structure was laid out as depicted by the record drawings; however, the structure did not contain a traditional weir, but instead a CSO is tripped when the water level exceeds a generally flat concrete shelf and then exits the regulator structure through a 7-foot high by 8-foot wide tide gate opening. Figure 2-2 below depicts the flow through the structure; in this case seawater is entering into the CSO regulator structure.

Figure 2-2: CSO 17 Regulator Structure Weir



The tide gate (which was observed to be leaking) is shown on the left side of the photo, and the primary structure outlet (just visible) is on the right. The survey data collected indicated that the relatively flat shelf, on which the inspector is standing is at elevation -2.05. The photo in Figure 2-2 was captured at approximately 06:30 on October 9, 2019. The tide elevation at NOAA Station 8418150 on the Maine State Pier at this time was approximately 1.54 feet, or 3.6 feet above the bottom of the tide gate; therefore, the gate is in the closed position with 3.6 feet of head acting on the downstream side. Deteriorated or malfunctioning seals are allowing water from Back Cove to enter the CSO regulator structure, flowing in from the left and out through the orifice at the upper right of the photo.

2.2.1.3 CSO 18 Regulator Structure

The CSO 18 regulator structure was also laid out as indicated on the record drawings provided by the City; however, the weir elevation measured during additional field survey was approximately 1.16 feet higher than the elevation provided in Addendum #8. Figure 2-3 shows the weir in the CSO 18 regulator structure.

Figure 2-3: CSO 18 Regulator Structure Weir



The top of the clay brick masonry weir pictured above was measured to be approximately 18 inches above the generally flat surface in the foreground on which the photographer is standing. The elevation observed during additional field survey corresponds approximately to the weir elevation of -3.32 indicated in the As-Built Plan dated March 1964 provided to the design team by the City of Portland on October 10, 2019 in response to RFI #1.

Record drawings dated August 1970 for the Maine Federal Aid Interstate Project No I-295-3(37)49 indicated that the CSO 18 pipe consists of a 78-inch plate (corrugated metal) pipe with an adverse slope for a portion of the pipe. Table 2-3 below indicates elevations along CSO 18 piping from the regulator structure, moving downstream.

Table 2-3: CSO 18 Pipe Elevations

Structure	Indicative Plans Invert Elevation	Sargent Field Survey Invert Elevation
SMH 1046 (downstream of CSO 18 Regulator)	Not provided	-4.69
DMH 2079 (downstream of CSO 18 Regulator)	Not provided	-3.91
CSO 18 Outfall Location	-5.37	-5.21

Based on review of the August 1970 record drawings, the high point of the 78-inch CMP is approximately +0.31 feet in elevation located approximately where the CMP crosses below the Back Cove Trail.

2.2.2 Geotechnical Investigations

Between September 9 and 13, 2019, Terracon conducted a boring exploration program in Back Cove Park consisting of five deep borings (approximately 103 to 133 feet in depth) at the location of the proposed CSO Storage Tanks and one shallow boring (37 feet in depth) at the location of the proposed Electrical Maintenance Building. The goal of the geotechnical investigation was to determine design parameters based on soil conditions and establish any special excavation and dewatering criteria associated with the BCSSF. On November 21, 2019, Terracon conducted additional soil investigation testing, including seismic and electric resistivity testing, to supplement the initial exploration results. A copy of the Geotechnical Engineering Report, dated February 7, 2020, prepared by Terracon is enclosed as Appendix A.

2.2.3 Environmental Sampling

From November 19 through 22, 2019, Woodard & Curran's Environmental Team completed an environmental investigation at Back Cove Park. The investigation was designed to:

- Evaluate soil and groundwater that may be encountered during construction to assess potential risk to site workers; and
- Evaluate deeper native materials that may contain lower concentrations of oil and/or hazardous materials to determine potential reuse options for this material.

The investigation approach was discussed with Maine DEP on November 13, 2019. A copy of the Limited Subsurface Investigation Report, dated February 7, 2020, prepared by Woodard & Curran is enclosed as Appendix B.

2.2.4 Structural Evaluation of Regulator Structures

In October 2019, Woodard & Curran and Sargent performed visual inspections of the following existing CSO Regulator Structures:

- CSO 16 Regulator Structure at the intersection of Forest Avenue and Bedford Street on October 18, 2019;
- CSO 16 Regulator Structure located in Preble Street at the former intersection with Bank Road on October 18, 2019;
- CSO 17 Regulator Structure at the intersection of Marginal Way and Preble Street on October 9, 2019; and
- CSO 18 Regulator Structure at the intersection of Marginal Way and Franklin Arterial on October 9, 2019.

Woodard & Curran's Senior Structural Engineer conducted confined space entries into each of the structures to perform visual inspections of the structures' interior and verify existing measurements. A copy of the CSO Regulator Structural Assessment Memorandum is enclosed as Appendix C.

3. HYDRAULIC ANALYSIS

This section summarizes the existing conditions of CSOs 16, 17, and 18, the hydraulic conditions presented in the RFP, and the proposed conditions upon which the BCSSF design is based.

3.1 Hydraulic Analysis Approach

The hydraulics of existing CSOs 16, 17, and 18 and the proposed storage tanks and conveyance piping were simulated using the Environmental Protection Agency (EPA) Storm Water Management Model (SWMM) version 5.1.013 within the PCSWMM software package. Design flowrates utilized in the model are from the RFP and are summarized in Tables 3-1 and 3-2. Greater detail regarding modeling approach is included in the Back Cove South Storage Facility Hydraulic Analysis Technical Memorandum, dated February 7, 2020, enclosed as Appendix D.

Table 3-1: Highest Peak Flow in Typical Year by CSO Outfall (Source: RFP, Table 3-1)

CSO Outfall	Highest Peak Flow in Typical Year (MGD)	Highest Peak Flow in Typical Year (cfs)
16	18	27.9
17	113	174.8
18	25	38.7
Total	156	241.4

Table 3-2: Maximum Peak Flows by CSO Outfall (Source: RFP, Table 3-2)

CSO Outfall	Peak Flow (MGD)	Peak Flow (cfs)
16	52	80.5
17	270	417.75
18	134	207.3
Total	456	705.55

3.2 Existing Combined Sewer Overflow System

The existing CSOs were simulated based on field survey data collected by Sargent in October of 2019 and data from existing drawings provided by the City of Portland as listed in Table 2-1. Existing CSO outfall pipe elevations and sizes were confirmed and compared to existing condition survey from recent projects in the area, including the Bedford Street Sewer Separation Project, the State Street Infrastructure Improvements Project, and the Preble Street/Kennebec Street/Somerset Street Sewer Separation Project. Where elevation or dimensional data differed, the recently collected field data was used. Table 3-3 summarizes the existing CSO sizes, material, and invert elevations.

Table 3-3: Existing CSO Data Summary

CSO	Regulator Structure Weir Elevation	Regulator Structure Outlet (to Overflow Outfall)		CSO Outfall		
		Size (in)	Material	Size (in)	Material	Invert Elevation
16A	11.18	30	RCP	36	RCP	-1.78
16B	8.02	24	RCP			
17	-2.05	108 x 90 (9' x 7.5')	RC	Dual 60	HDPE (slip-lined within RCP)	-4.41 -4.64
18	-3.17	72	RCP	78	CMP	-5.21

3.3 Diversion Structures

The diversion structures will be designed to divert flows up to those shown in Table 3-1 to the CSO tank conveyance piping. Each diversion structure will be designed to include a weir upstream of the outlet to the respective Back Cove outfalls that does not overtop at flows up to those in Table 3-1. The weir also provides a location for flow measurement of discharges to Back Cove. Diversion structure weir and outlet elevations are summarized in Table 3-4.

Table 3-4: Proposed Diversion Structure Information

CSO	Regulator Structure Weir Elevation	Proposed Diversion Structure Material	Proposed Diversion Structure Weir/Outlet Invert Elevation	Elevation Difference between Regulator Weir and Diversion Weir	Water Surface Elevation in Diversion Structure at 3.5 MG storage ¹
16A	11.18	Precast Concrete	-0.83	8.85	-1.7
16B	8.02				
17	-2.05	CIP Concrete	-2.82	0.29	-3.9
18	-3.17	CIP Concrete	-5.06	1.89	-5.7

Note 1: Calculated at Table 3-1 design flow rates

The proposed weir elevations provide greater than 0.25 feet of freeboard on the downstream side of each respective CSO regulator structure weir, with “freeboard” defined as the difference in elevation between the CSO regulator structure weir and respective CSO diversion structure weir.

3.4 CSO Conveyance Piping

Conveyance piping has been designed to convey design flows from Table 3-1 via gravity. The conveyance pipes are designed to surcharge as the Design Water Elevation is approached, while maintaining capacity to divert 3.5 MG to the new CSO storage tanks prior to CSO discharge to Back Cove. In addition, pipes connecting the storage tanks have been designed to convey flows specified in Table 3-2 by gravity to ensure tank connections do not limit the performance of the overall system. Conveyance piping and tank connection piping is summarized in Table 3-5 below.

Table 3-5: Proposed Conveyance & Tank Connection Piping Information

Piping Location	Pipe Diameter (in)	Pipe Material	Nominal Slope (ft/ft)	Normal Gravity Flow Capacity (cfs (MGD))	Approximate Length (ft)
CSO 16 Conveyance Piping	36	HDPE	0.0025	35.7 (23)	1,560
CSO 17 Conveyance Piping	60	HDPE	0.015	341.7 (220)	154
CSO 18 Conveyance Piping	60	HDPE	0.0015	108.1 (69.8)	1,165
Tank Connection Piping (Typical)	4 x 48	DI	0.015	754 (487.2)	21

Construction of the BCSSF will connect CSOs 16, 17, and 18 hydraulically, resulting in a different flow balance during CSO events after 3.5 MG of storage is reached. Both the higher elevation of CSO 16 and the high flowrate of CSO 17 relative to the low elevation and large pipe diameter of the CSO 18 outfall contribute to increased flow being pushed to the CSO 18 outfall and proportionally lower flows discharging from CSOs 16 and 17. The piping downstream of the CSO 18 diversion structure will consist of two 60-inch diameter pipes to accommodate this increase in flow without negatively impacting the hydraulic grade line upstream of the CSO 18 regulator structure. Proposed modifications to existing CSOs between the respective regulator structures and each outfall are summarized in Table 3-6 below.

Table 3-6: Comparison of CSO Outfall Capacity: Existing vs Proposed

CSO	Flow at Regulator Structure (cfs (MGD); Table 3-2)	Existing CSO Outfall			Proposed CSO Outfall		
		Size (in)	Material	Peak Flow (cfs (MGD); Calculated)	Size (in)	Material	Peak Flow (cfs (MGD); Calculated)
16	80.5 (52)	36	RCP	72.7 (46.9)	Same as Existing	Same as Existing	61.1 (39.5)
17	417.75 (270)	Dual 60	HDPE (slip-lined in RCP)	358.75 (231.9)	Same as Existing	Same as Existing	350.4 (226.5)
18	207.3 (134)	78	CMP	207.3 (134)	Dual 60	HDPE	255.75 (165.3)
Total Flow	705.55 (456)	Total Peak Flow		638.75 (412.8)	Total Peak Flow		667.25 (431.25)

The calculated flows for the Existing CSO Outfalls are based on the PCSWMM simulation results with normal flow outfalls. There is flooding at existing structures upstream of the proposed diversion structure locations in both existing and proposed scenarios at Table 3-2 flow rates and MHHW tailwater.

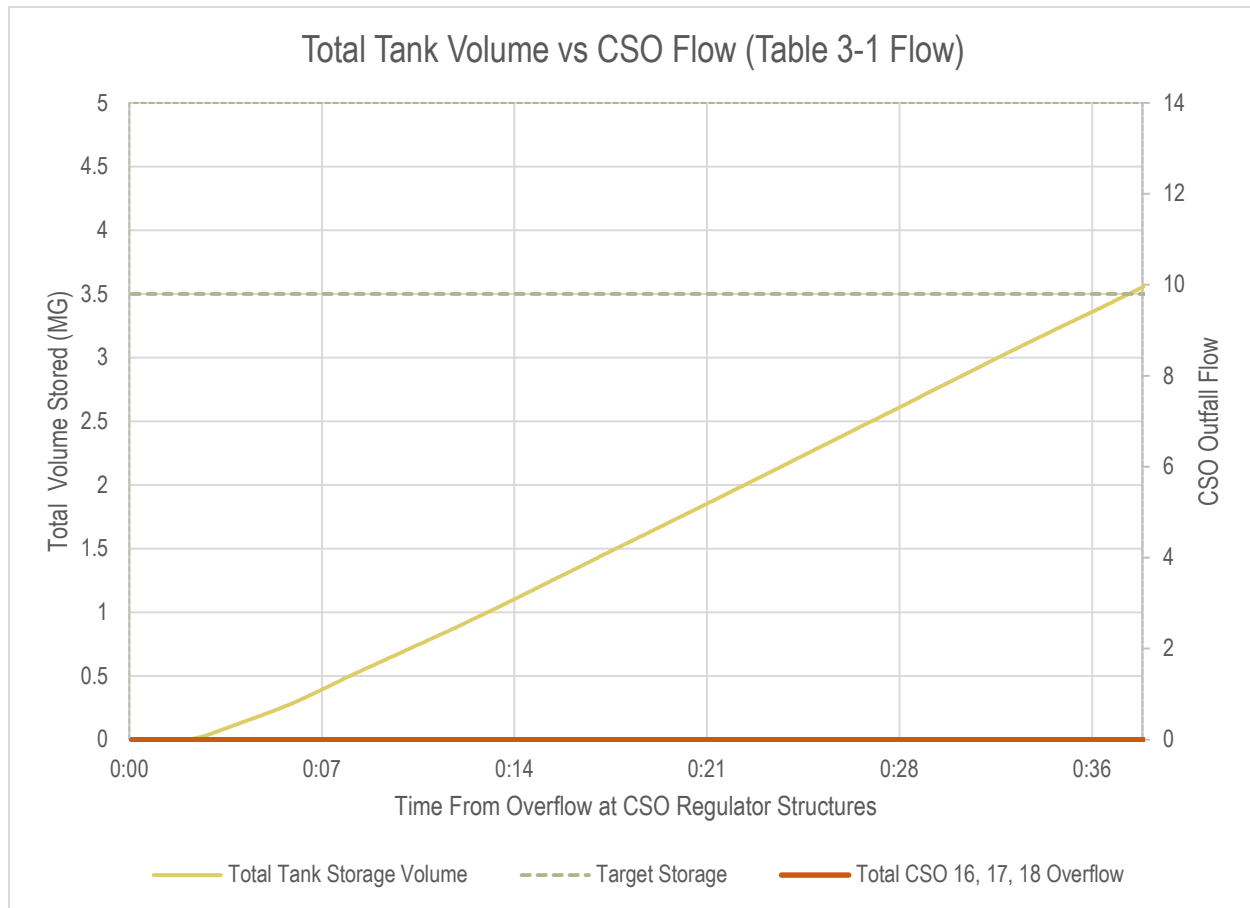
3.5 Storage Tank Design and Maximum Water Level

The storage tanks have been designed to store 3.5 MG prior to initiation of CSO discharge to Back Cove at CSOs 16, 17, or 18 under flow conditions specified in Table 3-1 with a design water surface elevation (WSE) of -6.50 feet. Due to the lag time between when the design water surface elevation is reached in Tank 1 versus subsequent tanks, the design WSE is noted as the highest water elevation in Tank 1 when 3.5 MG of storage is achieved.

The design WSE was determined based on PCSWMM simulation results to account for the dynamic relationship between water level within tanks, flow through conveyance piping and water levels in the diversion structures. Hand hydraulic calculations were used to check the hydraulic grade line produced by the computer model.

Figure 3-1 below illustrates the total volume stored in the storage tanks versus time at flows specified in Table 3-1 and CSO overflows to Back Cove, demonstrating that 3.5 MG of CSO volume is captured prior to initiation of CSO discharge from the outfalls.

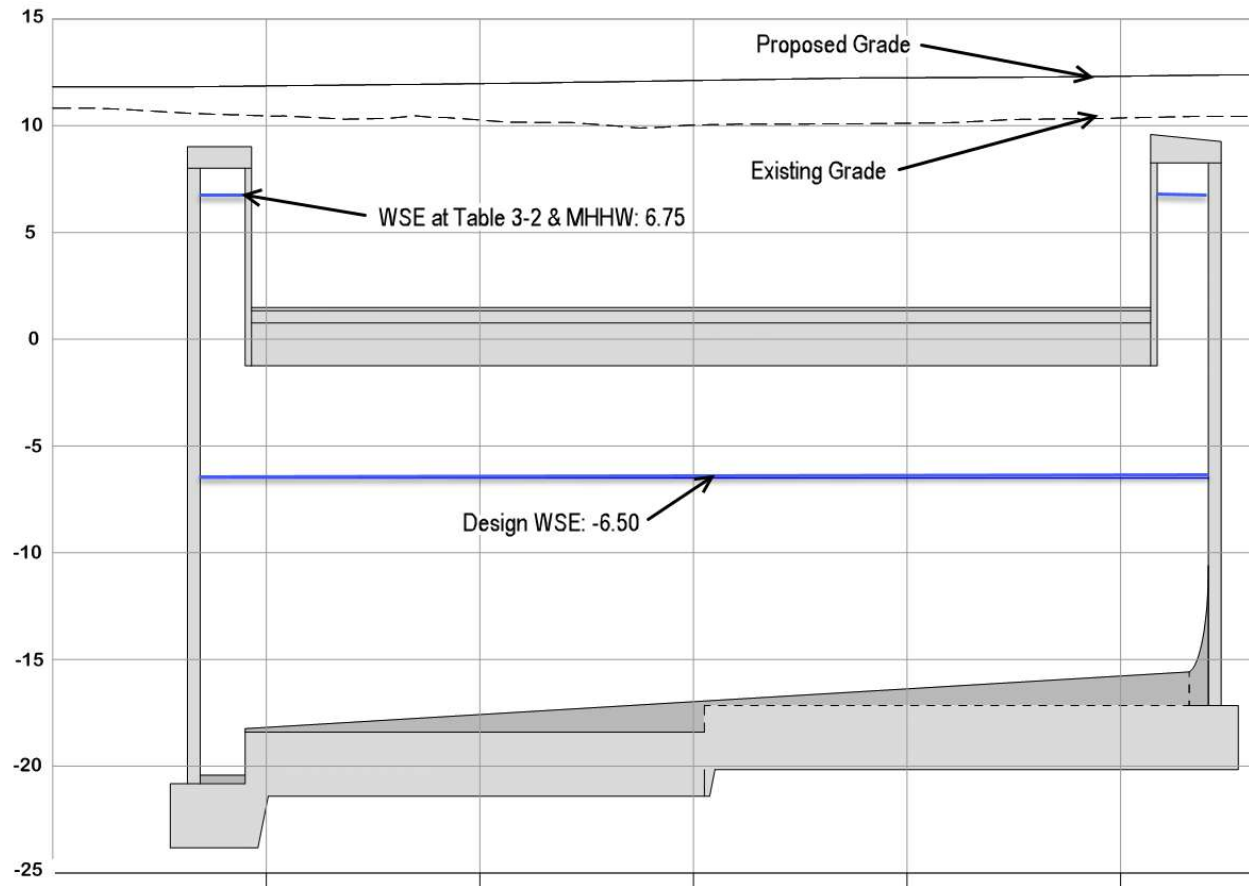
Figure 3-1: Tank Storage vs. CSO Flow at Highest Peak Flow in Typical Year by CSO Outfall (RFP Table 3-1)



Assuming instantaneous steady-state flows provided in Table 3-1, 3.5 MG of storage is achieved at the design WSE after approximately 37 minutes and 30 seconds of tank-filling. Overflow of the CSO 18 diversion structure into Back Cove occurs at approximately 40 minutes and 30 seconds of tank-filling.

A “Maximum Water Surface Elevation” is not defined in this design. The BCSSF will include tank isolation measures as required in order to facilitate safe maintenance of the tanks. The maximum water surface in the tanks cannot be controlled and will be a function of the inflow and water elevation in Back Cove during each CSO event. The storage tanks will be designed to withstand a design flood elevation of 13 feet (Base Flood Elevation of 10 plus three feet) as required by the RFP and pressurizing of the underside of the cover slabs. Our analysis indicates that during Table 3-2 flows with a tailwater of MHHW, the storage tanks will reach equilibrium with a water surface elevation of approximately 6.75 feet. Figure 3-2 shows a typical tank section with design WSE and WSE at Table 3-2 flows and MHHW.

Figure 3-2: Typical Tank & Water Level Schematic (RFP Table 3-2 at MHHW)



4. SITE CIVIL

This section describes the basis of the site civil design for the proposed CSO storage facility project.

4.1 Design Overview

The intent of the site civil design is to modify the Back Cove Park surface grading to reduce flooding inundation and restore and enhance publicly accessible amenities, including restoration of athletic and auxiliary fields, walking paths, irrigation and drinking fountains. The BCSSF site civil scope generally consists of the following:

- Erosion & Sedimentation Controls;
- Utilities;
- Yard Piping;
- Site Grading and Surface Finishes;
- Roadways;
- Walking Trails;
- Athletic Field Underdrain System; and
- Landscaping.

4.2 Design Standards, Codes and References

The site civil design for the BCSSF project will comply with all applicable design standards and reference documents including those referenced in Table 4-1 below.

Table 4-1: Civil Site Design Standards and References

Version	Standard or Reference
Latest Edition	City of Portland Technical Manual
November 2014	Maine Department of Transportation Standard Specifications
November 2014	Maine Department of Transportation Standard Details
May 2016	Maine Stormwater Management Design Manual, Technical Design Manual Volume III
October 2016	Maine Erosion and Sediment Control Best Management Practices (BMPs), Manual for Designers and Engineers
Latest Edition	Federal Emergency Management Agency (FEMA), National Flood Insurance Program, Floodplain Maps

Per the FEMA floodplain maps prepared for the National Flood Insurance Program, Back Cove Park is located within the 100-year flood plain (AE zone designation) with a base flood elevation of 10.0.

4.3 Erosion and Sedimentation Controls

Erosion and sedimentation control during construction, including management of dewatering discharges, will be performed in compliance with the Maine Construction General Permit, Erosion and Sedimentation Control Best Management Practices, and a Materials Management Plan to be developed for this project.

4.4 Utilities

Table 4-2 summarizes the existing site utilities and the utilities proposed as part of the BCSSF project.

Table 4-2: Existing and Proposed Back Cove Park Utilities

Utility	Existing	Proposed
Electrical	Power for site lighting	New three-phase medium-voltage service (Refer to Section 10 – Electrical for more information)
Water	2" services for irrigation and drinking fountain	New service for tank flushing, field irrigation and drinking fountains; size to be coordinated with Portland Water District (PWD) (Refer to Section 9 – Plumbing for more information)
Sewer (Domestic)	None	None
Telecommunications	None	None
Natural Gas	None	None

4.5 Yard Piping

Table 4-3 summarizes the materials for the yard piping proposed as part of the BCSSF project.

Table 4-3: Yard Piping Materials

Pipe	Material	Minimum Pipe Cover ¹
Storm Drains	≤60" Diameter – ADS SaniTite HP >60" Diameter – Reinforced Concrete	3 feet
CSO Conveyance	≤60" Diameter – ADS SaniTite HP >60" Diameter – Reinforced Concrete Pipe (RCP)	5 feet
CSO Forcemain	High Density Polyethylene (HDPE)	5 feet
Potable Water	Polyvinyl Chloride (PVC)	5 feet
Tank Ventilation	ADS SaniTite HP	2 feet

Notes: 1. Where minimum pipe cover is not achievable for non-drain pipes, 2" of rigid insulation will be provided.

4.5.1 Backflow Prevention Devices

Per the RFP, new backflow prevention devices will be provided as outlined in Table 4-4.

Table 4-4: Backflow Prevention Device Schedule

Location	Quantity and Size
Existing CSO 16 Outfall	(1) - 36" Diameter
Existing CSO 17 Outfall	(2) - 60" Diameter
New CSO 18 Outfall	(2) - 60" Diameter
New Franklin Street Storm Drain	(1) - 72" Diameter

All the backflow prevention devices will be Checkmate Inline Check valves manufactured by Tideflex Technologies. Once the new backflow prevention devices are installed, the tidegates within the existing CSO Regulator Structures will be removed. Checkmate valves were selected for their reliability and aesthetic benefit because they are an in-pipe solution and not outwardly visible.

4.6 Project Area Restoration

As construction of the BCSSF elements are completed, impacted features will be restored to their existing use, including walking paths, athletic field, smaller auxiliary field, exercise equipment and landscaped areas. The location of the playing fields and the walking trails will be altered slightly to accommodate the new components of the BCSSF.

4.6.1 Site Grading and Surface Finishes

The finish surface grades within the Back Cove Park area, between Preble Street and Franklin Street, will be raised approximately two to three feet, to meet or exceed the base flood elevation of 10.0, to reduce the impacts of inundation from storm surge, high tides, and waves. Elevation 13.0 will be maintained at the base of the I-295 embankment and the site will be graded with a gradual (~1%) slope towards Back Cove. The maximum design slope will not exceed 3' (H) to 1' (V), and regraded areas will be stabilized as outlined in Table 4-5.

Table 4-5: Back Cove Park Surface Restoration Schedule

Restoration Area	Surface Finish Material	Design Considerations
Preble Athletic Field Baby Preble Field	Sod	Automated Irrigation System (refer to Section 9 - Plumbing for more information)
Pervious Areas (outside playing fields)	Loam and Seed	6-inch layer
Back Cove Fill Slope	Riprap	D ₅₀ = 12" or as required for slope stability
Walking Trails	Stone Dust	2-inch layer

4.6.2 Roadways

All public roadways and sidewalks disturbed during construction will be repaired in accordance with the paving schedule outlined in the RFP, and as outlined in Table 4-6.

Table 4-6: Roadway Pavement Restoration Schedule

Roadway	Street Classification	Bituminous Surface Courses
Roadway Repaired with Permanent Trench Paving		
Preble Street	Minor Arterial	Surface Course = 2" of 12.5mm HMA Base Course = 3" of 19.0 mm HMA
Franklin Street	Principal Arterial	Surface Course = 2" of 12.5mm HMA Base Course = 3" of 19.0 mm HMA
Marginal Way	Local	Surface Course = 1-1/2" of 12.5mm HMA Base Course = 2" of 19.0 mm HMA
Roadway Repaired with Permanent Full-Width Paving		
MaineDOT On/Off Ramps	Principal Arterial/Interstate	Surface Course = 2" of 12.5mm HMA Base Course = 3" of 19.0 mm HMA

All sidewalks disturbed by construction will be reconstructed with a 2" thick surface course of 9.5 mm HMA. All bituminous materials will comply with MaineDOT and City of Portland technical design standards.

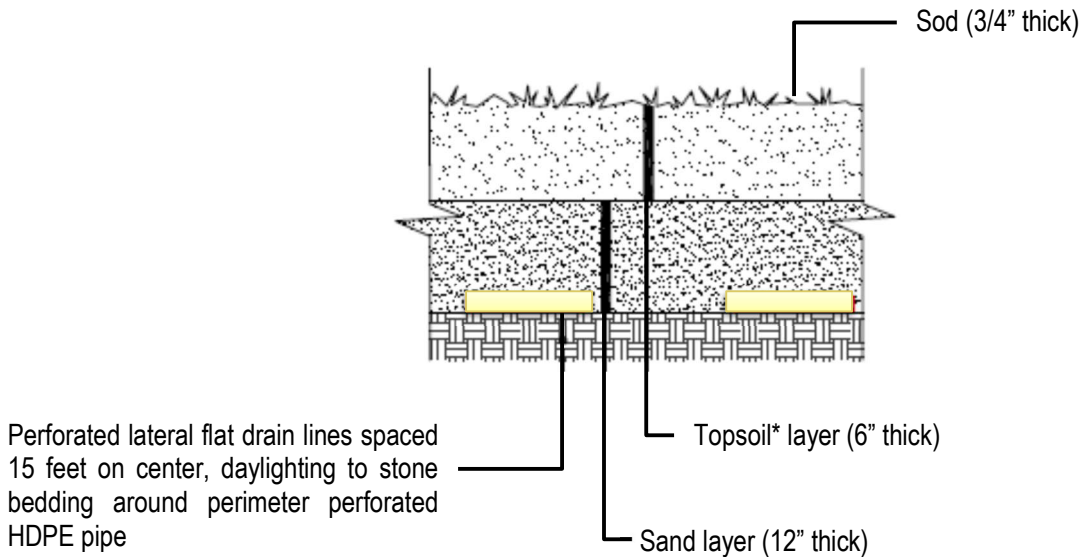
4.6.3 Back Cove Trail

Sections of the existing stone dust walking trails disturbed by construction will be reconstructed to closely match existing alignments, with adjustments made to align the trails near the proposed at-grade access hatches of the BCSSF to simplify vehicle access during future maintenance. The final design of the Back Cove trail restoration layout will be coordinated with the City's Parks and Recreation Department.

4.6.4 Athletic Field Underdrain

The existing athletic field is approximately 330 feet by 195 feet and is used for soccer, lacrosse, field hockey, and other activities. The field layout will be relocated such that the at-grade access hatches to the tank sumps and dewatering valve vaults are located outside the limits of the field of play. The field will continue to slope generally from southeast to northwest, toward Back Cove. An underdrain system will be installed under the field, collecting drainage and conveying it to an existing structure, DMH-2020, for discharge into Back Cove. The underdrain system will extend 20 feet beyond the limits of the field of play on all sides and will be constructed as shown in Figure 4-1.

Figure 4-1: Proposed Athletic Field Underdrain System



*Topsoil layer created from existing topsoil stripped and stockpiled during construction

To minimize disturbance to the underdrain system during future maintenance of the tipping buckets, the perforated lateral flat drains will be aligned so as not to have any drains crossing over the top of the tipping bucket access hatches or precast concrete tank covers.

4.6.5 Finish Surface and Landscaping

Existing landscaping at the Site will be protected by removal, transplanting, and storing throughout the duration of construction where practical. Restoration of the community garden planting area located to the southeast of the CSO storage tanks will be consistent with existing plantings, with plantings relocated where necessary due to hatches or structures associated with the BCSSF. Utilizing a total landscaping budget of \$25,000, final landscaping plans incorporating relocation of existing trees and new planting selections will be coordinated with the City Arborist.

5. ARCHITECTURAL

This section describes the basis of the architectural design for the proposed CSO storage facility project.

5.1 Design Overview

The project includes one new building to house mechanical and electrical equipment associated with the BCSSF. The Electrical Maintenance Building will be located in the southwest corner of Back Cove Park, adjacent to Preble Street and at the base of the I-295 embankment. This location was selected during meetings with the City with the goal of siting the building away from public areas to the greatest extent practicable. The building will not be staffed full-time and will only be occupied for routine maintenance activities.

The Electrical Maintenance Building will be a single-story building with gabled roof. The footprint will be approximately 22'-8" by 23'-4" and will contain four rooms: Electrical Room, Meter Room, Parks & Recreation Room and Vent Stack Room. Each room will have identification signage, including interior room signs, exit signs, and directional signs. The meter room will contain water meters for both the park and BCSSF water utilities. The vent stack discharge will be strategically located to minimize both visual impacts and potential vandalism. This vent will transition from HDPE pipe to a brick chimney providing improved aesthetics and a means to seal the roof deck with standard construction practices.

The proposed location and dimensions of the Electrical Maintenance Building have been modified from the RFP based on coordination with the City and will require a modification to the current contract prior to advancing design.

5.2 Design Standards, Codes and References

The Electrical Maintenance Building will be designed in accordance with the Maine Uniform Building and Energy Code (MUBEC) and other pertinent regulations by a Professional Engineer registered in the State of Maine. Table 5-1 lists the building codes and standards enforced under the MUBEC, currently adopted as of January 23, 2018. See Section 6 for additional building code requirements related to the structural design elements in the project.

Table 5-1: Architectural Building Codes and Design Standards

Version	Code	Use
2015	<i>International Building Code (IBC)</i>	Base Code
2009	<i>International Energy Conservation Code (IECC)</i>	Insulation Requirements for Buildings
2013	American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) 90.1 <i>Energy Standards for Buildings Except Low-Rise Residential Buildings</i>	Insulation Requirements for Buildings
2016	National Fire Protection Association (NFPA) 820 <i>Standard for Fire Protection in Wastewater Treatment and Collection Facilities</i>	Electrical Classification of Spaces
2001	American Society of Civil Engineers (ASCE) 32 <i>Design and Construction of Frost-Protected Shallow Foundations</i>	Foundation Frost Protection
2014	(NFPA) 70 <i>National Electrical Code</i>	Electrical Room Egress Requirements
General	Occupational Safety & Health Administration (OSHA)	Life Safety Standards

Version	Code	Use
2016	City of Portland Code of Ordinances (CPCO) Chapter 6	Buildings and Building Regulations
2011 Rev 2016	Technical Report 16 – Guides for the Design of Wastewater Treatment Works (TR-16)	Resiliency

5.2.1 2015 International Building Code (as Amended by MUBEC)

The MUBEC incorporates and amends both the International and National Building Codes by reference. Table 5-2 summarizes the architectural code study for the Electrical Maintenance Building.

Table 5-2: Architectural Code Summary

Code Section	Description	Back Cove South Storage Facility
IBC Section 312.1	Building Occupancy	U: Utility (Accessory Use Building)
IBC Section 602.5	Type of Construction	Type V-B
IBC Table 504.3	Building Height	Allowed: 40-FT Proposed: 14-FT
IBC Table 504.4	Building Stories	Allowed: 1 Proposed: 1
IBC Table 506.2	Building Area (Interior)	Allowed: 5,500 SQ FT Proposed: 415 SQ FT
IBC Table 508.4	Required Separation	No Separation Required
IBC Table 509	Incidental Uses	N/A
IBC Table 601	Fire Rating Building Elements	0-Hours for Type V-B Construction
NFPA 820	Building Classification	See Table 5-4
IBC Table 803.11	Interior Finish Requirements	No Restrictions (See Table 5-5)
IBC Section 903	Automatic Sprinkler Systems	Not Required; Not Provided
IBC Section 906	Portable Fire Extinguishers	Provided
IBC Section 907	Fire Alarms and Detection	Not Required; Smoke & Heat Detection Provided
IBC Table 1004.1.2	Occupant Load Factor	Mechanical Equipment Room: 300 Gross
IBC Table 1004.1.2	Number of Occupants	2 Occupants
IBC Table 1006.2.1	Number of Exits	1 Exit per Room
IBC Table 1006.3.2(2)	Travel Distance to Single Exit	Allowed: 75-FT Proposed: 21-FT
IBC Section 1103.2.3	Accessibility	Group U Occupancies not required to meet ICC A117.1 Requirements
CPCO Chapter 6	LEED Certifications	Not Required, Building Area < 2,000 SQ FT

5.2.2 State of Maine Energy Code

The Electrical Maintenance Building will comply with the MUBEC, which incorporates and amends the 2009 International Energy Conservation Code (IECC) and references the 2013 ASHRAE 90.1. Per IECC, the City of Portland,

Maine is in Climate Zone 6A. ASHRAE 90.1 specifies minimum thermal insulation for the building envelope outlined in Table 5-3 below.

Table 5-3: ASHRAE 90.1 Thermal Envelope Requirements for Climate Zone 6A

Building Element	Insulation System	Minimum R-Value Required	R-Value Provided
Exterior Mass Walls	Continuous 3-inch extruded (rigid) insulation placed in wall cavity	R-13.3 ci	R-15.0 ci
Slab-on-Grade Floors	4-inch extruded (rigid) insulation placed on the exterior side of the slab haunch and extending a minimum of 24 inches below grade	R-20.0	R-20.0
Attic	Blown-in fiberglass insulation	R-49.0	R-49.0

5.2.3 National Electrical Code

The National Electrical Code (NEC) requires the electrical room to have one egress door opening towards the path of egress travel. Panic hardware is required per IBC 1010.1.10 for electrical rooms with equipment rated 1,200 amperage or greater. Although amperage is below the value specified by the IBC, panic hardware will be provided on the egress door.

Anticipated heights of electrical equipment will exceed the standard 7'-0" door height. A removable transom over the Electrical Room door will allow for the equipment installation and removal. The door shall be 6 ft wide for easy access.

Per RFI #2, the desk and chair in the Electrical Room required per the RFP has been removed from the design as unqualified personnel should not be near electrical equipment.

5.2.4 Hazard Area Classifications Based on NFPA 820 Fire Protection

The following table provides a summary of the Hazard Area Classifications for the BCSSF. The Area Classifications have been determined in accordance with the National Fire Protection Association (NFPA) 820 Standard for Fire Protection in Wastewater Treatment & Collection Facilities (2016). Electrical, HVAC and controls work will be designed for compliance with the following Area Classifications as a part of the project.

Table 5-4: NFPA-820 Hazard Area Classifications

Name	NEC Area Classification	NFPA 820 Ventilation Requirements	Extent of Classified Area	NFPA 820 Fire Protection Measures (Note 2)	NFPA 820 (2016) Table Reference
Electrical Maintenance Building					
Electrical Room	Unclassified	Not Required	N/A	N/A (Note 1)	N/A
Meter Room	Unclassified	Not Required	N/A	N/A (Note 1)	N/A
Parks & Recreation Room	Unclassified	Not Required	N/A	N/A (Note 1)	N/A
Vent Room	Unclassified	Not Required	N/A	N/A (Note 1)	N/A
Vent Stack Discharge	Class 1, Division 2	Not Enclosed, open to atmosphere	Areas within 3 ft of vent stack discharge	FE (Note 1)	Table 4.2.2, Row 20, Line d
Other					
Tanks	Class 1, Division 1	Not Required	Interior of tanks	NR	Table 4.2.2, Row 34, Line a
Valve Vault 1 (Western Tank Dewatering Forcemain Vault)	Class 1, Division 2	Not Required	Interior of Vault, Including Access	NR	Table 4.2.2, Row 31, Line a
Valve Vault 2 (Eastern Tank Dewatering Forcemain Vault)	Class 1, Division 2	Not Required	Interior of Vault, Including Access	NR	Table 4.2.2, Row 31, Line a
Valve Vault 3 (Tipping Bucket Fill Water Vault)	Unclassified	Not Required	N/A	N/A	N/A

Notes

1. Fire extinguisher provided within electrical maintenance building.
2. Fire protection designations: H: Hydrant, FE: Fire Extinguisher
3. N/A: Not applicable

There is potential for future Odor Control Equipment to be located in the Vent Room after the completion of this project. Class 1, Division 2, materials will be provided in the Vent Room to accommodate future potential Odor Control Equipment. All interior finishes will meet material requirements for Noncombustible (NC), Limited-combustible (LC), or Low flame spread index (LFS) (UL-rated ceiling assembly and fire-rated, gas tight wall and floor construction).

Construction materials within three feet of the vent stack discharge will be NC, LC, or LFS. This requires the asphalt shingles be Class A with a base of noncombustible material and surfacing not exceeding a thickness of 1/8 of an inch where the surfacing exhibits a flame spread index not greater than 50 when tested in accordance with ASTM E84. The sheathing within this area will be fire-rated plywood to meet these requirements.

5.3 Electrical Maintenance Building Materials of Construction and Finishes

Tables 5-5 and 5-6 below summarize the proposed interior and exterior materials of construction and finishes. Colors for interior and exterior finishes will be coordinated with the City of Portland during construction and selected from manufacturer's standard color charts.

Table 5-5: Interior Finish Schedule

Room Name	Wall Finish				Ceiling	Floor
	North	South	East	West		
Electrical Room	Painted CMU	Painted CMU	Painted CMU	Painted CMU	Painted PGWB*	Sealed Concrete
Meter Room	Painted CMU	Painted CMU	Painted CMU	Painted CMU	Painted PGWB*	Sealed Concrete
Storage Room	Painted CMU	Painted CMU	Painted CMU	Painted CMU	Painted PGWB*	Sealed Concrete
Vent Room	Painted CMU	Painted CMU	Painted CMU	Painted CMU	Painted PGWB*	Sealed Concrete

*PGWB: Paperless Gypsum Wallboard with fiberglass tape to reduce potential for water damage and mold growth.

Table 5-6: Exterior Finish Schedule

Component	Materials of Construction
Exterior Walls*	Multi-wythe masonry with split face veneer, concrete masonry backup, and precast concrete accent bands. Wall cavity filled with continuous rigid insulation and dampproofing that meets energy code requirements. Masonry control joints will be provided at a maximum 25 ft on-center.
Gable Endwalls*	Gable end trusses with painted fiber cement siding. 20-Year Warranty on Materials.
Roof*	Premanufactured wood trusses with fire-rated plywood sheathing, continuous self-adhesive underlayment, and architectural asphalt shingles. 15-Year Warranty on Materials.
Vent Stack	Clay Brick with a 304L Stainless Steel cover and bird screen. Net free area of bird screening will be as required for proper venting.
Doors & Frames*	Painted metal doors and frames with polyurethane insulated cores.
Foundation Slab	Concrete with perimeter insulation covered in FRP protection board and prefinished aluminum flashing. Detailed as required by ASCE 32.

*Textures and colors to be verified by Owner during detailed design

All Materials selected in the above tables meet the minimum service life requirements outlined in the RFP.

Figures 5-1 and 5-2 below are examples of structures with similar construction materials as those proposed for this project.

Figure 5-1: Example of Building Construction Materials - Photo 1



Figure 5-2: Example of Building Construction Materials - Photo 2



6. STRUCTURAL

This section describes the basis of the structural design for the proposed CSO storage facility project.

6.1 Design Overview

The major below-grade structures comprising the BCSSF include the four independent cast-in-place concrete storage tanks and the three cast-in-place concrete CSO diversion structures designed to capture, convey and store 3.5 MG of CSO prior to initiation of a CSO discharge to Back Cove. CSO diversion structures will be designed as cast-in-place structures but may be alternatively proposed as precast structures if construction advantages are identified.

The above-grade masonry Electrical Maintenance Building is designed to house mechanical and electrical equipment associated with the BCSSF.

6.2 Design Standards, Codes and References

As of January 23, 2018, the State of Maine has adopted the statewide Maine Uniform Building and Energy Code (MUBEC) which amends the 2015 International Building Code (IBC). Table 6-1 lists the building codes and standards enforced under MUBEC that may be applicable to the structural elements of this project.

Table 6-1: Structural Building Codes and Design Standards

Version	Code or Standard	Use
2015	<i>International Building Code (IBC)</i>	Base Code
2010	<i>ASCE 7 Minimum Design Loads for Buildings and Other Structures</i>	Determination of structural design loads
2014	<i>ASCE 24 Flood Resistant Design and Construction</i>	Determination of flood loads
2014	<i>ACI 318 Building Code Requirements for Structural Concrete</i>	Concrete design
2006	<i>ACI 350 Code Requirements for Environmental Engineering Concrete Structures</i>	Concrete design of environmental structures
2006	<i>ACI 350.3 Seismic Design of Liquid-Containing Concrete Structures</i>	Determination of seismic loads on environmental structures
2013	<i>ACI 530 Building Code Requirements for Masonry Structures</i>	Masonry design
2015	<i>ADM1 Specification for Aluminum Structures</i>	Aluminum design
2010	<i>AISC 360 Specification for Structural Steel Buildings</i>	Structural steel design
2015	<i>AWC National Design Specification for Wood Construction w/ 2015 NDS Supplement</i>	Wood design
2014	<i>AASHTO LRFD Bridge Design Specifications, 7th</i>	Determination of vehicular loads
2014	<i>Army Corp of Engineers EM 1110-2-2104 Strength Design for Reinforced Concrete Hydraulic Structures</i>	Comparison standard for service life and durability
2011 Rev 2016	<i>Technical Report 16 – Guides for the Design of Wastewater Treatment Works (TR-16)</i>	Resiliency

ACI 350 applies to environmental concrete structures intended for storing water, wastewater, or other liquids whereas ACI 318 applies to other concrete structures. The proposed storage tanks and CSO diversion structures are considered

environmental structures and will be designed using the Strength Design method of ACI 350. Environmental exposures for this facility are classified as Normal under the ACI 350 standard.

6.3 Design Considerations

6.3.1 Service Life of Storage and Diversion Structures

The ACI 350 standard for design of environmental concrete structures indicates that “when all relevant loading conditions are considered, the design should provide adequate safety and serviceability, with a life expectancy of 50 to 60 years for the structural concrete. Some components of the structure, such as jointing materials, have a shorter life expectancy and will require maintenance or replacement.”

6.3.2 Design Criteria

Loading criteria based on requirements of ASCE 7 are summarized in Table 6-2 with additional detail on primary load cases in the following subsection. All facilities are considered Risk Category III. Seismic Site Class E was determined by geophysical testing. This results in a Seismic Design Category (SDC) of C, which represents a moderate seismic risk.

Table 6-2: Minimum Structural Design Criteria Summary

Load Type	Description	Designation	Design Conditions
Snow	Ground Snow Load	P _G	60 psf
Frost Depth	Frost depth	--	4.0 ft
Wind	Basic Wind Speed (3-second gust)	V	128 mph
Seismic	Seismic Coefficient	S _S	0.241
Seismic	Seismic Coefficient	S ₁	0.078
Seismic	Seismic Site Class (A-F) A-Low risk site soils; F-High risk site soils	Site Class	E
Seismic	Seismic Coefficient	S _{DS}	0.401
Seismic	Seismic Coefficient	S _{D1}	0.182
Seismic	Seismic Design Category	SDC	C
Groundwater & Max Final Grade	Design groundwater elevation (GW) Density of seawater 64.0 pcf	GW	Max Final Grade EL = 12.0 ft
Flood	Design Flood Stillwater Elevation (Zone A Non-Coastal) Density of seawater 64.0 pcf	DFE	EL = 13.0 ft
Fluid	Design water surface elevation (storage tanks)	DWSE	EL = -6.50 ft
Fluid	Maximum water surface elevation (storage tanks) -100% of interior volume full of water	MWSE	Assumed 100% full to at-grade hatches
Live Load	Electrical Building Slab-on-Grade	LL	300 psf
Live Load	Future uses of soccer field area	LL	100 psf
Vehicular Live Load	Vehicular load with dynamic load allowance as per AASHTO	LL	HL-93

6.3.3 Primary Design Loads

Dead Loads:

Weight of well-defined permanent loads will be based on typical accepted values such as those provided in ASCE 7.

Live Loads:

Live loads will be considered non-reducible.

A 100 psf uniform live load will be applied to buried structure covers. This live load will correspond with possible transient load effects for future uses of the soccer field area. This uniform live load will not be additive with vehicular live loads and will take the place of snow load.

Static and dynamic effects of mechanical equipment such as tipping buckets, sump pumps and sluice gates will be treated as live loads in combinations.

Vehicular Loads:

Vehicular loads will be AASHTO HL-93 (HS20 truck or tandem) and will be factored according to AASHTO. No lane load will be applied. It is assumed that only one heavy truck will influence a region of the buried cover slab at a time. Multiple presence factor will be as follows:

- Vertical loads not concurrent with uniform live load: 1.2
- Lateral loads applied uniformly to exterior walls: 1.0

Frequency of truck traffic will be much less than for roadways and bridges. To account for the reduced probability of attaining the AASHTO design event during the service life of buried structures, the total force effect of vehicular loads will be reduced by 10% in accordance with AASHTO C3.6.1.1.2.

- Buried Covers w/ ≤ 2.0 feet fill: HL-93 wheel loads with 33% dynamic load allowance.
- Buried Covers w/ > 2.0 feet fill: HL-93 wheel loads with 33% dynamic load allowance. Vertical pressures will be distributed through earth fill in accordance with AASHTO. Dynamic load allowance will be reduced as a function of fill depth in accordance with AASHTO.
- Walls of CSO Diversion Structures: Lateral pressures on buried walls due to vehicular surcharge will be based on 3 feet of soil surcharge applied uniformly per the RFP. No 10% probability reduction.
- Walls of Storage Tanks *above flushway covers*: Lateral pressures on buried exterior walls will be based on 3 feet of soil surcharge applied uniformly per the RFP. No 10% probability reduction.
- Walls of Storage Tanks *below flushway covers*: Lateral pressures on buried exterior walls due to vehicular loads will be based on HL-93 vertical loads reduced due to the distributing effect of fill overlying the flushway covers in accordance with AASHTO. These pressures will be applied uniformly.

Environmental Loads:

See Table 6-3 for parameters.

Flood loads will be determined based on a non-coastal A Zone. FEMA flood insurance rate map shows the project site within the AE Zone. Limit of Moderate Wave Action is not indicated on the FIRM. However, a non-coastal classification is reasonable for this protected cove and because the effects of breaking waves are not applicable to buried structures or to those structures with finished floor at or above the DFE.

Seismic Loads:

See Table 6-3 for seismic parameters.

Per IBC Section 1803.5.12 and ASCE 7-10 Section 11.8.3 determination of dynamic seismic lateral earth pressures is required in Seismic Design Categories D through F. All structures are assigned to Seismic Design Category C and will not be designed for dynamic lateral earth pressures.

Seismic loads will assume a coincident internal fluid level based on probabilistic methods.

Process Fluid Loads:

Load combinations will include process fluid loads based on the DWSE. Load effects corresponding to maximum water surface elevation will also be examined but will not be increased by the durability factor.

Interior tank walls will be designed for the largest possible head differential across the wall during tank filling as determined by hydraulic analysis.

Soil and Groundwater Loads:

Groundwater will be assumed at finish grade. Above-grade water will be treated as flood load in combinations.

Geotechnical parameters are listed in Table 6-3 below. Buried tank walls will be designed using at-rest pressures. The Geotechnical Engineer has indicated no liquefaction potential.

Table 6-3: Key Geotechnical Parameters

Item	RFP	Geotechnical Report	Design
Unit Weight of Backfill for Buried Tank Walls	120 pcf	125 pcf	125 pcf
Unit Weight of Backfill over Buried Tank Covers	120 pcf	120 pcf	120 pcf
At-rest earth pressure coefficient	0.50	0.66	0.66
Active earth pressure coefficient	0.33	0.49	0.49
Passive earth pressure coefficient	3.00	2.04	2.04
Sliding coefficient of friction – buried tanks	--	0.35	0.35
Sliding coefficient of friction – electrical building	--	0.45	0.45
Modulus of Subgrade Reaction -buried tanks	--	100 pci	100 pci

Item	RFP	Geotechnical Report	Design
Modulus of Subgrade Reaction -electrical building	--	200 pci	200 pci
Net Allowable Bearing Pressure -buried tanks	--	1,000 psf	1,000 psf
Net Allowable Bearing Pressure -electrical building	--	3,000 psf	3,000 psf

Load Combinations:

Both IBC and ACI 350 load combinations will be considered to generate the most conservative load effects from either standard. Ultimate load effects will be increased as required by the ACI 350 durability factors. Per ACI 350.3, durability factors need not be applied for seismic load combinations.

Load combinations applied to environmental structures will evaluate the following scenarios:

- Partially-complete structures: Backfill after walls achieve 4,000 psi compressive strength and no tank covers are in place. Backfill elevation limit will be determined. Durability factors will be applied.
- Partially-complete structures: Construction loading on cover slabs in conjunction with minimal fill to distribute wheel loads. Durability factors will be applied.
- Backfill-in-Place: Tanks empty with backfill-in-place and high groundwater. Cover slabs are in place and all concrete has achieved 5,000 psi compressive strength. Durability factors will be applied.
- Operational: Tanks with process fluid to design water surface elevation, backfill-in-place and various environmental and seismic loads according to IBC and ACI 350 combinations. Durability factors will be applied to all non-seismic combinations.
- Max Water Surface Elevation: Tanks with process fluid to maximum water surface elevation and backfill-in-place. Durability factors will not be applied.

Per RFP Addendum 8, a tightness test per ACI 350.1 will not be performed for any of the buried structures. Therefore, these structures will not be analyzed for the condition of water-filled tanks with no resisting backfill.

6.3.4 Serviceability Requirements

The following serviceability requirements will apply to aspects of the project.

- Masonry Lintel Deflection: $L/720$ or $3/8"$
- Building Roof Deflection: $L/240$
- Tank/Diversion Structure Cover Slab Deflections: Will provide adequate thickness per ACI 318 Sections 7.3 & 8.3 such that deflections need not be further evaluated.
- Mechanical equipment anchorage subject to vibration will use cast-in anchors

6.3.5 Global Stability Requirements

6.3.5.1 Flotation and Buoyancy

In addition to designing for structural capacity and serviceability requirements, buried tank structures will be evaluated for flotation with a minimum required factor of safety of 1.15 per the RFP. Per the RFP, this evaluation will be performed for flooding to the DFE and at any critical partial-completion construction phase. Soil weight directly over the structure, including base slab extensions, will be utilized to increase resistance to flotation. Soil friction capacity, soil cohesion capacity, weight of soil wedges, or internal fluid weight will not be relied upon to meet the required factor of safety.

Pressure relief valves will not be used anywhere on the project.

6.3.5.2 Sliding Resistance

The dimensions of the buried tanks and their proximity to the I-295 interstate embankment require shored excavations and construction phasing. The four independent storage tanks of the BCSSF will be constructed in two phases with excavations limited to the dimensions required for a single phase of construction. During Phase I, excavation and construction of the two tanks adjacent to the interstate (Tanks 1 and 4) will be performed. These tanks will be evaluated for sliding stability with a factor of safety of 1.50 per the RFP for the temporary condition where one side of a tank is completely backfilled to EL -1.0 feet with no resisting backfill on the opposite side, tanks empty, no concrete fill or covers installed, and excavation dewatered.

6.3.6 Watertightness and Crack Repair

Environmental concrete structures designed per ACI 350 standards are designed to limit cracks due to applied loads and shrinkage, however tanks designed to these standards may still develop cracks. The extent of cracking that could develop is difficult to predict and is the result of many factors (mix design and component quality, placement techniques, environmental factors, weather, curing methods, etc.). The standard ACI 350.1 tightness testing and crack repair procedure for environmental concrete structures is not required for this project. However, cracks that develop and leak will be repaired to provide durable, watertight structures. Cracks that develop after curing and backfilling which exhibit seepage will be repaired prior to substantial completion. The storage tanks will be examined for further cracking at the end of the warranty period and cracks which exhibit seepage will be repaired at that time. The crack repairs will be performed using polyurethane crack injection or crystalline cementitious surface coating methods described below. The method(s) to be used will be determined at the time of repair.

6.3.6.1 Polyurethane Crack Injection

The product is injected, under pressure, into predrilled access holes. The injection holes are typically drilled at a 45-degree angle along either side of the active leak at an initial spacing of 6-inches to 24-inches.

The installation contractor field mixes the liquid polyurethane with an accelerator prior to injecting into the concrete walls. Once injected into the wall, the liquid polyurethane expands to 15 to 30 times the liquid volume to form a permanently flexible polyurethane grout that infills voids and cracks to stop water infiltration.

Several rounds of applications, per crack, may be required depending on site conditions, quantity of accelerator used, locations of drill access holes, and overall tenacity of the cracked concrete. Each round of injection involves drilling additional holes between previously injected locations in order to intersect the crack near the mid-depth of the concrete's thickness. After cracks are sealed, the contractor grinds-off excess foam, removes injection ports and infills with grout at all interior tank surfaces.

6.3.6.2 Crystalline Waterproofing Surface Coating

Crystalline waterproofing technologies are a chemical treatment that fills the capillaries and pores of cured concrete with a non-soluble crystalline structure. The crystalline structure penetrates or “grows” into the concrete, and seals cracks and concrete porosity.

Actively leaking concrete cracks are sealed by the following approach: rout out the crack and surface apply a thin slurry coat of concentrated product to the prepared surface; apply a fast-setting, non-shrink hydraulic cement; and top-coating with a finish coat of concentrated product. Unlike polyurethane crack injection, these products require field curing and development time to seal a crack. Actively leaking cracks treated with these products will often continue to leak for several days after treatment, but they will typically seal the leak in one application after a few days of curing. The crystalline surface treatment will continue to migrate into the wall for several months after application with overall growth dependent on environmental conditions, crack width, and moisture content of the concrete.

6.3.7 Structural Materials

6.3.7.1 Cast-in-place Concrete (Environmental Structures)

- a) Pressure Relief Valves will not be used
- b) Reinforcing: ASTM A615, 60,000 psi minimum yield strength, uncoated
- c) 28-Day Design Strength (f_c): 5,000 psi
- d) Maximum water to cement: 0.40 max
- e) Maximum water-soluble chloride ion content of mix: 0.15 percent by weight of cement
- f) Specified Cover: 2” in walls, 2” in top and bottom of cover slabs, 3” in top and bottom of base slabs
- g) Durability requirements for brackish water exposure are met by the preceding requirements per ACI 318 Section 4.8 and ACI 350 Chapter 4. Corrosion inhibiting admixture will not be used.
- h) Waterproofing admixtures will not be used.
- i) Joint continuity: Expansion joints will be continuous through entire structure. Staggered and offsets of construction joints will be avoided wherever possible.
- j) Watertight joints to include a ribbed PVC continuous waterstop mechanism. Waterstops will be 6” wide in construction joints and 9” wide with center bulb in expansion joints. Waterstops in vertical construction joints will extend to within 2” of the top of wall.
- k) Construction joints in environmental structures: Per ACI 350.4 *Design Considerations for Environmental Engineering Concrete Structures*, Chapter 5 base slabs will be detailed with watertight expansion joints at 150 ft maximum spacing,
- l) Anchorage to concrete design method: ACI 318 Chapter 17
- m) Cast-in Anchors: 316 stainless steel
- n) Post-installed Anchors: 316 stainless steel; Expansion anchors are not allowed at tank interior locations and will only be used for non-critical applications and not for tensile or vibratory loads

6.3.7.2 Cast-in-place Concrete (Electrical Maintenance Building)

- a. 28-Day Design Strength (f'_c): 4,000 psi
- b. Maximum water to cement: 0.45
- c. Reinforcing: ASTM A615, 60,000 psi minimum yield strength
- d. Interior floor finishes will receive a float finish.

6.3.7.3 Precast Concrete

- a) Plank Covers: Solid, no voids permitted
- b) Pressure relief valves will not be used
- c) Mild Reinforcing: ASTM A615, 60,000 psi minimum yield strength, uncoated
- d) Prestressing strands: pending
- e) Design Strength (f'_c): 6,000 psi concrete at 28 days
- f) HL-93 load ratings
- g) Joint Sealant: ASTM C990 Butyl rubber
- h) Lifting Lugs: stainless steel

6.3.7.4 Masonry

- a) Specified Compressive Strength (f'_m): 2,000 psi
- b) Mortar: Type S
- c) Reinforcing: ASTM A615, 60,000 psi minimum yield strength, uncoated

6.3.7.5 Aluminum

- a) Shapes & Plates: ASTM B221 6061-T6
- b) Anchor Bolts and Hardware: 316 Stainless Steel
- c) Railings and Ladders: Anodized where hand contact expected
- d) Welding: 4043 filler wire

6.3.7.6 Structural Steel

- a) Wide flange shapes: ASTM A992
- b) Channels, angles, and plates: ASTM A36
- c) HSS: ASTM A500 Grade C

- d) Pipe: ASTM A53 Grade B
- e) High strength bolts: A325
- f) Welding Electrodes: E70XX

6.3.7.7 Shop-Fabricated Wood Trusses

- a) Design Calculations and Shop Drawings signed and sealed by Professional Engineer registered in the State of Maine (Manufacturer)
- b) Hot-Dip galvanized connector plates: ASTM A653 Grade A, G60
- c) Maximum moisture content of wood: 19 Percent
- d) Permanent bracing per BCSI-B3

6.3.7.8 Wood Framing

- a) All framing shall be Spruce-Pine-Fir (South) or Hem-Fir.
- b) Grade shall be No. 2 or better.
- c) Moisture content of lumber shall be less than 19%.
- d) Minimum attachment requirements for all lumber shall be per Table 2304.10.1 "Fastening Schedule" of the 2015 IBC.

6.3.7.9 Geotechnical

- a) Backfill buried structure walls with upper site sand soils
- b) Backfill over buried structures with balance of excavated site soils
- c) See Appendix A for Geotechnical Engineering Report

6.4 Structural Analysis Methodology

Structural analysis of cast-in-place buried concrete structures will be performed using STAAD.Pro, an industry standard 3-dimensional finite element analysis software by Bentley Systems. Structural geometry, properties and loading are input to develop a model representing the structure. Supporting soil will be modelled using soil springs with stiffness equivalent to the modulus of subgrade reaction. Analysis will be by linear static methods.

6.5 Storage Tanks

6.5.1 Design Considerations

The storage tanks are cast-in-place concrete with some precast components. All cast-in-place elements will have two mats of reinforcement. The BCSSF is split into four independent tank structures in order to minimize dewatering, allow for staged excavations, and to account for differential settlements. Tank-to-tank conveyance piping will be designed to accommodate differential settlements between independent tanks through the use of flexible couplings.

Storage tank seismic force resisting system is concrete shear walls. Per ASCE 7, Ordinary Concrete Shear Walls are permitted for Seismic Design Category C. Therefore, no special seismic detailing will be provided.

Storage tanks will not be designed for future expansion or for additional fill materials to be added to the site.

Storage tanks will be considered non-occupiable spaces.

Seismic restraints for mechanical and electrical equipment are not required per code for Seismic Design Category C unless the component is for life safety purposes or if it conveys, supports or contains toxic or hazardous substances.

6.5.2 Excavation and Shoring

6.5.3 Base Slab

The base slab of the storage tanks will be designed to provide a fixed wall base with a watertight joint. Concrete fill at 1.2% slope will be poured in the base of the tanks to create flushways for clean-out. The base slabs will be stepped to create a dewatering sump shared by both flushways, to limit the depth of sloping concrete fill and to reduce material in the walls.

Construction joints will be provided at slab elevation “steps” and at wall construction joint locations. Temperature and shrinkage steel will be increased per ACI 350 in the short direction to eliminate the need for a longitudinal construction joint through the slab. Due to the length of the tanks, a single doweled, watertight expansion joint will be constructed across the short length of the slab and located at an elevation step per ACI 350.4 recommendations.

Thickness will be sized as needed to resist the upward buoyancy forces acting on the bottom of the tank base slab. The slab will also be designed to resist temporary shoring loads where the slab is proposed to be cast against the sheet pile shoring.

6.5.4 Walls

Walls will have constant full-height thickness to maximize construction efficiency. Walls below the covers at the tipping buckets will be designed assuming no top of wall support is available from these removable covers.

An interior wall will be constructed to form the flushways, brace the exterior end walls and base slab and support the cover slab. Openings will be provided along the length of the interior wall to limit fluid head differential between the two flushway bays while the tanks are filling. These openings will also improve access from bay-to-bay during maintenance operations.

Wall construction joints will be spaced at 30 ft maximum to provide practical rebar cage dimensions to lift and fly-in, minimize shrinkage reinforcing requirements, and minimize shrinkage cracking. Walls will be “skip-poured” to alleviate temperature and shrinkage forces during concrete curing. The base slab expansion joint will be carried into the interior and exterior walls and detailed similarly.

Wall pours will be made full-height with no horizontal construction joints.

6.5.5 Covers

All tank covers will be buried under fill. Covers above the flushways and sump chimneys will be cast-in-place concrete. Drop panels or shear reinforcement may be needed to achieve shear capacity in the flushway covers. The expansion joint in the tank walls will be carried into the cast-in-place cover and detailed similarly. Concrete fill topping sloped at 2% will be installed on the flushway covers to drain water.

Single-leaf aluminum access hatches will be provided for sump pump removal and tank access. Hatches located above sump pumps daylight thru fill beyond the limits of the playing field and sit flush with finish grade. All hatches will include integral, OSHA-compliant fall protection grating and will be fitted with locking mechanisms.

Removable precast covers are required above tipping buckets for future maintenance and removal of the tipping buckets. Precast covers above the tipping buckets will be buried a minimum of 18 inches below finish grade. Precast covers will be solid rectangular planks with the tops sloped at 2% for drainage. A sacrificial waterproofing membrane will be installed which will need to be replaced whenever the precast units are removed. Cast iron manhole-type covers will be incorporated into the precast planks to allow access to each tipping bucket mount for inspection and maintenance.

All covers will be designed to meet the deflection requirements of ACI 318.

6.6 CSO Diversion Structures 16, 17 and 18

CSO diversion structures are proposed as cast-in-place but may be alternatively proposed as precast structures as the design progresses.

Base slabs, walls and cover slabs will generally be designed and constructed using the methods and materials described above for the storage tank structural elements. Expansion joints will not be needed in these structures due to compact dimensions. Manhole-type access to the buried, non-occupiable structures will be provided using precast risers. A cast iron removable cover will be needed in the roadway for installing/removing stop logs in Diversion Structure 16. Castings or buried hatch covers will be provided at Diversion Structures 17 and 18 for installing/removing stop logs.

Diversion structures will not be designed for future expansion or for future additional fill materials to be added to the site after the completion of this project.

6.7 Electrical Maintenance Building

The structure will consist of prefabricated wood trusses supported by CMU shear walls on a shallow frost protected turn-down slab-on-grade foundation.

6.7.1 Design Considerations

The building will be founded on a cast-in-place reinforced concrete turn-down slab-on-grade designed based on the data in the Geotechnical Engineering Report included in Appendix A. The finish floor elevation will be set at 13.0, 3'-0" above the 100-year flood elevation as required per Addendum #3 and in accordance with TR-16 design guidance for resiliency.

The building and foundation are not designed for future expansion.

6.7.2 Service Life of Electrical Maintenance Building

The service life of the masonry used to construct the Electrical Maintenance Building is anticipated to be 75 years or greater, as required per the RFP. The service life will depend on different variables considered during the design phase, as well as factors after construction, including maintenance schedule.

7. MECHANICAL PROCESS

This section describes the basis of the mechanical design for the proposed CSO storage facility project.

7.1 Design Overview

The mechanical process design consists of the following main components: CSO storage tank dewatering pumps, discharge piping and a common forcemain connecting to the City's wastewater collection system, valve vaults containing the valves and appurtenances associated with the tank dewatering pumps and tipping buckets, stop logs for each diversion structure to isolate the CSO storage tanks, tipping buckets in each CSO storage tank, and passive ventilation for the CSO storage tanks (ventilation of the Electrical Maintenance Building is discussed under Section 8 - HVAC).

Four submersible chopper pumps, one located in each of the four tanks, will dewater the tanks by pumping the stored overflows through a new forcemain that is connected the City's wastewater collection system. Each pump will have a 6-inch discharge pipe routed to one of the two tank dewatering pump valve vaults located adjacent to the CSO storage tanks. A 10-inch discharge pipe will connect the valve vaults. Process pipe in vaults and the tanks will be ductile iron; buried pipe will be HDPE to the maximum extent practicable.

From the valve vaults, flow is routed through a common forcemain. The tank dewatering forcemain will include approximately 2,400 lineal feet (LF) of 12-inch HDPE pipe routed east along Back Cove Trail, south on Franklin Street, east on Marginal Way, and will be connected to the existing gravity sewer system at the intersection of Marginal Way and Diamond Street, as shown on Figure 1-3.

Two tipping buckets will be located in each tank with one in each flushway for a total of eight tipping buckets. The buckets will be used in tanks which have received CSO flow after the tanks have been fully dewatered following a storm event. The tipping buckets will use potable water supplied by the City for flushing. Tanks that remain unused during the storm will not require a cleaning cycle.

Stop logs and guide channels will be installed in each CSO diversion structure on the outlet pipe to the tank to prevent combined wastewater flow from entering the CSO storage tanks during maintenance. When not in use, the stop logs will be stored by the City off-site.

The ventilation of the tanks will be passive, with room for future odor control, but none installed as part of this project. The valve vaults will not be ventilated. Ventilation for the tanks and valve vaults will allow the tanks and forcemain to fill and drain only, but it will not declassify spaces.

Appendix E includes an Equipment List with major pieces of equipment, and corresponding vendor shop drawings.

7.2 Design Standards, Codes and References

Table 7-1 includes the mechanical process design standards, codes and references used for this project.

Table 7-1: Mechanical Process Codes and Design Standards

Version	Code or Standard	Use
Varies	American Society for Testing and Materials (ASTM), Various	Product specifications
Varies	American Water Works Association (AWWA), Various	Product specifications
2012	Hydraulic Institute American National Standard for Rotodynamic Pumps for Pump Intake Design (ANSI/HI 9.8-2012)	Wetwell Design
2016	NFPA 820	Space Classification
Included w/ RFP	40 05 90.02: Stainless Steel Slide Gates and Appurtenances 40 23 13.01: Process Valves and Appurtenances 40 05 90.07: Stop Logs and Appurtenances 40 23 13.03: Electric Motor Actuators and Appurtenances	Product Specifications
2011 Rev 2016	Technical Report 16 – Guides For The Design Of Wastewater Treatment Works (TR-16)	Design Guidelines

7.3 Tank Dewatering Pumping System

7.3.1 Design Criteria

Tank Dewatering Pump design criteria is outlined in Table 7-2. See also Figure 7-1 Pump and System Curves in the following section.

Table 7-2: Tank Dewatering Pump Design Criteria

Criteria	Value
Total System Flowrate	3.5 MG / 24 Hours 2,431 gpm average
Number of Pumps Operating Simultaneously at Peak Flow	4
Per Pump Flowrate	608 gpm average over operating range, minimum.
Design low water surface elevation (WSE)	-22.3 ft
Design high WSE	-1.2 ft
Forcemain discharge elevation	5.0 ft
Design Static Head	6 ft to 27 ft
Design Point, Average Tank Drain Flow	608 gpm, 71 ft TDH
Peak discharge pressure (at shutoff head)	45 psig

7.3.2 Pump Selection

The Tank Dewatering Pump selected is the 25 HP Vaughan Chopper S4S, which is a submersible pump with a sealed oil filled housing. A submersible pump configuration was selected in accordance with the RFP, and due to reliability and durability of submersible pumps. The pump brand was selected based on its track record of reliability and client preference. The impeller and specific model were selected in coordination with Vaughan to meet the design criteria listed in Table 7-2. In accordance with Table 2-2 of the RFP, the pump components are anticipated to have the following minimum service life (MSL):

- Dewatering pump: 15 years.
- Pump bearings: B-10 life of 100,000 hours.
- Motor: 25 years.

Figure 7-1 shows the pump curve provided by the manufacturer with the acceptable operating range of this pump at varying speeds and corresponding efficiencies as well as the system curves and design points. System curves were created for the following conditions:

- All four pumps operating at low water level
- All four pumps operating at high water level
- One pump operating at high water level
- One pump operating at low water level

High water level is defined at elevation -1.2, which corresponds with the roof of the tanks, i.e. the bottom of the chimneys. Low water level is defined at elevation -22.3, which is inside of the tank sump. These elevations were selected as the midpoint of these curves conservatively represents the average drawdown rate of the tanks, so that the curves demonstrate the pumps can drawdown 3.5 MG in twenty-four hours as required by the RFP. Note that these are conservatively selected as the low water level elevation was taken inside of the pump sump, as opposed to at the tank floor, and the pumps will deliver less flow at lower water elevations.

Additionally, high and low sensitivity analyses were developed, with the curves shown on the graph. The high sensitivity curve shows four pumps operating at low water level. The high sensitivity curve provides a reference point for a high head condition; this curve still intersects the pump curve, which indicates the pump selection is acceptable.

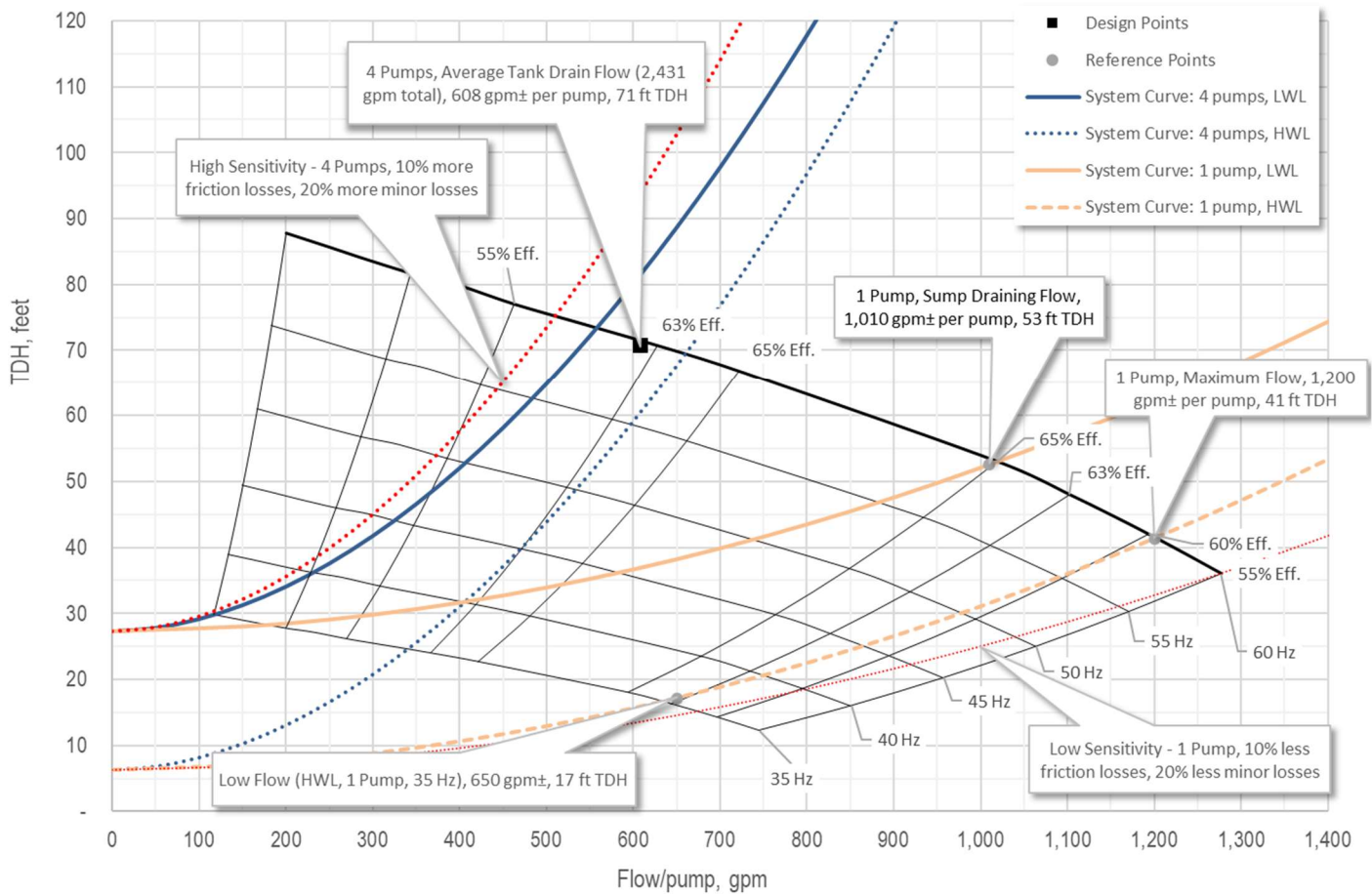
The low sensitivity curve represents one pump running with a high water level (i.e. full tanks). The low sensitivity curve provides a reference point for system performance if hydraulic calculations were excessively conservative. This curve also intersects the pump curve and again confirms the pump selection. Additionally, the system will be equipped with non-overloading motors which prevent the pump from running outside of its acceptable operating range. Maximum pump speed will also be control manually or automatically via SCADA to prevent overload.

Figure 7-1: Tank Dewatering Pump and System Curves

Portland ME Back Cove - PN 232069

Pump & System Curves

Vaughan Chopper S4S Curve D (25 HP / 18.5 KW, 1755 rpm, 10.00" impeller diameter)



Note: pump curve shown in Figure 7-1 is the acceptable operating range (AOR).

7.3.3 Pump Operation Strategy

Each tank will function with a fill and draw strategy monitored by redundant level sensors in each tank and using feedback from the PWD SCADA system. The tank will remain filled until such time that the PWD WWTF has adequate capacity to begin dewatering the tank. Flow will be measured in the dewatering forcemain using a flow meter located in Valve Vault 2. Based on the available capacity downstream, the tanks will be dewatered individually or concurrently. When the tanks cannot be dewatered at full capacity, the pumps will operate at reduced speed to convey wastewater equal to the available downstream capacity. Each pump will have independent speed control through the SCADA system using a variable frequency drive (VFD).

Upon completion of the drain down of all 4 tanks, each tank will begin a cleaning cycle, filling a tipping bucket, flipping and scouring the bucket's respective flush way. The flush water will be collected in the dewatering sump and pumped into the PWD collection system with the dewatering pumps. This cycle will repeat for each tank that captured combined sewage during the wet weather event. When the cleaning cycles are complete, the tank will be ready for the next event.

7.3.4 Tank Dewatering Forcemain Material Selection

The pump discharge will be as outlined in Table 7-3.

Table 7-3: Tank Dewatering Forcemain Material Schedule

Criteria	Value	MSL
In tank, valve vault, Air release manhole, cleanout manhole	Class 53 flanged Ductile Iron with epoxy lining	>20 years
Buried forcemain	DR 17 HDPE	>20 years

DI will be provided with interior epoxy lining per the RFP. HDPE will be used where practicable as it does not corrode in the presence of salt water and hydrogen sulfide attack.

7.3.5 Cleanouts and Venting for the Tank Dewatering Forcemain

Air release valves (ARV) for the forcemain are not permitted in the valve vaults. Therefore, an ARV will be located in a manhole adjacent to SMH-10 along Back Cove Trail. The forcemain will slope continuously upward from Valve Vault 2 to the ARV and continuously downward from that point to a cleanout manhole located adjacent to the Franklin Street pump station. A connection will be provided to allow the forcemain to be drained into the existing Franklin Street Pump Station. From the cleanout manhole, the forcemain will then slope upwards to its connection to the existing gravity sewer at the intersection of Marginal Way and Diamond Street.

7.3.6 Valves

Valves will be provided in accordance with Reference Specification 40 23 13.01 Process Valves and Appurtenances. Refer also to RFI #08: Valve Pressure Rating. All plug valves will be by the same manufacturer and will meet AWWA C517. All check valves will be of the same manufacturer and will meet AWWA C508.

Valve identification materials will be corrosion resistant. No outside valves are proposed; if any are added, the identification for those valves would also be ultraviolet resistant.

Valves are anticipated to have an MSL in excess of 20 years, in accordance with Table 2-2 of the RFP.

7.3.7 Valve Vaults

This section discusses the design criteria for the valve vaults; refer to the Drawings for preliminary layout and design information. The valve vaults will be precast concrete structures.

Three valve vaults are proposed for this project. Valve Vault 1 will house Tanks 1 and 2 dewatering pump valves. Valve Vault 2 will house Tanks 3 and 4 dewatering pump valves and the dewatering forcemain flow meter. Valve Vault 3 will house the tipping bucket water feed motor operated valves.

There will be a clear three-foot wide space within the vaults to facilitate access. There will be a minimum of one foot of space between the face of a flange and a wall for wall mounted pipe. Refer to RFI #04: Clearance Around Equipment.

There will be a minimum of five pipe diameters of separation between the centerline of the flowmeter and the face of an upstream fitting and three pipe diameters of separation between the centerline of the flowmeter and the face of the downstream isolation valve.

Equipment and piping in the vaults will either have flanged or grooved couplings to facilitate disassembly. The forcemain within the valve vaults will be marked to indicate the minimum working pressure in the forcemain system.

The valve vaults are not considered a potentially wetted area. Pipe supports will be concrete, steel, and/or ductile iron.

Valve vault ventilation will not be provided. Ventilation is not required for operational reasons because there will not be an air release located in the valve vaults. The valve vaults will be confined spaces, and air quality must be monitored by maintenance personnel and temporary ventilation provided as needed. Refer to RFI #06: Valve Vault Ventilation.

7.4 Stop Logs and Guides

Stop logs will be installed at each diversion structure at the outlet conveyance pipes to the CSO storage tanks to enable isolation of the tanks in accordance with the RFP. Guides will be mounted to the concrete diversion structure wall with anchors. The guide will provide a channel on the bottom and each side of the wall penetration. By locating the stop logs at the outlet conveyance pipes to the CSO tanks, flow will push the logs into the seating position. The guides and logs will be accessible from above via a removable plate, panel or casting. The top of the stop log installation in each structure will match the elevation of the crown of the CSO outfall pipe to which the diversion structure is connected.

Locating the stop logs at the diversion structures provides multiple benefits, including a lower likelihood that overtopping will occur and result in leakage rates higher than the required 0.05 gal/ft maximum specified in the RFP. However, stop logs are not designed to be overtopped, and thus provide “flow mitigation,” but not flow isolation. Maintenance personnel should not enter CSO tanks or any diversion structures during storm events. By locating the stop logs at the diversion structures, water will not become trapped in the conveyance system to the CSO tanks. Water in the diversion structure that is retained by the stop logs will need to be pumped out before the logs can be removed and locating the logs at diversion will allow the pumping to be completed and the CSO tanks to be returned to service more quickly.

The design criteria for the stop logs are summarized in Table 7-4.

Table 7-4: Stop Logs Basis of Design

Criteria	Value
Stop Logs	Stainless steel, Type 304
Frame Guides and Invert	Wall mounted sides and bottom, stainless steel, Type 304
Lip Seal	Urethane, EPDM, or Neoprene
Anchors	Stainless steel, Type 316

7.5 Tipping Bucket Requirements

Tipping buckets are designed to flush grit and debris accumulated on the tank floor to the dewatering pump sump after each tank has been dewatered. Each tank flushway will have its own tipping bucket connected to a dedicated potable water feed pipe with a motor operated valve; refer to Section 9 Plumbing for additional information on the tipping bucket water feed system. As required by the RFP, the motor operated valves will have manual bypass for maintenance and for operation in the event of failure. Each bucket will have a position sensor connected to SCADA to indicate when the bucket has filled and tipped. Section 11 – Instrumentation and Controls summarizes the control scheme for the tipping bucket feed pipes.

Table 7-5 summarizes the tipping bucket selection, which was provided by Grande (manufacturer) based on the proposed tank dimensions.

Table 7-5: Tipping Bucket Selection

Criteria	Value
Tank Flushway Dimensions	Length = 226 feet Width = 24.5 feet Bottom Slope = 1.2% Drop Height (Bucket Centerline to Floor) = 19.83 feet
Number of Buckets	Eight (1 per tank flushway – 2 flushways per tank – 4 tanks)
Tipping Bucket	Grande ACU-TIP Model GAT-135 Bucket Width: 23'-11" (Support width from wall: 8.5") Volume: 135 gal/ft
Required Fill Volume	3,240 gallons/bucket 25,920 gallons total

7.5.1 Tipping Bucket Grease Points

Fill tubes will be extended from tipping bucket grease nipples to the inside of the buried inspection hatch. Note that the hatch will need to be excavated to access the fill tubes. The tipping buckets proposed have permanently lubricated style bearings. Note that permanently lubricated style bearings still require lubrication; however, the bearing does not allow grease to easily escape. For this reason, the manufacturer recommends the bearings are greased only while the bearing can be viewed to avoid over-pressurization, which would potentially damage the bearing.

Refer to Appendix E for certification of the performance of these bearings from Grande.

7.5.2 Tank and Pump Sump Design Criteria

Each sump is shared by two flushways, which each are equipped with a tipping bucket for cleaning. The sumps are sized to have a minimum volume equal to one tipping bucket volume, times a 2.5 factor of safety in accordance with Section 3.1.6 of the RFP. The tank sump contains within it the pump sump, which houses the Tank Dewatering Pump. The pump sump has been dimensioned and designed to accommodate the pump described in Section 7.3.2 in accordance with Hydraulic Institute Standards inlet velocity for self-scouring. Table 7-6 summarizes the sump design criteria.

Table 7-6: Tank and Pump Sump Design Criteria

Criteria	Value
Minimum Volume	1,083 cubic feet (135 gal/ft tipping bucket volume per Table 7-5 x 24 feet of tipping bucket per tank x 2.5 factor of safety per RFP Section 3.1.6)
Minimum Slope Towards Pump Sump	2%
Pump Dimensions In-Line with Discharge Elbow	39.4" including discharge elbow 17.5" suction bell dimension Refer to Vaughan Shop Drawing included in Appendix E.
Pump Sump Design Basis	Hydraulic Institute Standards 9.8-2012 Rotodynamic Pumps for Pump Intake Design, Section 9.8.3 Intake Structures for solids-bearing liquids

7.6 Tank Venting Requirements

Each tank will have its own vent pipes, as shown on the Drawings, which are configured to allow air to be vented through the vent stack located in the Electrical Maintenance Building and condensation or water intrusion from a flood event to drain back to the tanks. The vent pipes are sized to allow each vent to equalize with the others such that the venting needs for each tank and chimney are constantly equal.

While Tank 1 is filling, displaced air will be exhausted into the vent pipes and through the tank interconnection pipelines into Tank 2. In this scenario, the pressure in the tanks will be able to equalize via both the vents and the interconnection pipelines.

Table 7-7 below summarizes the tank venting design criteria and supporting calculations are provided in Appendix F.

Table 7-7: Tank Vent Design Criteria

Criteria	Value
Maximum Velocity	2,500 fpm in Vents (per RFP Section 3.1.5)
Vent Flow Requirements	705.50 cfs to match peak fill rate per Table 3-2 in the RFP 176.38 cfs per tank (4 tanks) 88.19 cfs per chimney (2 chimneys per tank) * Note: the peak tank discharge rate is less than 2,500 gpm, which equals 5.6 cfs, which is far smaller than the design peak fill rate. Therefore, the peak fill rate dictates the size of the venting.
Minimum Outlet Size	
From an Individual Chimney (two chimneys per bay, four chimneys per tank, sixteen chimneys total)	1.06 sf / 13.9" Diameter
Venting for Two Chimneys	2.12 sf / 19.7" Diameter
Venting for Four Chimneys	4.23 sf / 27.9" Diameter
Venting for Eight Chimneys	8.47 sf / 39.4" Diameter
Venting for Ten Chimneys	10.58 sf / 44.0" Diameter
Venting for Twelve Chimneys	12.70 sf / 48.3" Diameter
All Venting (16 Chimneys)	16.93 sf / 55.72" Diameter

The vent discharge will be located above the roofline of the Electrical Maintenance Building, which will minimize the vent's visual impact and move the vent away from the playing fields. A cap and bird screen will be included to protect the vent outlet from vandalism, intrusion and precipitation.

7.6.1 Future Storage Tank Odor Control

The vent stack at the Electrical Maintenance Building is enclosed in an isolated room that can be retrofitted after the completion of this project for the addition of a future odor control system, if necessary.

8. HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

This section provides describes the basis of the Heating, Ventilation and Air Conditioning (HVAC) design for the proposed CSO storage facility project.

8.1 Design Overview

The Electrical Maintenance Building is comprised of four separate spaces: Electrical Room, Meter Room, Parks & Recreation Room and Vent Stack Room. The Electrical Room will be ventilated, filtered, heated, cooled and dehumidified as described in the following subsections to protect equipment contained within the space. The Meter Room will be heated only for freeze protection. The Storage Room and the space containing the vent stack will not have mechanical ventilation, heating or cooling.

8.2 Design Standards, Codes and References

As of January 23, 2018, the State of Maine has adopted the statewide Maine Uniform Building and Energy Code (MUBEC) which amends the 2015 International Building Code (IBC). In addition to MUBEC, the City of Portland requires compliance with several national code standards. Table 8-1 lists the building codes and design standards that may be applicable to the HVAC elements of this project.

Table 8-1: HVAC Codes and Design Standards

Version	Code or Standard
2015	International Building Code (IBC)
2015	International Existing Building Code (IEBC)
2009	International Energy Conservation Code (IECC)
2013	American Society of Heating, Refrigeration & Air Conditioning Engineers (ASHRAE) Standard 62.1 – 2013, Ventilation for Acceptable Indoor Air Quality
2013	ASHRAE Standard 62.2 – Ventilation for Acceptable Indoor Air Quality in Low-Rise Residential Buildings
2013	ASHRAE Standard 90.1 – Energy Standard for Building except Low-Rise Residential Buildings
2008	American Society for Testing and Materials (ASTM) Standard E-1465-2008, Standard Practice for Radon Control Options for the Design and Construction of New Low-Rise Residential Buildings
2017	National Electrical Code (NEC)
2015	Uniform Plumbing Code (UPC)
2015	Uniform Mechanical Code (UMC)

8.3 Design Conditions and Ventilation Rates

Indoor and outdoor design conditions and ventilation rates will be per the requirements of the RFP. The outdoor and indoor design criteria are outlined in Tables 8-2 and 8-3 below.

Table 8-2: Outdoor Design Criteria

Season	Temperature
Summer	86° F Dry-bulb
	71° F Wet-bulb
Winter	-3° F Dry-bulb

Table 8-3: Indoor Design Criteria

Room	Maximum Space Temperature (° F)	Minimum Space Temperature (° F)	Outdoor Ventilation Rate (CFM/sqft)	Hazard Rating	Comments
Electrical Room	84	62	0.25	Unclassified	
Meter Room	N/A	50	N/A	Unclassified	
Parks & Recreation Room	N/A	N/A	N/A	N/A	Storage Room will not be a conditioned space.

Per the RFP, the outside air ventilation and room pressurization will be achieved in the Electrical Room by a Positive Pressurization Unit (PPU). The PPU will supply and filter ambient air to the space at the rate defined in Table 8-3. The PPU will run continuously to maintain positive pressurization of the Electrical Room with respect to the adjacent rooms as well as the ambient atmosphere, preventing un-filtered air from entering the space. The PPU will be provided with a means of disconnect for maintenance purposes.

8.4 Heating and Cooling

To maintain interior temperatures, the Electrical Room will be equipped with a ductless, split system heat pump (mini-split). The mini-split consists of an outdoor condensing unit and one indoor air handling unit. The outdoor unit will be mounted to the exterior wall of the building and the indoor unit(s) will be wall-mounted within the space. A wall mounted thermostat located in the Electrical Room will control the mini-split to maintain temperature. The thermostat and mini-split will be connected to the SCADA system that will:

- Provide means of monitoring room temperature
- Create an alarm at Hi and Low temperature
- Provide on/off status

The Meter Room will be heated for pipe freeze protection only by means of an electric, forced air unit heater. The unit heater will be controlled by a line-voltage, wall-mounted thermostat. The thermostat and electric unit heater will be connected to the SCADA system that will:

- Provide means of monitoring room temperature
- Create an alarm at a Low temperature
- Provide on/off status

9. PLUMBING

This section describes the basis of the plumbing design for the proposed CSO storage facility project.

9.1 Design Overview

The BCSSF plumbing scope consists of the water utilities for tank cleaning, field irrigation and public drinking fountains. Each water system will have a separate water meter located in the Electrical Maintenance Building and backflow protection appropriate for the intended use. Design of the connection of the water utilities to the city water service will be coordinated with the Portland Water District (PWD).

9.2 Design Standards, Codes and References

The plumbing design for the BCSSF project will comply with applicable design standards and reference documents including the those listed in Table 9-1.

Table 9-1: Plumbing Codes and Design Standards

Version	Code or Standard
2015	Uniform Plumbing Code (UPC)
Latest	Maine State Drinking Water Regulations; Title 22 M.R.S.A. Section 601.
2017	Portland Water District; Water and Sewer Construction Specifications and Procedures
Latest	City of Portland Technical Manual

9.3 Utility Connection

The water service will be sourced from the PWD distribution system via a water main located in Preble Street Extension. Based on preliminary information from PWD, the 8-inch water main terminates with a hydrant on the southeast end of the park and has adequate water flow and pressure to meet the project needs.

The new service will be constructed from the existing main to the Meter Room in the Electrical Maintenance Building. From there, it will be split into three separate metered lines that will supply the tipping buckets, irrigation system and drinking fountains.

9.4 Tipping Buckets Feed Line

Per the RFP, tipping buckets will be filled with potable water for flushing of the storage tanks after the completion of a storm event. The PWD water service will connect to a meter and backflow preventer located within the Meter Room of the Electrical Maintenance Building. From there, a single water feed line will connect to a below grade valve vault, located within Back Cove Park, containing individual motor operated valves and dedicated water feed lines for each tipping bucket. Each motor operated valve will have a manual bypass for in hand operation, maintenance and testing. The tipping bucket water feed lines design criteria is summarized in Table 9-2.

Table 9-2: Tipping Bucket Fill Water Criteria

Criteria	Value
Tipping Bucket Fill Time	30 minutes
Maximum Tipping Buckets Filling at One Time	One
Required Flow Rate	108 gpm (135 gal/ft x 24 ft / 30 minutes)
Nominal Pipe Size	2" (min)

9.5 Field Irrigation

An automated field irrigation system will be provided within the Preble athletic field and Baby Preble area of Back Cove Park. The irrigation system will be designed and installed by Thirsty Turf Irrigation, Inc. who has designed, installed and maintains many of the existing irrigation systems at other City of Portland facilities. The design of the new Back Cove Park irrigation system will be consistent with the City's existing irrigation systems and based on the parameters outlined in Table 9-3.

Table 9-3: Irrigation System Design Criteria

Criteria	Value
Capacity	75 gallons per minute (gpm)
Cover Radius	55' to 60'
Pipe Cover	Minimum Cover = 12" Mainline Cover = 24" Lateral Cover = 18"
Pipe Material	PVC SDR 21 – Class 200

9.6 Drinking Fountain and Spigots

Two drinking fountains and two water spigots will be provided as part of the project. The fountains will be located near the existing drinking fountains in Back Cove Park, and the spigots will be located within the community garden area. The drinking fountains with spigots will be supplied by potable city water from a dedicated meter and backflow preventor located at the Electrical Maintenance Building. A shutoff valve will be located adjacent to each new drinking fountain and spigot. It is anticipated that the drinking fountains and spigots, similar to the irrigation system, will be operable seasonally and be winterized between November and April. The drinking fountains will drain to a subgrade gravel drywell.

The drinking fountains will be designed to meet Portland Water District standards to avoid potential for cross contamination. Spigots will be designed to meet the standard spigot detail provided by the City of Portland as part of the response to RFI #13. Drinking water fountain design criteria are outlined in Table 9-4.

Table 9-4: Drinking Fountain and Spigot Design Criteria

Criteria	Value
Capacity	1 gallons per minute (gpm)
Number	2

10. ELECTRICAL

This section describes the basis of the electrical design for the proposed CSO storage facility project.

10.1 Design Overview

The new Electrical Maintenance Building and equipment for the BCSSF requires electrical service for the CSO tanks dewatering pumps, motorized valves, lighting, HVAC, and instrumentation. The BCSSF electrical distribution system will be designed around a 480/277VAC, 3-phase, 4-wire motor control center (MCC) located within the Electrical Maintenance Building. This MCC will serve as the main source of power for BCSSF supporting equipment and will also house the variable frequency drives (VFDs) for each of the tank dewatering pumps. A 120/208V panelboard will also be provided to source power for items such as the Electrical Maintenance Building HVAC equipment, general house loads, and for Instrumentation and Controls system equipment. A sub-metered 120/240V panelboard will also be provided to accommodate the existing park loads such as lighting, irrigation, and crosswalk equipment.

10.2 Design Standards, Codes and References

The design and specifications associated with work under this section will comply with applicable state, federal and local codes and regulations including, but not limited to, the latest edition of each code and standard noted in Table 10-1 below.

Table 10-1: Electrical Codes and Design Standards

Code or Standard
American National Standards Institute (ANSI)
American Society for Testing and Materials (ASTM)
Institute of Electrical and Electronics Engineers (IEEE)
Illuminating Engineering Society (IES)
National Fire Protection Association (NFPA) 70 – National Electrical Code (NEC)
National Fire Protection Association (NFPA) 70E – Electrical Safety in the Workplace
National Electrical Manufacturers Association (NEMA)
National Electrical Safety Code (NESC)
Underwriter's Laboratory (UL)
Factory Mutual

10.3 Utility Connection

The electrical service will be sourced from Central Maine Power's (CMP) local medium-voltage (MV) distribution system. A three-phase MV service will extend via an underground duct bank to a pad-mounted transformer in the vicinity of the new Electrical Maintenance Building. From the transformer, a 480/277VAC 3-phase, 4-wire Wye secondary service will extend underground to the Electrical Maintenance Building main circuit breaker, located within the motor control center (MCC) in the Electrical Room.

10.4 Electrical Distribution System

The MCC will serve as the main distribution point for the BCSSF electrical system and will consist of the following:

- Manufacturer: Rockwell Allen-Bradley
 - Allen-Bradley IntelliCenter
- Mechanically interlocked (Kirk-Keyed) dual sources
 - Utility Source Main Circuit Breaker (normally open, N0)
 - Temporary Generator Circuit Breaker (normally closed, NC)
- Digital Power Monitor connected to SCADA via Ethernet communications
- Active Harmonic Filter (to meet IEEE 519 requirements)
- Surge Protective Device
- Full voltage non-reversing motor starters w/ electronic overloads
 - Future Odor Control System (40HP)
 - (2) Spares
- Variable Frequency Drives (VFDs) for four (4) submersible dewatering pumps
 - Line Reactors
 - Door-mounted human-interface modules
- Feeder Breakers
 - 480/277VAC, 3-phase, 4-wire panelboard
 - 120/208VAC, 3-phase, 4-wire panelboard (via dry-type transformer)
 - 240/120VAC, 1-phase, 3-wire park service panelboard (via dry-type transformer, w/ sub-meter, refeed existing park loads)
- All process motor controls and status will be handled via Ethernet Communications; each VFD and Motor Starter will be networked together to a single Ethernet Switch within the motor control center. The Ethernet Switch will then be connected to CP-1 via CAT6. The motor control center to be provided will be manufactured by Rockwell Allen-Bradley.

10.5 Standby Power

A wall-mounted generator connection box will be provided on the exterior of the Electrical Maintenance Building. This connection point will be tied to the generator source circuit breaker located within the MCC. The generator connection box will include the following:

- Cam-Lok style connections for connection of temporary generator cables

- Convenience duplex receptacle
- Phase Rotation monitor
- Pad-lockable cable access cover

10.6 Grounding System

A low impedance, equipotential ground system will be provided. The system will consist of bare copper ground ring around the Electrical Maintenance Building. Ground rods will be provided at the corners of the building. Integral ground buses within electrical distribution equipment will be bonded directly to the building ground loop. Supplemental grounding will be provided at the underground tanks, and within select duct banks as needed for exposed metallic components and structures. The pad-mounted CMP service transformer will be grounded and bonded in accordance with CMP requirements.

10.7 Materials of Construction

The materials of construction for electrical conduits, enclosures and supports are summarized in Table 10-2.

Table 10-2: Electrical Materials of Construction

Name	Classification	Support Type	Conduit Type	Enclosure Type
Electrical Room	Unclassified	Rigid Galvanized Steel	Rigid Galvanized Steel	Rigid Galvanized Steel
Meter Room	Unclassified	Rigid Galvanized Steel	Rigid Galvanized Steel	Rigid Galvanized Steel
Storage Room	Unclassified	Rigid Galvanized Steel	Rigid Galvanized Steel	Rigid Galvanized Steel
Vent Room	Unclassified	Rigid Galvanized Steel	Rigid Galvanized Steel	Rigid Galvanized Steel
Vent Stack Discharge	Class 1, Division 2 within 3 ft of stack	PVC Coated Rigid Galvanized Steel	PVC Coated Rigid Galvanized Steel	PVC Coated Rigid Galvanized Steel
Valve Vaults	Class 1, Division 2	PVC Coated Rigid Galvanized Steel	PVC Coated Rigid Galvanized Steel	NEMA 7, (NEMA 4X for intrinsically safe instrumentation)
Storage Tanks	Class 1, Division 1	PVC Coated Rigid Galvanized Steel	PVC Coated Rigid Galvanized Steel	NEMA 7

10.8 Site Electrical

Site electrical power and control cabling will be routed underground in raceways. Conduits with cabling of different systems will be spaced to mitigated electrical interference. Precast handhole structures will be provided. Underground conduit and cable will be extended from the Electrical Maintenance Building to the storage tanks and out to each of the CSO diversion structure locations.

At the storage tanks, each factory-installed submersible pump cable will be extended to a NEMA 4X, NEMA 7 connector or junction box mounted in an accessible location. This provides for a convenient location to disconnect the submersible pump power cables for equipment servicing. The line side cables associated with each submersible pump cable connection point will extend back to the MCC. All conduits entering underground structures will be sealed within 10'-0" of the classified area boundary in accordance with NEC.

10.9 Lighting

The Electrical Maintenance Building lighting will be light-emitting diode (LED) based, designed around ANSI/IES RP-7, Industrial Lighting. Design for the building lighting includes the following:

- Interior lighting will be controlled via wall-mounted switches at each area entrance.
- Exterior, building mounted lighting will be full-cutoff and controlled via a photocell. A Hand-Off-Auto switch will also be provided to allow for manual bypass of the photocell.
- Emergency egress lighting will consist of battery-supplied wall packs.

Two new pole mounted LED assemblies will be provided to match the existing park lights, and power for the lighting will be sourced from the new Electrical Maintenance Building 120/240V sub-metered panelboard. Power for the existing flashing crosswalk lighting, along with the existing bollards beneath the I-295 overpass will be also be re-sourced from the Electrical Maintenance Building sub-metered panelboard.

10.10 Lightning Protection

A complete lightning protection system will be provided for the Electrical Maintenance Building in accordance with UL 96, UL 96A, and NFPA 780. All systems will be designed, furnished, and installed by a qualified Lightning Protection Contractor; a Certificate of Compliance will be obtained.

10.11 Building Fire Detection

Stand-alone heat and/or smoke detectors will be provided in the Electrical Maintenance Building; each will be connected to SCADA for alarming.

10.12 Electrical System Studies

The following studies will be provided:

- Coordination Study for Overcurrent Protective Devices, including motor feeders and all other distribution system protective devices
 - Includes a tabulation of all device trip settings and recommended fuse sizes and types as applicable
- Short Circuit Fault Current Study
 - Each major bus, down to and including 120/208VAC panelboards
- Harmonic Analysis
- Arc Flash Analysis
 - EasyPower Arc Flash Analysis Software will be utilized to complete the analysis
 - Including labels for all associated equipment down to 120/208VAC panelboards

10.13 Electrical System Testing and Startup

The services of an independent, NETA Accredited, testing firm will be retained to execute the following:

- Clean all new electrical equipment to be supplied including panelboards, switchboards and motor control centers and all associated circuit breakers, starters, relays, contactors, and control equipment prior to any testing activities
- Megger testing of all wiring phase-to-phase and phase-to-ground
- Testing of all systems furnished.
- Provide certified test reports stating that the equipment meets and operates in accordance with the manufacturer and job specifications and that equipment and installation conforms to all applicable standards and specifications.
- The City Advisor will be notified at least two weeks in advance prior to conducting any tests.

11. INSTRUMENTATION AND CONTROLS

This section describes the basis of the instrumentation and controls design for the proposed CSO storage facility project.

11.1 Design Overview

The intent of the Instrumentation and Controls (I&C) design is to provide the City with Supervisory Controls and Data Acquisition (SCADA) programming that monitors flows, control pump-out and initiates post-event cleaning of the BCSSF. The design will closely follow existing City of Portland SCADA systems for operator familiarity and more effectively utilize existing spare parts for future servicing. The I&C scope encompasses the three CSO diversion structures, the four CSO storage tanks, electrical room motor controls and telemetry connecting to the existing licensed frequency radio network.

11.2 Design Standards, Codes and References

The I&C design will adhere to applicable codes and standards including those listed in Table 11-1.

Table 11-1: Instrumentation and Controls Codes and Design Standards

Code or Standard
2017 National Electrical Code (NEC)
American National Standards Institute (ANSI)
International Society of Automation (ISA) ISA-RP60.3 Recommended Practice
National Electrical Manufacturers Association (NEMA)
National Fire Protection Association (NFPA) - NFPA 70 - NFPA 79 Electrical Standard for Industrial Machinery
Underwriters Laboratories (UL) Standard 508A – Standard for Industrial Control Panels

11.3 City of Portland Existing SCADA System Overview

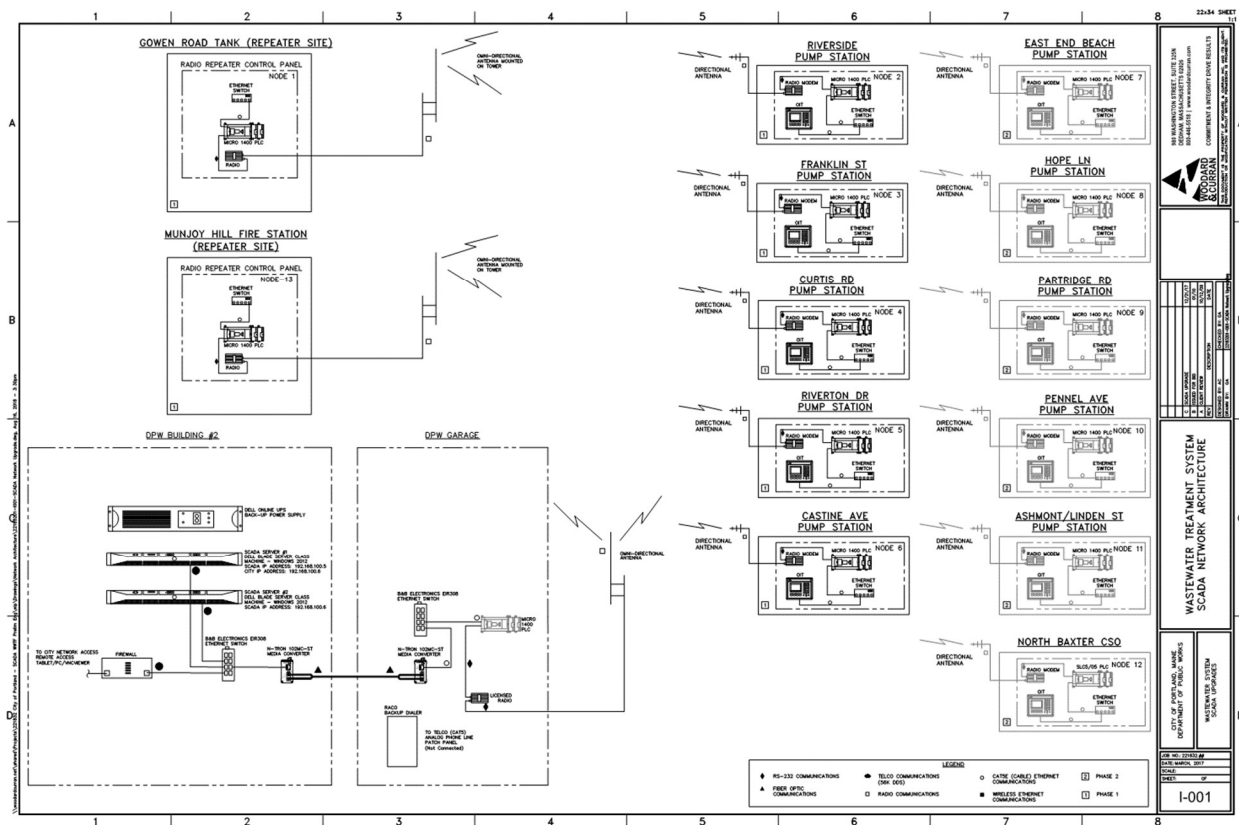
The City of Portland owns and operates eleven wastewater pump stations and a storm water storage facility. All stations in the City report to the radio master and associated SCADA system located at District Road via licensed frequency radio communication.

The DPW offices at the 109 District Road facility has a radio master control panel which serves as the current polling master for the remote sites. A MicroLogix Programmable Logic Controller (PLC) monitors alarm inputs from the remote sites. A TCS Communications radio and associated antenna communicates to the remote stations. A RACO autodialer is also mounted on the front of the control panel to notify plant personnel via phone if critical alarms go unacknowledged for a set time.

The City maintains two Windows10 SCADA computers connected to the main control panel via Ethernet, allowing operations staff to monitor and control the remote pump stations. One PC acts as the SCADA development node,

where changes to the graphical screens can be made. The other PC acts as a runtime node, giving staff a view of the processes while maintaining a database identical to the development node. If either PC fails, the other will continue to collect and store data to ensure no loss of process data during the PC downtime. The human-machine interface (HMI) software provides a graphical display of the process data, status and alarms necessary to run the plant and view the general status of the remote pump stations. Remote alarm notification is accomplished by the WIN-911 software package, alerting operations staff if critical alarms are not acknowledged within a set time. Automated reports are generated using the XLReporter software package, pulling historical data directly from the HMI to populate reports for regulatory submission and operational staff use.

Figure 11-1: Existing SCADA Network Architecture



11.4 BCSSF Instrumentation and Controls

Instrumentation and controls for the BCSSF site will communicate via the existing licensed frequency radio network back to the DPW to provide operational control and monitoring. The radio network sends station status and allows operational control adjustments to and from the site allowing operations to efficiently monitor process controls. This read/write communication will also allow for integration into the Portland Water District telemetry by-way-of the Gowen Hill tank repeater with existing hardwired analog signaling between the City of Portland and PWD SCADA. This signaling allows for the transmitting of flow information relating to the East End Wastewater Plant and effected storage facility operations.

The onsite SCADA PLC Panel will communicate with an adjacent Intelligent Motor Control Center for control of all motor controls when operator selected for Automatic. The monitoring of these motor controls will give operation information on pump performance (amperage), run times, faults, and other motor control information. Instrumentation

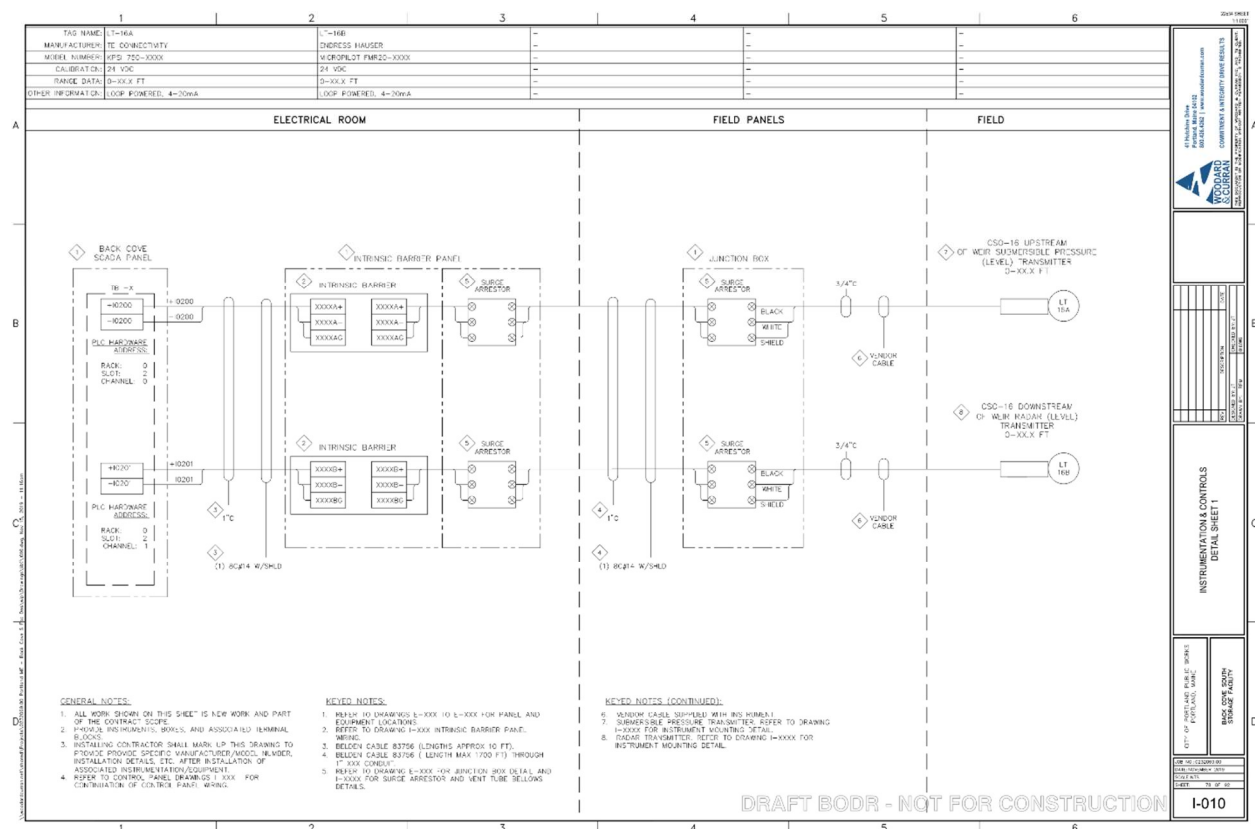
and controls onsite will be hard-wired to the SCADA PLC panel with an integral touchscreen for local control and system monitoring. Control of the storage tank pumps will operate based on level monitoring via redundant instrumentation utilizing submersible and radar level transducers. Operations will have the ability to manually select and/or automatically fail-over between level control devices. Combined discharge flow from the storage tank through a 10" magnetic flow meter measuring and totalizing station flow. The pumps will operate with on/off level setpoints based on tank levels with integral discharge flow trim control and East End Plant interlocking. All equipment will have SCADA HAND control selectable via the local touchscreen in the Electrical Room. Pumps will also include a Local/Off/Remote switch located on the front of the motor control panel.

The storage tank level monitoring instrumentation is handled by submersible pressure transducer and radar instruments located in the sump area of the storage tanks adjacent to the pumps. The submersible pressure transducer will be installed in a stilling well to prevent movement of the device and to protect the cabling. The radar level instrument will be installed in the sump end of the storage tanks on a bracket accessible via the pump manhole hatch. Both level instruments are headless (no local display) loop-powered devices that match City of Portland instrumentation already in operations at other locations. The instruments will be wired to junction boxes located in the valve vaults. These junction boxes will allow for easy disconnect of instrument cabling in the event a device needs to be replaced or relocated. The junction boxes will provide surge arrestors and terminals integral for ease of field connections and to protect instruments/hardware from transient surges. Wiring from the junction box back to the SCADA system will be permanent but allow for spare wiring for future devices and redundancy.

Flushing of the storage tanks via tipping buckets will utilize city water via hardwired motorized electrical ball valving and operator selectable time flush or tipping bucket proximity switch control based on storage facility operation. The motorized ball valve will be operated via the SCADA system to open/close the valve automatically or manually. Integral proximity switches will provide feedback for open and close status.

Flow monitoring of the three CSO diversion structure locations will utilize the same submersible and radar level monitoring devices as the storage tanks to detect flow to the storage tanks and initiation of overflow events. The submersible pressure transducers located in the CSO diversion structures will be installed as required to monitor normal flow to the storage tanks. The radar transducers will be installed in a rectangular weir monitoring overflow out of the CSO. All flow monitoring will provide for daily and event totalization providing data back to the SCADA system for operational and state reporting. Both level instruments are headless (no local display) loop-powered devices will be wired to an adjacent electrical hand-hole junction box installed at grade in a NEMA6P enclosure to allow for easy disconnect of instrument cabling in the event a device needs to be replaced or relocated. The junction boxes will provide surge arrestors and terminals integral for ease of field connections and to protect instruments/hardware from transient surges. Wiring from the junction box back to the SCADA system will be permanent but allow for spare wiring for future devices and redundancy. CSO16 and CSO18 diversion structures will be (at a maximum) 1,800 feet from the SCADA panel, but fall under acceptable design criteria for the instruments based on cable designation and selected signal barrier. CSO17 diversion structure will homerun instrument cabling to the Electrical Maintenance Building due to proximity to the CSO diversion structure.

Figure 11-1: Instrumentation Loop Sheet



The above instrumentation loop sheet outlines the design modification from the Indicative Drawings instrumentation design as referenced on 17025-E-002 drawings for CSO-16 and CSO-18 diversion structures. The new Instrumentation design for the remote CSO level/flow transmitters would utilize 4-20mA Loop powered devices that are hardwired to the BCSSF Electrical Room directly via underground conduit and junction boxes as necessary. Design would eliminate above grade outdoor Remote I/O control panels, hardware and associated wireless telemetry. Given the proximity to general public and potential for flooding the elimination of these Remote I/O control panels provides a simpler operational approach and a more aesthetically pleasing final product.

This approach would provide oversized, low resistivity signal cabling directly between the Back Cove South Electrical Room intrinsic barrier panel and an at-grade electrical manhole with an integral NEMA6P waterproof junction box. This junction box adjacent to the CSO diversion structures will allow for easy disconnect of instrument cabling in the event a device needs to be replaced or relocated. The junction boxes will provide surge arrestors and terminals integral for ease of field connections and to protect instruments/hardware from transient surges. Wiring from the junction box back to the SCADA system will be permanent but allow for spare wiring for future devices and redundancy. Without available utility power at these CSO diversion structures locations, hard-wiring the instrumentation to the BCSSF Electrical Maintenance Building provides the most effective solution.

Below are cabling calculations for Voltage Drop and Resistivity supporting the proposed application.

Voltage Drop Calculation:

$$V_d = < 1 \text{ Volt} = 0.01 \text{ Amp} * (2 \times 1800 \text{ FT}) * 0.0023 \text{ Ohms/FT} = 0.0828 \text{ Volts}$$

Assumptions:

Current of 0.01 Amp signal = 10mAmps = Normal conditions

Cable Length Maximum = 1800 FT multiplied by 2 for loop power circuit

Cable Resistivity = 0.0023 Ohms/FT for Belden 83756 or equal

Maximum Distance Resistance Calculation:

$$\text{Max Distance} = (1 / 0.0023 \text{ Ohm/FT}) * (500 \text{ Ohms} / 2) = 108,696 \text{ Feet maximum distance}$$

Assumptions:

Cable Resistivity = 0.0023 Ohms/FT for Belden 83756 or equal

Signal Receiving device 500 Ohms resistivity

11.4.1 SCADA System Needs

The BCSSF SCADA system will follow City of Portland standards, utilizing Allen-Bradley PLC/OIT hardware & software. This will include items such as the CompactLogix PLC, C-more Operator Interface displays, programming on the existing FactoryTalk SE-based servers, WIN-911 alarm notification software, XL Reporter automated reporting software, use of radio equipment matching the existing infrastructure by model and utilizing the existing licensed frequency. The SCADA panel design and fabrication will be performed to quality standards (UL-508), instrumentation specification with accepted industry standards for signal wiring compatible with all city control hardware.

11.4.2 Communication Strategy

The City of Portland wastewater collection system utilizes a licensed frequency radio network to communicate from the DPW office to the remote sites. The BCSSF site will become a new node on this radio communications network and will transmit data to and from the DPW using the City repeater sites listed below.

Gowen Road Repeater: The Gowen Tank site is operated by Portland Water District. The site consists of a water tank, surrounded by security fence, and a radio tower area, also surrounded by security fence, about 50 feet away. The radio tower area contains the radio tower and a building for housing the radio equipment. The radio tower has 4 omni directional antennas that are used by Portland Water District for their SCADA/telemetry network. There are two Yagi antennas mounted in the middle of the tower that were pointed to a nearby cell tower and are not used by Portland Water District. Onsite a SCADA control panel that houses a repeater for the radio communications between the remote sites and the DPW within the City.

Additionally, the Gowen Road PLC Panel as hardwired signaling between the City of Portland and the Portland Water District repeater panels. This signaling allows for the transmitting of the East End Wastewater Plant and the storage facility systems flow data. This flow data is used for interlocking of the storage facility control based on the East End flow.

Munjoy Hill Repeater: The Munjoy Hill repeater is located on a shared radio tower with an onsite SCADA control panel that houses a repeater for the radio communications between the remote sites and the DPW within the City.

11.4.3 Security and Protection

The BCSSF Electrical Maintenance Building will have door intrusion switches providing alarm indication through SCADA to operations that the building is accessed. Access hatches for the tanks and valve vaults will include intrusion switches on the hatch to alert operations that the locations are accessed. These intrusion switches will alert the operator locally on the touchscreen in addition to alarming via the WIN911 system.

Adjustable temperature thermostats will be installed in the Electrical Room, and low temperature switches will be installed in the three valve vaults. The thermostats and switches will be connected to SCADA with alarms to notify operations of high and low temperatures in the buildings and low temperatures in the valve vaults.

Flood switches will be included in the three valve vaults with alarms in SCADA to notify operations of water intrusion into these vaults.

12. PROJECT IMPLEMENTATION

This section details the implementation of the design and construction of the proposed CSO storage facility project.

12.1 Permitting

As outlined in the RFP, the following permits are required prior to construction:

- a. MaineDEP - Natural Resource Project Act (NRPA) Permit
- b. MaineDEP - Stormwater Permit-By-Rule (PBR)
- c. MaineDEP – Solid Waste Permit
- d. City of Portland Level III Site Plan Permit
- e. Building, Utility and Street Opening Permits

Table 12-1 outlines the roles and responsibilities of the all parties in obtaining the required permit applications for the project.

Table 12-1: BCSSF Permitting Responsibility

Permit	City of Portland	Design-Build Team
MaineDEP NRPA	• Submit Application – <i>Completed</i> • Respond to DEP questions – <i>Ongoing</i> • Obtain Permit Approval – <i>Ongoing</i>	• Provide proposal design plans – <i>Completed</i> • Provide E&SC plans – <i>Completed</i> • Provide support to DEP questions - <i>Ongoing</i>
MaineDEP Stormwater PBR	• File Application - <i>Ongoing</i>	• Provide proposal design plans – <i>Completed</i>
MaineDEP Solid Waste	• Preliminary Investigation – <i>Completed</i>	• Coordinate with MaineDEP – <i>Ongoing</i> • Conduct additional field investigation - <i>Ongoing</i>
City of Portland Site Plan*	• File Application – <i>Completed</i> • Respond to Planning Staff review questions – <i>Ongoing</i> • Obtain Permit Approval - <i>Ongoing</i>	• Provide proposal design plans – <i>Completed</i> • Provide supporting documentation as required - <i>Ongoing</i>
City of Portland Building Permit	No responsibility	• Obtain Permit Approval – <i>To be completed</i>
Street Opening and Utility Permits	No responsibility	• Obtain Permit Approval – <i>To be completed</i>

*With the Design-Build Team's goal to start construction on critical path items (i.e. storage tank shoring and excavation) in April 2020 while concurrently progressing the rest of the design, it is anticipated that the City of Portland Planning Board will either issue an Early Work Permit for below grade work (i.e. storage tanks) or issue a Site Plan Permit with final design of Back Cove walking trails, landscaping and Electrical Maintenance Building aesthetics as a condition of approval. Final design of these items is anticipated in July 2020, and construction is anticipated in 2021.

12.2 Project Coordination

The Design-Build team will be closely coordinating the overall design of the BCSSF project with the City's Public Works Department. Table 12-2 outlines specific BCSSF design components that will be coordinated with additional departments within the City, in conjunction with Public Works, prior to construction.

Table 12-2: Project Design and City Department Coordination

BCSSF Design Component	City Departments
Back Cove Park - Landscaping	• City Arborist • Planning
Back Cove Park – Walking Trails	• Parks and Recreation • Planning
Electrical Maintenance Building – Exterior Colors and Finishes	• Parks and Recreation • Planning

12.3 Project Schedule

The project schedule dated January 2020 delineates permitting, design submittals and construction activities and is included in Appendix G. The start of the construction activities in the project schedule is dependent on approvals of design submittals and permit applications, and therefore, the final the project schedule may change. Updated project schedules will be provided as necessary as design and construction progresses.

12.4 Project Design Submittals

The following project design submittals will be provided to the City and its advisory team for review:

- 30% Progress Set and Basis of Design Report (BODR) – design submittal includes this report outlining the scope and approach of the BCSSF design, design drawings (Listed in Appendix H, Drawings bound separately) and a preliminary technical specifications list (Appendix I).
 - Design submittal also includes a completed support of excavation design package for the storage tanks (Phase 1) prepared by H.B. Fleming. City review and approval of the excavation support early release design package is requested to allow for work on this critical path item to begin in early 2020 as the overall project design progresses.
- 60% Design Submittal – design submittal will provide sufficient information to clearly communicate the proposed materials, equipment and controls of the design and consist of updated design drawings, technical specifications, supporting calculations and contingency plans.
- 90% Design/Issued for Construction Set – design submittal will consist of substantially complete design drawings, technical specifications, support calculations and final contingency plans.
 - City review and approval of the 90% design submittal as the “Issued for Construction” package is requested to allow for work on the overall BCSSF project to begin in August of 2020.

- 100% Design/Record Drawings – Throughout construction of the BCSSF project, the 90% design drawings will be continuously updated to reflect actual construction and/or installation conditions. Final record drawings will represent the 100% design and be provided to the City upon completion of construction.

12.5 Construction Methodology and Sequencing

Construction of the BCSSF will take place from 2020 to 2022, with final acceptance testing of the system occurring in 2022. Construction will begin Spring 2020 and will generally be sequenced as follows:

1. Mobilize to project site to establish limits of work (i.e. construction fencing, erosion & sedimentation controls, temporary facilities);
2. Excavate, construct and backfill Phase 1 CSO storage tanks (Tanks 1 and 4);
3. Excavate, construct and backfill Phase 2 CSO storage tanks (Tanks 2 and 3);
4. Construct remaining BCSSF components including CSO diversion structures, conveyance piping, dewatering pumps, valve vaults, force main, CSO storage tank ventilation, tipping buckets water feed, and Electrical Maintenance Building; and
5. Restoration of BCSSF project site including athletic fields, walking trails, exercise equipment and landscaping.

The following subsections include a discussion of the general construction requirements, methods and techniques, environmental reviews during construction and the expected construction documentation process.

12.5.1 General Construction Requirements

12.5.1.1 Trail Maintenance and Access

The safety of workers, the City's operations and maintenance staff, and the general public is of the highest importance. Pedestrian traffic will be directed around and through our work site without incident. In order to accomplish this, similar tactics as used on past projects adjacent to the Back Cove trail will be utilized. These tactics include the use of temporary construction fencing, routine inspection and maintenance of pathways, temporary walkways, and work area crossings as well as appropriate levels of construction signage and field monitoring. During construction, the project site will be enclosed by temporary construction fencing that will tie-in to the MaineDOT fencing along the I-295 embankment. This perimeter fencing will have a limited number of access points that will be locked during non-working hours. During construction, pedestrian traffic will be routed to the existing pathway closest to the edge of Back Cove to provide the greatest distance between the public and the work area. This path location will be changed as necessary as the work progresses on the project. Existing trail sections will be utilized and when necessary, temporary trail sections will be constructed. Our crews will monitor existing and temporary trail conditions on a daily basis and will address quality issues as needed. We will also put in a large effort to effectively sign and direct the general public around our work site to the greatest extent possible. This will be done using a combination of electronic message boards, construction signage, barricades, cones, barrels, and other warning devices. In certain circumstances, employees may be utilized as trail flaggers, spotters, or guides.

12.5.1.2 Traffic Limitations & Control

With respect to traffic limitations and control, the project has been separated into four distinct work areas:

1. Preble Street Extension / Baxter Boulevard
2. Back Cove Park

3. Exit 7 – Franklin Street
4. Marginal Way (Franklin Street to Diamond Street)

Each of the above work areas will have a specific work permit that will be applied for through the City of Portland Citizen Self Service Portal.

The online work permits involve a thorough application process that includes the development and approval of traffic control plans. Prior to construction in any of the work areas, a permit will be applied for and obtained. Any requests for deviation from the normal City of Portland work hours and traffic restrictions will be addressed during the permit approval process.

Specific comments for each work area are as follows:

1. Preble Street Extension / Baxter Boulevard – This work will consist of the installation of the CSO 16 diversion structure and conveyance piping, which generally follows the outbound shoulder of Preble Street Extension. Two-way traffic will be maintained to the greatest extent possible through utilization of the 4-lane roadway. The CSO 16 diversion structure will be located within Baxter Boulevard and it is anticipated that construction of the diversion structure will require traffic to be reduced to 1-lane alternating traffic with a flagger-controlled intersection, and possibly use a short duration detour the structure is being installed.
2. Back Cove Park – This work consists of the construction of the CSO storage tanks, associated yard piping, Electrical Maintenance Building and site restoration. The primary concern for this work area is management of pedestrian traffic. Refer the above section related to trail maintenance and access during construction. The easternmost section of the Back Cove Park parking lot will be utilized for construction laydown and office space. An additional construction entrance may be installed off of Preble Street Extension to allow construction traffic to directly access the work area and minimize traffic in the existing Preble Street parking lot.
3. Exit 7 – Franklin Street – This work consists of the installation of the CSO 18 diversion structure, associated conveyance piping, forcemain and the Franklin Street separated stormdrain. Sargent will apply for a permit with the City of Portland as well as provide a Traffic Control Plan to the Maine Department of Transportation (MaineDOT) for review and approval. Work restrictions and requirements for Exit 7 outlined in the RFP documents are as follows:

2.5.6.6 Maine Department of Transportation Coordination and Permitting.

Planning Coordination meetings have been held between the City Advisor, City of Portland and MDOT. Since project work will involve grading into the I-295 ROW and working within the Exit 7 on and off ramps utility placement permits and a substantive traffic control plans will be required. The D-B Contractor will be responsible the Utility Placement Permitting based upon the Design Builder's design.

The work in the Exit 7 area will also require that the Design Builder coordinate directly with the MDOT and City of Portland Traffic Engineering to develop an acceptable traffic control plan. Preliminary coordination with the MDOT suggests that Exit 7 must remain open and fully operational during construction with the exception of carefully coordinated weekend shutdowns. This will require the Design Builder to complete all work (other than the weekend shutdowns) during the nighttime. The nighttime work hours will be determined in coordination with the City of Portland and MDOT. In addition, the Design Builder will be responsible for all traffic control signage and acquiring MDOT and City approval for the traffic control plan.

Since the Franklin Arterial and Marginal Way intersection is integral to Exit 7, the Design Builder shall develop a traffic control plan for work within this intersection and surrounding area. The intersection must remain open during the construction period with allowances for night work at which time portions of the intersection may be closed provided that on/off ramp movements are accommodated at Exit 7.

Coordination between the Design-Build Team, the City of Portland, and the MaineDOT is ongoing as a meeting was held on November 7, 2019 during which all parties participated. Project requirements and permitting information was discussed and coordination meetings will continue at least every two weeks moving forward. Sargent will comply with the restrictions outlined above, with any potential deviations to be approved by both the City of Portland and the MaineDOT. It was noted at the first meeting that production will be very slow while working in this area due to these restrictions.

4. Marginal Way from Franklin Street to Diamond Street - This work consists of the installation of the CSO forcemain, which generally follows the east side of Marginal Way. The intent is to provide 2-way traffic to the greatest extent possible. One-way alternating traffic will be used as needed, and night work with traffic officer and / or flagger control will be needed when working near the intersection of Marginal Way and Franklin Street.

12.5.1.3 Spill Prevention & Control

As the majority of the project area is directly adjacent to Back Cove, spill prevention and control is of the utmost importance. Sargent's Spill Prevention & Control plan is located in the Health and Safety Plan, Section IX, subsection 6.0 "Oil and Fuel Spills". A copy of this plan is provided in Appendix J.

12.5.1.4 Health & Safety Requirements

Sargent's project superintendent will function as the primary health and safety officer on the project site. They will have the responsibility and authority to execute and enforce the project Health and Safety Plan (HASp). The field safety specialist will make weekly visits to the project site to conduct inspections and safe work observations. Emergency contact information is provided in Table 12-3.

Table 12-3: BCSSF Project Emergency and Safety Contact List

Contact	Phone Number
Emergency	911
Ambulance	911
Portland Fire	(207) 874-8400
Portland Police	(207) 874-8479
Cumberland County Sheriff	(207) 693-3369
Maine State Police	(207) 624-7079
Sargent Superintendent (Ian McCarthy)	Cell Phone: (207) 478-0010
Sargent Design-Build Project Manager (Glenn Adams)	Cell Phone: (207) 215-2055
Sargent Operations Manager (Doug Morrison)	Cell Phone: (207) 478-3401
Sargent Field Safety Specialist (Arthur Herbest)	Cell Phone: (207) 943-3395
Sargent Safety Director (Adam Kasprzak)	Cell Phone: (207) 745-4817

Site safety will be promoted through Tuesday morning toolbox talks and daily plan-of-the-day (POD) meetings. Crew members are all required to sign-in and participate in these important meetings. The following minimum Personal Protection Equipment (PPE) will be required by all personal on the project site, including visitors:

- Hard hat
- Hi-visibility vest
- Safety glasses
- Safety toe boots
- Long pants
- T-shirt with sleeves

Hearing protection and other PPE will be provided for use as required.

A copy of Sargent's Health and Safety Plan (HASP) is provided Appendix J. A site-specific safety plan will continue to be developed as the project progresses forward. Special attention will be paid to the handling and treatment of hazardous soil and water. Section IX of our HASP "Hazardous Material Exposure" establishes the requirements that everyone working on the project site will follow.

Sargent agrees and warrants that all articles and / or services provided in connection with any work under the contract will shall meet or exceed the safety standards established and promulgated under the Federal Occupational Safety and Health Act (OSHA) of 1970, or under any applicable law of the State of Maine in lieu thereof, for the protection of employees who will be affected by the use or performance of said articles and / or services.

Sargent's subcontractors will comply with all of the above provisions and any further guidelines or project site rules that are developed for use on the project.

In the event of an accident involving the Design-Builder or the Work, an investigative report will be prepared by the Design-Builder and one copy thereof given to the City within 24 hours of the occurrence of the accident.

12.5.2 Construction Methods and Techniques

12.5.2.1 Temporary Utilities

The following temporary utilities are expected for the project:

- Electricity - There is an existing power supply in the southwest corner of Back Cove Park, between Preble Street Extension and the Back Cove Park parking lot. It is anticipated that this location will be utilized as the source of temporary power during construction. Once the primary and secondary power is installed on site, construction power will transition over to that system.
- Potable Water - Potable water for drinking will be supplied by Sargent Corporation. Potable water for construction use, such as testing, will come from a temporary water feed coordinated with the Portland Water District. The PWD currently has a meter pit at the southeast corner of Back Cove Park. Once constructed, the new water fill line for the tipping buckets will be used for construction and testing.
- Sanitary Facilities - Portable toilets will be provided on site for project staff and visitors. They will be kept within the limits of the temporary fence and will be cleaned and maintained weekly. A sufficient number will be provided as the number of project staff changes.

The existing Back Cove Park irrigation and drinking water system is currently shut down. The system is to be removed and replaced in its entirety as part of the BCSSF project.

12.5.2.2 Staging and Stockpiling

Due to the nature of the underlying soils on the project site, staging and stockpiling of materials will be carefully coordinated between Sargent and Terracon to ensure that certain areas do not get overloaded and over-consolidate the underlying clay materials. Limits as to what weight or volume of specific material that can be stockpiled around the project will be determined and followed during the course of the project. The phased construction approach for the tank construction provides for more room on site for staging and stockpiling of materials at any one time. There is no plan for any material to be temporarily staged off-site for later reuse on the project.

Excavated material remaining on site will be protected from erosion by perimeter controls and temporary mulch. If the stockpiled material (such as urban fill) is deemed hazardous, then controls minimizing groundwater infiltration or exfiltration, such as poly liners or containment berms, will be utilized.

Materials to be stockpiled / reused on site include:

- Topsoil
- Urban fill (required to remain on site)
- Granular fill
- Hard clay

Materials to be removed from site include:

- Bay Mud
- Hard clay
- Soft clay

12.5.2.3 Clearing and Grubbing

There is a small amount of clearing on the project. The majority of the trees and shrubs to be taken are located in the northern “finger” of the job between the playing field area of Back Cove Park and the I-295 Exit 7 off-ramp. Prior to clearing, Sargent will notify and meet with the City Arborist in order to confirm what trees will be removed. Based on the current design, all trees located within the project area, including some in the I-295 right-of-way will need to be removed.

Most of the project area is covered by grassed areas underlain by topsoil. This topsoil will be stripped and stockpiled on-site for future screening and reuse when reclaiming the project area. Areas having substantial tree or shrub growth will be grubbed and the material will be stockpiled on site for future screening and reuse on the project. The larger root masses and stumps will be removed from the project site and taken to a local waste dump.

12.5.2.4 Excavation and Backfill

The estimated excavation quantities for the project (not including pipe runs or diversion structures) are as follows:

Total estimated project excavation:	= 80,000 CY
Total estimated project waste material:	= 40,000 CY
Total estimated material to remain on site:	= 40,000 CY

Due to proposed phased construction approach, 40,000 CY of excavation will occur in Phase 1, and a similar amount will occur during Phase 2. This means that for each phase, 20,000 CY will remain on site and 20,000 CY will be taken to a disposal location. These quantities are approximate and may change due to the type of material involved.

Woodard & Curran will oversee the environmental components on the project and will provide direction as necessary related to handling, storage, re-use and disposal of excavation. See the “Environmental Review during Construction” below for further information.

As described in the “Staging and Stockpiling” section above, certain site soils are not suitable for reuse on the project including bay mud and soft clay.

All excavation work will be in accordance with the Geotechnical Engineering Report prepared by Terracon. This includes taking the necessary steps, such as use of geotextile and stone to prevent areas below structures and pipes from becoming destabilized. Sargent will retain the services of a soils testing firm to test compaction and other soil parameters to demonstrate compliance with the contract documents.

12.5.2.5 Dewatering

Sargent has extensive experience with the pumping, treatment, and disposal of groundwater on underground utility projects adjacent to Back Cove. Standard sump and pump methods of groundwater removal will be utilized when working on both the underground utility and diversion structure installations. If tidal influence is seen in a trench, additional pumps will be added as necessary to control the water levels in the work area. If the influence is too great, temporarily sheeting of the outfall areas may be conducted to help cut off flow.

Sargent’s in-house small tools department has a wide range of electric and gas/diesel pumps available. At this point the proposed pumping efforts and methods are preliminary. While leakage into the excavation through the sheets is anticipated, the best time to determine what level of groundwater influence we will be dealing with is when the excavation is in progress. The dewatering plan will be adjusted as necessary.

If the pumped groundwater happens to be clean (no silt or contaminants), it will be discharged directly into the storm drain system. Silty water without contaminants would be pumped to an appropriate treatment system as recommended by the MaineDEP Best Management Practices for Erosion and Sedimentation Control handbook. Clean water would then be discharged into the storm drain system. When groundwater testing indicates the presence of contaminants, a profile will be created, and discharge will be as follows:

- If evidence of potential contamination is observed (e.g., petroleum sheen, odor, or contaminated soil in the vicinity of the groundwater table), sampling will be conducted to generate data that evaluate the presence of contaminants of concern. Contaminated water within the pre-determined allowable limits will be discharged into the sanitary sewer system for treatment at the plant.
- Contaminated water that is not within the pre-determined allowable limits will not be discharged from site. Depending on the contaminant profile, appropriate treatment methods will be utilized, or if necessary, based on the type or degree of contamination, the water may be transported off-site for treatment or disposal.

The Design-Builder is committed to following all groundwater disposal guidelines at set forth in the RFP and all regulatory requirements including the EPA NPDES, DEP MEPDES, and OSHA Hazardous Waste Operations (29 CFR 1910.120).

12.5.2.6 Excavation Support

Sargent has subcontracted with H.B. Fleming to design and install the excavation support system for this project. H.B. Fleming has worked closely with Terracon, to develop a shoring plan that accounts for the unique depth, soil makeup, and global stability of the excavation. The support of excavation design utilizes a combination of 50' long and 90' long sheet piles and tie rods with deadmen to create a cofferdam. Based on the relatively weak subgrade soils on site and the bottom of excavation elevation, the magnitude of the loads applied to the cofferdam are such that additional measures are needed to reduce the overall load. The basis for reducing the overall load is to provide an unobstructed work area (no internal bracing) once the base slab is constructed. In order to achieve this, several different options for reducing the applied load on the cofferdam were evaluated and the following three measures were determined to be the most effective and efficient to implement:

1. Pre-excavation around the cofferdam - The pre-excavation will extend a lateral distance equal to one excavation depth (or greater) away from the cofferdam limits. The pre-excavation will extend to EL 8.0 and will reduce the overall height of the supported soil as well as reduce the surcharge effect of the removed soil; both of which translate to lower loads applied to the cofferdam walls.
2. Maintaining water elevation on the outside of the cofferdam at or below EL 0.0. - This reduces the hydrostatic load applied to the cofferdam and translates to a pronounced reduction in lateral load at/near the bottom of the excavation because of the way hydrostatic pressure builds with depth. The deadmen sheet piles will be utilized to help cut off water infiltration into the area immediately outside the cofferdam walls.
3. Stone drainage/depressurization columns – These will be installed in a grid pattern inside the footprint of the cofferdam. Even with the outside of the cofferdam dewatered to EL 0.0, there will be significant hydrostatic pressure applied to the cofferdam. The combination of the subgrade soil strength and the magnitude of applied hydrostatic pressures provides potential for water migration into the base of the excavation. The risk associated with migration into the base of the excavation is that the subgrade soils could be disturbed in a way that reduces the passive resistance of the soils while the cofferdam is excavated (soil “mattressing”). By installing stone columns within the cofferdam, defined pathways will be provided to relieve excess water

pressure. These columns will also be used for sump placement associated with maintenance of dewatering efforts.

A copy of the excavation support design plans for CSO storage tanks (Phase 1) are provided in Appendix K.

To ensure the quality and effectiveness of the excavation support system, survey monitoring will be utilized on a periodic basis. If movement is detected, we will increase the frequency of monitoring and appropriate steps will be taken to minimize further movement. Periodic vibration monitoring will be conducted, specifically during the sheeting / shoring system installation and removal, inclinometers will be used behind the temporary earth support system to monitor for early detection of ground movement and piezometers will be used to monitor pore water pressure.

12.5.2.7 Site Maintenance

Due to the highly visible nature of the project and the proximity to Back Cove and the Back Cove Trail, the project site will require routine maintenance to address erosion, debris and waste buildup, and to prevent safety and health hazards. Access will always be provided to fire and police personnel and their equipment. If the access gates are locked, such as overnight or during a weekend, keys to any gates in the temporary construction fencing will be provided to responsible parties at those departments. Dumpsters will always be available for use by the Design-Builder and subcontractors during the course of the project. At a minimum, the crews will conduct weekly clean-ups of the work areas. Erosion controls will be established as shown in the project plans and staging and stockpiling of materials will follow the "Staging and Stockpiling" section above. For more information on access to the Back Cove Trail network, please see the "Trail Maintenance and Access during Construction" section above.

12.5.3 Environmental Review During Construction

Woodard & Curran's environmental team has completed pre-construction testing of in-place soil and groundwater in the proposed excavation areas. This process allows classification of the excavated materials prior to performing the mass excavation work. The materials will be disposed of in the required manner based on the results of the classification; see Limited Subsurface Investigation Report in Appendix B. Disposal will be in accordance with all applicable federal, state, and local regulations, including the OSHA Hazardous Waste Operations (29 CFR 1910.120), EPA Hazardous Waste Regulations (40 CFR 261-268), and DEP Hazardous Waste Regulations (DEM OWM-HW01-07).

At a minimum, the Design-Builder will conduct weekly inspections of the project site to ensure erosion control devices are installed where required and maintained properly. A copy of the weekly inspection form is below.

Figure 12-1: Example Erosion Control Inspection Form



EROSION CONTROL INSPECTION

DATE: _____
PROJECT: _____
JOB # _____

DESCRIPTION	YES	NO	N/A	LOCATION / COMMENTS
Are silt fences and super silt fences installed properly?				
Are silt fences and super silt fences in need of maintenance/repair?				
Are any disturbed areas unprotected by erosion control measures?				
Are soil stockpiles piled on high side and protected?				
Are wetland areas properly delineated?				
Are operations limited to specific areas of disturbance?				
Are any areas available for restoration/temporary mulch?				
Are all check dams or sediment traps cleaned out?				
Is all storm drain inlet protection in place?				
Are stabilization entrances in place and maintained?				
Are hay bales in place and in accordance with specifications?				
Are any other erosion controls necessary to complete the work in accordance with specifications?				
Is any construction water being pumped/discharged improperly?				

COMMENTS AND SAFETY CONCERNS:

Sign below if all site conditions meet or exceed the intent of the Erosion Control Plan.

Foreman's Signature _____

Superintendent's Signature _____

12.5.4 Construction Documentation

Per the RFP, the following documentation will be produced during and at the completion of construction:

- Construction Plans;
- Submittals including shop drawings, samples and product data;
- RFIs;
- O&M Manual; and
- Record Drawings.

All construction shop drawings and RFIs will be submitted and tracked via the Project Procore site.

APPENDIX A: GEOTECHNICAL ENGINEERING REPORT



Geotechnical Engineering Report Basis of Design Phase

**Portland Back Cove South Storage Facility
Portland, Maine**

February 7, 2020

Terracon Project No. J1185157

Prepared for:

Sargent Corporation
Stillwater, Maine

Prepared by:

Terracon Consultants, Inc.
Manchester, New Hampshire



February 7, 2020

Sargent Corporation
378 Bennoch Road, P.O. Box 435
Stillwater, ME 04489



Attn: Mr. Glenn J. Adams, P.E. – Senior Project Manager
P: (207) 827 4435
E: gadams@sargentcorp.com

Re: Geotechnical Engineering Report – Basis of Design Phase
Portland Back Cove South Storage Facility
Preble Street Extension
Portland, Maine
Terracon Project No. J1185157

Dear Mr. Adams:

We have completed the Geotechnical Engineering services for the Basis of Design Phase for the above referenced project. This study was performed in general accordance with Sargent Corp's Technical Proposal – Volume 2 – Technical Proposal dated March 28, 2019. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning design and construction of the Portland Back Cove South Storage Facility.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Marc A. Gullison, P.E. (NH)
Senior Staff Engineer

Carl W. Thunberg, P.E.
Geotechnical Department Manager



REPORT TOPICS

INTRODUCTION.....	1
PROJECT DESCRIPTION.....	1
GEOTECHNICAL CHARACTERIZATION.....	2
GEOTECHNICAL OVERVIEW	4
GEOTECHNICAL ANALYSIS	5
SEISMIC CONSIDERATIONS	6
GENERAL COMMENTS.....	7
FIGURES	9

Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the **GeoReport** logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES
SITE LOCATION AND EXPLORATION PLANS
EXPLORATION RESULTS
SUPPORTING INFORMATION

Note: Refer to each individual Attachment for a listing of contents.

Geotechnical Engineering Report
Basis of Design Phase
Portland Back Cove South Storage Facility
Preble Street Extension
Portland, Maine
Terracon Project No. J1185157
February 7, 2020

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Portland Back Cove South Storage Facility to be located beneath Back Cove Park, Preble Street Extension in Portland, Maine. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Soil laboratory testing
- Global stability analysis results
- Deep excavation considerations
- Excavation considerations
- Groundwater conditions
- Soil parameters for analysis
- Seismic site classification per IBC
- Lateral earth pressures
- Post construction settlement

The geotechnical engineering Scope of Services for this project included the advancement of six test borings to depths ranging from approximately 37 to 132.8 feet below existing site grades. This Basis of Design Phase geotechnical report presents the analyses and recommendations to support the Basis of Design Report and reflects the current state of design and analysis. This report will be finalized following completion of additional analyses, including consolidation settlement of areas outside the CSO storage tank in response to an additional two feet of fill, earthwork construction recommendations, and instrumentation/monitoring recommendations.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and/or as separate graphs in the **Exploration Results** section.

PROJECT DESCRIPTION

The City of Portland has retained the Sargent design-build team to design and construct a 3.5 million gallon combined sewer overflow (CSO) storage tank below the Back Cove Park off Preble Street Extension in Portland, Maine. The design-build team has developed a tank configuration

incorporating four separate cast-in-place tanks. Refer to the Basis of Design report prepared by Woodard & Curran for details of the hydraulic design.

The relevant tank dimensions for geotechnical considerations are as follows:

- Bottom of base slab elevation -20.6
- Plan Area – 242 ft long, 56 ft wide (outside) dimensions

GEOTECHNICAL CHARACTERIZATION

Six test borings were advanced at the site between September 9 and 13, 2019. The test borings were drilled by Northern Test Borings under the direction of Terracon. Test borings were advanced to depths ranging from 37 to 132.8 feet. In general, the borings within the CSO storage tank footprint were drilled to sufficient depths to characterize the upper sands, bay mud, upper and lower clays, and to penetrate the clay until encountering glacial till or roller bit refusal on presumed bedrock. Field vane shear tests were performed generally at 5-foot intervals through the bay mud and clay. Undisturbed Shelby tube samples were obtained while drilling for soil laboratory testing.

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
01	Fill	Silty sand with gravel, Silty sand, Silt, occasional brick fragments, trace organic matter, dark brown, variable density
02	Upper Sand	Poorly graded Sand (SP), Poorly graded sand with Silt (SP-SM), brown to gray, loose to medium dense
03	Bay Mud	Organic Silt (OH), black, very soft, strong organic odor
04	Upper Clay	Lean clay (CL), gray, very soft, with occasional sand and silt seams
05	Lower Clay	Lean clay (CL), gray to dark blue-gray, very soft
06	Lower Sand	Poorly graded Sand with silt (SP-SM), Silty Sand (SM), gray, medium dense

07	Glacial Till	Silty sand with Gravel (SM), gray, medium dense to dense
08	Bedrock	Inferred from roller bit resistance at bottom of boring. No rock coring performed.

Groundwater Conditions

Groundwater measurements are summarized in the following table and are noted on the boring logs in the **Exploration Results** section.

Boring No.	Approximate Ground Surface Elevation (feet)	Approximate Groundwater Depth (feet)	Approximate Groundwater Elevation (feet)
TB 1	9	Not Determined	---
TB-2	9.5	7.3	2.2
TB-3	10	7.0	3.0
TB-4	10	7.0	3.0
TB-5	9	22.0	-13
TB-6	11	7.9	3.1

1. Groundwater levels measured while drilling or upon completion.

Groundwater level fluctuations occur due to tidal influence and seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

In-Situ Electrical Resistivity

An in-situ soil resistivity test was performed in the vicinity of the proposed electrical building. Soil electrical resistivity data were obtained in accordance with ASTM G57 Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method. Two perpendicular lines were tested, one running roughly north-south and the other running east-west, with "a" spacings of 2, 5, 10, 20, and 50 feet.

We included the field data sheets in the **Exploration Results** section.

Field resistivity values may vary depending upon the season, precipitation, and temperature, and subsurface factors such as variations in soil density and degree of compaction, presence of coarse gravel and cobbles, and soil constituent solubility which may be different from those at the

time of testing. Field resistivity values should be evaluated based on the measured data in conjunction with published values for the material.

Soil Laboratory Testing

Undisturbed Shelby tube samples and split spoon samples were transported to our in-house soil laboratory for soil laboratory testing. The following soil laboratory tests were performed:

- Atterberg Limits
- Unconsolidated, Undrained Compression Tests
- One-dimensional consolidation Tests

Refer to **Exploration Results** for soil laboratory test reports. Additionally, S.W. Cole performed soil laboratory testing during the preliminary geotechnical investigation of the site. The S.W. Cole soil laboratory data were also used to support our analyses.

GEOTECHNICAL OVERVIEW

Based on the subsurface explorations and soil laboratory data, we have developed the following geotechnical parameters for global stability analyses

Material	Unsaturated Unit Weight (pcf)	Saturated Unit Weight	Friction Angle (degrees)	Cohesion (psf)
I-295 Fill	125	130	36	0
Urban Fill	120	125	32	0
Upper Sand	120	125	32	0
Bay Mud	90	95	0	450
Upper Clay	110	115	0	375
Lower Clay	110	115	0	625
Deep Sand	120	125	34	0
Glacial Till	125	130	38	0

We have developed the following table of geotechnical parameters for structural design of the CSO storage tank and electrical building

Geotechnical Parameter	CSO Tank	Electrical Building
Saturated Unit Weight of Backfill (pcf)	125	125
Saturated Unit Weight of Backfill over Buried Cover Slabs (pcf)	120	Not Applicable
Net Allowable Bearing Pressure (psf)	1,000	3,000
Active Earth Pressure Coefficient	0.49	0.49
At-rest Earth Pressure Coefficient	.066	0.66
Passive Earth Pressure Coefficient	2.04	2.04
Sliding Coefficient of Friction	0.35	0.45
Modulus of Subgrade Reaction (psi/in)	100	200

GEOTECHNICAL ANALYSIS

The site is underlain by normally consolidated clay. Key geotechnical concerns are global slope stability concerns from the I-295 embankment, traffic and construction surcharge, stability of the bottom of the excavation, and long-term consolidation settlements for the CSO storage tanks.

Global Slope Stability Analyses

Terracon performed global slope stability analyses using the computer model SLIDE. The above soil parameters were used in our analyses. Traffic surcharge was modeled as a uniform surcharge of 250 psf. Construction surcharge was modeled as uniform surcharge of 240 psf applied at the perimeter of the sheet pile coffer dam. A factor of safety of 1.3 was used for temporary excavations, and 1.5 was used for permanent. Given the construction schedule, the excavation was modeled as a permanent excavation.

Our analysis results show a tip elevation of -80 feet for the sheet pile coffer dam is required for a factor of safety of 1.5. Groundwater must be maintained at elevation 0.0 by dewatering. The shoring designer has included stone columns to facilitate drainage and relieve pore pressures in the clay. The minimum sheet pile embedment elevation required for seepage cutoff is -40. The shoring Contractor H.B. Fleming has incorporated staggered sheeting into their analyses. Alternating sheets will be staggered at tip elevations of -80 and -40. Our global slope stability analyses are included in Supporting Information.

Bottom Stability

Terracon evaluated the bottom stability of the excavation using the computer program HEAVE version 8. The same soil parameters were used for bottom stability calculations. Our analyses indicate a factor of safety of 3.05 against bottom heave.

However, to protect the clay in an undisturbed condition, we recommend a minimum 2-foot thick layer of crushed stone underlain by woven geotextile be placed as a working mat.

Instrumentation and Monitoring

The performance of the excavation should be monitored using a combination of horizontal and vertical survey points, slope inclinometers installed outside the braced excavations, and piezometers to monitor pore water pressure. The intent of the geotechnical instrumentation monitoring is to detect early movements in time to make corrective actions. The vertical and horizontal survey points should be established along the face of the sheet piles following installation and prior to excavation. Survey monitoring points are intended to measure deflection of the sheet piles. Slope inclinometers are intended to detect soil movement behind the wall. Piezometers are intended to monitor pore water pressure to assure the stone columns are functioning properly to relieve hydrostatic pressure. The layout and specifications of geotechnical instrumentation will be determined during final design.

Long-term Consolidation Settlement

The clay below the site is normally consolidated and prone to consolidation settlement under the weight of structures and new fills. Based on a comparison of tank weights and volumes provided by Woodard & Curran to the weight of soil excavated, there will be a slight net decrease (i.e. unloading) in effective stress in the clay below the tanks. Therefore, long-term consolidation settlements of the clay below the tanks should be negligible.

An additional 2-feet of fill is planned in the soccer field area outside the limits of the CSO storage tanks. We estimate up to 12 inches of consolidation settlement within the bay mud may occur in the areas outside the CSO storage tanks. Based on our discussions with Sargent Corp, there is an option to pre-load the areas outside the CSO storage tank footprint using excavation spoils from the CSO excavation. At this time in project development, we have not yet modeled the effects of pre-load on the bay mud in areas outside the CSO footprint. This will be completed as part of final design.

SEISMIC CONSIDERATIONS

Surface Seismic Testing

On November 21, 2019, Terracon used a seismic refraction system (SRS) consisting of a seismograph and 24 geophones to perform a site-specific seismic class survey. One linear array of 24 geophones were placed at the edge of pavement in the proposed building footprint area. A computer was used to record refraction microtremors produced by ambient seismic noise. The data were then processed using a wavefield-transformation data-processing technique and an interactive Rayleigh-wave dispersion-modeling tool. The refraction microtremor method exploits aspects of spectral analysis of surface waves (SASW) and multi-channel analysis of surface waves (MASW) to derive a shear wave profile and an average shear-wave velocity along the array for a corresponding depth of about 100 feet.

The average shear-wave velocity analysis and recommendations presented in this report are based upon the data obtained from the seismic refraction system performed at the indicated location and on the indicated date. This analysis does not reflect variations that may occur across the site, or variations that may occur throughout the year, such as groundwater fluctuations. The refraction microtremor method is an approximate method, and one of many methods that can be used to determine shear-wave velocities. Surface seismic test results are included in **Exploration Results**

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the surface seismic testing performed, the average shear wave velocity to a depth of 100 feet was measured as 350 feet per second, which corresponds to a **Seismic Site Classification of E**.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of

Geotechnical Engineering Report

Portland Back Cove South Storage Facility ■ Portland, Maine

February 7, 2020 ■ Terracon Project No. J1185157



pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

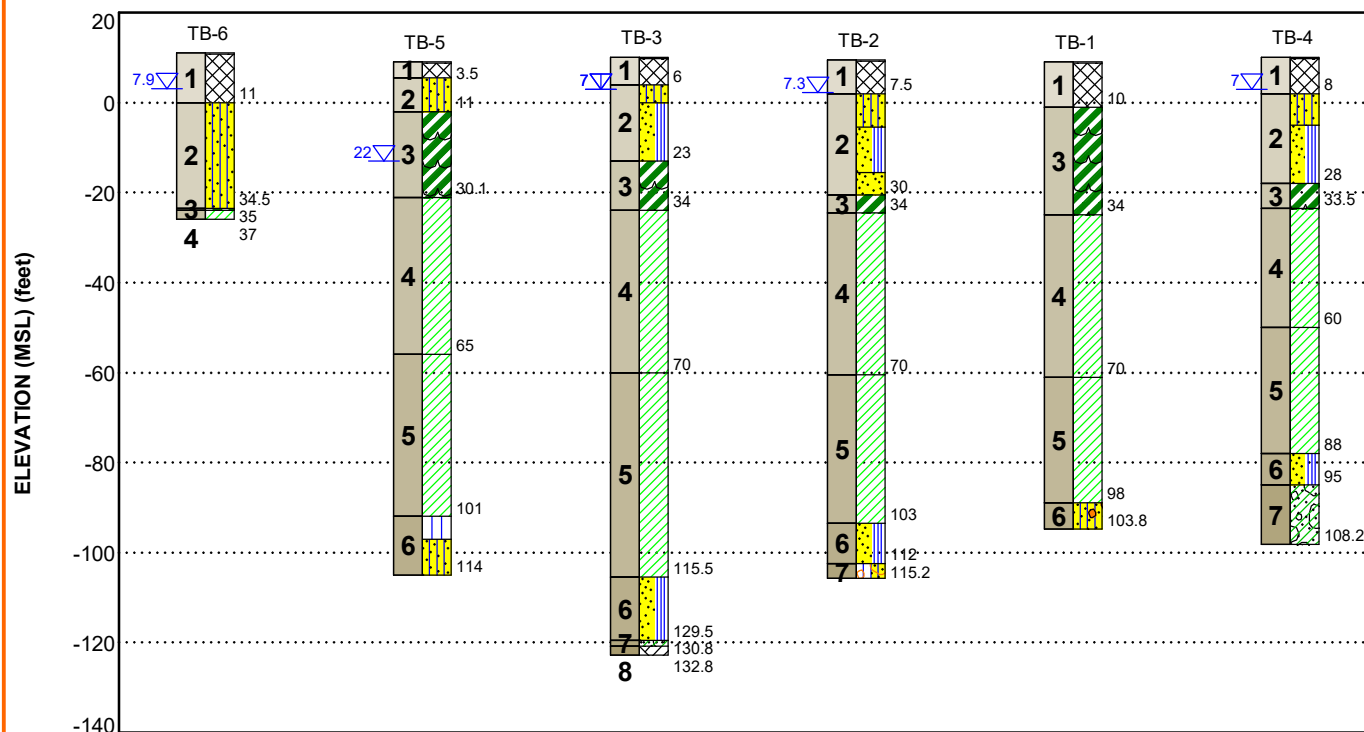
FIGURES

Contents:

GeoModel

GEOMODEL

Back Cove South Storage Facility ■ Portland, ME
Terracon Project No. J1185157



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

LEGEND

Model Layer	Layer Name	General Description
1	Fill	Silty sand with gravel, Silty sand, Silt, occasional brick fragments, trace organic matter, dark brown, variable density
2	Upper Sand	Poorly graded Sand (SP), Poorly graded sand with Silt (SP-SM), brown to gray, loose to medium dense
3	Bay Mud	Organic Silt (OH), black, very soft, strong organic odor
4	Upper Clay	Lean clay (CL), gray, very soft, with occasional sand and silt seams
5	Lower Clay	Lean clay (CL), gray to dark blue-gray, very soft
6	Lower Sand	Poorly graded Sand with silt (SP-SM), Silty Sand (SM), gray, medium dense
7	Glacial Till	Silty sand with Gravel (SM), gray, medium dense to dense
8	Bedrock	Inferred from roller bit resistance at bottom of boring. No rock coring performed.

Topsoil	Fill
Organic Elastic Silt	Lean Clay
Silty Sand with Gravel	Silty Sand
Poorly-graded Sand with Silt	Poorly-graded Sand
Silty Gravel with Sand	Glacial Till
Bedrock	Silt

NOTES:

Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.

GROUNDWATER NOTES:

First Water Observation
Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Second Water Observation
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

ATTACHMENTS

SITE LOCATION AND EXPLORATION PLANS

Contents:

Site Location

Exploration Plan

Note: All attachments are one page unless noted above.

SITE LOCATION

Portland Back Cove South Storage Facility ■ Portland, Maine

February 7, 2020 ■ Terracon Project No. J1185157



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN

Portland Back Cove South Storage Facility ■ Portland, Maine

February 7, 2020 ■ Terracon Project No. J1185157



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

Boring Logs (TB-1 through TB-5)

Atterberg Limits

Unconsolidated Undrained Compression Tests (4)

One-dimensional Consolidation Tests (4)

Field Electrical Resistivity Test

Surface Seismic Shear Wave Velocity

Note: All attachments are one page unless noted above.

BORING LOG NO. TB-1

Page 1 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6649° Longitude: -70.2641° Approximate Surface Elev.: 9 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH 0.3 3 inches of topsoil ELEVATION (Ft.) 8.5 +/-					
1		FILL - SILTY SAND WITH GRAVEL , dark brown to gray, medium dense				24	3-8-8-7 N=16
						20	8-8-8-23 N=16
		FILL - SILT , dark gray to black, very loose	5			20	1-2-1-1 N=3
		10.0	10			24	WOH/12"-1-1 N=1
		ORGANIC SILT (OH) , dark gray to black, very soft					
						24	WOH/24"
3			15				
			20			24	WOH/24"
			25				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:
s_u = Undrained Shear Strength (Corrected)
s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

Water level not determined

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-09-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-09-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

BORING LOG NO. TB-1

Page 2 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6649° Longitude: -70.2641° Approximate Surface Elev.: 9 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
3		ORGANIC SILT (OH) , dark gray to black, very soft (<i>continued</i>)	30		X	24	WOH/24"
			34.0				
4		LEAN CLAY (CL) , gray, very soft $s_u / s_{ur} = 308 / 51.3$ psf $s_u / s_{ur} = 291 / 51.3$ psf $s_u / s_{ur} = 274 / 34.2$ psf	35		X	24	WOH/24"
			40		X	24	WOR/12"-WOH/12"
			45		X	24	WOH/24"
			50				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:
 s_u = Undrained Shear Strength (Corrected)
 s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

Water level not determined

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-09-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-09-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

BORING LOG NO. TB-1

Page 3 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, MESITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6649° Longitude: -70.2641° Approximate Surface Elev.: 9 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
DEPTH		ELEVATION (Ft.)					
4		LEAN CLAY (CL), gray, very soft (<i>continued</i>) $s_u / s_{ur} = 342 / 51.3$ psf $s_u / s_{ur} = 376 / 68.4$ psf $s_u / s_{ur} = 462 / 68.4$ psf $s_u / s_{ur} = 428 / 51.3$ psf	55				
			60				
			65				
			70				
5		LEAN CLAY (CL), gray, very soft $s_u / s_{ur} = 589 / 34.6$ psf $s_u / s_{ur} = 554 / 34.6$ psf	75				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:

 s_u = Undrained Shear Strength (Corrected) s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

Water level not determined

Terracon77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-09-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-09-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

BORING LOG NO. TB-1

Page 4 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, MESITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6649° Longitude: -70.2641° Approximate Surface Elev.: 9 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
DEPTH		ELEVATION (Ft.)					
5		LEAN CLAY (CL) , gray, very soft (<i>continued</i>)	80				
			85			24	WOH/24"
			90				
			95				
6		SILTY SAND WITH GRAVEL (SM) , gray, dense	98.0				
			-89+/-				
			100				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:

 s_u = Undrained Shear Strength (Corrected) s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

Water level not determined

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-09-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-09-2019

Driller: NTB / M. Nadeau

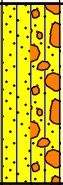
THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

BORING LOG NO. TB-1

Page 5 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, MESITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6649° Longitude: -70.2641° Approximate Surface Elev.: 9 (Ft.) +/- DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
6		SILTY SAND WITH GRAVEL (SM) , gray, dense (<i>continued</i>) Roller bit resistance on probable bedrock at 103.8 feet Boring Terminated at 103.8 Feet	103.8 -95+/-			18	17-21-17-12 N=38
Stratification lines are approximate. In-situ, the transition may be gradual. Hammer Type: Automatic							
Advancement Method: 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole		See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (if any). See Supporting Information for explanation of symbols and abbreviations.		Notes: Field Vane Shear Symbols: s _u = Undrained Shear Strength (Corrected) s _{ur} = Remolded Undrained Shear Strength (Corrected)			
Abandonment Method: Boring backfilled with soil cuttings and imported gravel upon completion.							
WATER LEVEL OBSERVATIONS		 77 Sundial Ave, Ste 401W Manchester, NH		Boring Started: 09-09-2019		Boring Completed: 09-09-2019	
Water level not determined				Drill Rig: Diedrich D-50		Driller: NTB / M. Nadeau	
				Project No.: J1185157			

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BORING LOG NO. TB-2

Page 1 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6644° Longitude: -70.2647° Approximate Surface Elev.: 9.5 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH 0.3 3 inches of topsoil FILL - SILTY SAND WITH GRAVEL , dark brown to black, very dense, with brick fragments 9+/-					
1		FILL - SILTY SAND , trace gravel, dark gray, medium dense 7.5 Auger resistance reduced at 7.5 feet SILTY SAND (SM) , dark gray, loose, shell fragment 2+/-	5			18	20-23-30-21 N=53
						17	6-11-12-11 N=23
			10			12	2-3-3-2 N=6
2		15.0 POORLY GRADED SAND WITH SILT (SP-SM) , gray to light brown, medium dense -5.5+/- Roller bit resistance reduced at 19.7 feet Similar, with gravel 25.0 -15.5+/-	15			8	9-7-6-12 N=13
			20			10	4-4-4-3 N=8
			25				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:
s_u = Undrained Shear Strength (Corrected)
s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

7.3 feet on 9/11/2019

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-10-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-10-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_J1185157 BACK COVE SOUTH S.GPJ TERRACON.DATATEMPLATE.GDT 2/4/20

BORING LOG NO. TB-2

Page 2 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6644° Longitude: -70.2647° Approximate Surface Elev.: 9.5 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
2		POORLY GRADED SAND (SP) , trace gravel, loose 30.0 -20.5+/-	30			5	2-2-3-4 N=5
3		ORGANIC SILT (OH) , black, soft, with shell fragments 34.0 -24.5+/-	35			24	1-1-2-3 N=3
4		LEAN CLAY (CL) , gray, very soft Similar, dark blue-gray 1/4-inch thick layers at 36 and 36.8 feet $s_u / s_{ur} = 376 / 85.6$ psf $s_u / s_{ur} = 376 / 102.7$ psf $s_u / s_{ur} = 376 / 85.6$ psf $s_u / s_{ur} = 342 / 102.7$ psf	40 45 50			22 24 24	WOH/24" WOH/24" WOH/24"

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

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 s_u = Undrained Shear Strength (Corrected)
 s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

7.3 feet on 9/11/2019

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-10-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-10-2019

Driller: NTB / M. Nadeau

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BORING LOG NO. TB-2

Page 3 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6644° Longitude: -70.2647° Approximate Surface Elev.: 9.5 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
		LEAN CLAY (CL) , gray, very soft (<i>continued</i>)					
		Similar, dark blue-gray 1/4-inch thick layer at 56.5 feet $s_u / s_{ur} = 376 / 68.4$ psf $s_u / s_{ur} = 411 / 85.6$ psf	55			22	WOR/24"
		Similar, dark blue-gray 1/4-inch thick layer at 61 feet $s_u / s_{ur} = 445 / 51.3$ psf $s_u / s_{ur} = 462 / 68.4$ psf	60			24	WOR/24"
			65				
			70			24	WOR/24"
			75				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

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 s_u = Undrained Shear Strength (Corrected)
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WATER LEVEL OBSERVATIONS

7.3 feet on 9/11/2019

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-10-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-10-2019

Driller: NTB / M. Nadeau

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BORING LOG NO. TB-2

Page 4 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6644° Longitude: -70.2647° Approximate Surface Elev.: 9.5 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
		LEAN CLAY (CL) , dark blue-gray, very soft, varved (<i>continued</i>) Similar, transitioning to less dark blue-gray at 76 feet, 1/8-inch sand seam at 76.3 feet $s_u / s_{ur} = 658 / 34.6$ psf $s_u / s_{ur} = 606 / 34.6$ psf				24	WOR/24"
		Similar, gray to dark blue-gray mottling $s_u / s_{ur} = 641 / 52.0$ psf $s_u / s_{ur} = 658 / 69.3$ psf	80			24	WOR/24"
		Similar, gray, 1/4 to 1/2-inch thick dark blue-gray layers at 1 to 3 inch spacing	85			24	WOR/24"
		Similar, with dark blue-gray layers $s_u / s_{ur} = 641 / 34.6$ psf $s_u / s_{ur} = 624 / 34.6$ psf	90			20	WOR/24"
		Similar, with occasional sand seams	95			22	WOR/24"
			100				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

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 s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

7.3 feet on 9/11/2019

Terracon

77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-10-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-10-2019

Driller: NTB / M. Nadeau

BORING LOG NO. TB-2

Page 5 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6644° Longitude: -70.2647° Approximate Surface Elev.: 9.5 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
5		LEAN CLAY (CL) , dark blue-gray, very soft, varved (<i>continued</i>) Similar, with occasional sand seams Drilling resistance increased at 103 feet 103.0	-93.5+/-			20	WOH/24"
6		POORLY GRADED SAND WITH SILT (SP-SM) , gray, medium dense Similar, 2-inch thick lean clay layer at 105.5 feet Similar, clayey sand in tip of the sampler Roller bit resistance increased at 112 feet 112.0	-102.5+/-			16	5-9-13-14 N=22
7		SILTY GRAVEL WITH SAND (GM) , gray, very dense Attempted to advance boring past 115 feet, however the hole caved in at 105 feet 115.2	-105.5+/-			14	13-11-11-17 N=22
		Boring Terminated at 115.2 Feet	115			2	50/2"

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

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Notes:

Field Vane Shear Symbols:
s_u = Undrained Shear Strength (Corrected)
s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

7.3 feet on 9/11/2019

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-10-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-10-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

BORING LOG NO. TB-3

Page 1 of 6

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6639° Longitude: -70.2655° Approximate Surface Elev.: 10 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH 0.3 3 inches of topsoil FILL - SILTY SAND WITH GRAVEL , brown, medium dense, brick fragments POORLY GRADED SAND WITH SILT , light brown, medium dense 6.0 SILTY SAND (SM) , gray to blue-gray, medium dense, wood fiber at 6.5 feet 10.0 POORLY GRADED SAND WITH SILT (SP-SM) , brown to gray Advanced sampler through cobble at 11 feet 2 Similar, trace gravel No recovery, wash cuttings indicate gray sand to 20 feet 23.0 Wash cuttings change from gray to black at 23 feet ORGANIC SILT (OH) , black, very soft 25.0	ELEVATION (Ft.) 9.5+/- 4+/- 0+/- -13+/-				
1						14	8-12-9-12 N=21
			5			17	6-6-9-17 N=15
			10			12	17-24-25-22 N=49
			15			10	4-6-7-6 N=13
			20			0	2-1-1-1 N=2
3			25				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 25 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:
s_u = Undrained Shear Strength (Corrected)
s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

▽ 7.0 feet at completion of drilling
▽ 7.0 feet on 9/12/2019

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-11-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-11-2019

Driller: NTB / M. Nadeau

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BORING LOG NO. TB-3

Page 2 of 6

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6639° Longitude: -70.2655° Approximate Surface Elev.: 10 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
		ORGANIC SILT (OH) , black, very soft (<i>continued</i>)					
		$s_u / s_{ur} = 620 / 29.5$ psf				22	WOH/24"
3		$s_u / s_{ur} = 1270 / 181.5$ psf $s_u / s_{ur} = 1089 / 158.8$ psf	30			24	WOH/24"
		34.0 Wash cuttings change from black to gray at 34 feet					
		LEAN CLAY (CL) , gray, very soft, with occasional dark blue-gray layers					
		Sand and silt seam at 36 feet	35			24	WOR/24"
		$s_u / s_{ur} = 359 / 51.3$ psf $s_u / s_{ur} = 205 / 68.4$ psf					
4			40				
		Similar, dark blue-gray layers not observed	45			22	WOR/24"
		$s_u / s_{ur} = 342 / 34.2$ psf $s_u / s_{ur} = 342 / 68.4$ psf					
			50				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 25 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

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Notes:

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 s_u = Undrained Shear Strength (Corrected)
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WATER LEVEL OBSERVATIONS

- 7.0 feet at completion of drilling
- 7.0 feet on 9/12/2019

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-11-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-11-2019

Driller: NTB / M. Nadeau

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BORING LOG NO. TB-3

Page 3 of 6

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6639° Longitude: -70.2655° Approximate Surface Elev.: 10 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
4		LEAN CLAY (CL) , gray, very soft, with occasional dark blue-gray layers (<i>continued</i>) $s_u / s_{ur} = 411 / 68.4$ psf $s_u / s_{ur} = 411 / 68.4$ psf				22	WOR/24"
		Sand seam at 56.5 feet $s_u / s_{ur} = 376 / 17.1$ psf $s_u / s_{ur} = 411 / 34.2$ psf	55			24	WOR/24"
			60				
		$s_u / s_{ur} = 513 / 102.7$ psf $s_u / s_{ur} = 445 / 68.4$ psf	65			18	WOR/24"
5		LEAN CLAY (CL) , gray to dark blue-gray, very soft $s_u / s_{ur} = 676 / 86.6$ psf $s_u / s_{ur} = 658 / 69.3$ psf	70			24	WOR/24"
			75				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 25 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

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Notes:

Field Vane Shear Symbols:
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WATER LEVEL OBSERVATIONS

- 7.0 feet at completion of drilling
- 7.0 feet on 9/12/2019

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-11-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-11-2019

Driller: NTB / M. Nadeau

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BORING LOG NO. TB-3

Page 4 of 6

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6639° Longitude: -70.2655° Approximate Surface Elev.: 10 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
DEPTH		ELEVATION (Ft.)					
		LEAN CLAY (CL) , gray to dark blue-gray, very soft (<i>continued</i>) $s_u / s_{ur} = 797 / 69.3$ psf $s_u / s_{ur} = 762 / 69.3$ psf				24	WOR/24"
		Similar, gray with dark blue-gray mottling $s_u > 866$ psf (Torque wrench reached capacity) Silt seam at 86 feet	80				
			85			24	WOR/24"
		Slight drilling resistance at 93 feet	90				
		Similar, gray with dark blue-gray mottling	95			12	WOR/12"- WOH/12"
			100				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 25 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

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 s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

- 7.0 feet at completion of drilling
- 7.0 feet on 9/12/2019

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-11-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-11-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

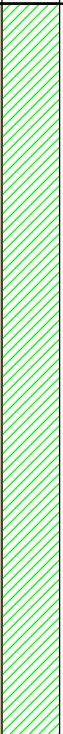
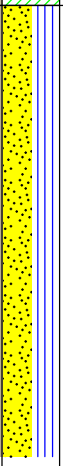
BORING LOG NO. TB-3

Page 5 of 6

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6639° Longitude: -70.2655° Approximate Surface Elev.: 10 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
DEPTH		ELEVATION (Ft.)					
5		LEAN CLAY (CL) , gray to dark blue-gray, very soft (<i>continued</i>) Similar, varved	105				
			110				
			115				
6		POORLY GRADED SAND WITH SILT (SP-SM) , gray, medium dense 2-inch thick clayey sand layer at 116 feet	120				
			125				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 25 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:
s_u = Undrained Shear Strength (Corrected)
s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

- 7.0 feet at completion of drilling
- 7.0 feet on 9/12/2019

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-11-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-11-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

BORING LOG NO. TB-3

Page 6 of 6

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6639° Longitude: -70.2655° Approximate Surface Elev.: 10 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
DEPTH		ELEVATION (Ft.)					
6		POORLY GRADED SAND WITH SILT (SP-SM) , gray, medium dense (<i>continued</i>) 2-inch thick sandy lean clay layer at 126 feet				14	11-10-18-14 N=28
		129.5	-119.5+/-				
7		Roller bit resistance increased at 129.5 feet on probable glacial till or weathered rock	130				
		130.8	-121+/-				
8		Roller bit resistance at 130.8 feet on probable bedrock					
		132.8	-123+/-				
Boring Terminated at 132.8 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 25 feet, then open hole

Abandonment Method:
Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:
s_u = Undrained Shear Strength (Corrected)
s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

7.0 feet at completion of drilling
7.0 feet on 9/12/2019

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-11-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-11-2019

Driller: NTB / M. Nadeau

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BORING LOG NO. TB-4

Page 1 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6645° Longitude: -70.2639° Approximate Surface Elev.: 10 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
		0.3 3 inches of topsoil FILL - SILTY SAND WITH GRAVEL , brown to gray, medium dense, coal fragments	9.5+/-				
1			5			20	17-28-15-10 N=43
			8.0			8	6-15-9-9 N=24
		SILTY SAND (SM) , brown, medium dense, trace gravel	2+/-				
			10			4	3-5-8-7 N=13
		Trace bay mud in wash cuttings at 14 feet					
			15.0			10	3-2-2-2 N=4
2		POORLY GRADED SAND WITH SILT (SP-SM) , light brown, trace gravel	-5+/-				
			20			7	2-1-2-4 N=3
			25				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:
s_u = Undrained Shear Strength (Corrected)
s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

▽ 7.0 feet at completion of drilling

Terracon

77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-12-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-12-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

BORING LOG NO. TB-4

Page 2 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6645° Longitude: -70.2639° Approximate Surface Elev.: 10 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
DEPTH		ELEVATION (Ft.)					
2		POORLY GRADED SAND WITH SILT (SP-SM) , light brown, trace gravel (<i>continued</i>) 28.0 -18+/-				13	3-1-2-4 N=3
3		ORGANIC SILT (OH) , black, very soft Shells present at 30 feet 33.5 -23.5+/-	30			24	1-2-3-3 N=5
4		LEAN CLAY (CL) , gray, very soft, with occasional dark blue-gray layers $s_u / s_{ur} = 787 / 171.1$ psf $s_u / s_{ur} = 445 / 102.7$ psf $s_u / s_{ur} = 240 / 68.4$ psf $s_u / s_{ur} = 257 / 68.4$ psf $s_u / s_{ur} = 342 / 68.4$ psf $s_u / s_{ur} = 342 / 68.4$ psf	35 40 45 50			24 24 0	WOR/24" WOR/24" WOR/24"

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

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Notes:

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WATER LEVEL OBSERVATIONS

7.0 feet at completion of drilling

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-12-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-12-2019

Driller: NTB / M. Nadeau

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BORING LOG NO. TB-4

Page 3 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6645° Longitude: -70.2639° Approximate Surface Elev.: 10 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
4		LEAN CLAY (CL) , gray, very soft, with occasional dark blue-gray layers (<i>continued</i>) $s_u / s_{ur} = 462 / 85.6$ psf $s_u / s_{ur} = 428 / 102.7$ psf $s_u / s_{ur} = 479 / 85.6$ psf $s_u / s_{ur} = 462 / 51.3$ psf	55		 	24	WOR/24"
			60.0		 	24	WOR/24"
5		LEAN CLAY (CL) , gray to dark blue-gray, very soft $s_u / s_{ur} = 589 / 34.6$ psf $s_u / s_{ur} = 589 / 34.6$ psf $s_u / s_{ur} = 589 / 52.0$ psf $s_u / s_{ur} = 572 / 69.3$ psf	60 65 70 75		     	24	WOR/24"

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

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 s_u = Undrained Shear Strength (Corrected)
 s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

 7.0 feet at completion of drilling

Terracon
 77 Sundial Ave, Ste 401W
 Manchester, NH

Boring Started: 09-12-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-12-2019

Driller: NTB / M. Nadeau

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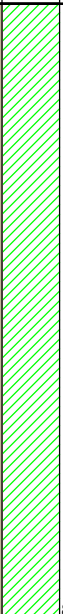
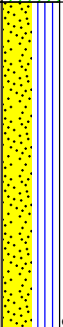
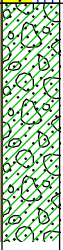
BORING LOG NO. TB-4

Page 4 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6645° Longitude: -70.2639° Approximate Surface Elev.: 10 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
5		LEAN CLAY (CL) , gray to dark blue-gray, very soft (<i>continued</i>) $s_u / s_{ur} = 554 / 52.0$ psf $s_u / s_{ur} = 537 / 69.3$ psf $s_u / s_{ur} = 624 / 52.0$ psf $s_u / s_{ur} = 589 / 34.6$ psf Shells present at 82 feet	80 85		     	24	WOR/24"
6		POORLY GRADED SAND WITH SILT (SP-SM) , light gray, medium dense Roller bit resistance increased at 93 feet on probable gravel layer	88.0 90 95.0		  	14	3-8-15-17 N=23
7		SILTY SAND WITH GRAVEL (SM) , gray	-78+/- 95 100		  	10	15-12-11-8 N=23

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:
 s_u = Undrained Shear Strength (Corrected)
 s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

 7.0 feet at completion of drilling

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-12-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-12-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

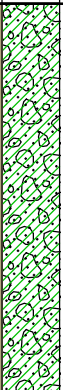
BORING LOG NO. TB-4

Page 5 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6645° Longitude: -70.2639° Approximate Surface Elev.: 10 (Ft.) +/- DEPTH ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
7		SILTY SAND WITH GRAVEL (SM) , gray (<i>continued</i>) 108.2 Roller bit resistance at 108.2 feet on probable bedrock Boring Terminated at 108.2 Feet -98+/-	105			15	9-10-9-28 N=19

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:
Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:
s_u = Undrained Shear Strength (Corrected)
s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

 7.0 feet at completion of drilling

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-12-2019

Boring Completed: 09-12-2019

Drill Rig: Diedrich D-50

Driller: NTB / M. Nadeau

Project No.: J1185157

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

Page 1 of 5

**CLIENT: Sargent Corporation
Stillwater, ME**

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		Latitude: 43.6642° Longitude: -70.2658°		Approximate Surface Elev.: 9 (Ft.) +/-					
			0.3	8.5+/-					
1		FILL - POORLY GRADED SAND WITH SILT , brown						13	3-4-3-5 N=7
			3.5	5.5+/-	5				
2		SILTY SAND , gray to dark gray, medium dense						24	15-10-10-7 N=20
			11.0	-2+/-	10			24	1/12"-1/12" N=1
3		ORGANIC SILT (OH) , dark gray to black, very soft			15				
		$s_u / s_{ur} = 443 / 118.0$ psf $s_u / s_{ur} = 443 / 132.8$ psf			20			24	WOH/24"
					25				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See **Exploration and Testing Procedures** for a description of field and laboratory procedures used and additional data (if any).

See **Supporting Information** for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:

s_u = Undrained Shear Strength (Corrected)

s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

 22.0 feet at completion

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-12-2019

Boring Completed: 09-13-2019

Drill Rig: Diedrich D-50

Driller: NTB / M. Nadeau

Project No.: J1185157

BORING LOG NO. TB-5

Page 2 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6642° Longitude: -70.2658° Approximate Surface Elev.: 9 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
3		ORGANIC SILT (OH) , dark gray to black, very soft (<i>continued</i>) 30.1				24	WOH/24"
4		LEAN CLAY (CL) , gray, very soft $s_u / s_{ur} = 411 / 68.4$ psf $s_u / s_{ur} = 428 / 85.6$ psf $s_u / s_{ur} = 274 / 51.3$ psf $s_u / s_{ur} = 291 / 51.3$ psf $s_u / s_{ur} = 257 / 51.3$ psf $s_u / s_{ur} = 325 / 68.4$ psf $s_u / s_{ur} = 308 / 51.3$ psf $s_u / s_{ur} = 342 / 68.4$ psf -21+/-	30 35 40 45 50			24 24 24 24	WOR/24" WOR/24" WOR/24" WOR/24"

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:
 s_u = Undrained Shear Strength (Corrected)
 s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

22.0 feet at completion

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-12-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-13-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

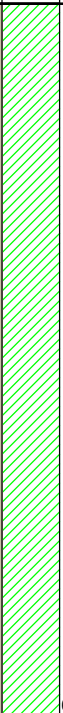
BORING LOG NO. TB-5

Page 3 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6642° Longitude: -70.2658° Approximate Surface Elev.: 9 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
4		LEAN CLAY (CL) , gray, very soft (<i>continued</i>) $s_u / s_{ur} = 376 / 51.3$ psf $s_u / s_{ur} = 496 / 102.7$ psf $s_u / s_{ur} = 462 / 68.4$ psf $s_u / s_{ur} = 462 / 68.4$ psf	55		 	24	WOR/24"
			60		 	24	WOR/24"
5		LEAN CLAY (CL) , gray, very soft $s_u / s_{ur} = 572 / 69.3$ psf $s_u / s_{ur} = 520 / 52.0$ psf $s_u / s_{ur} = 554 / 69.3$ psf $s_u / s_{ur} = 589 / 52.0$ psf	65		 	24	WOR/24"
			70		 		
			75				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

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Notes:

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WATER LEVEL OBSERVATIONS

 22.0 feet at completion

Terracon

77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-12-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-13-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

BORING LOG NO. TB-5

Page 4 of 5

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6642° Longitude: -70.2658°	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
			LEAN CLAY (CL) , gray, very soft (<i>continued</i>) $s_u / s_{ur} = 676 / 17.3$ psf $s_u / s_{ur} = 624 / 34.6$ psf $s_u / s_{ur} = 727 / 52.0$ psf $s_u / s_{ur} = 641 / 52.0$ psf $s_u / s_{ur} = 779 / 69.3$ psf $s_u / s_{ur} = 676 / 52.0$ psf						
					80			24	WOR/24"
					85			24	WOR/24"
					90				
					95			24	WOR/24"
					100				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

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 s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

22.0 feet at completion

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-12-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-13-2019

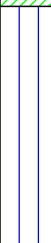
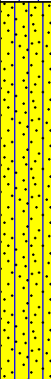
Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

Page 5 of 5

**CLIENT: Sargent Corporation
Stillwater, ME**

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6642° Longitude: -70.2658° Approximate Surface Elev.: 9 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
5		LEAN CLAY (CL) , gray, very soft <i>(continued)</i> 101.0 -92+/-				12	WOR/24"
6		SILT (ML) , gray, medium dense 106.0 -97+/-	105				
		SILTY SAND (SM) , gray, medium dense 114.0 Becoming gravelly at 113.9 feet. Boring Terminated at 114 Feet -105+/-	110			15	8-9-14-9 N=23
						16	19-15-15 N=30

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet, then open hole

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See **Exploration and Testing Procedures** for a description of field and laboratory procedures used and additional data (if any).

See **Supporting Information** for explanation of symbols and abbreviations.

Notes:

Field Vane Shear Symbols:

s_u = Undrained Shear Strength (Corrected)

 s_{ur} = Remolded Undrained Shear Strength (Corrected)

WATER LEVEL OBSERVATIONS

 22.0 feet at completion

Terracon

77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-12-2019

Boring Completed: 09-13-2019

Drill Rig: Diedrich D-50

Driller: NTB / M. Nadeau

Project No.: J1185157

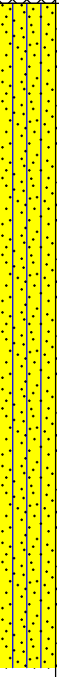
BORING LOG NO. TB-6

Page 1 of 2

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6637° Longitude: -70.2662° Approximate Surface Elev.: 11 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH 0.3 3 inches of topsoil FILL - SILTY SAND , light brown, trace gravel	ELEVATION (Ft.) 10.5+/-				
1			5			18	9-7-8-7 N=15
						13	4-6-5-4 N=11
							
		11.0 SILTY SAND , light brown, medium dense, trace gravel	10			22	7-9-10-12 N=19
2			15			5	6-5-7-5 N=12
			20			2	2-1-2-2 N=3
		Traces of bay mud were observed in wash water.	25				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:

Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet

Abandonment Method:

Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

 7.9 feet at completion

Terracon

77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-13-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

Boring Completed: 09-13-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL_J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

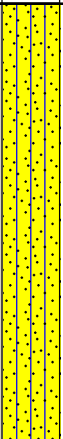
BORING LOG NO. TB-6

Page 2 of 2

PROJECT: Back Cove South Storage Facility

CLIENT: Sargent Corporation
Stillwater, ME

SITE: Preble Street Extension
Portland, ME

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 43.6637° Longitude: -70.2662° Approximate Surface Elev.: 11 (Ft.) +/-	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (in.)	FIELD TEST RESULTS
		DEPTH ELEVATION (Ft.)					
2		SILTY SAND , light brown, medium dense, trace gravel (<i>continued</i>)				5	2-2-3-4 N=5
3		34.5 ORGANIC SILT (OH) , dark gray to black, very soft	-23.5+/-			10	6-7-8-7 N=15
4		35.0 LEAN CLAY (CL) , gray, very soft	-24+/-			24	1/12"-1-2 N=1
		37.0 Boring Terminated at 37 Feet	-26+/-				

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
Hand dug to 1.5 feet, 4-1/4-inch diameter solid stem augers to 10 feet, 4-inch diameter roller bit with flush-joint casing to 35 feet

Abandonment Method:
Boring backfilled with soil cuttings and imported gravel upon completion.

See [Exploration and Testing Procedures](#) for a description of field and laboratory procedures used and additional data (if any).

See [Supporting Information](#) for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

 7.9 feet at completion

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

Boring Started: 09-13-2019

Drill Rig: Diedrich D-50

Project No.: J1185157

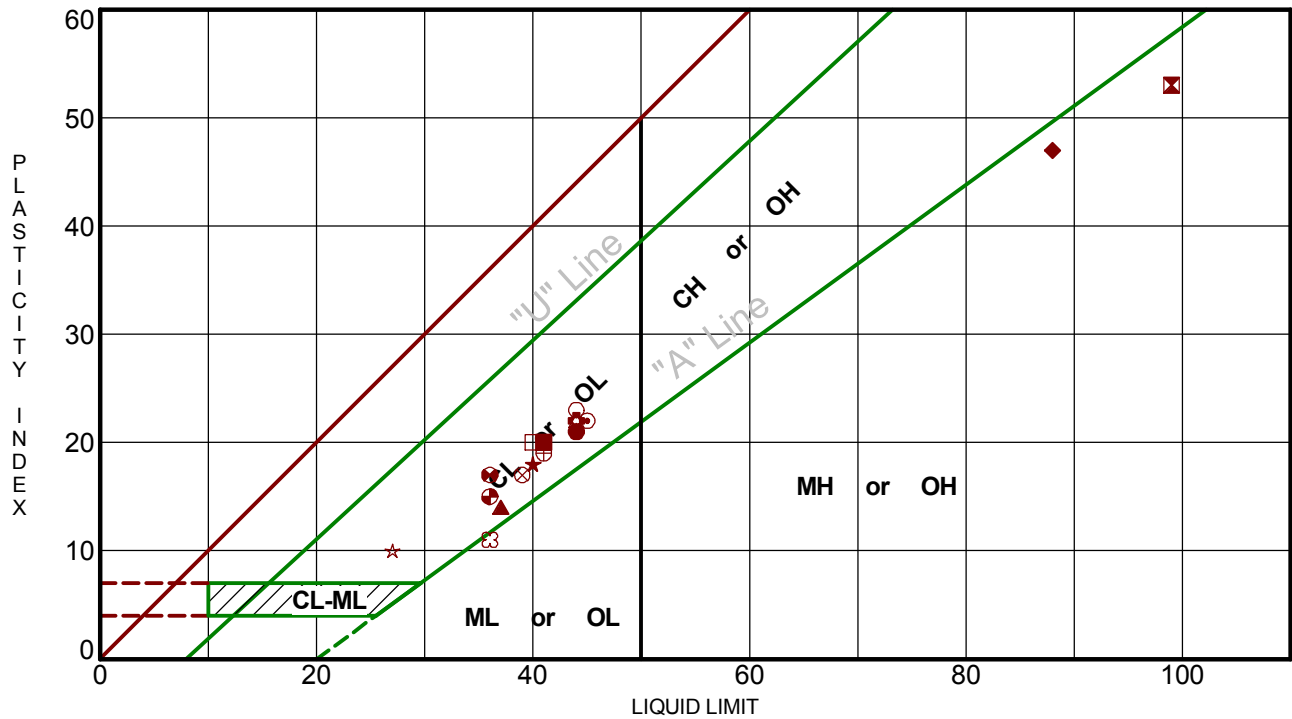
Boring Completed: 09-13-2019

Driller: NTB / M. Nadeau

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 2/4/20

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID	Depth	LL	PL	PI	Fines	USCS	Description
● TB-1	50 - 52	44	23	21		CL	Lean Clay
⊠ TB-2	30 - 32	99	46	53		OH	Organic Silt
▲ TB-2	35 - 37	37	23	14		CL	Lean Clay
★ TB-2	40 - 42	40	22	18		CL	Lean Clay
⊙ TB-2	45 - 47	45	23	22		CL	Lean Clay
⊕ TB-2	55 - 57	44	22	22		CL	Lean Clay
○ TB-2	60 - 62	44	21	23		CL	Lean Clay
△ TB-2	70 - 72	44	22	22		CL	Lean Clay
⊗ TB-2	75 - 77	39	22	17		CL	Lean Clay
⊕ TB-2	80 - 82	41	22	19		CL	Lean Clay
□ TB-2	85 - 87	40	20	20		CL	Lean Clay
⊕ TB-2	90 - 92	36	19	17		CL	Lean Clay
⊕ TB-2	95 - 97	36	21	15		CL	Lean Clay
★ TB-2	100 - 102	27	17	10		CL	Lean Clay
⊗ TB-3	40 - 42	36	25	11		ML	Silt
■ TB-4	70 - 72	41	21	20		CL	Lean Clay
◆ TB-5	15 - 17	88	41	47		OH	Organic Silt

PROJECT: Back Cove South Storage Facility

SITE: Preble Street Extension
Portland, ME

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

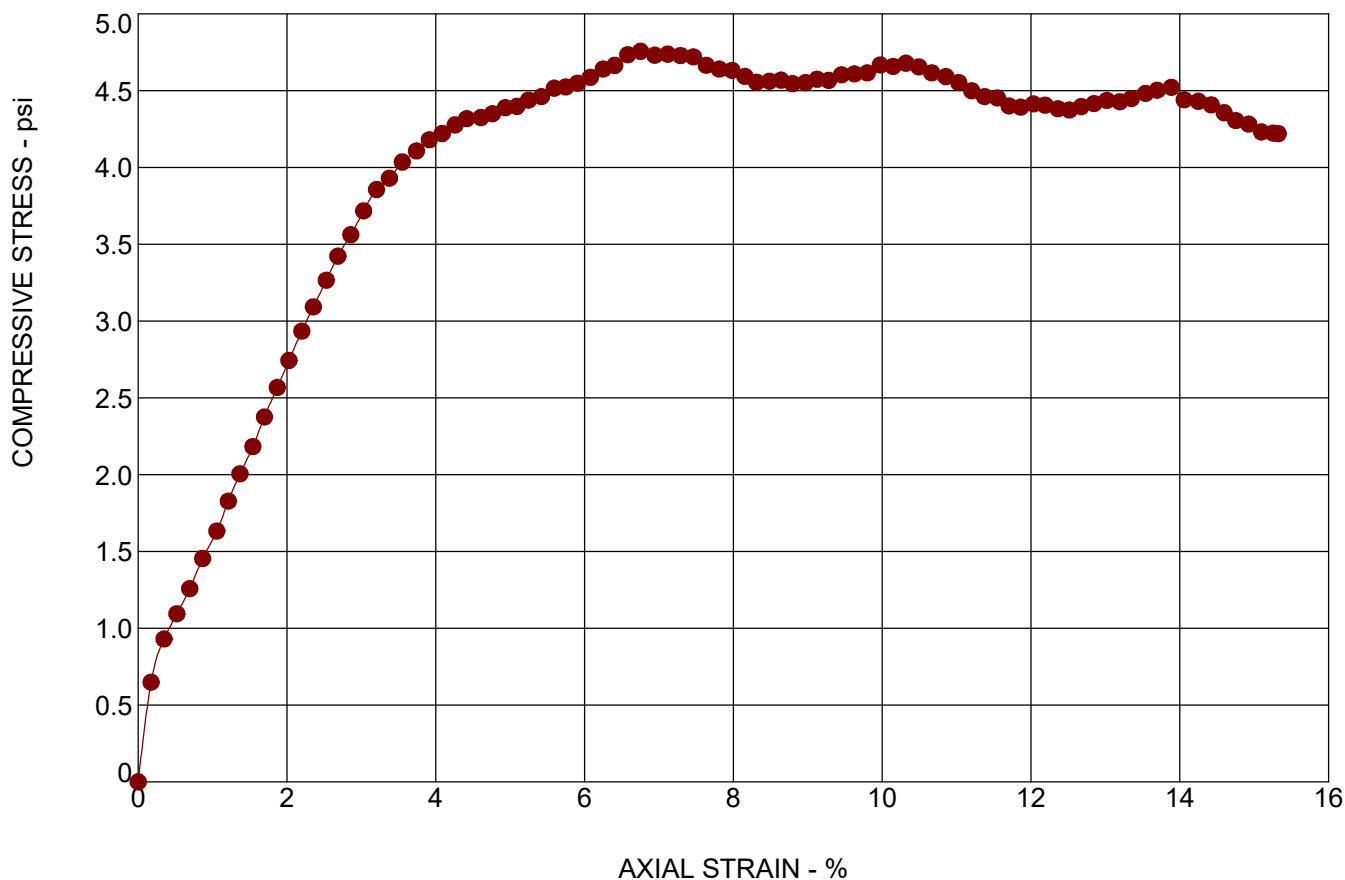
PROJECT NUMBER: J1185157

CLIENT: Sargent Corporation
Stillwater, ME

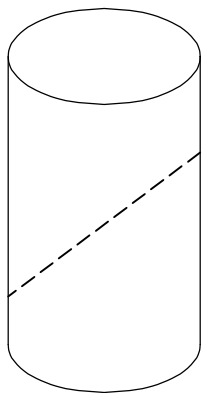
LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ATTERBERG LIMITS J1185157 BACK COVE SOUTH S_LAB DATA ENTRY -AS.GPJ TERRACON_DATATEMPLATE.GDT 11/13/19

UNCONFINED COMPRESSION TEST

ASTM D2166



SPECIMEN FAILURE MODE



Failure Mode: Shear (dashed)

SPECIMEN TEST DATA

Moisture Content:	%	46
Dry Density:	pcf	80
Diameter:	in.	2.76
Height:	in.	5.78
Height / Diameter Ratio:		2.09
Calculated Saturation:	%	
Calculated Void Ratio:		
Assumed Specific Gravity:		
Failure Strain:	%	6.75
Unconfined Compressive Strength	(psi)	5
Undrained Shear Strength:	(psi)	2
Strain Rate:	in/min	
Remarks:		

SAMPLE TYPE: Shelby Tube

SAMPLE LOCATION: TB-1 @ 50 - 52 feet

DESCRIPTION: Lean Clay

LL
44

PL
23

PI
21

Percent < #200 Sieve

PROJECT: Back Cove South Storage Facility

SITE: Preble Street Extension
Portland, ME

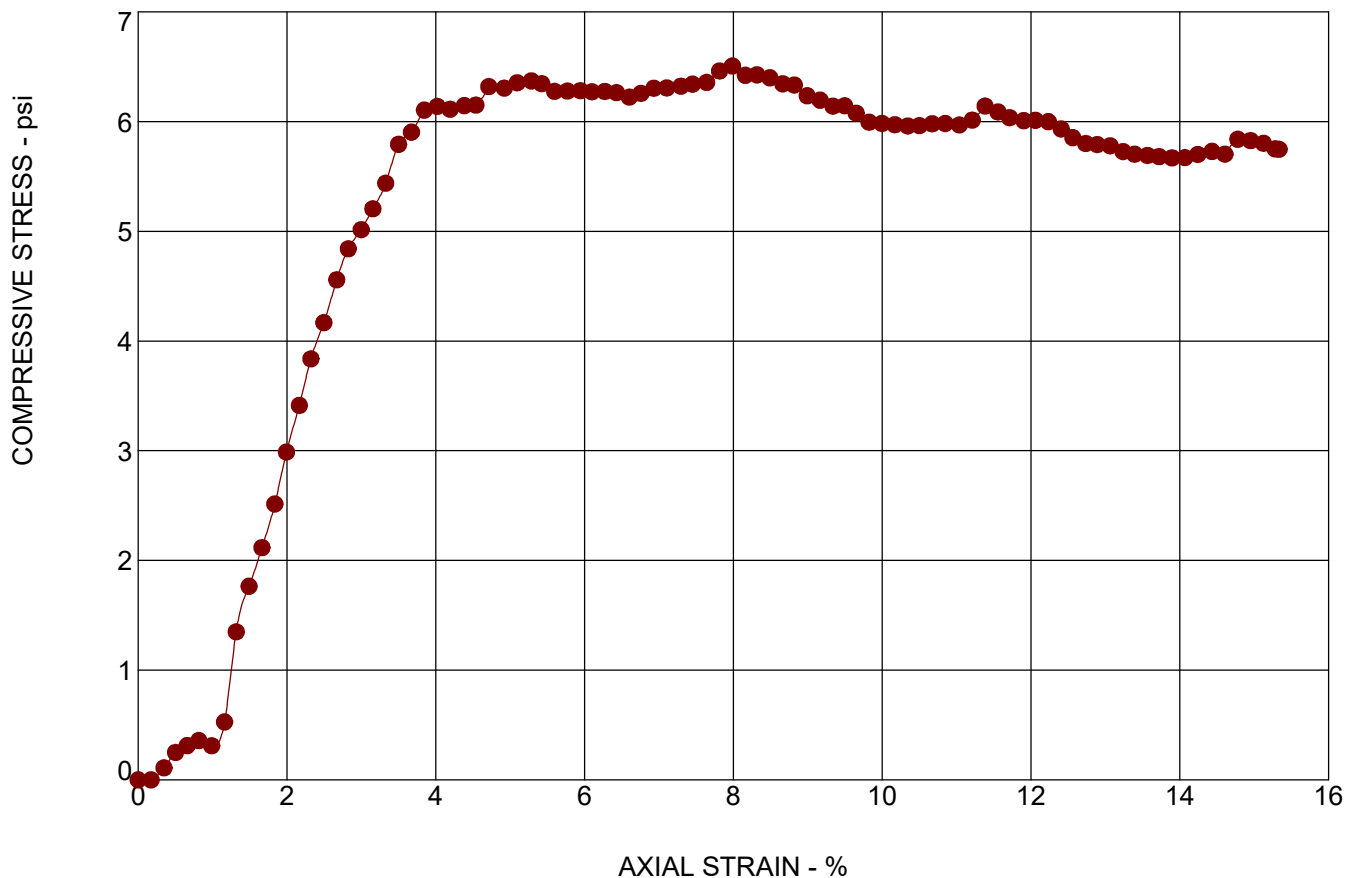
Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

PROJECT NUMBER: J1185157

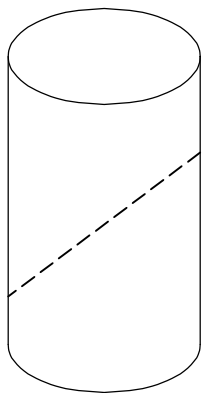
CLIENT: Sargent Corporation
Stillwater, ME

UNCONFINED COMPRESSION TEST

ASTM D2166



SPECIMEN FAILURE MODE



Failure Mode: Shear (dashed)

SPECIMEN TEST DATA

Moisture Content:	%	40
Dry Density:	pcf	81
Diameter:	in.	2.85
Height:	in.	5.77
Height / Diameter Ratio:		2.03
Calculated Saturation:	%	
Calculated Void Ratio:		
Assumed Specific Gravity:		
Failure Strain:	%	7.99
Unconfined Compressive Strength	(psi)	7
Undrained Shear Strength:	(psi)	3
Strain Rate:	in/min	
Remarks:		

SAMPLE TYPE: Shelby Tube

SAMPLE LOCATION: TB-3 @ 40 - 42 feet

DESCRIPTION: Silt

LL
36

PL
25

PI
11

Percent < #200 Sieve

PROJECT: Back Cove South Storage Facility

PROJECT NUMBER: J1185157

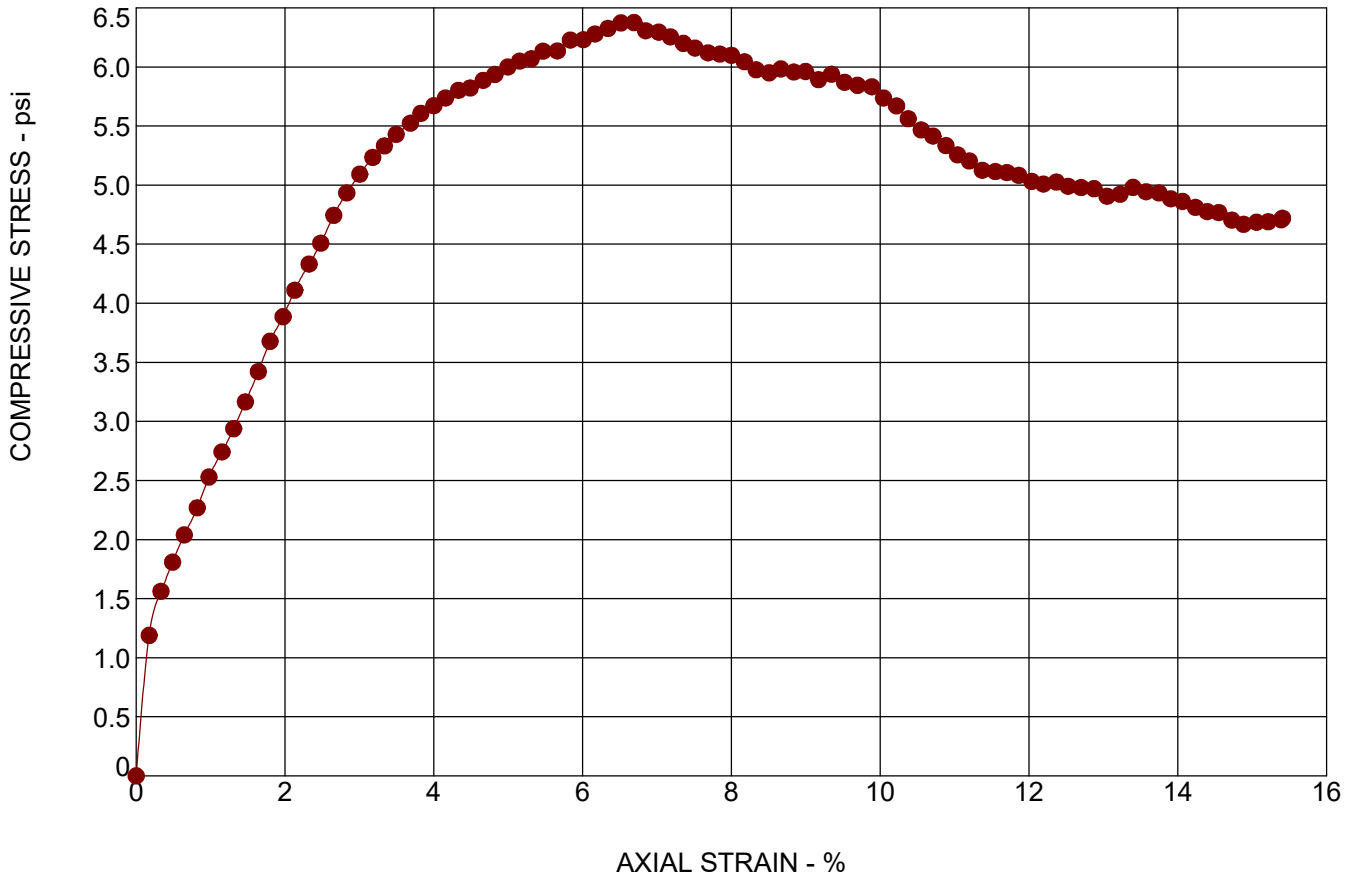
SITE: Preble Street Extension
Portland, ME

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

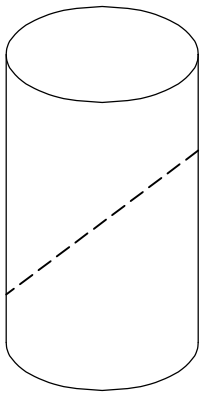
CLIENT: Sargent Corporation
Stillwater, ME

UNCONFINED COMPRESSION TEST

ASTM D2166



SPECIMEN FAILURE MODE



Failure Mode: Shear (dashed)

SPECIMEN TEST DATA

Moisture Content:	%	39
Dry Density:	pcf	84
Diameter:	in.	2.85
Height:	in.	5.72
Height / Diameter Ratio:		2.01
Calculated Saturation:	%	
Calculated Void Ratio:		
Assumed Specific Gravity:		
Failure Strain:	%	6.69
Unconfined Compressive Strength	(psi)	6
Undrained Shear Strength:	(psi)	3
Strain Rate:	in/min	
Remarks:		

SAMPLE TYPE: Shelby Tube

SAMPLE LOCATION: TB-4 @ 70 - 72 feet

DESCRIPTION: Lean Clay

LL
41

PL
21

PI
20

Percent < #200 Sieve

PROJECT: Back Cove South Storage Facility

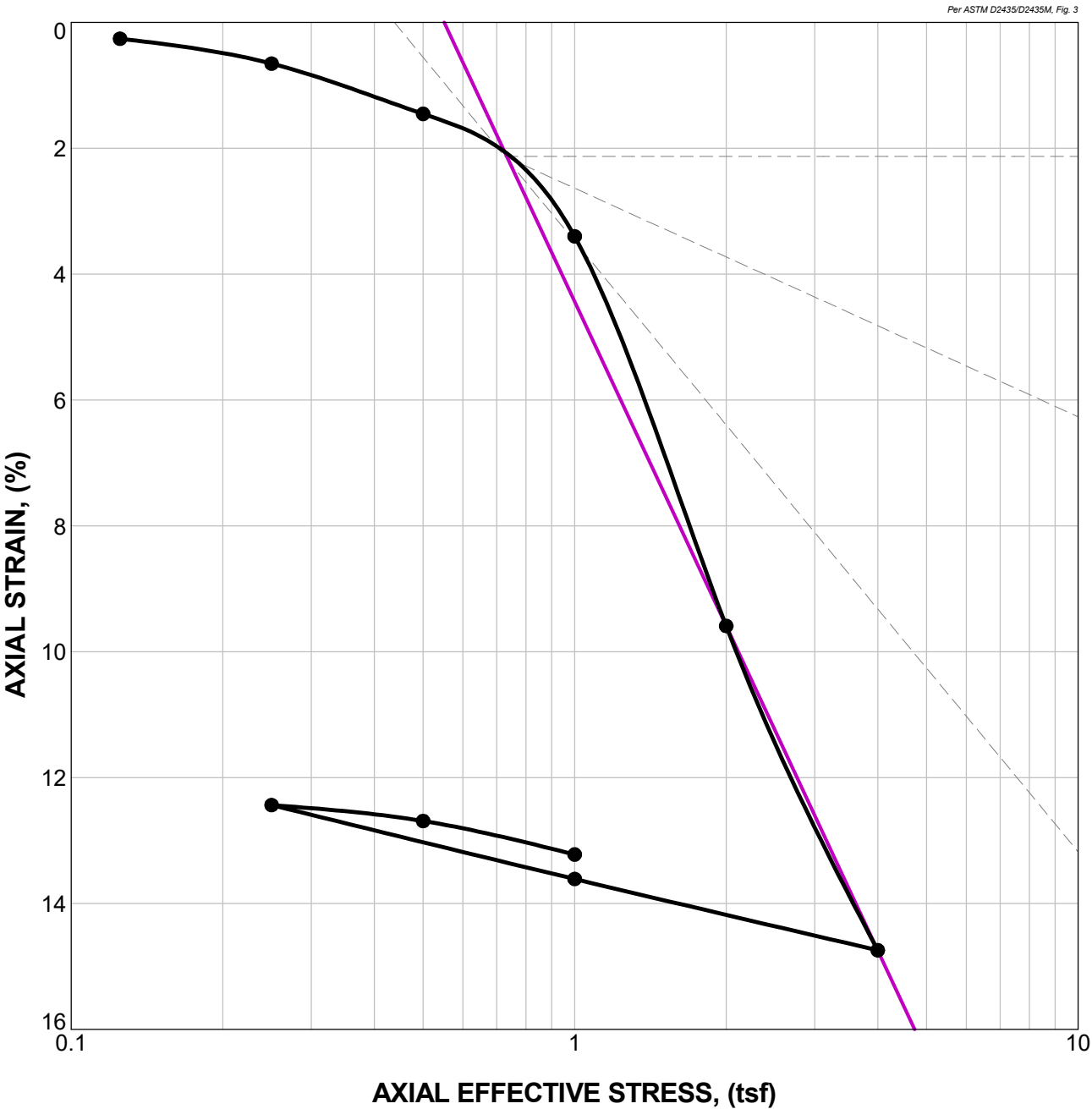
PROJECT NUMBER: J1185157

SITE: Preble Street Extension
Portland, ME

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

CLIENT: Sargent Corporation
Stillwater, ME

CONSOLIDATION TEST (D2435)



Natural		Initial Dry Density (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P _c (tsf)	C _c (% / log stress)	C _c (% / log stress)	Initial Void Ratio
Saturation	Moisture									
100.8 %	46.3 %	75.5	36	11	2.72		0.74	17.119	1.916	1.248

MATERIAL DESCRIPTION									USCS	AASHTO
Silt									ML	

NOTES:

Borehole: TB-3 Depth: 40 ft Specimen #: SH-2

PROJECT: Back Cove South Storage Facility

SITE: Preble Street Extension
Portland, ME

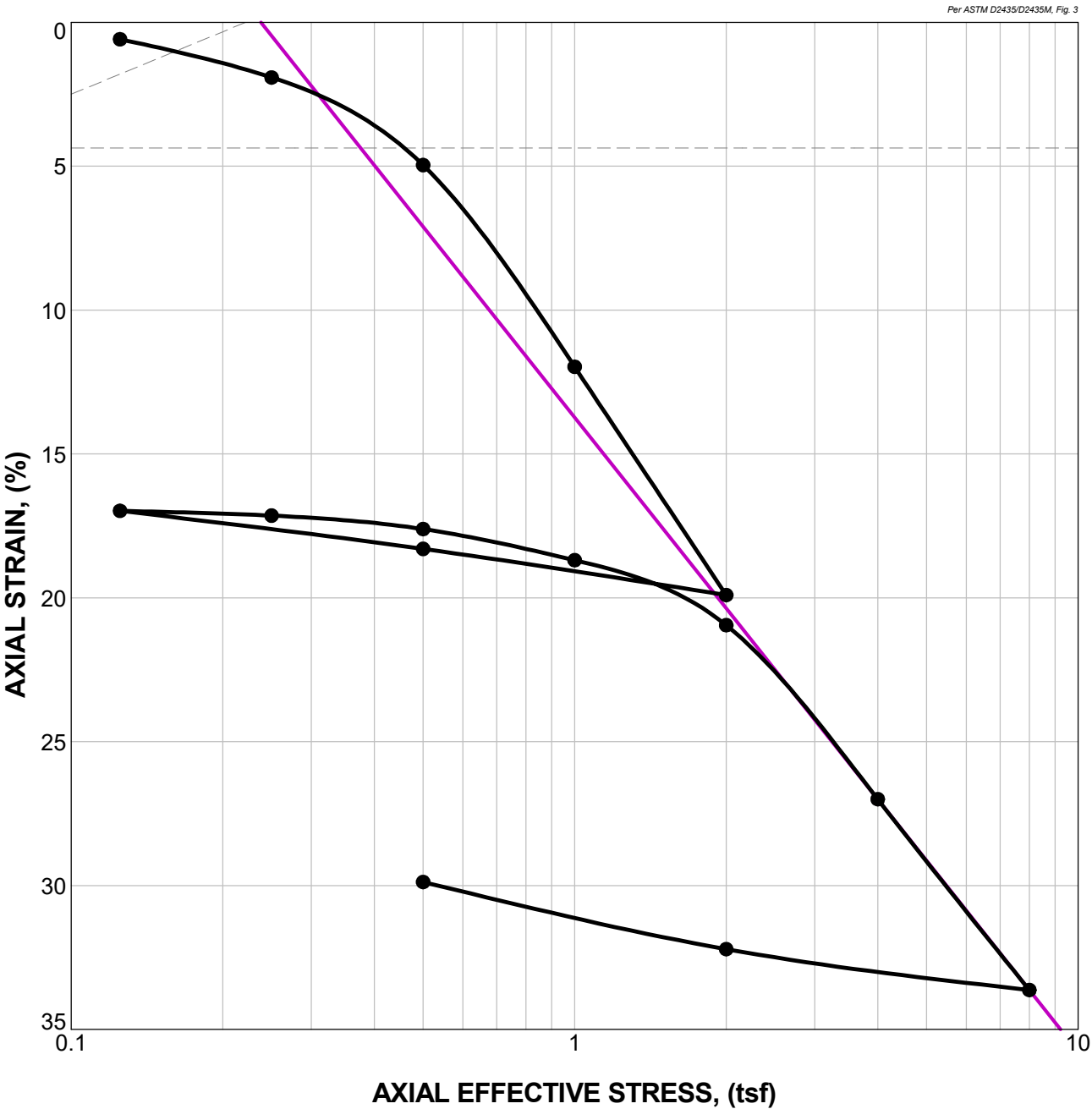


PROJECT NUMBER: J1185157

CLIENT: Sargent Corporation
Stillwater, ME

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CONS_LOAD-DEF_PROP_STRESS-STRAIN J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 10/23/19

CONSOLIDATION TEST (D2435)



Natural		Initial Dry Density (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P _c (tsf)	C _c (% / log stress)	C _c (% / log stress)	Initial Void Ratio
Saturation	Moisture									
92.7 %	77.8 %	51.7	88	47	2.72		0.23	22.033	2.431	2.283

MATERIAL DESCRIPTION									USCS	AASHTO

NOTES:

Borehole: TB-5 Depth: 15 ft Specimen #: SH-1

PROJECT: Back Cove South Storage Facility

SITE: Preble Street Extension
Portland, ME

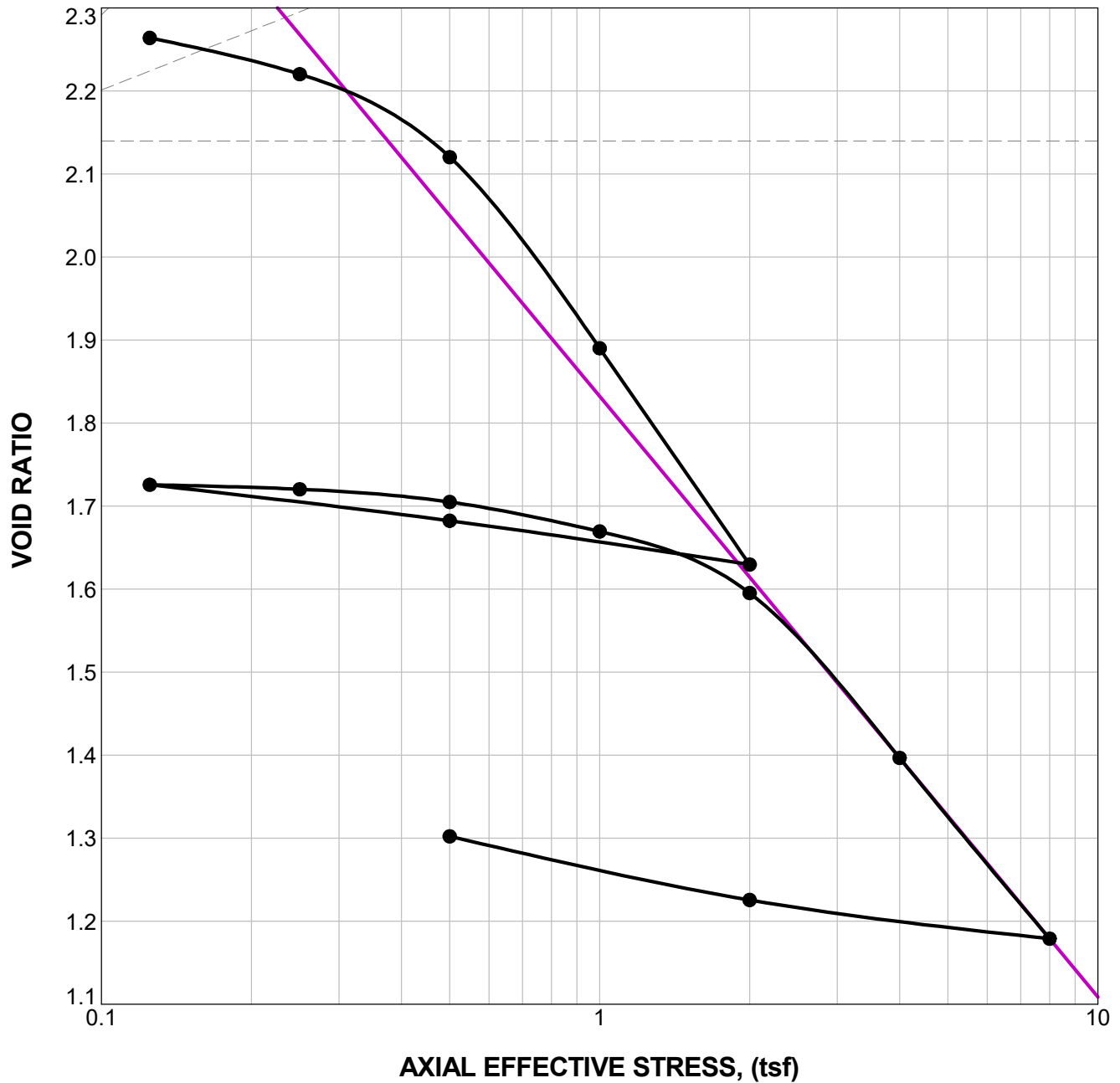


PROJECT NUMBER: J1185157

CLIENT: Sargent Corporation
Stillwater, ME

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CONS_LOAD-DEF_PROP_STRESS-STRAIN J1185157 BACK COVE SOUTH S.GPJ TERRACON_DATATEMPLATE.GDT 10/23/19

CONSOLIDATION TEST (D2435)



Natural		Initial Dry Density (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P _c (tsf)	C _c (vr / log stress)	C _c (vr / log stress)	Initial Void Ratio
Saturation	Moisture									
92.7 %	77.8 %	51.7	88	47	2.72		0.23	0.723	0.080	2.283

MATERIAL DESCRIPTION									USCS	AASHTO

NOTES:

Borehole: TB-5 Depth: 15 ft Specimen #: SH-1

PROJECT: Back Cove South Storage Facility

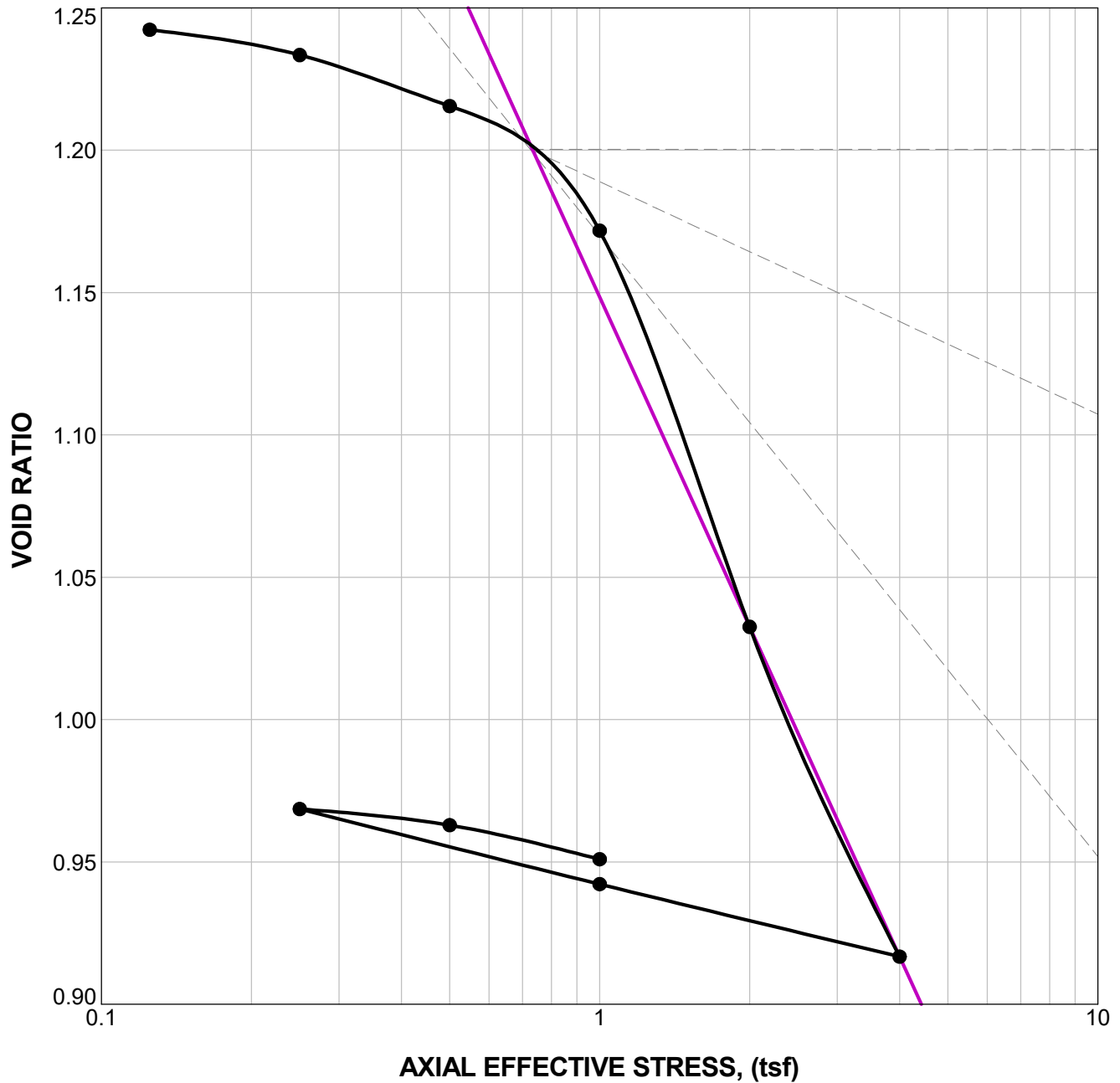
SITE: Preble Street Extension
Portland, ME

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

PROJECT NUMBER: J1185157

CLIENT: Sargent Corporation
Stillwater, ME

CONSOLIDATION TEST (D2435)



Natural		Initial Dry Density (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c (vr / log stress)	C_r (vr / log stress)	Initial Void Ratio
Saturation	Moisture									
100.8 %	46.3 %	75.5	36	11	2.72		0.74	0.385	0.043	1.248

MATERIAL DESCRIPTION									USCS	AASHTO
Silt									ML	

NOTES:

Borehole: TB-3 Depth: 40 ft Specimen #: SH-2

PROJECT: Back Cove South Storage Facility

SITE: Preble Street Extension
Portland, ME

Terracon
77 Sundial Ave, Ste 401W
Manchester, NH

PROJECT NUMBER: J1185157

CLIENT: Sargent Corporation
Stillwater, ME

Exhibit A-1
Field Electrical Resistivity Test Results
Portland Back Cove CSO
Portland, Maine
Project No. J1185157



Test Location: Near Boring TB-6	Equipment: MiniSting R1
11/21/2019	Tested by: J. Jurnack
Weather: Overcast	Temperature: 60s

Resistivity Line 1					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω -cm)
	R1	R2	R3	Average	
2	60.67	60.79	60.7	61	23,256
5	13.57	13.56	13.56	14	12,987
10	7.166	7.168	7.168	7	13,725
20	4.08	4.08	4.081	4	15,628
50	2.28	2.28	2.28	2	21,831
Center Point Coordinates: 43.6637, -70.2662					
Line Orientation: N-S					
Line Notes: Grassy field, firm soil.					

Resistivity Line 2					
Probe Spacing (ft)	Resistance Reading (Ω)				Apparent Resistivity (Ω -cm)
	R1	R2	R3	Average	
2	94.79	94.82	94.86	95	36,317
5	14.89	14.88	14.88	15	14,251
10	6.734	6.735	6.735	7	12,897
20	3.935	3.935	3.934	4	15,070
50	2.431	2.431	2.431	2	23,277
Center Point Coordinates: 43.6637, -70.2662					
Line Orientation: E-W					
Line Notes: Grassy field, firm soil.					

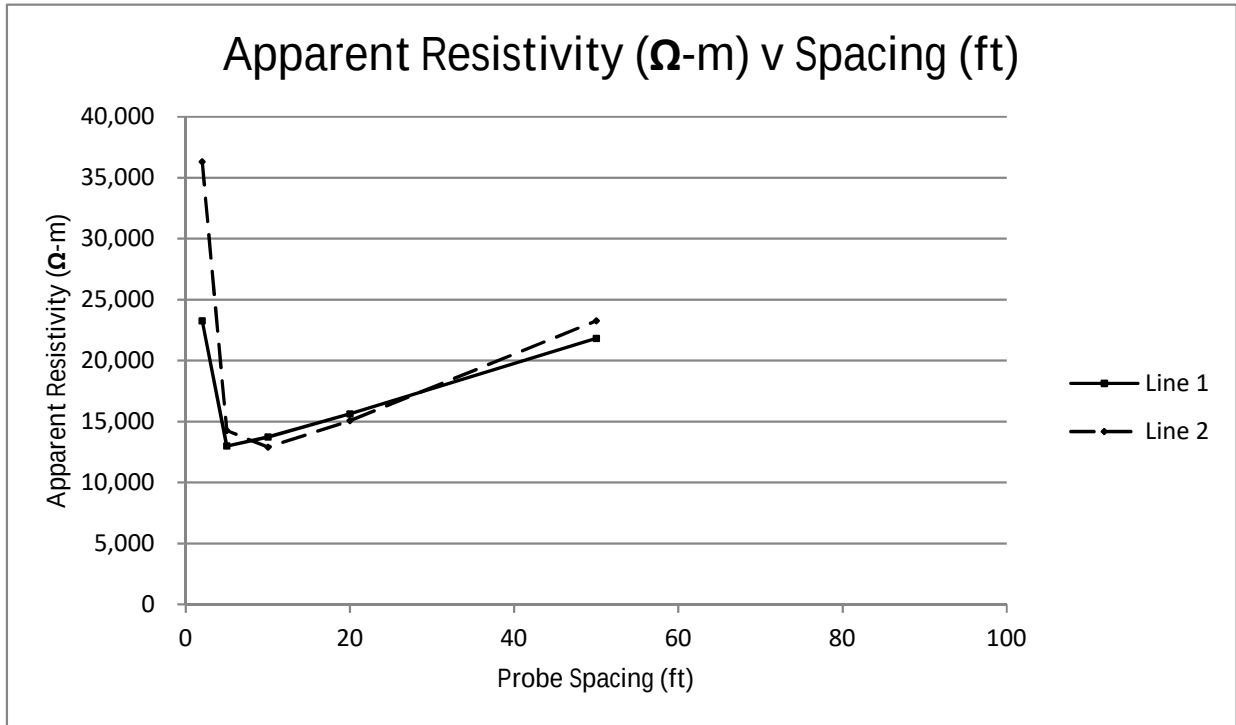
Comments:

1. Field electrical resistivity testing performed per ASTM G57-06, "Standard Test Method for Field Measurement of Electrical Resistivity Using the Wenner Four-Electrode Method"

Exhibit A-1
Field Electrical Resistivity Test Results
Portland Back Cove CSO
Portland, Maine
Project No. J1185157

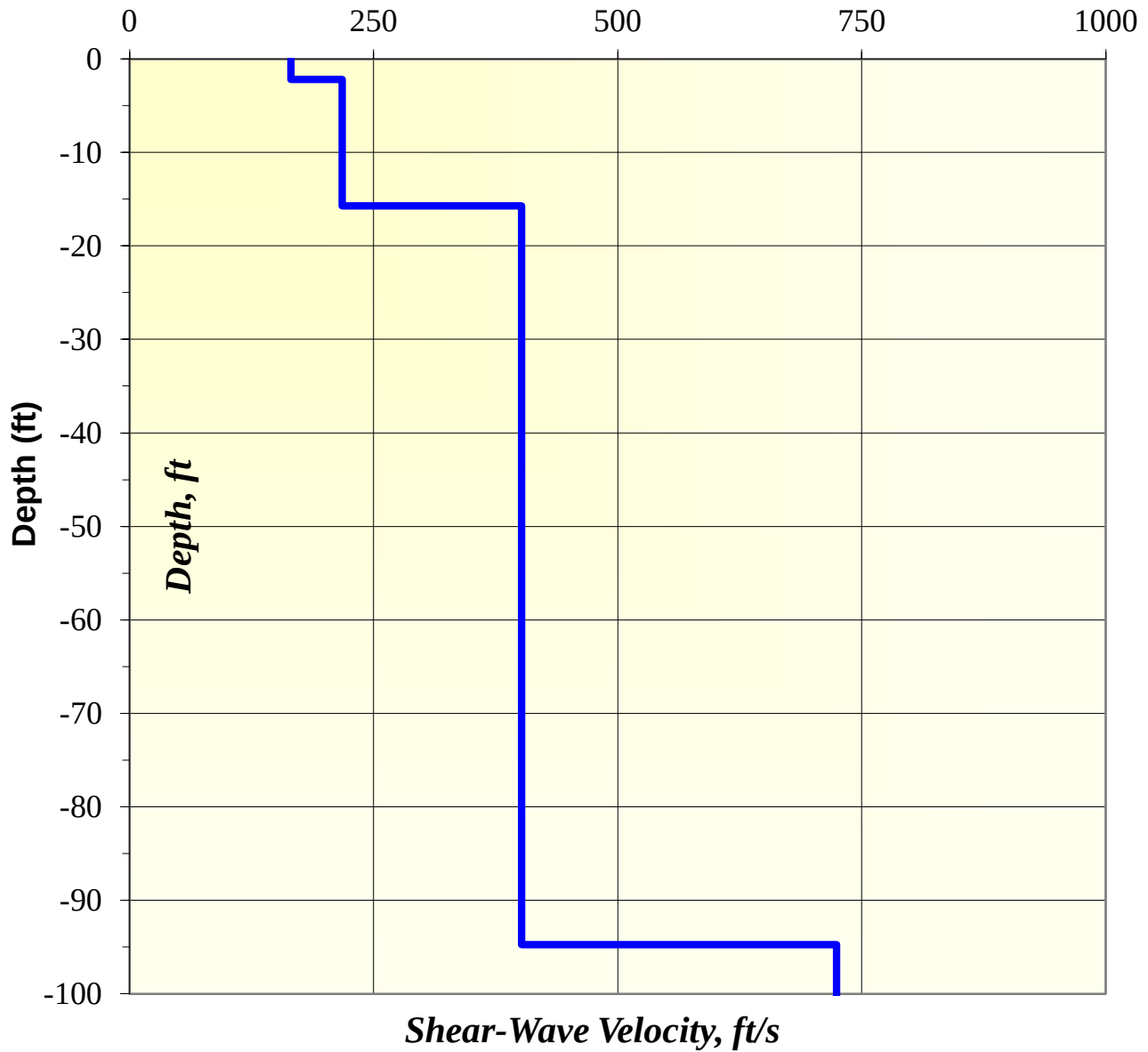


Test Location: Near Boring TB-6



ReMi

Shear Wave Velocity (ft/s)



Average Vs to 100 ft = 350 ft/s

Project Manager:
MAG
Drawn by:
MAG
Checked by:
CWT
Approved by: CWT

Project No.
J1185157
Scale:
N.T.S.
File Name:
T1 MASW.xlsx
Date:
Nov. 2018

Terracon
Consulting Engineers & Scientists

77 Sundial Avenue, Suite 401W Manchester, New Hampshire 03103
PH: (603) 647-9700 FAX: (603) 647-4432

SEISMIC VELOCITY PROFILE
PORTLAND BACK COVE CSO STORAGE TANK
PORTLAND, MAINE

SUPPORTING INFORMATION

Contents:

General Notes

Unified Soil Classification System

Global Stability Analysis

Bottom Heave Stability Analysis

Note: All attachments are one page unless noted above.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

Back Cove South Storage Facility ■ Portland, ME

February 5, 2020 ■ Terracon Project No. J1185157

SAMPLING	WATER LEVEL	FIELD TESTS
 Shelby Tube  Standard Penetration Test  Vane Shear	 Water Initially Encountered  Water Level After a Specified Period of Time  Water Level After a Specified Period of Time  Cave In Encountered Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer UC Unconfined Compressive Strength (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

LOCATION AND ELEVATION NOTES

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See [Exploration and Testing Procedures](#) in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength Qu, (tsf)	Standard Penetration or N-Value Blows/Ft.
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELEVANCE OF SOIL BORING LOG

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests ^A					Soil Classification	
					Group Symbol	Group Name ^B
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	Gravels: More than 50% of coarse fraction retained on No. 4 sieve	Clean Gravels: Less than 5% fines ^C	$Cu \geq 4$ and $1 \leq Cc \leq 3$ ^E	GW	Well-graded gravel ^F	
			$Cu < 4$ and/or $[Cc < 1$ or $Cc > 3.0]$ ^E	GP	Poorly graded gravel ^F	
		Gravels with Fines: More than 12% fines ^C	Fines classify as ML or MH	GM	Silty gravel ^{F, G, H}	
			Fines classify as CL or CH	GC	Clayey gravel ^{F, G, H}	
	Sands: 50% or more of coarse fraction passes No. 4 sieve	Clean Sands: Less than 5% fines ^D	$Cu \geq 6$ and $1 \leq Cc \leq 3$ ^E	SW	Well-graded sand ^I	
			$Cu < 6$ and/or $[Cc < 1$ or $Cc > 3.0]$ ^E	SP	Poorly graded sand ^I	
		Sands with Fines: More than 12% fines ^D	Fines classify as ML or MH	SM	Silty sand ^{G, H, I}	
			Fines classify as CL or CH	SC	Clayey sand ^{G, H, I}	
Fine-Grained Soils: 50% or more passes the No. 200 sieve	Silts and Clays: Liquid limit less than 50	Inorganic:	$PI > 7$ and plots on or above “A”	CL	Lean clay ^{K, L, M}	
			$PI < 4$ or plots below “A” line ^J	ML	Silt ^{K, L, M}	
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay ^{K, L, M, N}
			Liquid limit - not dried			Organic silt ^{K, L, M, O}
	Silts and Clays: Liquid limit 50 or more	Inorganic:	PI plots on or above “A” line	CH	Fat clay ^{K, L, M}	
			PI plots below “A” line	MH	Elastic Silt ^{K, L, M}	
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay ^{K, L, M, P}
			Liquid limit - not dried			Organic silt ^{K, L, M, Q}
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat	

^A Based on the material passing the 3-inch (75-mm) sieve.

^B If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

^C Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

^D Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

$$Cu = D_{60}/D_{10} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$$

^F If soil contains $\geq 15\%$ sand, add "with sand" to group name.

^G If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

^H If fines are organic, add "with organic fines" to group name.

^I If soil contains $\geq 15\%$ gravel, add "with gravel" to group name.

^J If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

^K If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

^L If soil contains $\geq 30\%$ plus No. 200 predominantly sand, add "sandy" to group name.

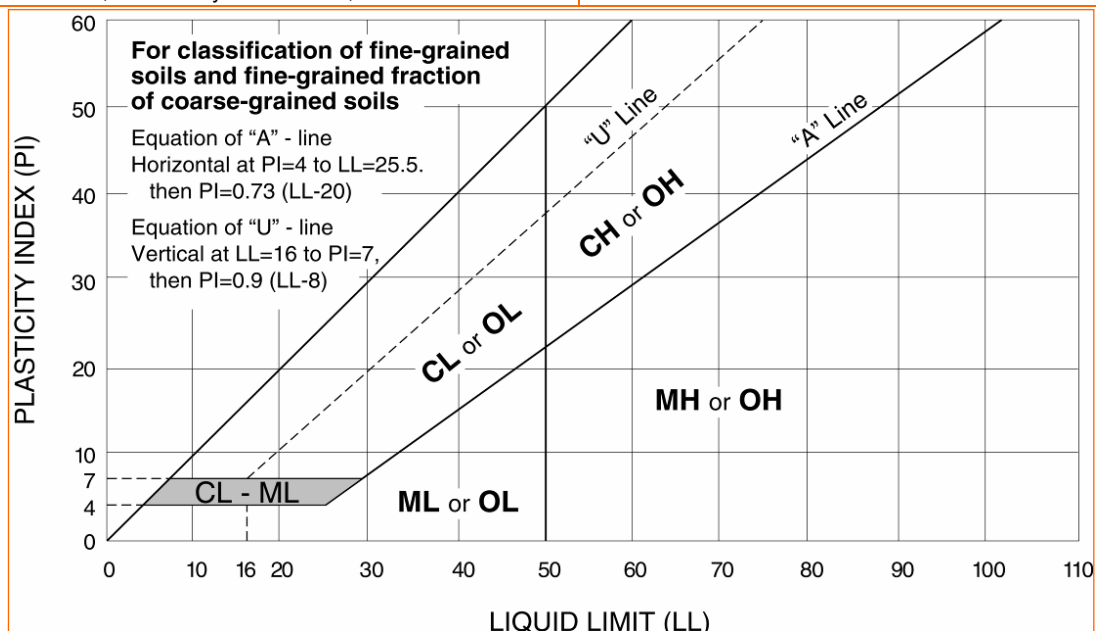
^M If soil contains $\geq 30\%$ plus No. 200, predominantly gravel, add "gravelly" to group name.

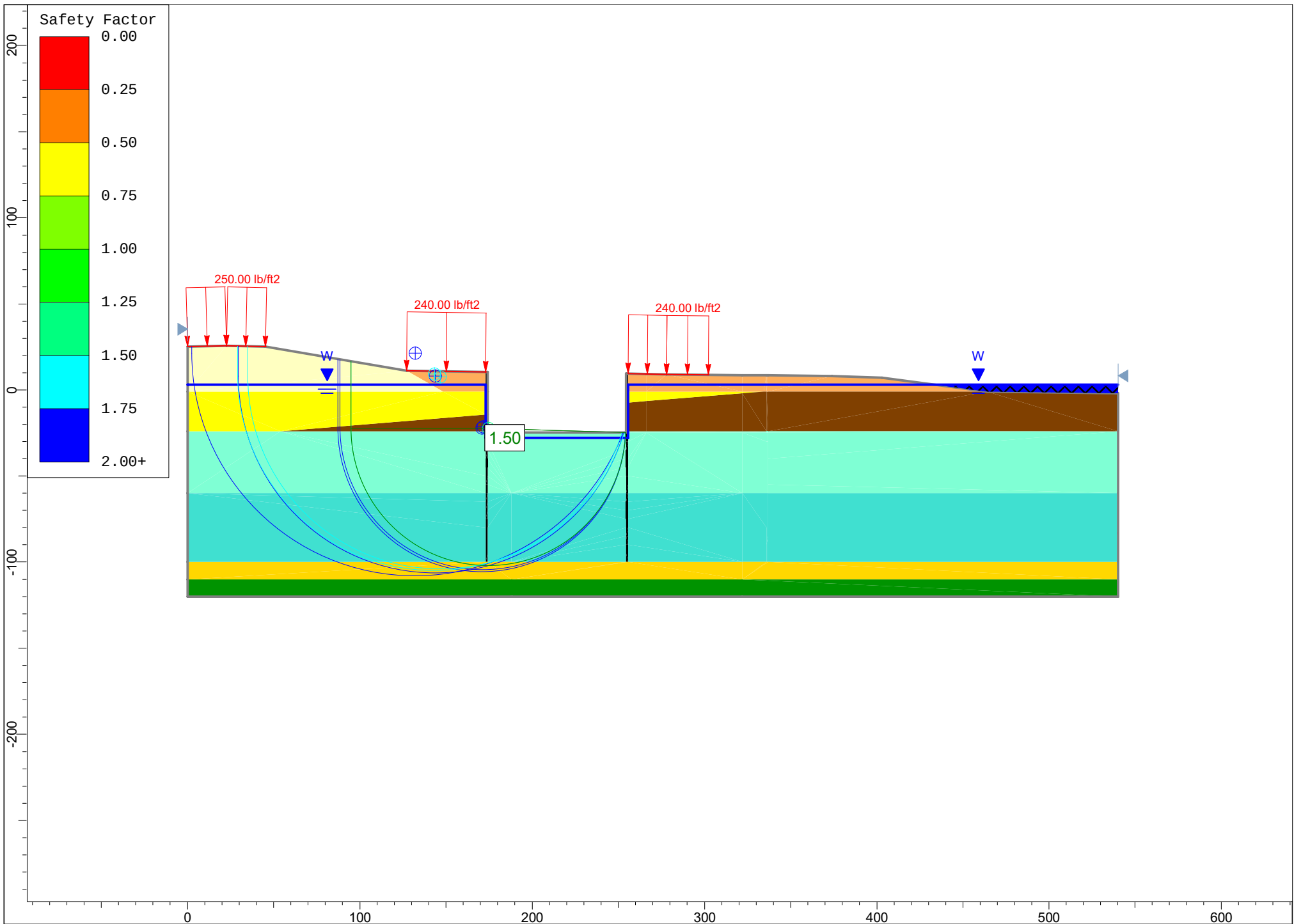
^N $PI \geq 4$ and plots on or above "A" line.

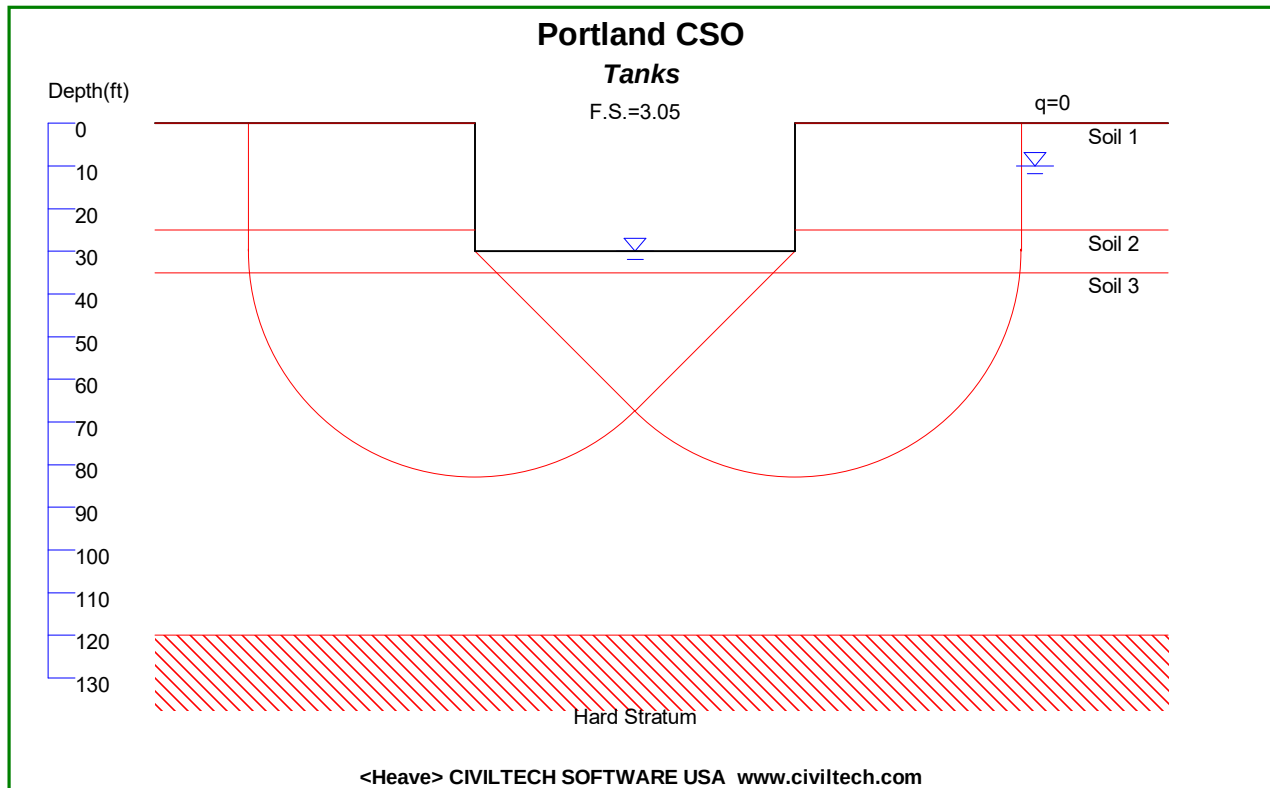
^O $PI < 4$ or plots below "A" line.

^P PI plots on or above "A" line.

^Q PI plots below "A" line.







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Date: 5/1/2019 File: C:\Users\sclanne\Desktop\Back Cove\Heave.hv8

COMPUTATION RESULTS

Excavation Depth (H) = 30.00
 Excavation Width (B) = 75.00
 Excavation Length (L) = 550.00
 Surcharge Pressure Outside = 0.25
 Surcharge Pressure Inside = 0.00
 Water Table Outside = 10.00
 Water Table Inside = 30.00
 Depth of Hard Stratum = 120.00

Soil Layers:

No.	Depth	Friction	Cohesion	Unit Weight
1	0.00	32.00	0.00	120.00
2	25.00	24.00	0.00	110.00
3	35.00	0.00	650.00	110.00

Base Soil: Friction Angle = 24.00 Cohesion = 0.00 Unit Weight = 110.00

Resistance Force: $(1+2+3)*B+4+5 = 614.64$

Effective Width at Base (B) = 53.03

1. Bearing Capacity at Base (pressure)= 11.46

2. Surcharge Inside (pressure)= 0.00

3. Inside Water Pressure at Base (pressure)= 0.00

4. Side Adhesion from C (force)= 0.00

5. Side Friction from Phi (force)= 7.00

Driving Force: $(6+7+8)*B = 201.53$

Effective Width at Base (B) = 53.03

6. Overburden Pressure at Base (pressure)= 2.30

7. Surcharge Outside (pressure)= 0.25

8. Outside Water Pressure at Base (pressure)= 1.25

Factor of Safety = Resistance Force / Driving Force = 3.05

APPENDIX B: LIMITED SUBSURFACE INVESTIGATION REPORT



DRAFT
LIMITED
SUBSURFACE
INVESTIGATION
REPORT

Back Cove South
Storage Facility

41 Hutchins Drive
Portland, ME 04102
800-426-4262

woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

0232069.00
Sargent Corporation
February 11, 2020

TABLE OF CONTENTS

SECTION	PAGE NO.
1. INTRODUCTION.....	1-1
2. BACKGROUND.....	2-1
3. ENVIRONMENTAL INVESTIGATION	3-1
3.1 Soil Boring Installation	3-1
3.2 Soil Sampling	3-1
3.3 Groundwater Sampling.....	3-2
4. FINDINGS	4-1
4.1 Subsurface Conditions	4-1
4.2 Soil Analytical Results	4-1
4.3 Groundwater Analytical Results	4-1
4.4 Data Validation	4-2
5. CONCLUSIONS AND IMPLEMENTATION MEASURES	5-1
6. REFERENCES.....	6-1

TABLES

Table 1:	Soil Description Summary
Table 2:	Soil Analytical Results - Detections Only
Table 3:	Groundwater Analytical Results - Detections Only

FIGURES

Figure 1:	Site Locus
Figure 2:	Site Layout

APPENDICES

Appendix A:	Laboratory Analytical Results
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1. INTRODUCTION

This report presents the findings of a limited subsurface investigation conducted in support of the Back Cove South Storage Facility (BCSSF) project in Portland, Maine. The proposed project area consists of approximately 11 acres located along the south shore of Back Cove, with Preble Street to the west, I-295 to the south, and Southbound I-295 Franklin Street (exit 7) ramp to the east, hereinafter referred to as the Site (**Figure 1**). The Site is currently used as a soccer field and outdoor recreational area as part of Back Cove Park and Back Cove Trail.

The purpose of the BCSSF project is to reduce combined sewer overflows (CSOs) into Back Cove by intercepting flow from existing CSO outfalls and sending it to a proposed 3.5 million-gallon offline CSO storage facility. The BCSSF will consist of four separate cast-in-place concrete tanks interconnected with piping. An important component of the proposed project will also be the proper handling of potentially contaminated soil and groundwater that are expected to be disturbed during construction. The project is expected to disturb approximately 80,000 cubic yards (CY) of material and generate approximately 40,000 CY of excess material that cannot be reused onsite.

The purpose of this investigation was to evaluate current environmental conditions at the Site so they may be considered during the planning and construction of the BCSSF. Sample locations selected for this investigation were focused on locations within the project area where soil is expected to be disturbed and generated as excess during construction (**Figure 2**). The purpose of the investigation was to:

- Evaluate soil and groundwater that may be encountered during construction to assess potential risk to site workers; and
- Evaluate deeper native materials that may contain lower concentrations of oil and/or hazardous materials to investigate potential reuse options.

2. BACKGROUND

The Site is in an urban area of Portland that was initially filled between the 1850s and 1870s. The area was also regraded and filled during the construction of I-295 in the early 1970s. Additional urban fill was likely added to the area of the Site during the subsequent growth and reconfiguration of the Bayside neighborhood of Portland both before and after the construction of I-295.

Based on the initial geotechnical investigation completed by S.W. Cole in 2018 on behalf of the City of Portland, the subsurface conditions at the Site generally included urban fill and granular fill overlying bay mud overlying glaciomarine clays. Granular fill, consisting brown to gray sand with silt and gravel, was interpreted by S.W. Cole to be associated with the construction I-295 (S. W. Cole, 2018b). Urban fill is a soil matrix that may include such material as brick, cement, wood, wood ash, coal, coal ash, boiler ash, clinkers, other ash, asphalt, glass, plastic, metal, demolition debris, roadside ditch materials. Certain urban areas of Maine, such as the Bayside area of Portland, have large quantities of urban fill present. (Maine DEP, 2018)

Granular and urban fills that may be located at the Site are interpreted to be the result of anthropogenic activities, whereas the underlying bay mud and clay represent naturally deposited marine sediments.

In addition to the initial geotechnical investigation referenced above, S. W. Cole completed a limited environmental investigation in 2018 to assess existing conditions at the Site (S. W. Cole, 2018a). This investigation included the installation of six direct push soil borings to a depth of 40 feet below ground surface (bgs). The locations of these borings are shown on **Figure 2** and are generally within the proposed project area, except for GP-2 which is located adjacent to Back Cove.

Soil samples of fill material from three of the six locations (GP-1, GP-2, and GP-3) were collected from 8 to 12 bgs and were submitted for laboratory analysis of volatile petroleum hydrocarbons (VPH), extractable petroleum hydrocarbons (EPH), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and priority pollutant metals. In addition, three monitoring wells were installed at boring locations GP-1, GP-2 and GP-3 to assess groundwater quality. Groundwater samples were submitted for laboratory analysis of VPH, EPH, VOCs, SVOCs, PCBs, and dissolved priority pollutant metals. S. W. Cole's general findings included:

- Groundwater and soil results from GP-1 and GP-3, within the project area, indicated low level detections of metals below Maine Department of Environmental Protection (DEP) Remedial Action Guidelines (RAGs) for construction workers.
- The soil sample from GP-2 (10 to 12 feet bgs) had a lead concentration of 530 mg/kg which exceeds the construction worker RAG. GP-2 also had low level detections of EPH fractions, petroleum related VOCs, and naphthalene.
- Naphthalene was detected in the groundwater sample from GP-2 in exceedance of the construction worker RAG of 19 microgram per liter ($\mu\text{g/L}$), at a reported concentration of 190 $\mu\text{g/L}$.

Based on Woodard & Curran's experience conducting environmental assessments in the Bayside neighborhood of Portland, the soil conditions found by S.W. Cole during their 2018 investigation are not unusual and are typical of the urban fill materials present throughout the area of the Site. Though groundwater conditions may vary throughout the area, the groundwater results reported by S.W. Cole are within the range of what may be expected in Bayside.

3. ENVIRONMENTAL INVESTIGATION

Based on the findings of previous Site investigations and the proposed design of the BCSSF, a focused subsurface investigation was initiated to evaluate soil and groundwater that may be encountered during construction to assess potential risk to site workers and to assess deeper native materials that may contain lower concentrations of oil and/or hazardous materials to investigate potential reuse options. This investigation included the following general scope of work:

1. Installation of 13 soil borings throughout the anticipated area of construction at the Site, including the proposed locations of storage tanks and associated subsurface utilities, to a maximum depth of 40 feet bgs, which is expected to be at or below the maximum depth of excavation, based on current design;
2. Collection of 27 soil samples and two duplicate samples from the installed soil borings;
3. Collection of one groundwater sample from a pre-existing piezometer;
4. Independent laboratory analysis of soil and groundwater samples; and
5. Data validation to verify that field and analytical results are usable for their intended purpose.

3.1 Soil Boring Installation

Prior to initiating subsurface activities, Woodard & Curran pre-marked investigation locations and coordinated with Dig Safe for utility clearance. In addition, the sample locations were cleared on November 15, 2020, by Dig-Smart of Maine, a private utility survey contractor, to further reduce the risk of contact or damage to underground utilities.

A total of 13 soil borings were completed at by MAI Environmental on November 20, 21, and 22, 2019. All soil borings were completed using direct push methods. Soil boring locations and depths were selected based on the proposed tank and utility layout as shown on **Figure 2**. Boring locations WC-1, WC-2, WC-3, WC-4, WC-5, WC-7, WC-8, WC-10 and WC-12, were completed in the area of proposed excavation for the storage tanks to depth of 40 feet bgs. Boring locations WC-13, WC-18, and WC-20 were conducted in areas of proposed subsurface utilities and were completed to depths of 15 to 20 feet bgs.

Each collected soil sample was screened in the field for the presence of total volatile organic compounds (TVOCs) using a photoionization detector (PID).

Subsurface conditions and field screening results are discussed in Section 4.1.

3.2 Soil Sampling

Soil sampling activities were performed at the Site by Woodard & Curran personnel on November 20, 21, and 22, 2019. Soil sample depth intervals were selected to characterize both fill and native materials. A total of 27 composite soil samples were collected from the 13 borings. Nine samples consisted of fill materials, eight samples consisted of bay mud, and ten samples consisted of clay. In addition to the 27 soil samples, two blind field duplicates were collected from WC-7 (29-36) and WC-8 (0-29) for quality assurance and quality control (QA/QC) purposes.

Soil samples from each boring were properly preserved and placed into appropriate laboratory supplied glassware for laboratory analysis. Soil samples were logged on a chain of custody form and submitted to Contest Analytical Laboratory of East Longmeadow, Massachusetts (Contest). Samples were analyzed for the following analytical suite, which included common contaminants of concern for urban fill.

- VOCs by EPA Method 8260C-D
- EPH including target compounds by the Massachusetts DEP Method

- RCRA 8 Metals by EPA Methods 6010D/7471B (for fill samples)
- Lead by EPA Method 6010 (for native samples)

For samples where the total lead concentration in soil exceeded a value equal to 20 times the applicable toxicity characterization leaching potential (TCLP) limit (TCLP lead limit: 5 mg/L; threshold concentration in soil for TCLP analysis: 100 mg/kg), the sample was also analyzed for using the TCLP procedure. Soil sample results are discussed in Section 4.2.

3.3 Groundwater Sampling

One groundwater sample was collected on November 22, 2020 from the pre-existing piezometer shown on **Figure 2**. Field water quality parameters (i.e., pH, temperature, dissolved oxygen, oxidation-reduction potential [ORP], turbidity, and specific conductance) were documented during purging. The turbidity was above the detectable range of the turbidity meter for the entire sampling period. Following the stabilization of groundwater parameters, Woodard & Curran collected one groundwater sample (PZ-1) using low flow/low stress purging.

The groundwater sample was logged on a chain of custody form and submitted to Contest for the following analyses:

- VOCs by EPA Method 8260C-D
- EPH including target compounds by Massachusetts DEP Method
- Total metals (arsenic, barium, cadmium, chromium, copper, lead, nickel, mercury, selenium, silver, and zinc) by EPA Methods 6010D/7471B

These analytical methods were selected to evaluate potential impact from urban fill materials and to evaluate management and disposal options for dewatered groundwater that may be generated during construction. Groundwater sample results are discussed in Section 4.3.

4. FINDINGS

Findings of the subsurface investigation conducted at the Site are presented in the sections below. Soil analytical results were compared to the Maine Remedial Action Guidelines (RAGs) for construction worker exposure criteria. Groundwater results were compared to Maine construction worker RAGs and Portland Public Owned Treatment Works (POTW) discharge limits. A summary of detected analytical results are tabulated in **Tables 2** and **3**, and copies of the laboratory analytical packages are provided in **Appendix A**.

4.1 Subsurface Conditions

Woodard & Curran's investigation identified four main strata in the subsurface; Urban fill, granular fill, bay mud, and glaciomarine clay. Fill materials extend from ground surface to approximately 13 to 32 feet bgs. Native materials were encountered at a depth ranging from 17 to 33 feet bgs. These findings are generally consistent with observations recorded by S.W. Cole during their initial geotechnical investigation (S.W. Cole 2018b).

Based on field observations, groundwater seems to be condensed within the layers of urban and granular fill ranging from 6 to 9 feet bgs. Based on Site topography, groundwater likely flows in the northerly direction towards Back Cove.

Table 1 presents the varying depths of each strata throughout the borings, the depth interval of each sample, and the corresponding PID field screening results.

4.2 Soil Analytical Results

Results for compounds with one or more detections are in **Table 2**. All detected concentrations were below the RAGs for the construction worker scenario. Copies of the laboratory analytical packages are provided in **Appendix A**.

Four metals (arsenic, barium, chromium, and lead) were detected above laboratory reporting limits in all 9 of the fill samples. Cadmium was detected in one fill soil sample WC-12 (0-10) and mercury was detected in four of the fill samples. The duplicate sample WC-DUP-2 was originally reported by the laboratory to have an arsenic concentration of 100 mg/kg, while the corresponding fill sample, WC-8(0-29), had an arsenic concentration of 2.2 mg/kg. The laboratory reanalyzed WC-DUP-2 for metals and the reanalysis resulted in an arsenic concentration of 2.6 mg/kg. Based on this outcome, the initial metals results for WC-DUP-2 were rejected and the re-analysis results are presented in **Table 2**.

Lead was detected at concentrations ranging from 17 mg/kg to 190 mg/kg in bay mud composite samples and 12 mg/kg to 15 mg/kg in clay samples. TCLP lead concentrations in the 3 samples with total lead concentrations over 100 mg/kg were not detected above the reporting limit.

Low levels of EPH petroleum hydrocarbon fractions and target compounds were reported above the laboratory detection limit in fill and bay mud samples. Detections of EPH petroleum hydrocarbon fractions were the highest in bay mud samples. EPH petroleum hydrocarbon fractions and target compounds were not detected at concentrations above the reporting limits for clay composite samples.

Benzene was detected above laboratory detection limits in one fill sample WC-5 (0-15), at a concentration below the applicable construction worker RAG. No other soil samples had detections of VOCs above the laboratory reporting limit.

4.3 Groundwater Analytical Results

Detectable analyte concentrations in the collected groundwater sample are presented in **Table 3**. Copies of the laboratory analytical packages are provided in **Appendix A**.

VOCs were not detected at concentration above laboratory reporting limits. Three EPH petroleum hydrocarbon fractions were reported above laboratory detection limits (C9-C18 aliphatics, C19-C36 aliphatics, and C11-C22 aromatics) though concentrations were below the Maine RAGs for construction worker exposure scenario.

Eleven metals were reported above the laboratory detection limits (arsenic, barium, cadmium, chromium, copper, lead, nickel, selenium, silver, zinc, and mercury). All metals except for mercury were reported below the applicable RAG. Mercury was reported at a concentration of 4.1 µg/L, exceeding the Maine RAG for construction worker exposure of 2.1 µg/L. Arsenic, lead, nickel, and zinc were reported at a concentration exceeding the POTW discharge limits for Portland.

It is relevant to note that aside from collecting the samples via the low flow/low stress method, no filtering or treatment of the collected groundwater sample was conducted. Therefore, these results represent a total concentration that may be influenced by solids entrained in the groundwater column.

4.4 Data Validation

The analytical results associated with the soil and groundwater samples were validated to assess the quality and usability of the reported concentrations. Quality control results were compared against EPA criteria in the National Functional Guidelines for Organic Superfund Methods Review (USEPA, 2017a), National Functional Guidelines for Inorganic Superfund Methods Review (USEPA, 2017b) and method-specified criteria. Quality control parameters that were evaluated included holding times, surrogates (VOCs and EPH), method blanks, trip blanks (VOCs only), laboratory control samples, and field duplicates. Copies of the laboratory analytical packages are provided in **Appendix A**.

Quality control results were generally compliant with the criteria used for the validation procedure with a few minor exceptions. The groundwater sample was analyzed at a one to five dilution, resulting in elevated detection limits. The reason for the dilution was reported to be related to issues associated with the sample matrix that resulted in foaming. For the VOC analysis associated with the groundwater sample and all soil samples except for WC-11(35-40), non-compliant continuing calibration results were reported for the following compounds: 1,1,2-trichloro-1,2,2-trifluoroethane, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, dichlorodifluoromethane, methyl cyclohexane and naphthalene. Concentrations of these VOCs were qualified as estimated (J-) to reflect the low bias indicated by the calibration results. For the sample WC-11(35-40), VOC concentrations of naphthalene, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, and trans-1,4-dichloro-2-butene were flagged as estimated biased low (J-) based on non-compliant calibration results.

For the EPH analysis, all soil samples had compliant quality control results and no qualifiers were applied to any of the results. However, for the groundwater sample collected from PZ-1, low recoveries were reported for two of the surrogates used to monitor instrument performance. The laboratory reextracted and reanalyzed the sample with similar results indicating potential matrix effects. Based on these results, the aliphatic and aromatic carbon fraction results reported for the groundwater sample PZ-1 was qualified as estimated biased low (J-). The first run was used for reporting purposes since higher concentrations of the aliphatic range were reported and only slightly lower aromatic results were obtained. For the metals analyses, all quality control results had compliant results with the following exceptions. A matrix spike analysis for lead only was conducted using the sample WC-5(30-33.5). The recovery of 170 percent exceeded the upper control limit, suggesting a high bias to the sample concentration. The lead concentration for WC-5(30-33.5) was qualified as estimated, biased high (J+) based on this result.

For the field duplicate sample collected at WC-8(0-29), a high relative percent difference (RPD) was calculated for arsenic. A concentration of 2.2 mg/kg was reported in the sample while in the duplicate, DUP-2, a concentration of 100 mg/kg was reported. The laboratory reanalyzed DUP-2. Arsenic was detected at a concentration of 2.6 mg/kg in this reanalyzed sample indicating an acceptable level of precision.

Method and trip blank results were non-detect indicating that false positive results related to cross contamination and laboratory processing are not likely. Laboratory control sample recoveries were generally acceptable, indicating that sample concentrations were accurately quantified. Field duplicate results suggest acceptable precision and limited variability and heterogeneity of the soil and aqueous matrices for all analytical parameters. In summary, the quality of the reported data are acceptable as qualified for the end use of characterization of soil and groundwater at the Site.

5. CONCLUSIONS AND IMPLEMENTATION MEASURES

Consistent with the findings of this investigation, our conclusions regarding general soil and groundwater conditions are summarized below:

- Soil analytical results were all below the construction worker RAGs. This indicates that no specialized training or other measures are warranted to reduce the risk of exposure to workers during construction.
- Detected concentrations of metals and petroleum constituents in fill and bay mud material may restrict reuse possibilities, while the underlying clay does not appear to have been impacted by anthropogenic sources.
- Mercury was reported at a concentration of 4.1 µg/L in the one groundwater sample, exceeding the RAG for the construction worker exposure of 2.1 µg/L. Arsenic, lead, nickel, and zinc were detected at concentrations exceeding the POTW discharge limits for Portland. The elevated concentrations of metals are suspected to be associated with the high turbidity of the groundwater sample collected. It is possible that these conditions could be mitigated during construction by treatment to reduce fine solid materials that may be present in the groundwater column.

Based on the subsurface investigation findings, Woodard & Curran offers the following implementation measures and additional considerations:

1. Work with the City of Portland to submit an application for participation in the Maine DEP Voluntary Response Action Program (VRAP). Though not specifically required by regulation or statute, participating in VRAP provides additional Maine DEP support and concurrence regarding soil reuse and disposal decisions that will be made by the Design-Build Team during design and construction. Participation in VRAP also benefits the City of Portland by providing liability protection for these soil reuse and disposal decisions.
2. An additional groundwater sample will be collected and analyzed for total and dissolved metals to investigate whether or not the source of these metals is associated with suspended sediment in the groundwater. Depending on the proposed construction dewatering design, the installation of additional groundwater monitoring wells to further characterize groundwater that may be encountered during construction may be warranted.
3. Prior to the initiation of construction activities, a materials management plan (MMP) that describes proper management and disposal options for soil that may be disturbed during construction will be developed and implemented.
4. Though conditions documented through this investigation do not warrant specialized training, known soil and groundwater conditions will be shared with Site workers via the MMP as part of risk communication.
5. Construction-derived soil originating from the Site will be managed onsite in accordance with the MMP (once developed) and reused during construction to the greatest extent possible in order to minimize construction costs. For excess soil that cannot be reused onsite, potential reuse options will be further evaluated based on continued discussions with DEP, including VRAP and the Solid Waste Department. Initial conclusions regarding management options are presented below:
 - Fill – this material will be reused onsite to the extent possible; however, potential reuse options may be available through beneficial reuse options following appropriate Maine DEP permitting and evaluation of suitability by an Environmental Professional.
 - Bay mud – if feasible from a geotechnical/structural standpoint, this material should be reused onsite to the extent possible. Otherwise, excess bay mud may be acceptable for disposal at a Maine DEP

permitted solid waste landfill. Further discussions with DEP are warranted to determine if other reuse options for this material may be viable.

- Clay – this material may be reused onsite but is also likely suitable for reuse at other properties. Potential reuse options may include grading or daily cover for landfills, cap material for landfill closure, pit reclamation, or other unrestricted reuse options.
6. The design will incorporate risk reduction measures to minimize direct contact with existing urban fill soil following construction and during the future use of the Site. Example approaches, which will be detailed in the MMP, include but are not limited to the following minimum requirements: a high visibility demarcation layer overlain by 12 inches or greater of clean imported materials and landscaping; 24 inches or greater of clean imported materials (no underlying demarcation layer required if 24 inches of clean materials are used); or permanent building foundations.
 7. Appropriate long-term risk reduction measure and maintenance procedures shall be included in the MMP to guide future use and operation of the Site following construction.

6. REFERENCES

Maine Department of Environmental Protection (DEP), 2018. Maine Remedial Action Guidelines (RAGs) for Sites Contaminated with Hazardous Substances. October 19, 2018.

S. W. Cole Engineering, Inc (S.W. Cole), 2018a. Environmental Services, Proposed Back Cove South Stormwater Storage Facility, Preble Street, Portland, Maine. October 22, 2018

S. W. Cole, 2018b. Explorations and Preliminary Geotechnical Services, Proposed Back Cove South Stormwater Storage Facility, Preble Street Ext & I-295, Portland, Maine. September 17, 2018

United States Environmental Protection Agency (USEPA), 2017a. National Functional Guidelines for Superfund Organic Methods Data Review. January 2017.

USEPA, 2017b. National Functional Guidelines for Inorganic Superfund Methods Data Review. January 2017.

TABLES

Table 1
Soil Description Summary
Back Cove South Storage Facility

Feet bgs	WC-1	WC-2	WC-3	WC-4	WC-5	WC-7	WC-8	WC-10	WC-11	WC-12	WC-13	WC-18	WC-20					
1																		
2	WC-1 (0-5) 0.3 ppm																	
3																		
4																		
5										WC-12 (0-10) 1.0 ppm		WC-18 (0-15) 0.1 ppm						
6					WC-5 (0-15) 0.8 ppm													
7																		
8																		
9											WC-13 (0-20) 0.0 ppm							
10			WC-3 (0-28) 0.0 ppm					WC-10 (0-20) 0.0 ppm					WC-20 (0-20) 0.1 ppm					
11																		
12																		
13																		
14																		
15				no data			WC-8 (0-29) 0.3 ppm		no data									
16																		
17																		
18																		
19										no data								
20																		
21																		
22	WC-1 (20-25) 0.1 ppm				no data													
23																		
24																		
25								no data										
26																		
27		WC-2 (25-30) 0.0 ppm																
28																		
29																		
30																		
31			WC-3 (30-35) 0.0 ppm	WC-4 (30-35) 0.3 ppm	WC-5 (30-33.5) 0.2 ppm	WC-7 (29-36) 0.2 ppm	WC-8 (29-38) 0.4 ppm				no data		no data					
32																		
33																		
34								WC-10 (35)										
35																		
36	WC-1 (34-40) 0.0 ppm				WC-5 (33.5-40) 0.2 ppm					WC-12 (33-40) 0.3 ppm								
37		WC-2 (35-40) 0.0 ppm	WC-3 (35-40) 0.0 ppm	WC-4 (35-40) 0.2 ppm														
38																		
39						WC-7 (36-40) 0.2 ppm	WC- 8 (38-40) 0.2 ppm											
40																		

Key:	
	Urban fill
	Granular Fill
	Bay Mud
	Clay
	Undefined layer extent

Notes:

- bgs = below ground surface. Please note that all depth intervals should be considered approximate due to potential compression or other factors that may occur during drilling.
- a. Table shows generalized soil layers. In cases where continuous sampling was not completed, the contact between the soil layer is unknown. Unknown extents are indicated with a dashed line.
- b. The PID reading for WC-10 (35) was 0.2 ppm.

Table 2 Soil Analytical Results - Detections Only Back Cove South Storage Facility																														
Boring ID	WC-1	WC-1	WC-1	WC-2	WC-2	WC-3	WC-3	WC-3	WC-4	WC-4	WC-5	WC-5	WC-5	WC-7	WC-DUP-1	WC-7	WC-8	WC-DUP-2	WC-8	WC-8	WC-10	WC-10	WC-10	WC-11	WC-12	WC-12	WC-13	WC-18	WC-20	Maine Remedial Action Guidelines
Depth (feet bgs)	0-5	20-25	34-40	25-30	35-40	0-28	30-35	35-40	30-35	35-40	0-15	30-33.5	33.5-40	29-36	29-36	36-40	0-29	0-29	29-38	38-40	0-20	35	35-40	35-40	0-10	33-40	0-20	0-15	0-20	Construction Worker
Date Sampled	19-Nov-19	19-Nov-19	19-Nov-19	19-Nov-19	19-Nov-19	19-Nov-19	19-Nov-19	19-Nov-19	22-Nov-19	22-Nov-19	21-Nov-19	21-Nov-19	21-Nov-19	20-Nov-19	20-Nov-19	20-Nov-19	20-Nov-19	20-Nov-19	20-Nov-19	20-Nov-19	20-Nov-19	21-Nov-19	21-Nov-19	21-Nov-19	22-Nov-19	21-Nov-19	22-Nov-19	21-Nov-19	21-Nov-19	
Geologic Unit	Fill	Bay Mud	Clay	Bay Mud	Clay	Fill	Bay Mud	Clay	Bay Mud	Clay	Fill	Bay Mud	Clay	Bay Mud	Bay Mud	Clay	Fill	Fill	Bay Mud	Clay	Fill	Bay Mud	Clay	Clay	Fill	Clay	Fill	Fill	Fill	mg/kg
Volatile Organic Compounds (mg/kg)																														
Benzene	<0.053	<0.048	<0.059	<0.085	<0.060	<0.037	<0.056	<0.062	<0.079	<0.069	0.039	<0.067	<0.072	<0.080	<0.082	<0.057	<0.040	<0.041	<0.079	<0.061	<0.041	<0.052	<0.055	<0.066	<0.038	<0.063	<0.038	<0.038	<0.034	240
Extractable Petroleum Hydrocarbons (mg/kg)																														
C9-C18 Aliphatics	<11	14	<14	55	<14	<11	<16	<14	25	<14	<11	15	<14	50	54	<13	<11	<11	51	<14	<11	43	<14	<14	<11	<13	<11	<11	<11	4,800
C19-C36 Aliphatics	29	71	<14	410	<14	40	130	<14	230	<14	20	110	<14	300	310	<13	<11	<11	320	<14	15	140	<14	<14	39	<13	<11	<11	<11	74,000
C11-C22 Aromatics	23	19	<14	120	<14	18	55	<14	100	<14	16	59	<14	110	120	<13	<11	<11	120	<14	<11	65	<14	<0.14	39	<13	<11	<11	<11	74,000
Acenaphthene	<0.11	<0.12	<0.14	<0.15	<0.14	<0.11	<0.16	<0.14	<0.15	<0.14	<0.11	<0.14	<0.14	<0.16	<0.16	<0.13	<0.11	<0.11	<0.15	<0.14	<0.11	<0.13	<0.14	<0.14	0.24	<0.13	<0.11	<0.11	<0.11	48,000
Anthracene	<0.11	<0.12	<0.14	0.18	<0.14	<0.11	<0.16	<0.14	<0.15	<0.14	<0.11	<0.14	<0.14	<0.16	<0.16	<0.13	<0.11	<0.11	<0.15	<0.14	<0.11	<0.13	<0.14	<0.14	0.36	<0.13	<0.11	<0.11	<0.11	100,000
Benzo(a)anthracene	<0.11	<0.12	<0.14	0.93	<0.14	<0.11	0.43	<0.14	0.72	<0.14	0.16	0.38	<0.14	0.5	0.63	<0.13	<0.11	<0.11	0.59	<0.14	<0.11	0.3	<0.14	<0.14	0.75	<0.13	<0.11	0.18	<0.11	1,700
Benzo(a)pyrene	0.13	<0.12	<0.14	0.76	<0.14	<0.11	0.21	<0.14	1.3	<0.14	0.18	0.24	<0.14	0.35	0.35	<0.13	<0.11	<0.11	0.34	<0.14	<0.11	0.21	<0.14	<0.14	0.62	<0.13	<0.11	0.17	<0.11	9.9
Benzo(b)fluoranthene	0.13	<0.12	<0.14	1.1	<0.14	0.25	0.26	<0.14	0.4	<0.14	0.21	0.21	<0.14	0.53	0.57	<0.13	<0.11	<0.11	0.52	<0.14	<0.11	0.31	<0.14	<0.14	0.84	<0.13	<0.11	0.21	<0.11	1,700
Benzo(g,h,i)perylene	<0.11	<0.12	<0.14	0.53	<0.14	<0.11	<0.16	<0.14	0.2	<0.14	<0.11	<0.14	<0.14	0.26	0.28	<0.13	<0.11	<0.11	0.25	<0.14	<0.11	0.15	<0.14	<0.14	0.36	<0.13	<0.11	<0.11	<0.11	72,000
Benzo(k)fluoranthene	<0.11	<0.12	<0.14	0.36	<0.14	<0.11	<0.16	<0.14	<0.15	<0.14	<0.11	<0.14	<0.14	0.17	0.17	<0.13	<0.11	<0.11	<0.15	<0.14	<0.11	<0.13	<0.14	<0.14	0.3	<0.13	<0.11	<0.11	<0.11	17,000
Chrysene	<0.11	<0.12	<0.14	1.3	<0.14	0.12	0.71	<0.14	1.2	<0.14	0.15	0.72	<0.14	0.87	0.99	<0.13	<0.11	<0.11	0.86	<0.14	<0.11	0.36	<0.14	<0.14	0.78	<0.13	<0.11	0.2	<0.11	100,000
Fluoranthene	0.19	0.15	<0.14	1.8	<0.14	0.22	0.44	<0.14	0.72	<0.14	0.3	0.45	<0.14	0.83	0.99	<0.13	<0.11	<0.11	0.93	<0.14	<0.11	0.59	<0.14	<0.14	1.9	<0.13	<0.11	0.44	<0.11	24,000
Fluorene	<0.11	<0.12	<0.14	0.23	<0.14	<0.11	<0.16	<0.14	<0.15	<0.14	<0.11	<0.14	<0.14	<0.16	0.17	<0.13	<0.11	<0.11	0.17	<0.14	<0.11	<0.13	<0.14	<0.14	0.22	<0.13	<0.11	<0.11	<0.11	96,000
Indeno(1,2,3-cd)pyrene	<0.11	<0.12	<0.14	0.52	<0.14	<0.11	<0.16	<0.14	0.21	<0.14	<0.11	<0.14	<0.14	0.27	0.29	<0.13	<0.11	<0.11	0.26	<0.14	<0.11	0.14	<0.14	<0.14	0.47	<0.13	<0.11	<0.11	<0.11	1,700
2-Methylnaphthalene	<0.11	<0.12	<0.14	<0.15	<0.14	<0.11	<0.16	<0.14	<0.15	<0.14	<0.11	<0.14	<0.14	<0.16	<0.16	<0.13	<0.11	<0.11	<0.15	<0.14	<0.11	<0.13	<0.14	<0.14	<0.11	<0.13	<0.11	<0.11	<0.11	960
Naphthalene	<0.11	0.16	0.25	<0.15	<0.14	<0.11	<0.16	<0.14	<0.15	<0.14	<0.11	<0.14	<0.14	<0.16	0.2	<0.13	<0.11	<0.11	<0.15	<0.14	<0.11	<0.13	<0.14	<0.14	<0.11	<0.13	<0.11	<0.11	<0.11	130
Phenanthrene	0.14	<0.12	<0.14	0.83	<0.14	0.15	0.28	<0.14	0.42	<0.14	0.18	0.28	<0.14	0.46	0.6	<0.13	<0.11	<0.11	0.56	<0.14	<0.11	0.32	<0.14	<0.14	1.2	<0.13	<0.11	0.36	<0.11	72,000
Pyrene	0.2	0.14	<0.14	1.7	<0.14	0.22	0.48	<0.14	0.68	<0.14	0.31	0.43	<0.14	0.9	0.93	<0.13	<0.11	<0.11	0.99	<0.14	<0.11	0.56	<0.14	<0.14	1.7	<0.13	<0.11	0.41	<0.11	72,000
Metals (mg/kg)																														
Arsenic	3.9	--	--	--	--	9.7	--	--	--	--	4.6	--	--	--	--	--	2.2	2.6	--	--	2.7	--	--	--	8.5	--	3	5	6.3	54
Barium	28	--	--	--	--	53	--	--	--	--	36	--	--	--	--	--	10	11	--	--	12	--	--	--	49	--	10	42	35	20,000
Cadmium	<0.18	--	--	--	--	<0.19	--	--	--	--	<0.18	--	--	--	--	--	<0.18	2.5	--	--	<0.18	--	--	--	0.25	--	<0.18	<0.18	<0.18	4,800
Chromium ^b	13	--	--	--	--	29	--	--	--	--	17	--	--	--	--	--	5.7	7.5	--	--	6.2	--	--	--	21	--	7.3	21	21	46
Lead	30	48	13	130	13	16	88	14	89	14	20	62 J+	13	190	130	12	2.9	4.2	82	13	4.3	17	13	15	54	15	3.6	7.1	5.5	450
Mercury	0.068	--	--	--	--	0.18	--	--	--	--	0.078	--	--	--	--	--	<0.028	<0.029	--	--	<0.027	--	--	--	0.077	--	<0.027	<0.028	<0.027	490
Notes:																														
Bold= Analyte is in exceedance of the applicable Maine RAG																														
-- = Not sampled for specific analyte																														
mg/kg = milligram per kilogram																														
< = not detected at indicated reporting limit																														
J+ = Results qualified as estimated, biased high, by laboratory and/or data validation																														
bgs= below ground surface																														
DUP-1 corresponds to sample WC-7 (29-36), DUP-2 corresponds to sample WC-8 (0-29).																														
a. Maine Remedial Action Guidelines for Sites Contaminated with Hazardous Substances, Maine DEP, Bureau of Remediation and Waste Management (revised October 19, 2018).																														
b. The toxicity of chromium varies with its valence state and hexavalent chromium is much more toxic than trivalent chromium. No chromium speciation analysis (i.e., to distinguish between trivalent and hexavalent chromium) was conducted. However, based on the fairly consistent and ubiquitous presence of total chromium in soil at the Site, and that no history of higher risk uses that are known to cause hexavalent chromium concentrations in soil (e.g., electricity generation, tanning, metal finishing, photographic development, textile dyeing, wood preserving), it is unlikely that the detected total chromium concentrations contain a significant ratio of hexavalent chromium. Therefore, total chromium concentrations were compared to trivalent chromium RAGs.																														

Table 3
Groundwater Analytical Results - Detections Only
Back Cove South Storage Facility

Sample ID	PZ-1	POTW Discharge Limits ^a	Remedial Action Guidelines for Construction Worker ^b
Date Sampled	22-Nov-19		
Extractable Petroleum Hydrocarbons (ug/L)			
C9-C18 Aliphatics	250 J-	-	3,700
C19-C36 Aliphatics	1,500 J-	-	100,000
C11-C22 Aromatics	420 J-	-	100,000
Total Metals (ug/L)			
Arsenic	210	20	5,800
Barium	2,700	-	100,000
Cadmium	11	24	3,900
Chromium ^c	1,400	1,900	100,000
Copper	940	1,880	100,000
Lead	1,200	600	-
Nickel	870	760	100,000
Selenium	38	-	96,000
Silver	12	420	12,000
Zinc	3,500	2,570	100,000
Mercury	4.1	140	2.1

Notes:

Bold = analyte is in exceedance of the POTW discharge limits.

Shaded = analyte is in exceedance of the Remedial Action Guideline.

- = no standard

ug/L = micrograms per liter

< = not detected at indicated reporting limit

J- = Results qualified as estimated, biased low, by laboratory and/or data validation

POTW = Portland Publicly Owned Treatment Works

a. From Public Works Department Rules and Regulations for the Use of the Sewer System, Schedule A. Effective October 22, 2016.

b. Maine Remedial Action Guidelines for Sites Contaminated with Hazardous Substances, Maine DEP, Bureau of Remediation and Waste Management (revised October 19, 2018).

c. The toxicity of chromium varies with its valence state and hexavalent chromium is much more toxic than trivalent chromium. No chromium speciation analysis was conducted. No history of higher risk uses that are known to cause hexavalent chromium concentrations in soil were active on the Site. Therefore, total chromium concentrations were compared to trivalent chromium RAGs.

FIGURES

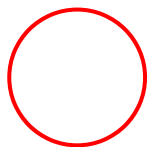


SITE LOCUS

BACK COVE SOUTH
STORAGE FACILITY

FIGURE 1

Legend



Locus



Project #: 0232069
Map Created: February 2020

0 500 1,000 2,000
Feet

Figure Exported: 2/11/2020 By: klambek Using: \\woodardcurran.net\shared\Projects\0232069\00 Portland ME - Back Cove S Fac Des\wp\GIS\Project Files\Figure 2 Site Layout.mxd



SITE LAYOUT

BACK COVE SOUTH
STORAGE FACILITY

FIGURE 2

N



Legend

-  Approximate Location of Peizometer
-  Approximate Location of Historical Boring
-  Approximate Location of Soil Boring
-  Approximate Location of Proposed Tank
-  Approximate Location of Proposed Site Piping

0 25 50 100
Feet



Project #: 0232069
Map Created: February 2020

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources:** ESRI

APPENDIX A: LABORATORY ANALYTICAL RESULTS

December 17, 2019

Jedd Steinglass
Woodard & Curran - Portland, ME
41 Hutchins Drive
Portland, ME 04102

Project Location: Portland, ME
Client Job Number:
Project Number: 0232069
Laboratory Work Order Number: 19K1416

Enclosed are results of analyses for samples received by the laboratory on November 22, 2019. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Meghan E. Kelley". The signature is written in a cursive, flowing style.

Meghan E. Kelley
Project Manager

Table of Contents

Sample Summary	5
Case Narrative	9
Sample Results	13
19K1416-01	13
19K1416-02	18
19K1416-03	23
19K1416-04	28
19K1416-05	33
19K1416-06	38
19K1416-07	43
19K1416-08	48
19K1416-09	53
19K1416-10	58
19K1416-11	63
19K1416-12	68
19K1416-13	73
19K1416-14	78
19K1416-15	83
19K1416-16	88
19K1416-17	93
19K1416-18	98
19K1416-19	103
19K1416-20	108
19K1416-21	113
19K1416-22	118

Table of Contents (continued)

19K1416-23	123
19K1416-24	128
19K1416-25	133
19K1416-26	138
19K1416-27	143
19K1416-28	148
19K1416-29	153
Sample Preparation Information	155
QC Data	159
Volatile Organic Compounds by GC/MS	159
B246934	159
B246935	164
Petroleum Hydrocarbons Analyses - EPH	169
B246837	169
B246957	171
Metals Analyses (Total)	175
B247115	175
B247130	175
B247190	175
B247191	176
B247281	177
B247983	177
Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)	179
B246947	179
Flag/Qualifier Summary	180

Table of Contents (continued)

Certifications	181
Chain of Custody/Sample Receipt	185

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Woodard & Curran - Portland, ME
41 Hutchins Drive
Portland, ME 04102
ATTN: Jedd Steinglass

REPORT DATE: 12/17/2019

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 0232069

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 19K1416

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Portland, ME

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WC-1 (0-5)	19K1416-01	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 7471B SW-846 8260C-D	
WC-1 (20-25)	19K1416-02	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-1 (34-40)	19K1416-03	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-2 (25-30)	19K1416-04	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-2 (35-40)	19K1416-05	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-3 (0-28)	19K1416-06	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 7471B SW-846 8260C-D	
WC-3 (30-35)	19K1416-07	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-3 (35-40)	19K1416-08	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-7 (29-36)	19K1416-09	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	

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REPORT DATE: 12/17/2019

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 0232069

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 19K1416

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Portland, ME

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WC-7 (36-40)	19K1416-10	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-8 (0-29)	19K1416-11	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 7471B SW-846 8260C-D	
WC-8 (29-38)	19K1416-12	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-8 (38-40)	19K1416-13	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-10 (0-20)	19K1416-14	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 7471B SW-846 8260C-D	
WC-DUP-1	19K1416-15	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-DUP-2	19K1416-16	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 7471B SW-846 8260C-D	
WC-10 (35)	19K1416-17	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-10 (35-40)	19K1416-18	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	

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Woodard & Curran - Portland, ME
41 Hutchins Drive
Portland, ME 04102
ATTN: Jedd Steinglass

REPORT DATE: 12/17/2019

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 0232069

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 19K1416

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Portland, ME

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WC-5 (0-15)	19K1416-19	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 7471B SW-846 8260C-D	
WC-5 (30-33.5)	19K1416-20	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-5 (33.5-40)	19K1416-21	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-12 (0-10)	19K1416-22	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 7471B SW-846 8260C-D	
WC-18 (0-15)	19K1416-23	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 7471B SW-846 8260C-D	
WC-20 (0-20)	19K1416-24	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 7471B SW-846 8260C-D	
WC-13 (0-20)	19K1416-25	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 7471B SW-846 8260C-D	
WC-12 (33-40)	19K1416-26	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
WC-4 (30-35)	19K1416-27	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Woodard & Curran - Portland, ME
41 Hutchins Drive
Portland, ME 04102
ATTN: Jedd Steinglass

REPORT DATE: 12/17/2019

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 0232069

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 19K1416

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Portland, ME

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WC-4 (35-40)	19K1416-28	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
Trip Blank 1	19K1416-29	Trip Blank Soil		SW-846 8260C-D	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

Revision: 12/17/2019 -

For method 6010, Sample 19K1416-16. Laboratory checked reported results with no errors found with results. Per clients request sample 16 was re-extracted and both results are reported.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

MADEP-EPH-04-1.1**Qualifications:****L-07**

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:**n-Nonane**

B246837-BS1

MS-07A

Matrix spike and spike duplicate recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possibility of matrix effects that lead to low bias or non-homogeneous sample aliquot cannot be eliminated.

Analyte & Samples(s) Qualified:**n-Nonane**

B246957-MS1, B246957-MSD1

SW-846 6010D**Qualifications:****L-07**

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:**Arsenic**

B247130-BSD1, B247983-BS1

L-10

The reporting limit verification for the AIHA lead program is outside of control limits for this element. Any reported result at or near the detection limit may be bias on the high side.

Analyte & Samples(s) Qualified:**Lead**

19K1416-02[WC-1 (20-25)], 19K1416-03[WC-1 (34-40)], 19K1416-04[WC-2 (25-30)], 19K1416-05[WC-2 (35-40)], 19K1416-07[WC-3 (30-35)], B247190-DUP1, B247190-MRL1

MS-11

Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:**Lead**

19K1416-20[WC-5 (30-33.5)], B247191-MS1

SW-846 8260C-D**Qualifications:****L-04**

Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.

Analyte & Samples(s) Qualified:**1,2,3-Trichlorobenzene**

19K1416-01[WC-1 (0-5)], 19K1416-02[WC-1 (20-25)], 19K1416-03[WC-1 (34-40)], 19K1416-04[WC-2 (25-30)], 19K1416-05[WC-2 (35-40)], 19K1416-06[WC-3 (0-28)], 19K1416-07[WC-3 (30-35)], 19K1416-08[WC-3 (35-40)], 19K1416-09[WC-7 (29-36)], 19K1416-10[WC-7 (36-40)], 19K1416-11[WC-8 (0-29)], 19K1416-12[WC-8 (29-38)], 19K1416-13[WC-8 (38-40)], 19K1416-14[WC-10 (0-20)], 19K1416-15[WC-DUP-1], 19K1416-16[WC-DUP-2], 19K1416-17[WC-10 (35)], 19K1416-18[WC-10 (35-40)], 19K1416-19[WC-5 (0-15)], 19K1416-20[WC-5 (30-33.5)], 19K1416-21[WC-5 (33.5-40)], 19K1416-22[WC-12 (0-10)], 19K1416-23[WC-18 (0-15)], 19K1416-24[WC-20 (0-20)], 19K1416-25[WC-13 (0-20)], 19K1416-26[WC-12 (33-40)], 19K1416-27[WC-4 (30-35)], 19K1416-28[WC-4 (35-40)], 19K1416-29[Trip Blank 1], B246934-BLK1, B246934-BS1, B246934-BSD1, B246935-BLK1, B246935-BS1, B246935-BSD1

V-05

Continuing calibration verification (CCV) did not meet method specifications and was biased on the low side for this compound.

Analyte & Samples(s) Qualified:**1,1,2-Trichloro-1,2,2-trifluoroethane**

19K1416-01[WC-1 (0-5)], 19K1416-02[WC-1 (20-25)], 19K1416-03[WC-1 (34-40)], 19K1416-04[WC-2 (25-30)], 19K1416-05[WC-2 (35-40)], 19K1416-06[WC-3 (0-28)], 19K1416-07[WC-3 (30-35)], 19K1416-08[WC-3 (35-40)], 19K1416-09[WC-7 (29-36)], 19K1416-10[WC-7 (36-40)], 19K1416-11[WC-8 (0-29)], 19K1416-12[WC-8 (29-38)], 19K1416-13[WC-8 (38-40)], 19K1416-14[WC-10 (0-20)], 19K1416-15[WC-DUP-1], 19K1416-16[WC-DUP-2], 19K1416-17[WC-10 (35)], 19K1416-18[WC-10 (35-40)], 19K1416-19[WC-5 (0-15)], 19K1416-20[WC-5 (30-33.5)], 19K1416-21[WC-5 (33.5-40)], 19K1416-22[WC-12 (0-10)], 19K1416-23[WC-18 (0-15)], 19K1416-24[WC-20 (0-20)], 19K1416-25[WC-13 (0-20)], 19K1416-26[WC-12 (33-40)], 19K1416-27[WC-4 (30-35)], 19K1416-28[WC-4 (35-40)], 19K1416-29[Trip Blank 1], B246934-BLK1, B246934-BS1, B246934-BSD1, B246935-BLK1, B246935-BS1, B246935-BSD1, S043244-CCV1, S043279-CCV1

1,2,3-Trichlorobenzene

19K1416-01[WC-1 (0-5)], 19K1416-02[WC-1 (20-25)], 19K1416-03[WC-1 (34-40)], 19K1416-04[WC-2 (25-30)], 19K1416-05[WC-2 (35-40)], 19K1416-06[WC-3 (0-28)], 19K1416-07[WC-3 (30-35)], 19K1416-08[WC-3 (35-40)], 19K1416-09[WC-7 (29-36)], 19K1416-10[WC-7 (36-40)], 19K1416-11[WC-8 (0-29)], 19K1416-12[WC-8 (29-38)], 19K1416-13[WC-8 (38-40)], 19K1416-14[WC-10 (0-20)], 19K1416-15[WC-DUP-1], 19K1416-16[WC-DUP-2], 19K1416-17[WC-10 (35)], 19K1416-18[WC-10 (35-40)], 19K1416-19[WC-5 (0-15)], 19K1416-20[WC-5 (30-33.5)], 19K1416-21[WC-5 (33.5-40)], 19K1416-22[WC-12 (0-10)], 19K1416-23[WC-18 (0-15)], 19K1416-24[WC-20 (0-20)], 19K1416-25[WC-13 (0-20)], 19K1416-26[WC-12 (33-40)], 19K1416-27[WC-4 (30-35)], 19K1416-28[WC-4 (35-40)], 19K1416-29[Trip Blank 1], B246934-BLK1, B246934-BS1, B246934-BSD1, B246935-BLK1, B246935-BS1, B246935-BSD1, S043244-CCV1, S043279-CCV1

1,2,4-Trichlorobenzene

19K1416-01[WC-1 (0-5)], 19K1416-02[WC-1 (20-25)], 19K1416-03[WC-1 (34-40)], 19K1416-04[WC-2 (25-30)], 19K1416-05[WC-2 (35-40)], 19K1416-06[WC-3 (0-28)], 19K1416-07[WC-3 (30-35)], 19K1416-08[WC-3 (35-40)], 19K1416-09[WC-7 (29-36)], 19K1416-10[WC-7 (36-40)], 19K1416-11[WC-8 (0-29)], 19K1416-12[WC-8 (29-38)], 19K1416-13[WC-8 (38-40)], 19K1416-14[WC-10 (0-20)], 19K1416-15[WC-DUP-1], 19K1416-16[WC-DUP-2], 19K1416-17[WC-10 (35)], 19K1416-18[WC-10 (35-40)], 19K1416-19[WC-5 (0-15)], 19K1416-20[WC-5 (30-33.5)], 19K1416-21[WC-5 (33.5-40)], 19K1416-22[WC-12 (0-10)], 19K1416-23[WC-18 (0-15)], 19K1416-24[WC-20 (0-20)], 19K1416-25[WC-13 (0-20)], 19K1416-26[WC-12 (33-40)], 19K1416-27[WC-4 (30-35)], 19K1416-28[WC-4 (35-40)], 19K1416-29[Trip Blank 1], B246934-BLK1, B246934-BS1, B246934-BSD1, B246935-BLK1, B246935-BS1, B246935-BSD1, S043244-CCV1, S043279-CCV1

Dichlorodifluoromethane (Freon 12)

19K1416-01[WC-1 (0-5)], 19K1416-02[WC-1 (20-25)], 19K1416-03[WC-1 (34-40)], 19K1416-04[WC-2 (25-30)], 19K1416-05[WC-2 (35-40)], 19K1416-06[WC-3 (0-28)], 19K1416-07[WC-3 (30-35)], 19K1416-08[WC-3 (35-40)], 19K1416-09[WC-7 (29-36)], 19K1416-10[WC-7 (36-40)], 19K1416-11[WC-8 (0-29)], 19K1416-12[WC-8 (29-38)], 19K1416-13[WC-8 (38-40)], 19K1416-14[WC-10 (0-20)], 19K1416-15[WC-DUP-1], 19K1416-16[WC-DUP-2], 19K1416-17[WC-10 (35)], 19K1416-18[WC-10 (35-40)], 19K1416-19[WC-5 (0-15)], 19K1416-20[WC-5 (30-33.5)], 19K1416-21[WC-5 (33.5-40)], 19K1416-22[WC-12 (0-10)], 19K1416-23[WC-18 (0-15)], 19K1416-24[WC-20 (0-20)], 19K1416-25[WC-13 (0-20)], 19K1416-26[WC-12 (33-40)], 19K1416-27[WC-4 (30-35)], 19K1416-28[WC-4 (35-40)], 19K1416-29[Trip Blank 1], B246934-BLK1, B246934-BS1, B246934-BSD1, B246935-BLK1, B246935-BS1, B246935-BSD1, S043244-CCV1, S043279-CCV1

Methyl Cyclohexane

19K1416-01[WC-1 (0-5)], 19K1416-02[WC-1 (20-25)], 19K1416-03[WC-1 (34-40)], 19K1416-04[WC-2 (25-30)], 19K1416-05[WC-2 (35-40)], 19K1416-06[WC-3 (0-28)], 19K1416-07[WC-3 (30-35)], 19K1416-08[WC-3 (35-40)], 19K1416-09[WC-7 (29-36)], 19K1416-10[WC-7 (36-40)], 19K1416-11[WC-8 (0-29)], 19K1416-12[WC-8 (29-38)], 19K1416-13[WC-8 (38-40)], 19K1416-14[WC-10 (0-20)], 19K1416-15[WC-DUP-1], 19K1416-16[WC-DUP-2], 19K1416-17[WC-10 (35)], 19K1416-18[WC-10 (35-40)], 19K1416-19[WC-5 (0-15)], 19K1416-20[WC-5 (30-33.5)], 19K1416-21[WC-5 (33.5-40)], 19K1416-22[WC-12 (0-10)], 19K1416-23[WC-18 (0-15)], 19K1416-24[WC-20 (0-20)], 19K1416-25[WC-13 (0-20)], 19K1416-26[WC-12 (33-40)], 19K1416-27[WC-4 (30-35)], 19K1416-28[WC-4 (35-40)], 19K1416-29[Trip Blank 1], B246934-BLK1, B246934-BS1, B246934-BSD1, B246935-BLK1, B246935-BS1, B246935-BSD1, S043244-CCV1, S043279-CCV1

Naphthalene

19K1416-01[WC-1 (0-5)], 19K1416-02[WC-1 (20-25)], 19K1416-03[WC-1 (34-40)], 19K1416-04[WC-2 (25-30)], 19K1416-05[WC-2 (35-40)], 19K1416-06[WC-3 (0-28)], 19K1416-07[WC-3 (30-35)], 19K1416-08[WC-3 (35-40)], 19K1416-09[WC-7 (29-36)], 19K1416-10[WC-7 (36-40)], 19K1416-11[WC-8 (0-29)], 19K1416-12[WC-8 (29-38)], 19K1416-13[WC-8 (38-40)], 19K1416-14[WC-10 (0-20)], 19K1416-15[WC-DUP-1], 19K1416-16[WC-DUP-2], 19K1416-17[WC-10 (35)], 19K1416-18[WC-10 (35-40)], 19K1416-19[WC-5 (0-15)], 19K1416-20[WC-5 (30-33.5)], 19K1416-21[WC-5 (33.5-40)], 19K1416-22[WC-12 (0-10)], 19K1416-23[WC-18 (0-15)], 19K1416-24[WC-20 (0-20)], 19K1416-25[WC-13 (0-20)], 19K1416-26[WC-12 (33-40)], 19K1416-27[WC-4 (30-35)], 19K1416-28[WC-4 (35-40)], 19K1416-29[Trip Blank 1], B246934-BLK1, B246934-BS1, B246934-BSD1, B246935-BLK1, B246935-BS1, B246935-BSD1, S043244-CCV1, S043279-CCV1

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:**Bromomethane**

B246934-BS1, B246934-BSD1, B246935-BS1, B246935-BSD1, S043244-CCV1, S043279-CCV1

Chloromethane

B246934-BS1, B246934-BSD1, B246935-BS1, B246935-BSD1, S043244-CCV1, S043279-CCV1

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MADEP-EPH-04-1.1

SPE cartridge contamination with non-petroleum compounds, if present, is verified by GC/MS in each method blank per extraction batch and excluded from C 11-C22 aromatic range fraction in all samples in the batch. No significant modifications were made to the method.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

A handwritten signature in black ink, appearing to read "Lisa Worthington", is written over a light gray rectangular background.

Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (0-5)

Sampled: 11/19/2019 08:50

Sample ID: 19K1416-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.7	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Acrylonitrile	ND	0.27	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Benzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Bromobenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Bromochloromethane	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Bromodichloromethane	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Bromoform	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Bromomethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
2-Butanone (MEK)	ND	1.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
tert-Butyl Alcohol (TBA)	ND	1.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
n-Butylbenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
sec-Butylbenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
tert-Butylbenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Carbon Disulfide	ND	0.27	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Carbon Tetrachloride	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Chlorobenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Chlorodibromomethane	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Chloroethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Chloroform	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Chloromethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
2-Chlorotoluene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
4-Chlorotoluene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.27	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,2-Dibromoethane (EDB)	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Dibromomethane	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,2-Dichlorobenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,3-Dichlorobenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,4-Dichlorobenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
trans-1,4-Dichloro-2-butene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.11	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,1-Dichloroethane	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,2-Dichloroethane	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,1-Dichloroethylene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
cis-1,2-Dichloroethylene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
trans-1,2-Dichloroethylene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,2-Dichloropropane	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,3-Dichloropropane	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
2,2-Dichloropropane	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,1-Dichloropropene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
cis-1,3-Dichloropropene	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
trans-1,3-Dichloropropene	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Diethyl Ether	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF

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Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (0-5)

Sampled: 11/19/2019 08:50

Sample ID: 19K1416-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,4-Dioxane	ND	2.7	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Ethylbenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Hexachlorobutadiene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
2-Hexanone (MBK)	ND	0.53	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Isopropylbenzene (Cumene)	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Methyl Acetate	ND	0.53	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Methyl Cyclohexane	ND	0.053	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Methylene Chloride	ND	0.27	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.53	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Naphthalene	ND	0.11	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
n-Propylbenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Styrene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,1,1,2-Tetrachloroethane	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,1,2,2-Tetrachloroethane	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Tetrachloroethylene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Tetrahydrofuran	ND	0.53	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Toluene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,2,3-Trichlorobenzene	ND	0.27	mg/Kg dry	1	V-05, L-04	SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,2,4-Trichlorobenzene	ND	0.053	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,3,5-Trichlorobenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,1,1-Trichloroethane	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,1,2-Trichloroethane	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Trichloroethylene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Trichlorofluoromethane (Freon 11)	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,2,3-Trichloropropane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.053	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,2,4-Trimethylbenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
1,3,5-Trimethylbenzene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Vinyl Chloride	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
m+p Xylene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
o-Xylene	ND	0.053	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:27	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	96.3	70-130							
Toluene-d8	97.4	70-130							
4-Bromofluorobenzene	98.2	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (0-5)

Sampled: 11/19/2019 08:50

Sample ID: 19K1416-01

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
C19-C36 Aliphatics	29	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Unadjusted C11-C22 Aromatics	24	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
C11-C22 Aromatics	23	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Benzo(a)pyrene	0.13	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Benzo(b)fluoranthene	0.13	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Fluoranthene	0.19	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Phenanthrene	0.14	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB
Pyrene	0.20	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 17:06	KLB

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	72.8	40-140	
o-Terphenyl (OTP)	71.3	40-140	
2-Bromonaphthalene	90.7	40-140	
2-Fluorobiphenyl	94.2	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (0-5)

Sampled: 11/19/2019 08:50

Sample ID: 19K1416-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	3.9	1.8	mg/Kg dry	1		SW-846 6010D	11/26/19	11/27/19 19:45	tbc
Barium	28	1.8	mg/Kg dry	1		SW-846 6010D	11/26/19	11/27/19 19:45	tbc
Cadmium	ND	0.18	mg/Kg dry	1		SW-846 6010D	11/26/19	11/27/19 19:45	tbc
Chromium	13	0.36	mg/Kg dry	1		SW-846 6010D	11/26/19	11/27/19 19:45	tbc
Lead	30	0.54	mg/Kg dry	1		SW-846 6010D	11/26/19	11/27/19 19:45	tbc
Mercury	0.068	0.029	mg/Kg dry	1		SW-846 7471B	11/26/19	11/27/19 10:28	CJV
Selenium	ND	3.6	mg/Kg dry	1		SW-846 6010D	11/26/19	12/3/19 1:37	TBC
Silver	ND	0.36	mg/Kg dry	1		SW-846 6010D	11/26/19	12/3/19 1:37	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/19/2019 08:50

Field Sample #: WC-1 (0-5)

Sample ID: 19K1416-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.4		% Wt	1		SM 2540G	11/25/19	11/26/19 10:48	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (20-25)

Sampled: 11/19/2019 09:45

Sample ID: 19K1416-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.4	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Acrylonitrile	ND	0.24	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.024	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Benzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Bromobenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Bromochloromethane	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Bromodichloromethane	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Bromoform	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Bromomethane	ND	0.097	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
2-Butanone (MEK)	ND	0.97	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
tert-Butyl Alcohol (TBA)	ND	0.97	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
n-Butylbenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
sec-Butylbenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
tert-Butylbenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.024	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Carbon Disulfide	ND	0.24	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Carbon Tetrachloride	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Chlorobenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Chlorodibromomethane	ND	0.024	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Chloroethane	ND	0.097	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Chloroform	ND	0.097	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Chloromethane	ND	0.097	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
2-Chlorotoluene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
4-Chlorotoluene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.24	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,2-Dibromoethane (EDB)	ND	0.024	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Dibromomethane	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,2-Dichlorobenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,3-Dichlorobenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,4-Dichlorobenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
trans-1,4-Dichloro-2-butene	ND	0.097	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.097	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,1-Dichloroethane	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,2-Dichloroethane	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,1-Dichloroethylene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
cis-1,2-Dichloroethylene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
trans-1,2-Dichloroethylene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,2-Dichloropropane	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,3-Dichloropropane	ND	0.024	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
2,2-Dichloropropane	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,1-Dichloropropene	ND	0.097	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
cis-1,3-Dichloropropene	ND	0.024	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
trans-1,3-Dichloropropene	ND	0.024	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Diethyl Ether	ND	0.097	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (20-25)

Sampled: 11/19/2019 09:45

Sample ID: 19K1416-02

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.024	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,4-Dioxane	ND	2.4	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Ethylbenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Hexachlorobutadiene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
2-Hexanone (MBK)	ND	0.48	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Isopropylbenzene (Cumene)	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Methyl Acetate	ND	0.48	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Methyl Cyclohexane	ND	0.048	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Methylene Chloride	ND	0.24	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.48	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Naphthalene	ND	0.097	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
n-Propylbenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Styrene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,1,1,2-Tetrachloroethane	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,1,2,2-Tetrachloroethane	ND	0.024	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Tetrachloroethylene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Tetrahydrofuran	ND	0.48	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Toluene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,2,3-Trichlorobenzene	ND	0.24	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,2,4-Trichlorobenzene	ND	0.048	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,3,5-Trichlorobenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,1,1-Trichloroethane	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,1,2-Trichloroethane	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Trichloroethylene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Trichlorofluoromethane (Freon 11)	ND	0.097	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,2,3-Trichloropropane	ND	0.097	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.048	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,2,4-Trimethylbenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
1,3,5-Trimethylbenzene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Vinyl Chloride	ND	0.097	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
m+p Xylene	ND	0.097	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
o-Xylene	ND	0.048	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 12:54	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	99.1	70-130							
Toluene-d8	98.3	70-130							
4-Bromofluorobenzene	97.6	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (20-25)

Sampled: 11/19/2019 09:45

Sample ID: 19K1416-02

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	14	12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
C19-C36 Aliphatics	71	12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Unadjusted C11-C22 Aromatics	20	12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
C11-C22 Aromatics	19	12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Acenaphthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Acenaphthylene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Benzo(a)anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Benzo(a)pyrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Benzo(b)fluoranthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Benzo(g,h,i)perylene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Benzo(k)fluoranthene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Chrysene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Dibenz(a,h)anthracene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Fluoranthene	0.15	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Fluorene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Indeno(1,2,3-cd)pyrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
2-Methylnaphthalene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Naphthalene	0.16	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Phenanthrene	ND	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW
Pyrene	0.14	0.12	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:49	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	80.9	40-140	
o-Terphenyl (OTP)	79.6	40-140	
2-Bromonaphthalene	88.1	40-140	
2-Fluorobiphenyl	90.0	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (20-25)

Sampled: 11/19/2019 09:45

Sample ID: 19K1416-02

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	48	0.58	mg/Kg dry	1	L-10	SW-846 6010D	11/27/19	11/27/19 20:25	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (20-25)

Sampled: 11/19/2019 09:45

Sample ID: 19K1416-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	81.9		% Wt	1		SM 2540G	11/25/19	11/26/19 10:48	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (34-40)

Sampled: 11/19/2019 11:40

Sample ID: 19K1416-03

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Acrylonitrile	ND	0.29	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Benzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Bromobenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Bromochloromethane	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Bromodichloromethane	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Bromoform	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Bromomethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
2-Butanone (MEK)	ND	1.2	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
tert-Butyl Alcohol (TBA)	ND	1.2	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
n-Butylbenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
sec-Butylbenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
tert-Butylbenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Carbon Disulfide	ND	0.29	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Carbon Tetrachloride	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Chlorobenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Chlorodibromomethane	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Chloroethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Chloroform	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Chloromethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
2-Chlorotoluene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
4-Chlorotoluene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.29	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,2-Dibromoethane (EDB)	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Dibromomethane	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,2-Dichlorobenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,3-Dichlorobenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,4-Dichlorobenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
trans-1,4-Dichloro-2-butene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.12	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,1-Dichloroethane	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,2-Dichloroethane	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,1-Dichloroethylene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
cis-1,2-Dichloroethylene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
trans-1,2-Dichloroethylene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,2-Dichloropropane	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,3-Dichloropropane	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
2,2-Dichloropropane	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,1-Dichloropropene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
cis-1,3-Dichloropropene	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
trans-1,3-Dichloropropene	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Diethyl Ether	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (34-40)

Sampled: 11/19/2019 11:40

Sample ID: 19K1416-03

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,4-Dioxane	ND	2.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Ethylbenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Hexachlorobutadiene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
2-Hexanone (MBK)	ND	0.59	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Isopropylbenzene (Cumene)	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Methyl Acetate	ND	0.59	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Methyl Cyclohexane	ND	0.059	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Methylene Chloride	ND	0.29	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.59	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Naphthalene	ND	0.12	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
n-Propylbenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Styrene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,1,1,2-Tetrachloroethane	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,1,2,2-Tetrachloroethane	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Tetrachloroethylene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Tetrahydrofuran	ND	0.59	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Toluene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,2,3-Trichlorobenzene	ND	0.29	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,2,4-Trichlorobenzene	ND	0.059	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,3,5-Trichlorobenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,1,1-Trichloroethane	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,1,2-Trichloroethane	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Trichloroethylene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Trichlorofluoromethane (Freon 11)	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,2,3-Trichloropropane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.059	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,2,4-Trimethylbenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
1,3,5-Trimethylbenzene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Vinyl Chloride	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
m+p Xylene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
o-Xylene	ND	0.059	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:20	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	97.2	70-130							
Toluene-d8	97.0	70-130							
4-Bromofluorobenzene	98.3	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (34-40)

Sampled: 11/19/2019 11:40

Sample ID: 19K1416-03

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
C19-C36 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Unadjusted C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Acenaphthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Acenaphthylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Benzo(a)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Benzo(a)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Benzo(b)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Benzo(g,h,i)perylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Benzo(k)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Chrysene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Dibenz(a,h)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Fluorene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Indeno(1,2,3-cd)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
2-Methylnaphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Naphthalene	0.25	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Phenanthrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW
Pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 6:54	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	71.6	40-140	
o-Terphenyl (OTP)	75.7	40-140	
2-Bromonaphthalene	89.2	40-140	
2-Fluorobiphenyl	91.8	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (34-40)

Sampled: 11/19/2019 11:40

Sample ID: 19K1416-03

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	13	0.68	mg/Kg dry	1	L-10	SW-846 6010D	11/27/19	11/27/19 20:31	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-1 (34-40)

Sampled: 11/19/2019 11:40

Sample ID: 19K1416-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	71.8		% Wt	1		SM 2540G	11/25/19	11/26/19 10:48	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-2 (25-30)

Sampled: 11/19/2019 13:50

Sample ID: 19K1416-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	4.2	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Acrylonitrile	ND	0.42	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.042	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Benzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Bromobenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Bromochloromethane	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Bromodichloromethane	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Bromoform	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Bromomethane	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
2-Butanone (MEK)	ND	1.7	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
tert-Butyl Alcohol (TBA)	ND	1.7	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
n-Butylbenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
sec-Butylbenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
tert-Butylbenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.042	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Carbon Disulfide	ND	0.42	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Carbon Tetrachloride	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Chlorobenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Chlorodibromomethane	ND	0.042	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Chloroethane	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Chloroform	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Chloromethane	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
2-Chlorotoluene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
4-Chlorotoluene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.42	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,2-Dibromoethane (EDB)	ND	0.042	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Dibromomethane	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,2-Dichlorobenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,3-Dichlorobenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,4-Dichlorobenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
trans-1,4-Dichloro-2-butene	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.17	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,1-Dichloroethane	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,2-Dichloroethane	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,1-Dichloroethylene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
cis-1,2-Dichloroethylene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
trans-1,2-Dichloroethylene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,2-Dichloropropane	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,3-Dichloropropane	ND	0.042	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
2,2-Dichloropropane	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,1-Dichloropropene	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
cis-1,3-Dichloropropene	ND	0.042	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
trans-1,3-Dichloropropene	ND	0.042	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Diethyl Ether	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-2 (25-30)

Sampled: 11/19/2019 13:50

Sample ID: 19K1416-04

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.042	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,4-Dioxane	ND	4.2	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Ethylbenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Hexachlorobutadiene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
2-Hexanone (MBK)	ND	0.85	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Isopropylbenzene (Cumene)	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Methyl Acetate	ND	0.85	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Methyl Cyclohexane	ND	0.085	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Methylene Chloride	ND	0.42	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.85	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Naphthalene	ND	0.17	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
n-Propylbenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Styrene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,1,1,2-Tetrachloroethane	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,1,2,2-Tetrachloroethane	ND	0.042	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Tetrachloroethylene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Tetrahydrofuran	ND	0.85	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Toluene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,2,3-Trichlorobenzene	ND	0.42	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,2,4-Trichlorobenzene	ND	0.085	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,3,5-Trichlorobenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,1,1-Trichloroethane	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,1,2-Trichloroethane	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Trichloroethylene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Trichlorofluoromethane (Freon 11)	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,2,3-Trichloropropane	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.085	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,2,4-Trimethylbenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
1,3,5-Trimethylbenzene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Vinyl Chloride	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
m+p Xylene	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
o-Xylene	ND	0.085	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 13:46	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	102	70-130							
Toluene-d8	97.7	70-130							
4-Bromofluorobenzene	99.8	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-2 (25-30)

Sampled: 11/19/2019 13:50

Sample ID: 19K1416-04

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	55	15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
C19-C36 Aliphatics	410	77	mg/Kg dry	5		MADEP-EPH-04-1.1	11/25/19	12/2/19 18:22	KLB
Unadjusted C11-C22 Aromatics	130	15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
C11-C22 Aromatics	120	15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Acenaphthene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Acenaphthylene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Anthracene	0.18	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Benzo(a)anthracene	0.93	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Benzo(a)pyrene	0.76	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Benzo(b)fluoranthene	1.1	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Benzo(g,h,i)perylene	0.53	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Benzo(k)fluoranthene	0.36	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Chrysene	1.3	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Dibenz(a,h)anthracene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Fluoranthene	1.8	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Fluorene	0.23	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Indeno(1,2,3-cd)pyrene	0.52	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
2-Methylnaphthalene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Naphthalene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Phenanthrene	0.83	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW
Pyrene	1.7	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:08	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	60.5	40-140	
Chlorooctadecane (COD)	54.6	40-140	
o-Terphenyl (OTP)	67.5	40-140	
2-Bromonaphthalene	89.4	40-140	
2-Fluorobiphenyl	97.1	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-2 (25-30)

Sampled: 11/19/2019 13:50

Sample ID: 19K1416-04

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	130	0.77	mg/Kg dry	1	L-10	SW-846 6010D	11/27/19	11/27/19 20:18	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-2 (25-30)

Sampled: 11/19/2019 13:50

Sample ID: 19K1416-04

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	62.9		% Wt	1		SM 2540G	11/25/19	11/26/19 10:49	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-2 (35-40)

Sampled: 11/19/2019 14:25

Sample ID: 19K1416-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	3.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Acrylonitrile	ND	0.30	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Benzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Bromobenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Bromochloromethane	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Bromodichloromethane	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Bromoform	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Bromomethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
2-Butanone (MEK)	ND	1.2	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
tert-Butyl Alcohol (TBA)	ND	1.2	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
n-Butylbenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
sec-Butylbenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
tert-Butylbenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Carbon Disulfide	ND	0.30	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Carbon Tetrachloride	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Chlorobenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Chlorodibromomethane	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Chloroethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Chloroform	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Chloromethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
2-Chlorotoluene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
4-Chlorotoluene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.30	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,2-Dibromoethane (EDB)	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Dibromomethane	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,2-Dichlorobenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,3-Dichlorobenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,4-Dichlorobenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
trans-1,4-Dichloro-2-butene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.12	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,1-Dichloroethane	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,2-Dichloroethane	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,1-Dichloroethylene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
cis-1,2-Dichloroethylene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
trans-1,2-Dichloroethylene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,2-Dichloropropane	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,3-Dichloropropane	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
2,2-Dichloropropane	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,1-Dichloropropene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
cis-1,3-Dichloropropene	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
trans-1,3-Dichloropropene	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Diethyl Ether	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-2 (35-40)

Sampled: 11/19/2019 14:25

Sample ID: 19K1416-05

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,4-Dioxane	ND	3.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Ethylbenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Hexachlorobutadiene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
2-Hexanone (MBK)	ND	0.60	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Isopropylbenzene (Cumene)	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Methyl Acetate	ND	0.60	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Methyl Cyclohexane	ND	0.060	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Methylene Chloride	ND	0.30	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.60	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Naphthalene	ND	0.12	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
n-Propylbenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Styrene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,1,1,2-Tetrachloroethane	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,1,2,2-Tetrachloroethane	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Tetrachloroethylene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Tetrahydrofuran	ND	0.60	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Toluene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,2,3-Trichlorobenzene	ND	0.30	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,2,4-Trichlorobenzene	ND	0.060	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,3,5-Trichlorobenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,1,1-Trichloroethane	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,1,2-Trichloroethane	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Trichloroethylene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Trichlorofluoromethane (Freon 11)	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,2,3-Trichloropropane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.060	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,2,4-Trimethylbenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
1,3,5-Trimethylbenzene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Vinyl Chloride	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
m+p Xylene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
o-Xylene	ND	0.060	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:13	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	99.8	70-130							
Toluene-d8	98.3	70-130							
4-Bromofluorobenzene	100	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-2 (35-40)

Sampled: 11/19/2019 14:25

Sample ID: 19K1416-05

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
C19-C36 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Unadjusted C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Acenaphthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Acenaphthylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Benzo(a)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Benzo(a)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Benzo(b)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Benzo(g,h,i)perylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Benzo(k)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Chrysene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Dibenz(a,h)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Fluorene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Indeno(1,2,3-cd)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
2-Methylnaphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Naphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Phenanthrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW
Pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:13	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	72.8	40-140	
o-Terphenyl (OTP)	65.5	40-140	
2-Bromonaphthalene	83.7	40-140	
2-Fluorobiphenyl	86.5	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-2 (35-40)

Sampled: 11/19/2019 14:25

Sample ID: 19K1416-05

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	13	0.69	mg/Kg dry	1	L-10	SW-846 6010D	11/27/19	11/27/19 20:51	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-2 (35-40)

Sampled: 11/19/2019 14:25

Sample ID: 19K1416-05

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	71.6		% Wt	1		SM 2540G	11/25/19	11/26/19 10:49	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (0-28)

Sampled: 11/19/2019 15:40

Sample ID: 19K1416-06

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	1.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Acrylonitrile	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Benzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Bromobenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Bromochloromethane	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Bromodichloromethane	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Bromoform	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Bromomethane	ND	0.074	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
2-Butanone (MEK)	ND	0.74	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
tert-Butyl Alcohol (TBA)	ND	0.74	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
n-Butylbenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
sec-Butylbenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
tert-Butylbenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Carbon Disulfide	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Carbon Tetrachloride	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Chlorobenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Chlorodibromomethane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Chloroethane	ND	0.074	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Chloroform	ND	0.074	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Chloromethane	ND	0.074	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
2-Chlorotoluene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
4-Chlorotoluene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,2-Dibromoethane (EDB)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Dibromomethane	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,2-Dichlorobenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,3-Dichlorobenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,4-Dichlorobenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
trans-1,4-Dichloro-2-butene	ND	0.074	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.074	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,1-Dichloroethane	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,2-Dichloroethane	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,1-Dichloroethylene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
cis-1,2-Dichloroethylene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
trans-1,2-Dichloroethylene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,2-Dichloropropane	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,3-Dichloropropane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
2,2-Dichloropropane	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,1-Dichloropropene	ND	0.074	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
cis-1,3-Dichloropropene	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
trans-1,3-Dichloropropene	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Diethyl Ether	ND	0.074	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (0-28)

Sampled: 11/19/2019 15:40

Sample ID: 19K1416-06

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,4-Dioxane	ND	1.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Ethylbenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Hexachlorobutadiene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
2-Hexanone (MBK)	ND	0.37	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Isopropylbenzene (Cumene)	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Methyl Acetate	ND	0.37	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Methyl Cyclohexane	ND	0.037	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Methylene Chloride	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.37	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Naphthalene	ND	0.074	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
n-Propylbenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Styrene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,1,1,2-Tetrachloroethane	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,1,2,2-Tetrachloroethane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Tetrachloroethylene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Tetrahydrofuran	ND	0.37	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Toluene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,2,3-Trichlorobenzene	ND	0.19	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,2,4-Trichlorobenzene	ND	0.037	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,3,5-Trichlorobenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,1,1-Trichloroethane	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,1,2-Trichloroethane	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Trichloroethylene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Trichlorofluoromethane (Freon 11)	ND	0.074	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,2,3-Trichloropropane	ND	0.074	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.037	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,2,4-Trimethylbenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
1,3,5-Trimethylbenzene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Vinyl Chloride	ND	0.074	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
m+p Xylene	ND	0.074	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
o-Xylene	ND	0.037	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 14:39	MFF
Surrogates	% Recovery	Recovery Limits			Flag/Qual				
1,2-Dichloroethane-d4	98.5	70-130						11/30/19 14:39	
Toluene-d8	98.0	70-130						11/30/19 14:39	
4-Bromofluorobenzene	98.8	70-130						11/30/19 14:39	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (0-28)

Sampled: 11/19/2019 15:40

Sample ID: 19K1416-06

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
C19-C36 Aliphatics	40	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Unadjusted C11-C22 Aromatics	19	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
C11-C22 Aromatics	18	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Benzo(b)fluoranthene	0.25	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Chrysene	0.12	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Fluoranthene	0.22	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Phenanthrene	0.15	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW
Pyrene	0.22	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:38	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	75.6	40-140	
o-Terphenyl (OTP)	74.8	40-140	
2-Bromonaphthalene	91.3	40-140	
2-Fluorobiphenyl	95.0	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (0-28)

Sampled: 11/19/2019 15:40

Sample ID: 19K1416-06

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	9.7	1.9	mg/Kg dry	1		SW-846 6010D	11/26/19	11/27/19 19:51	tbc
Barium	53	1.9	mg/Kg dry	1		SW-846 6010D	11/26/19	11/27/19 19:51	tbc
Cadmium	ND	0.19	mg/Kg dry	1		SW-846 6010D	11/26/19	11/27/19 19:51	tbc
Chromium	29	0.38	mg/Kg dry	1		SW-846 6010D	11/26/19	11/27/19 19:51	tbc
Lead	16	0.57	mg/Kg dry	1		SW-846 6010D	11/26/19	11/27/19 19:51	tbc
Mercury	0.18	0.029	mg/Kg dry	1		SW-846 7471B	11/26/19	11/27/19 10:30	CJV
Selenium	ND	3.8	mg/Kg dry	1		SW-846 6010D	11/26/19	12/3/19 1:44	TBC
Silver	ND	0.38	mg/Kg dry	1		SW-846 6010D	11/26/19	12/3/19 1:44	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/19/2019 15:40

Field Sample #: WC-3 (0-28)

Sample ID: 19K1416-06

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.1		% Wt	1		SM 2540G	11/25/19	11/26/19 10:49	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (30-35)

Sampled: 11/19/2019 16:15

Sample ID: 19K1416-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.8	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Acrylonitrile	ND	0.28	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.028	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Benzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Bromobenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Bromochloromethane	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Bromodichloromethane	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Bromoform	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Bromomethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
2-Butanone (MEK)	ND	1.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
tert-Butyl Alcohol (TBA)	ND	1.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
n-Butylbenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
sec-Butylbenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
tert-Butylbenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.028	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Carbon Disulfide	ND	0.28	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Carbon Tetrachloride	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Chlorobenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Chlorodibromomethane	ND	0.028	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Chloroethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Chloroform	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Chloromethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
2-Chlorotoluene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
4-Chlorotoluene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.28	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,2-Dibromoethane (EDB)	ND	0.028	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Dibromomethane	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,2-Dichlorobenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,3-Dichlorobenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,4-Dichlorobenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
trans-1,4-Dichloro-2-butene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.11	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,1-Dichloroethane	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,2-Dichloroethane	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,1-Dichloroethylene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
cis-1,2-Dichloroethylene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
trans-1,2-Dichloroethylene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,2-Dichloropropane	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,3-Dichloropropane	ND	0.028	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
2,2-Dichloropropane	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,1-Dichloropropene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
cis-1,3-Dichloropropene	ND	0.028	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
trans-1,3-Dichloropropene	ND	0.028	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Diethyl Ether	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (30-35)

Sampled: 11/19/2019 16:15

Sample ID: 19K1416-07

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.028	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,4-Dioxane	ND	2.8	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Ethylbenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Hexachlorobutadiene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
2-Hexanone (MBK)	ND	0.56	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Isopropylbenzene (Cumene)	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Methyl Acetate	ND	0.56	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Methyl Cyclohexane	ND	0.056	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Methylene Chloride	ND	0.28	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.56	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Naphthalene	ND	0.11	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
n-Propylbenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Styrene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,1,1,2-Tetrachloroethane	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,1,2,2-Tetrachloroethane	ND	0.028	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Tetrachloroethylene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Tetrahydrofuran	ND	0.56	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Toluene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,2,3-Trichlorobenzene	ND	0.28	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,2,4-Trichlorobenzene	ND	0.056	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,3,5-Trichlorobenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,1,1-Trichloroethane	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,1,2-Trichloroethane	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Trichloroethylene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Trichlorofluoromethane (Freon 11)	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,2,3-Trichloropropane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.056	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,2,4-Trimethylbenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
1,3,5-Trimethylbenzene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Vinyl Chloride	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
m+p Xylene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
o-Xylene	ND	0.056	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:06	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	99.0	70-130							
Toluene-d8	97.7	70-130							
4-Bromofluorobenzene	98.6	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (30-35)

Sampled: 11/19/2019 16:15

Sample ID: 19K1416-07

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
C19-C36 Aliphatics	130	16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Unadjusted C11-C22 Aromatics	58	16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
C11-C22 Aromatics	55	16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Acenaphthene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Acenaphthylene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Anthracene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Benzo(a)anthracene	0.43	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Benzo(a)pyrene	0.21	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Benzo(b)fluoranthene	0.26	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Benzo(g,h,i)perylene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Benzo(k)fluoranthene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Chrysene	0.71	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Dibenz(a,h)anthracene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Fluoranthene	0.44	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Fluorene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Indeno(1,2,3-cd)pyrene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
2-Methylnaphthalene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Naphthalene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Phenanthrene	0.28	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW
Pyrene	0.48	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 9:57	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	74.7	40-140	
o-Terphenyl (OTP)	77.1	40-140	
2-Bromonaphthalene	88.5	40-140	
2-Fluorobiphenyl	90.4	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (30-35)

Sampled: 11/19/2019 16:15

Sample ID: 19K1416-07

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date	Date/Time	Analyst
							Prepared	Analyzed	
Lead	88	0.79	mg/Kg dry	1	L-10	SW-846 6010D	11/27/19	11/27/19 20:57	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/19/2019 16:15

Field Sample #: WC-3 (30-35)

Sample ID: 19K1416-07

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	63.2		% Wt	1		SM 2540G	11/25/19	11/26/19 10:49	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (35-40)

Sampled: 11/19/2019 16:25

Sample ID: 19K1416-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	3.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Acrylonitrile	ND	0.31	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Benzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Bromobenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Bromochloromethane	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Bromodichloromethane	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Bromoform	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Bromomethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
2-Butanone (MEK)	ND	1.2	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
tert-Butyl Alcohol (TBA)	ND	1.2	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
n-Butylbenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
sec-Butylbenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
tert-Butylbenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Carbon Disulfide	ND	0.31	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Carbon Tetrachloride	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Chlorobenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Chlorodibromomethane	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Chloroethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Chloroform	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Chloromethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
2-Chlorotoluene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
4-Chlorotoluene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.31	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,2-Dibromoethane (EDB)	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Dibromomethane	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,2-Dichlorobenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,3-Dichlorobenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,4-Dichlorobenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
trans-1,4-Dichloro-2-butene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.12	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,1-Dichloroethane	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,2-Dichloroethane	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,1-Dichloroethylene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
cis-1,2-Dichloroethylene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
trans-1,2-Dichloroethylene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,2-Dichloropropane	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,3-Dichloropropane	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
2,2-Dichloropropane	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,1-Dichloropropene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
cis-1,3-Dichloropropene	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
trans-1,3-Dichloropropene	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Diethyl Ether	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (35-40)

Sampled: 11/19/2019 16:25

Sample ID: 19K1416-08

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,4-Dioxane	ND	3.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Ethylbenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Hexachlorobutadiene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
2-Hexanone (MBK)	ND	0.62	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Isopropylbenzene (Cumene)	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Methyl Acetate	ND	0.62	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Methyl Cyclohexane	ND	0.062	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Methylene Chloride	ND	0.31	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.62	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Naphthalene	ND	0.12	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
n-Propylbenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Styrene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,1,1,2-Tetrachloroethane	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,1,2,2-Tetrachloroethane	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Tetrachloroethylene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Tetrahydrofuran	ND	0.62	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Toluene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,2,3-Trichlorobenzene	ND	0.31	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,2,4-Trichlorobenzene	ND	0.062	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,3,5-Trichlorobenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,1,1-Trichloroethane	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,1,2-Trichloroethane	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Trichloroethylene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Trichlorofluoromethane (Freon 11)	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,2,3-Trichloropropane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.062	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,2,4-Trimethylbenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
1,3,5-Trimethylbenzene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Vinyl Chloride	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
m+p Xylene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
o-Xylene	ND	0.062	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:32	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	99.2	70-130							
Toluene-d8	97.1	70-130							
4-Bromofluorobenzene	98.1	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (35-40)

Sampled: 11/19/2019 16:25

Sample ID: 19K1416-08

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
C19-C36 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Unadjusted C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Acenaphthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Acenaphthylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Benzo(a)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Benzo(a)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Benzo(b)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Benzo(g,h,i)perylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Benzo(k)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Chrysene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Dibenz(a,h)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Fluorene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Indeno(1,2,3-cd)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
2-Methylnaphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Naphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Phenanthrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW
Pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:32	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	74.1	40-140	
o-Terphenyl (OTP)	73.6	40-140	
2-Bromonaphthalene	88.2	40-140	
2-Fluorobiphenyl	90.9	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (35-40)

Sampled: 11/19/2019 16:25

Sample ID: 19K1416-08

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	14	0.69	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:04	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-3 (35-40)

Sampled: 11/19/2019 16:25

Sample ID: 19K1416-08

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	68.9		% Wt	1		SM 2540G	11/25/19	11/26/19 10:49	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-7 (29-36)

Sampled: 11/20/2019 10:55

Sample ID: 19K1416-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	4.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Acrylonitrile	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Benzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Bromobenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Bromochloromethane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Bromodichloromethane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Bromoform	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Bromomethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
2-Butanone (MEK)	ND	1.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
tert-Butyl Alcohol (TBA)	ND	1.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
n-Butylbenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
sec-Butylbenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
tert-Butylbenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Carbon Disulfide	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Carbon Tetrachloride	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Chlorobenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Chlorodibromomethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Chloroethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Chloroform	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Chloromethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
2-Chlorotoluene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
4-Chlorotoluene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,2-Dibromoethane (EDB)	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Dibromomethane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,2-Dichlorobenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,3-Dichlorobenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,4-Dichlorobenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
trans-1,4-Dichloro-2-butene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.16	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,1-Dichloroethane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,2-Dichloroethane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,1-Dichloroethylene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
cis-1,2-Dichloroethylene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
trans-1,2-Dichloroethylene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,2-Dichloropropane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,3-Dichloropropane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
2,2-Dichloropropane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,1-Dichloropropene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
cis-1,3-Dichloropropene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
trans-1,3-Dichloropropene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Diethyl Ether	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-7 (29-36)

Sampled: 11/20/2019 10:55

Sample ID: 19K1416-09

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,4-Dioxane	ND	4.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Ethylbenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Hexachlorobutadiene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
2-Hexanone (MBK)	ND	0.80	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Isopropylbenzene (Cumene)	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Methyl Acetate	ND	0.80	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Methyl Cyclohexane	ND	0.080	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Methylene Chloride	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.80	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Naphthalene	ND	0.16	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
n-Propylbenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Styrene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,1,1,2-Tetrachloroethane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,1,2,2-Tetrachloroethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Tetrachloroethylene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Tetrahydrofuran	ND	0.80	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Toluene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,2,3-Trichlorobenzene	ND	0.40	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,2,4-Trichlorobenzene	ND	0.080	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,3,5-Trichlorobenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,1,1-Trichloroethane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,1,2-Trichloroethane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Trichloroethylene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Trichlorofluoromethane (Freon 11)	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,2,3-Trichloropropane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.080	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,2,4-Trimethylbenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
1,3,5-Trimethylbenzene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Vinyl Chloride	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
m+p Xylene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
o-Xylene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 15:59	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	101	70-130							
Toluene-d8	97.8	70-130							
4-Bromofluorobenzene	99.4	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-7 (29-36)

Sampled: 11/20/2019 10:55

Sample ID: 19K1416-09

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	50	16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
C19-C36 Aliphatics	300	32	mg/Kg dry	2		MADEP-EPH-04-1.1	11/25/19	12/2/19 18:41	KLB
Unadjusted C11-C22 Aromatics	120	16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
C11-C22 Aromatics	110	16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Acenaphthene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Acenaphthylene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Anthracene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Benzo(a)anthracene	0.50	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Benzo(a)pyrene	0.35	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Benzo(b)fluoranthene	0.53	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Benzo(g,h,i)perylene	0.26	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Benzo(k)fluoranthene	0.17	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Chrysene	0.87	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Dibenz(a,h)anthracene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Fluoranthene	0.83	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Fluorene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Indeno(1,2,3-cd)pyrene	0.27	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
2-Methylnaphthalene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Naphthalene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Phenanthrene	0.46	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW
Pyrene	0.90	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:17	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	81.8	40-140	12/2/19 10:17
Chlorooctadecane (COD)	70.8	40-140	12/2/19 18:41
o-Terphenyl (OTP)	80.9	40-140	12/2/19 10:17
2-Bromonaphthalene	90.0	40-140	12/2/19 10:17
2-Fluorobiphenyl	93.6	40-140	12/2/19 10:17

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-7 (29-36)

Sampled: 11/20/2019 10:55

Sample ID: 19K1416-09

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	190	0.81	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:23	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/20/2019 10:55

Field Sample #: WC-7 (29-36)

Sample ID: 19K1416-09

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	62.8		% Wt	1		SM 2540G	11/25/19	11/26/19 10:49	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-7 (36-40)

Sampled: 11/20/2019 11:00

Sample ID: 19K1416-10

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Acrylonitrile	ND	0.29	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Benzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Bromobenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Bromochloromethane	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Bromodichloromethane	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Bromoform	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Bromomethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
2-Butanone (MEK)	ND	1.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
tert-Butyl Alcohol (TBA)	ND	1.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
n-Butylbenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
sec-Butylbenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
tert-Butylbenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Carbon Disulfide	ND	0.29	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Carbon Tetrachloride	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Chlorobenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Chlorodibromomethane	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Chloroethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Chloroform	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Chloromethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
2-Chlorotoluene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
4-Chlorotoluene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.29	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,2-Dibromoethane (EDB)	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Dibromomethane	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,2-Dichlorobenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,3-Dichlorobenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,4-Dichlorobenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
trans-1,4-Dichloro-2-butene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.11	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,1-Dichloroethane	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,2-Dichloroethane	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,1-Dichloroethylene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
cis-1,2-Dichloroethylene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
trans-1,2-Dichloroethylene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,2-Dichloropropane	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,3-Dichloropropane	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
2,2-Dichloropropane	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,1-Dichloropropene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
cis-1,3-Dichloropropene	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
trans-1,3-Dichloropropene	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Diethyl Ether	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-7 (36-40)

Sampled: 11/20/2019 11:00

Sample ID: 19K1416-10

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,4-Dioxane	ND	2.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Ethylbenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Hexachlorobutadiene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
2-Hexanone (MBK)	ND	0.57	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Isopropylbenzene (Cumene)	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Methyl Acetate	ND	0.57	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Methyl Cyclohexane	ND	0.057	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Methylene Chloride	ND	0.29	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.57	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Naphthalene	ND	0.11	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
n-Propylbenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Styrene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,1,1,2-Tetrachloroethane	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,1,2,2-Tetrachloroethane	ND	0.029	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Tetrachloroethylene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Tetrahydrofuran	ND	0.57	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Toluene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,2,3-Trichlorobenzene	ND	0.29	mg/Kg dry	1	V-05, L-04	SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,2,4-Trichlorobenzene	ND	0.057	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,3,5-Trichlorobenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,1,1-Trichloroethane	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,1,2-Trichloroethane	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Trichloroethylene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Trichlorofluoromethane (Freon 11)	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,2,3-Trichloropropane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.057	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,2,4-Trimethylbenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
1,3,5-Trimethylbenzene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Vinyl Chloride	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
m+p Xylene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
o-Xylene	ND	0.057	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:25	MFF
Surrogates	% Recovery	Recovery Limits			Flag/Qual				
1,2-Dichloroethane-d4	99.4	70-130						11/30/19 16:25	
Toluene-d8	97.7	70-130						11/30/19 16:25	
4-Bromofluorobenzene	99.1	70-130						11/30/19 16:25	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-7 (36-40)

Sampled: 11/20/2019 11:00

Sample ID: 19K1416-10

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
C19-C36 Aliphatics	ND	13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Unadjusted C11-C22 Aromatics	ND	13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
C11-C22 Aromatics	ND	13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Acenaphthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Acenaphthylene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Anthracene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Benzo(a)anthracene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Benzo(a)pyrene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Benzo(b)fluoranthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Benzo(g,h,i)perylene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Benzo(k)fluoranthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Chrysene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Dibenz(a,h)anthracene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Fluoranthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Fluorene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Indeno(1,2,3-cd)pyrene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
2-Methylnaphthalene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Naphthalene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Phenanthrene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW
Pyrene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 7:52	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	77.3	40-140	
o-Terphenyl (OTP)	73.0	40-140	
2-Bromonaphthalene	89.1	40-140	
2-Fluorobiphenyl	92.7	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-7 (36-40)

Sampled: 11/20/2019 11:00

Sample ID: 19K1416-10

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	12	0.66	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:29	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-7 (36-40)

Sampled: 11/20/2019 11:00

Sample ID: 19K1416-10

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	73.1		% Wt	1		SM 2540G	11/25/19	11/26/19 10:50	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (0-29)

Sampled: 11/20/2019 13:15

Sample ID: 19K1416-11

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Acrylonitrile	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Benzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Bromobenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Bromochloromethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Bromodichloromethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Bromoform	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Bromomethane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
2-Butanone (MEK)	ND	0.80	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
tert-Butyl Alcohol (TBA)	ND	0.80	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
n-Butylbenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
sec-Butylbenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
tert-Butylbenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Carbon Disulfide	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Carbon Tetrachloride	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Chlorobenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Chlorodibromomethane	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Chloroethane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Chloroform	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Chloromethane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
2-Chlorotoluene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
4-Chlorotoluene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,2-Dibromoethane (EDB)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Dibromomethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,2-Dichlorobenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,3-Dichlorobenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,4-Dichlorobenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
trans-1,4-Dichloro-2-butene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.080	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,1-Dichloroethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,2-Dichloroethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,1-Dichloroethylene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
cis-1,2-Dichloroethylene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
trans-1,2-Dichloroethylene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,2-Dichloropropane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,3-Dichloropropane	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
2,2-Dichloropropane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,1-Dichloropropene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
cis-1,3-Dichloropropene	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
trans-1,3-Dichloropropene	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Diethyl Ether	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (0-29)

Sampled: 11/20/2019 13:15

Sample ID: 19K1416-11

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,4-Dioxane	ND	2.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Ethylbenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Hexachlorobutadiene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
2-Hexanone (MBK)	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Isopropylbenzene (Cumene)	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Methyl Acetate	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Methyl Cyclohexane	ND	0.040	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Methylene Chloride	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Naphthalene	ND	0.080	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
n-Propylbenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Styrene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,1,1,2-Tetrachloroethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,1,2,2-Tetrachloroethane	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Tetrachloroethylene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Tetrahydrofuran	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Toluene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,2,3-Trichlorobenzene	ND	0.20	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,2,4-Trichlorobenzene	ND	0.040	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,3,5-Trichlorobenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,1,1-Trichloroethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,1,2-Trichloroethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Trichloroethylene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Trichlorofluoromethane (Freon 11)	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,2,3-Trichloropropane	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.040	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,2,4-Trimethylbenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
1,3,5-Trimethylbenzene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Vinyl Chloride	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
m+p Xylene	ND	0.080	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
o-Xylene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 16:51	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	97.6	70-130							
Toluene-d8	99.2	70-130							
4-Bromofluorobenzene	96.8	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (0-29)

Sampled: 11/20/2019 13:15

Sample ID: 19K1416-11

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Unadjusted C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:11	RMW
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	78.6	40-140							
o-Terphenyl (OTP)	78.4	40-140							
2-Bromonaphthalene	93.1	40-140							
2-Fluorobiphenyl	94.8	40-140							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (0-29)

Sampled: 11/20/2019 13:15

Sample ID: 19K1416-11

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	2.2	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:35	MJH
Arsenic	2.4	1.8	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:23	TBC
Barium	10	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:35	MJH
Barium	9.8	1.8	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:23	TBC
Cadmium	ND	0.18	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:35	MJH
Cadmium	ND	0.18	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:23	TBC
Chromium	5.7	0.37	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:35	MJH
Chromium	4.4	0.37	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:23	TBC
Lead	2.9	0.55	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:35	MJH
Lead	3.7	0.55	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:23	TBC
Mercury	ND	0.028	mg/Kg dry	1		SW-846 7471B	11/26/19	11/27/19 10:36	CJV
Selenium	ND	3.7	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:35	MJH
Selenium	ND	3.7	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:23	TBC
Silver	ND	0.37	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:35	MJH
Silver	ND	0.37	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:23	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/20/2019 13:15

Field Sample #: WC-8 (0-29)

Sample ID: 19K1416-11

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.9		% Wt	1		SM 2540G	11/25/19	11/26/19 10:50	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (29-38)

Sampled: 11/20/2019 14:10

Sample ID: 19K1416-12

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	4.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Acrylonitrile	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Benzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Bromobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Bromochloromethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Bromodichloromethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Bromoform	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Bromomethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
2-Butanone (MEK)	ND	1.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
tert-Butyl Alcohol (TBA)	ND	1.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
n-Butylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
sec-Butylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
tert-Butylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Carbon Disulfide	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Carbon Tetrachloride	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Chlorobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Chlorodibromomethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Chloroethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Chloroform	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Chloromethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
2-Chlorotoluene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
4-Chlorotoluene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,2-Dibromoethane (EDB)	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Dibromomethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,2-Dichlorobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,3-Dichlorobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,4-Dichlorobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
trans-1,4-Dichloro-2-butene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.16	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,1-Dichloroethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,2-Dichloroethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,1-Dichloroethylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
cis-1,2-Dichloroethylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
trans-1,2-Dichloroethylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,2-Dichloropropane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,3-Dichloropropane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
2,2-Dichloropropane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,1-Dichloropropene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
cis-1,3-Dichloropropene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
trans-1,3-Dichloropropene	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Diethyl Ether	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (29-38)

Sampled: 11/20/2019 14:10

Sample ID: 19K1416-12

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,4-Dioxane	ND	4.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Ethylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Hexachlorobutadiene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
2-Hexanone (MBK)	ND	0.79	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Isopropylbenzene (Cumene)	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Methyl Acetate	ND	0.79	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Methyl Cyclohexane	ND	0.079	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Methylene Chloride	ND	0.40	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.79	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Naphthalene	ND	0.16	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
n-Propylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Styrene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,1,1,2-Tetrachloroethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,1,2,2-Tetrachloroethane	ND	0.040	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Tetrachloroethylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Tetrahydrofuran	ND	0.79	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Toluene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,2,3-Trichlorobenzene	ND	0.40	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,2,4-Trichlorobenzene	ND	0.079	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,3,5-Trichlorobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,1,1-Trichloroethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,1,2-Trichloroethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Trichloroethylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Trichlorofluoromethane (Freon 11)	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,2,3-Trichloropropane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.079	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,2,4-Trimethylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
1,3,5-Trimethylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Vinyl Chloride	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
m+p Xylene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
o-Xylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:18	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	98.1	70-130							
Toluene-d8	98.5	70-130							
4-Bromofluorobenzene	98.9	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (29-38)

Sampled: 11/20/2019 14:10

Sample ID: 19K1416-12

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	51	15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
C19-C36 Aliphatics	320	31	mg/Kg dry	2		MADEP-EPH-04-1.1	11/25/19	12/2/19 19:00	KLB
Unadjusted C11-C22 Aromatics	120	15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
C11-C22 Aromatics	120	15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Acenaphthene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Acenaphthylene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Anthracene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Benzo(a)anthracene	0.59	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Benzo(a)pyrene	0.34	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Benzo(b)fluoranthene	0.52	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Benzo(g,h,i)perylene	0.25	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Benzo(k)fluoranthene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Chrysene	0.86	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Dibenz(a,h)anthracene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Fluoranthene	0.93	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Fluorene	0.17	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Indeno(1,2,3-cd)pyrene	0.26	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
2-Methylnaphthalene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Naphthalene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Phenanthrene	0.56	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW
Pyrene	0.99	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:36	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	75.9	40-140	12/2/19 10:36
Chlorooctadecane (COD)	72.2	40-140	12/2/19 19:00
o-Terphenyl (OTP)	77.1	40-140	12/2/19 10:36
2-Bromonaphthalene	87.0	40-140	12/2/19 10:36
2-Fluorobiphenyl	91.5	40-140	12/2/19 10:36

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (29-38)

Sampled: 11/20/2019 14:10

Sample ID: 19K1416-12

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date	Date/Time	Analyst
							Prepared	Analyzed	
Lead	82	0.80	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:41	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (29-38)

Sampled: 11/20/2019 14:10

Sample ID: 19K1416-12

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	62.7		% Wt	1		SM 2540G	11/25/19	11/26/19 10:50	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (38-40)

Sampled: 11/20/2019 14:15

Sample ID: 19K1416-13

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	3.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Acrylonitrile	ND	0.30	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Benzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Bromobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Bromochloromethane	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Bromodichloromethane	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Bromoform	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Bromomethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
2-Butanone (MEK)	ND	1.2	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
tert-Butyl Alcohol (TBA)	ND	1.2	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
n-Butylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
sec-Butylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
tert-Butylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Carbon Disulfide	ND	0.30	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Carbon Tetrachloride	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Chlorobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Chlorodibromomethane	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Chloroethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Chloroform	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Chloromethane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
2-Chlorotoluene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
4-Chlorotoluene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.30	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,2-Dibromoethane (EDB)	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Dibromomethane	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,2-Dichlorobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,3-Dichlorobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,4-Dichlorobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
trans-1,4-Dichloro-2-butene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.12	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,1-Dichloroethane	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,2-Dichloroethane	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,1-Dichloroethylene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
cis-1,2-Dichloroethylene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
trans-1,2-Dichloroethylene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,2-Dichloropropane	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,3-Dichloropropane	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
2,2-Dichloropropane	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,1-Dichloropropene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
cis-1,3-Dichloropropene	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
trans-1,3-Dichloropropene	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Diethyl Ether	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (38-40)

Sampled: 11/20/2019 14:15

Sample ID: 19K1416-13

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,4-Dioxane	ND	3.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Ethylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Hexachlorobutadiene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
2-Hexanone (MBK)	ND	0.61	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Isopropylbenzene (Cumene)	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Methyl Acetate	ND	0.61	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Methyl Cyclohexane	ND	0.061	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Methylene Chloride	ND	0.30	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.61	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Naphthalene	ND	0.12	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
n-Propylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Styrene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,1,1,2-Tetrachloroethane	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,1,2,2-Tetrachloroethane	ND	0.030	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Tetrachloroethylene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Tetrahydrofuran	ND	0.61	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Toluene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,2,3-Trichlorobenzene	ND	0.30	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,2,4-Trichlorobenzene	ND	0.061	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,3,5-Trichlorobenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,1,1-Trichloroethane	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,1,2-Trichloroethane	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Trichloroethylene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Trichlorofluoromethane (Freon 11)	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,2,3-Trichloropropane	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.061	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,2,4-Trimethylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
1,3,5-Trimethylbenzene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Vinyl Chloride	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
m+p Xylene	ND	0.12	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
o-Xylene	ND	0.061	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 17:44	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	98.8	70-130							
Toluene-d8	97.8	70-130							
4-Bromofluorobenzene	98.0	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (38-40)

Sampled: 11/20/2019 14:15

Sample ID: 19K1416-13

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
C19-C36 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Unadjusted C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Acenaphthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Acenaphthylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Benzo(a)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Benzo(a)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Benzo(b)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Benzo(g,h,i)perylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Benzo(k)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Chrysene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Dibenz(a,h)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Fluorene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Indeno(1,2,3-cd)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
2-Methylnaphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Naphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Phenanthrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW
Pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 8:30	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	70.3	40-140	
o-Terphenyl (OTP)	71.9	40-140	
2-Bromonaphthalene	93.7	40-140	
2-Fluorobiphenyl	95.1	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (38-40)

Sampled: 11/20/2019 14:15

Sample ID: 19K1416-13

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	13	0.70	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:47	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-8 (38-40)

Sampled: 11/20/2019 14:15

Sample ID: 19K1416-13

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	68.7		% Wt	1		SM 2540G	11/25/19	11/26/19 10:50	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (0-20)

Sampled: 11/20/2019 15:15

Sample ID: 19K1416-14

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Acrylonitrile	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Benzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Bromobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Bromochloromethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Bromodichloromethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Bromoform	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Bromomethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
2-Butanone (MEK)	ND	0.82	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
tert-Butyl Alcohol (TBA)	ND	0.82	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
n-Butylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
sec-Butylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
tert-Butylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Carbon Disulfide	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Carbon Tetrachloride	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Chlorobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Chlorodibromomethane	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Chloroethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Chloroform	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Chloromethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
2-Chlorotoluene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
4-Chlorotoluene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,2-Dibromoethane (EDB)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Dibromomethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,2-Dichlorobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,3-Dichlorobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,4-Dichlorobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
trans-1,4-Dichloro-2-butene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.082	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,1-Dichloroethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,2-Dichloroethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,1-Dichloroethylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
cis-1,2-Dichloroethylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
trans-1,2-Dichloroethylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,2-Dichloropropane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,3-Dichloropropane	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
2,2-Dichloropropane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,1-Dichloropropene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
cis-1,3-Dichloropropene	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
trans-1,3-Dichloropropene	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Diethyl Ether	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (0-20)

Sampled: 11/20/2019 15:15

Sample ID: 19K1416-14

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,4-Dioxane	ND	2.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Ethylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Hexachlorobutadiene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
2-Hexanone (MBK)	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Isopropylbenzene (Cumene)	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Methyl Acetate	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Methyl Cyclohexane	ND	0.041	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Methylene Chloride	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Naphthalene	ND	0.082	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
n-Propylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Styrene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,1,1,2-Tetrachloroethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,1,2,2-Tetrachloroethane	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Tetrachloroethylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Tetrahydrofuran	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Toluene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,2,3-Trichlorobenzene	ND	0.20	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,2,4-Trichlorobenzene	ND	0.041	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,3,5-Trichlorobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,1,1-Trichloroethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,1,2-Trichloroethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Trichloroethylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Trichlorofluoromethane (Freon 11)	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,2,3-Trichloropropane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.041	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,2,4-Trimethylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
1,3,5-Trimethylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Vinyl Chloride	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
m+p Xylene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
o-Xylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:11	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	97.0	70-130							
Toluene-d8	98.2	70-130							
4-Bromofluorobenzene	97.5	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (0-20)

Sampled: 11/20/2019 15:15

Sample ID: 19K1416-14

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
C19-C36 Aliphatics	15	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Unadjusted C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 10:55	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	69.8	40-140	
o-Terphenyl (OTP)	68.2	40-140	
2-Bromonaphthalene	90.3	40-140	
2-Fluorobiphenyl	92.4	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (0-20)

Sampled: 11/20/2019 15:15

Sample ID: 19K1416-14

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	2.7	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:53	MJH
Barium	12	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:53	MJH
Cadmium	ND	0.18	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:53	MJH
Chromium	6.2	0.36	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:53	MJH
Lead	4.3	0.54	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:53	MJH
Mercury	ND	0.027	mg/Kg dry	1		SW-846 7471B	11/26/19	11/27/19 10:37	CJV
Selenium	ND	3.6	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:53	MJH
Silver	ND	0.36	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:53	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (0-20)

Sampled: 11/20/2019 15:15

Sample ID: 19K1416-14

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	90.2		% Wt	1		SM 2540G	11/25/19	11/26/19 10:50	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-DUP-1

Sampled: 11/20/2019 00:00

Sample ID: 19K1416-15

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	4.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Acrylonitrile	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Benzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Bromobenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Bromochloromethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Bromodichloromethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Bromoform	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Bromomethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
2-Butanone (MEK)	ND	1.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
tert-Butyl Alcohol (TBA)	ND	1.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
n-Butylbenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
sec-Butylbenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
tert-Butylbenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Carbon Disulfide	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Carbon Tetrachloride	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Chlorobenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Chlorodibromomethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Chloroethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Chloroform	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Chloromethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
2-Chlorotoluene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
4-Chlorotoluene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,2-Dibromoethane (EDB)	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Dibromomethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,2-Dichlorobenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,3-Dichlorobenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,4-Dichlorobenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
trans-1,4-Dichloro-2-butene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.16	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,1-Dichloroethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,2-Dichloroethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,1-Dichloroethylene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
cis-1,2-Dichloroethylene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
trans-1,2-Dichloroethylene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,2-Dichloropropane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,3-Dichloropropane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
2,2-Dichloropropane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,1-Dichloropropene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
cis-1,3-Dichloropropene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
trans-1,3-Dichloropropene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Diethyl Ether	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-DUP-1

Sampled: 11/20/2019 00:00

Sample ID: 19K1416-15

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,4-Dioxane	ND	4.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Ethylbenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Hexachlorobutadiene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
2-Hexanone (MBK)	ND	0.82	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Isopropylbenzene (Cumene)	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Methyl Acetate	ND	0.82	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Methyl Cyclohexane	ND	0.082	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Methylene Chloride	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.82	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Naphthalene	ND	0.16	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
n-Propylbenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Styrene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,1,1,2-Tetrachloroethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,1,2,2-Tetrachloroethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Tetrachloroethylene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Tetrahydrofuran	ND	0.82	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Toluene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,2,3-Trichlorobenzene	ND	0.41	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,2,4-Trichlorobenzene	ND	0.082	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,3,5-Trichlorobenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,1,1-Trichloroethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,1,2-Trichloroethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Trichloroethylene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Trichlorofluoromethane (Freon 11)	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,2,3-Trichloropropane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.082	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,2,4-Trimethylbenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
1,3,5-Trimethylbenzene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Vinyl Chloride	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
m+p Xylene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
o-Xylene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 18:37	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	96.4	70-130							
Toluene-d8	98.1	70-130							
4-Bromofluorobenzene	99.2	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-DUP-1

Sampled: 11/20/2019 00:00

Sample ID: 19K1416-15

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	54	16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
C19-C36 Aliphatics	310	32	mg/Kg dry	2		MADEP-EPH-04-1.1	11/25/19	12/2/19 19:19	KLB
Unadjusted C11-C22 Aromatics	130	16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
C11-C22 Aromatics	120	16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Acenaphthene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Acenaphthylene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Anthracene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Benzo(a)anthracene	0.63	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Benzo(a)pyrene	0.35	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Benzo(b)fluoranthene	0.57	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Benzo(g,h,i)perylene	0.28	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Benzo(k)fluoranthene	0.17	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Chrysene	0.99	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Dibenz(a,h)anthracene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Fluoranthene	0.99	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Fluorene	0.17	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Indeno(1,2,3-cd)pyrene	0.29	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
2-Methylnaphthalene	ND	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Naphthalene	0.20	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Phenanthrene	0.60	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW
Pyrene	0.93	0.16	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 11:14	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	63.6	40-140	
o-Terphenyl (OTP)	74.5	40-140	
2-Bromonaphthalene	92.8	40-140	
2-Fluorobiphenyl	100	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/20/2019 00:00

Field Sample #: WC-DUP-1

Sample ID: 19K1416-15

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	130	0.79	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 14:58	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/20/2019 00:00

Field Sample #: WC-DUP-1

Sample ID: 19K1416-15

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	62.9		% Wt	1		SM 2540G	11/25/19	11/26/19 10:40	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-DUP-2

Sampled: 11/20/2019 00:00

Sample ID: 19K1416-16

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Acrylonitrile	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Benzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Bromobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Bromochloromethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Bromodichloromethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Bromoform	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Bromomethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
2-Butanone (MEK)	ND	0.82	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
tert-Butyl Alcohol (TBA)	ND	0.82	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
n-Butylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
sec-Butylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
tert-Butylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Carbon Disulfide	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Carbon Tetrachloride	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Chlorobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Chlorodibromomethane	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Chloroethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Chloroform	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Chloromethane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
2-Chlorotoluene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
4-Chlorotoluene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,2-Dibromoethane (EDB)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Dibromomethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,2-Dichlorobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,3-Dichlorobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,4-Dichlorobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
trans-1,4-Dichloro-2-butene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.082	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,1-Dichloroethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,2-Dichloroethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,1-Dichloroethylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
cis-1,2-Dichloroethylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
trans-1,2-Dichloroethylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,2-Dichloropropane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,3-Dichloropropane	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
2,2-Dichloropropane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,1-Dichloropropene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
cis-1,3-Dichloropropene	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
trans-1,3-Dichloropropene	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Diethyl Ether	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-DUP-2

Sampled: 11/20/2019 00:00

Sample ID: 19K1416-16

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,4-Dioxane	ND	2.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Ethylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Hexachlorobutadiene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
2-Hexanone (MBK)	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Isopropylbenzene (Cumene)	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Methyl Acetate	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Methyl Cyclohexane	ND	0.041	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Methylene Chloride	ND	0.20	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Naphthalene	ND	0.082	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
n-Propylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Styrene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,1,1,2-Tetrachloroethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,1,2,2-Tetrachloroethane	ND	0.020	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Tetrachloroethylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Tetrahydrofuran	ND	0.41	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Toluene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,2,3-Trichlorobenzene	ND	0.20	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,2,4-Trichlorobenzene	ND	0.041	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,3,5-Trichlorobenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,1,1-Trichloroethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,1,2-Trichloroethane	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Trichloroethylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Trichlorofluoromethane (Freon 11)	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,2,3-Trichloropropane	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.041	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,2,4-Trimethylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
1,3,5-Trimethylbenzene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Vinyl Chloride	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
m+p Xylene	ND	0.082	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
o-Xylene	ND	0.041	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:03	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	97.6	70-130							
Toluene-d8	98.0	70-130							
4-Bromofluorobenzene	98.1	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-DUP-2

Sampled: 11/20/2019 00:00

Sample ID: 19K1416-16

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Unadjusted C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:30	KLB

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	78.5	40-140	
o-Terphenyl (OTP)	84.0	40-140	
2-Bromonaphthalene	98.1	40-140	
2-Fluorobiphenyl	100	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-DUP-2

Sampled: 11/20/2019 00:00

Sample ID: 19K1416-16

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	2.6	1.8	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:31	TBC
Arsenic	100	1.9	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:04	MJH
Barium	11	1.9	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:04	MJH
Barium	10	1.8	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:31	TBC
Cadmium	2.5	0.19	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:04	MJH
Cadmium	ND	0.18	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:31	TBC
Chromium	7.5	0.38	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:04	MJH
Chromium	5.2	0.36	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:31	TBC
Lead	4.2	0.56	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:04	MJH
Lead	3.2	0.54	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:31	TBC
Mercury	ND	0.029	mg/Kg dry	1		SW-846 7471B	11/26/19	11/27/19 10:39	CJV
Selenium	ND	3.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:04	MJH
Selenium	ND	3.6	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:31	TBC
Silver	ND	0.38	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:04	MJH
Silver	ND	0.36	mg/Kg dry	1		SW-846 6010D	12/10/19	12/10/19 20:31	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/20/2019 00:00

Field Sample #: WC-DUP-2

Sample ID: 19K1416-16

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	87.6		% Wt	1		SM 2540G	11/25/19	11/26/19 10:40	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (35)

Sampled: 11/21/2019 09:00

Sample ID: 19K1416-17

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Acrylonitrile	ND	0.26	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.026	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Benzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Bromobenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Bromochloromethane	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Bromodichloromethane	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Bromoform	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Bromomethane	ND	0.10	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
2-Butanone (MEK)	ND	1.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
tert-Butyl Alcohol (TBA)	ND	1.0	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
n-Butylbenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
sec-Butylbenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
tert-Butylbenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.026	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Carbon Disulfide	ND	0.26	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Carbon Tetrachloride	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Chlorobenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Chlorodibromomethane	ND	0.026	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Chloroethane	ND	0.10	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Chloroform	ND	0.10	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Chloromethane	ND	0.10	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
2-Chlorotoluene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
4-Chlorotoluene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.26	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,2-Dibromoethane (EDB)	ND	0.026	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Dibromomethane	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,2-Dichlorobenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,3-Dichlorobenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,4-Dichlorobenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
trans-1,4-Dichloro-2-butene	ND	0.10	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.10	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,1-Dichloroethane	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,2-Dichloroethane	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,1-Dichloroethylene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
cis-1,2-Dichloroethylene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
trans-1,2-Dichloroethylene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,2-Dichloropropane	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,3-Dichloropropane	ND	0.026	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
2,2-Dichloropropane	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,1-Dichloropropene	ND	0.10	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
cis-1,3-Dichloropropene	ND	0.026	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
trans-1,3-Dichloropropene	ND	0.026	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Diethyl Ether	ND	0.10	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (35)

Sampled: 11/21/2019 09:00

Sample ID: 19K1416-17

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.026	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,4-Dioxane	ND	2.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Ethylbenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Hexachlorobutadiene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
2-Hexanone (MBK)	ND	0.52	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Isopropylbenzene (Cumene)	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Methyl Acetate	ND	0.52	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Methyl Cyclohexane	ND	0.052	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Methylene Chloride	ND	0.26	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.52	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Naphthalene	ND	0.10	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
n-Propylbenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Styrene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,1,1,2-Tetrachloroethane	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,1,2,2-Tetrachloroethane	ND	0.026	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Tetrachloroethylene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Tetrahydrofuran	ND	0.52	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Toluene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,2,3-Trichlorobenzene	ND	0.26	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,2,4-Trichlorobenzene	ND	0.052	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,3,5-Trichlorobenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,1,1-Trichloroethane	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,1,2-Trichloroethane	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Trichloroethylene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Trichlorofluoromethane (Freon 11)	ND	0.10	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,2,3-Trichloropropane	ND	0.10	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.052	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,2,4-Trimethylbenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
1,3,5-Trimethylbenzene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Vinyl Chloride	ND	0.10	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
m+p Xylene	ND	0.10	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
o-Xylene	ND	0.052	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:30	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	98.6	70-130							
Toluene-d8	100	70-130							
4-Bromofluorobenzene	97.2	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (35)

Sampled: 11/21/2019 09:00

Sample ID: 19K1416-17

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	43	13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
C19-C36 Aliphatics	140	25	mg/Kg dry	2		MADEP-EPH-04-1.1	11/25/19	12/3/19 13:41	RMW
Unadjusted C11-C22 Aromatics	68	13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
C11-C22 Aromatics	65	13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Acenaphthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Acenaphthylene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Anthracene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Benzo(a)anthracene	0.30	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Benzo(a)pyrene	0.21	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Benzo(b)fluoranthene	0.31	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Benzo(g,h,i)perylene	0.15	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Benzo(k)fluoranthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Chrysene	0.36	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Dibenz(a,h)anthracene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Fluoranthene	0.59	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Fluorene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Indeno(1,2,3-cd)pyrene	0.14	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
2-Methylnaphthalene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Naphthalene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Phenanthrene	0.32	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB
Pyrene	0.56	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:08	KLB

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	77.1	40-140	
Chlorooctadecane (COD)	47.7	40-140	
o-Terphenyl (OTP)	77.6	40-140	
2-Bromonaphthalene	93.4	40-140	
2-Fluorobiphenyl	97.5	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/21/2019 09:00

Field Sample #: WC-10 (35)

Sample ID: 19K1416-17

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	17	0.61	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:10	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/21/2019 09:00

Field Sample #: WC-10 (35)

Sample ID: 19K1416-17

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	79.3		% Wt	1		SM 2540G	11/25/19	11/26/19 10:41	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (35-40)

Sampled: 11/21/2019 09:05

Sample ID: 19K1416-18

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.7	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Acrylonitrile	ND	0.27	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Benzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Bromobenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Bromochloromethane	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Bromodichloromethane	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Bromoform	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Bromomethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
2-Butanone (MEK)	ND	1.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
tert-Butyl Alcohol (TBA)	ND	1.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
n-Butylbenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
sec-Butylbenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
tert-Butylbenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Carbon Disulfide	ND	0.27	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Carbon Tetrachloride	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Chlorobenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Chlorodibromomethane	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Chloroethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Chloroform	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Chloromethane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
2-Chlorotoluene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
4-Chlorotoluene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.27	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,2-Dibromoethane (EDB)	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Dibromomethane	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,2-Dichlorobenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,3-Dichlorobenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,4-Dichlorobenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
trans-1,4-Dichloro-2-butene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.11	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,1-Dichloroethane	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,2-Dichloroethane	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,1-Dichloroethylene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
cis-1,2-Dichloroethylene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
trans-1,2-Dichloroethylene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,2-Dichloropropane	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,3-Dichloropropane	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
2,2-Dichloropropane	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,1-Dichloropropene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
cis-1,3-Dichloropropene	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
trans-1,3-Dichloropropene	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Diethyl Ether	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (35-40)

Sampled: 11/21/2019 09:05

Sample ID: 19K1416-18

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,4-Dioxane	ND	2.7	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Ethylbenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Hexachlorobutadiene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
2-Hexanone (MBK)	ND	0.55	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Isopropylbenzene (Cumene)	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Methyl Acetate	ND	0.55	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Methyl Cyclohexane	ND	0.055	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Methylene Chloride	ND	0.27	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.55	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Naphthalene	ND	0.11	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
n-Propylbenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Styrene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,1,1,2-Tetrachloroethane	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,1,2,2-Tetrachloroethane	ND	0.027	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Tetrachloroethylene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Tetrahydrofuran	ND	0.55	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Toluene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,2,3-Trichlorobenzene	ND	0.27	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,2,4-Trichlorobenzene	ND	0.055	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,3,5-Trichlorobenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,1,1-Trichloroethane	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,1,2-Trichloroethane	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Trichloroethylene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Trichlorofluoromethane (Freon 11)	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,2,3-Trichloropropane	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.055	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,2,4-Trimethylbenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
1,3,5-Trimethylbenzene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Vinyl Chloride	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
m+p Xylene	ND	0.11	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
o-Xylene	ND	0.055	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 19:56	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	101	70-130							
Toluene-d8	96.4	70-130							
4-Bromofluorobenzene	98.3	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (35-40)

Sampled: 11/21/2019 09:05

Sample ID: 19K1416-18

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
C19-C36 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Unadjusted C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Acenaphthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Acenaphthylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Benzo(a)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Benzo(a)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Benzo(b)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Benzo(g,h,i)perylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Benzo(k)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Chrysene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Dibenz(a,h)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Fluorene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Indeno(1,2,3-cd)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
2-Methylnaphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Naphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Phenanthrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB
Pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 15:49	KLB

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	71.2	40-140	
o-Terphenyl (OTP)	76.9	40-140	
2-Bromonaphthalene	95.6	40-140	
2-Fluorobiphenyl	97.6	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (35-40)

Sampled: 11/21/2019 09:05

Sample ID: 19K1416-18

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	13	0.65	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:16	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-10 (35-40)

Sampled: 11/21/2019 09:05

Sample ID: 19K1416-18

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	72.8		% Wt	1		SM 2540G	11/25/19	11/26/19 10:41	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (0-15)

Sampled: 11/21/2019 09:45

Sample ID: 19K1416-19

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	1.8	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Acrylonitrile	ND	0.18	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.018	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Benzene	0.039	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Bromobenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Bromochloromethane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Bromodichloromethane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Bromoform	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Bromomethane	ND	0.073	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
2-Butanone (MEK)	ND	0.73	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
tert-Butyl Alcohol (TBA)	ND	0.73	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
n-Butylbenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
sec-Butylbenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
tert-Butylbenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.018	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Carbon Disulfide	ND	0.18	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Carbon Tetrachloride	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Chlorobenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Chlorodibromomethane	ND	0.018	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Chloroethane	ND	0.073	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Chloroform	ND	0.073	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Chloromethane	ND	0.073	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
2-Chlorotoluene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
4-Chlorotoluene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.18	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,2-Dibromoethane (EDB)	ND	0.018	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Dibromomethane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,2-Dichlorobenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,3-Dichlorobenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,4-Dichlorobenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
trans-1,4-Dichloro-2-butene	ND	0.073	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.073	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,1-Dichloroethane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,2-Dichloroethane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,1-Dichloroethylene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
cis-1,2-Dichloroethylene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
trans-1,2-Dichloroethylene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,2-Dichloropropane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,3-Dichloropropane	ND	0.018	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
2,2-Dichloropropane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,1-Dichloropropene	ND	0.073	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
cis-1,3-Dichloropropene	ND	0.018	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
trans-1,3-Dichloropropene	ND	0.018	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Diethyl Ether	ND	0.073	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (0-15)

Sampled: 11/21/2019 09:45

Sample ID: 19K1416-19

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.018	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,4-Dioxane	ND	1.8	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Ethylbenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Hexachlorobutadiene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
2-Hexanone (MBK)	ND	0.36	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Isopropylbenzene (Cumene)	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Methyl Acetate	ND	0.36	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Methyl Cyclohexane	ND	0.036	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Methylene Chloride	ND	0.18	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.36	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Naphthalene	ND	0.073	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
n-Propylbenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Styrene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,1,1,2-Tetrachloroethane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,1,2,2-Tetrachloroethane	ND	0.018	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Tetrachloroethylene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Tetrahydrofuran	ND	0.36	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Toluene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,2,3-Trichlorobenzene	ND	0.18	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,2,4-Trichlorobenzene	ND	0.036	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,3,5-Trichlorobenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,1,1-Trichloroethane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,1,2-Trichloroethane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Trichloroethylene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Trichlorofluoromethane (Freon 11)	ND	0.073	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,2,3-Trichloropropane	ND	0.073	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.036	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,2,4-Trimethylbenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
1,3,5-Trimethylbenzene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Vinyl Chloride	ND	0.073	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
m+p Xylene	ND	0.073	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
o-Xylene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:23	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	99.2	70-130						11/30/19 20:23	
Toluene-d8	97.2	70-130						11/30/19 20:23	
4-Bromofluorobenzene	94.0	70-130						11/30/19 20:23	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (0-15)

Sampled: 11/21/2019 09:45

Sample ID: 19K1416-19

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
C19-C36 Aliphatics	20	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Unadjusted C11-C22 Aromatics	18	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
C11-C22 Aromatics	16	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Benzo(a)anthracene	0.16	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Benzo(a)pyrene	0.18	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Benzo(b)fluoranthene	0.21	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Chrysene	0.15	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Fluoranthene	0.30	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Phenanthrene	0.18	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB
Pyrene	0.31	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:27	KLB

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	76.8	40-140	12/2/19 16:27
o-Terphenyl (OTP)	75.7	40-140	12/2/19 16:27
2-Bromonaphthalene	98.9	40-140	12/2/19 16:27
2-Fluorobiphenyl	101	40-140	12/2/19 16:27

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (0-15)

Sampled: 11/21/2019 09:45

Sample ID: 19K1416-19

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	4.6	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:48	MJH
Barium	36	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:48	MJH
Cadmium	ND	0.18	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:48	MJH
Chromium	17	0.37	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:48	MJH
Lead	20	0.55	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:48	MJH
Mercury	0.078	0.027	mg/Kg dry	1		SW-846 7471B	11/26/19	11/27/19 10:41	CJV
Selenium	ND	3.7	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:48	MJH
Silver	ND	0.37	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:48	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/21/2019 09:45

Field Sample #: WC-5 (0-15)

Sample ID: 19K1416-19

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.0		% Wt	1		SM 2540G	11/25/19	11/26/19 10:41	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (30-33.5)

Sampled: 11/21/2019 10:10

Sample ID: 19K1416-20

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	3.4	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Acrylonitrile	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Benzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Bromobenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Bromochloromethane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Bromodichloromethane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Bromoform	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Bromomethane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
2-Butanone (MEK)	ND	1.3	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
tert-Butyl Alcohol (TBA)	ND	1.3	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
n-Butylbenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
sec-Butylbenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
tert-Butylbenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Carbon Disulfide	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Carbon Tetrachloride	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Chlorobenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Chlorodibromomethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Chloroethane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Chloroform	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Chloromethane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
2-Chlorotoluene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
4-Chlorotoluene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,2-Dibromoethane (EDB)	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Dibromomethane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,2-Dichlorobenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,3-Dichlorobenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,4-Dichlorobenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
trans-1,4-Dichloro-2-butene	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.13	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,1-Dichloroethane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,2-Dichloroethane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,1-Dichloroethylene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
cis-1,2-Dichloroethylene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
trans-1,2-Dichloroethylene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,2-Dichloropropane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,3-Dichloropropane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
2,2-Dichloropropane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,1-Dichloropropene	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
cis-1,3-Dichloropropene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
trans-1,3-Dichloropropene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Diethyl Ether	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (30-33.5)

Sampled: 11/21/2019 10:10

Sample ID: 19K1416-20

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,4-Dioxane	ND	3.4	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Ethylbenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Hexachlorobutadiene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
2-Hexanone (MBK)	ND	0.67	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Isopropylbenzene (Cumene)	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Methyl Acetate	ND	0.67	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Methyl Cyclohexane	ND	0.067	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Methylene Chloride	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.67	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Naphthalene	ND	0.13	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
n-Propylbenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Styrene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,1,1,2-Tetrachloroethane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,1,2,2-Tetrachloroethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Tetrachloroethylene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Tetrahydrofuran	ND	0.67	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Toluene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,2,3-Trichlorobenzene	ND	0.34	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,2,4-Trichlorobenzene	ND	0.067	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,3,5-Trichlorobenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,1,1-Trichloroethane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,1,2-Trichloroethane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Trichloroethylene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Trichlorofluoromethane (Freon 11)	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,2,3-Trichloropropane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.067	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,2,4-Trimethylbenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
1,3,5-Trimethylbenzene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Vinyl Chloride	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
m+p Xylene	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
o-Xylene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/30/19 20:49	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	99.1	70-130							
Toluene-d8	98.0	70-130							
4-Bromofluorobenzene	96.4	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (30-33.5)

Sampled: 11/21/2019 10:10

Sample ID: 19K1416-20

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	15	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
C19-C36 Aliphatics	110	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Unadjusted C11-C22 Aromatics	62	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
C11-C22 Aromatics	59	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Acenaphthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Acenaphthylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Benzo(a)anthracene	0.38	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Benzo(a)pyrene	0.24	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Benzo(b)fluoranthene	0.21	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Benzo(g,h,i)perylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Benzo(k)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Chrysene	0.72	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Dibenz(a,h)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Fluoranthene	0.45	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Fluorene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Indeno(1,2,3-cd)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
2-Methylnaphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Naphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Phenanthrene	0.28	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB
Pyrene	0.43	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/25/19	12/2/19 16:46	KLB

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	64.8	40-140	12/2/19 16:46
o-Terphenyl (OTP)	74.0	40-140	12/2/19 16:46
2-Bromonaphthalene	95.2	40-140	12/2/19 16:46
2-Fluorobiphenyl	98.0	40-140	12/2/19 16:46

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (30-33.5)

Sampled: 11/21/2019 10:10

Sample ID: 19K1416-20

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	62	0.71	mg/Kg dry	1	MS-11	SW-846 6010D	11/27/19	12/2/19 13:58	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

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Field Sample #: WC-5 (30-33.5)

Sampled: 11/21/2019 10:10

Sample ID: 19K1416-20

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	70.2		% Wt	1		SM 2540G	11/25/19	11/26/19 10:41	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (33.5-40)

Sampled: 11/21/2019 10:30

Sample ID: 19K1416-21

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	3.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Acrylonitrile	ND	0.36	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Benzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Bromobenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Bromochloromethane	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Bromodichloromethane	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Bromoform	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Bromomethane	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
2-Butanone (MEK)	ND	1.4	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
tert-Butyl Alcohol (TBA)	ND	1.4	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
n-Butylbenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
sec-Butylbenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
tert-Butylbenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Carbon Disulfide	ND	0.36	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Carbon Tetrachloride	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Chlorobenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Chlorodibromomethane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Chloroethane	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Chloroform	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Chloromethane	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
2-Chlorotoluene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
4-Chlorotoluene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.36	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,2-Dibromoethane (EDB)	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Dibromomethane	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,2-Dichlorobenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,3-Dichlorobenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,4-Dichlorobenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
trans-1,4-Dichloro-2-butene	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.14	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,1-Dichloroethane	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,2-Dichloroethane	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,1-Dichloroethylene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
cis-1,2-Dichloroethylene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
trans-1,2-Dichloroethylene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,2-Dichloropropane	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,3-Dichloropropane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
2,2-Dichloropropane	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,1-Dichloropropene	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
cis-1,3-Dichloropropene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
trans-1,3-Dichloropropene	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Diethyl Ether	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF

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Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (33.5-40)

Sampled: 11/21/2019 10:30

Sample ID: 19K1416-21

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,4-Dioxane	ND	3.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Ethylbenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Hexachlorobutadiene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
2-Hexanone (MBK)	ND	0.72	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Isopropylbenzene (Cumene)	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Methyl Acetate	ND	0.72	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Methyl Cyclohexane	ND	0.072	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Methylene Chloride	ND	0.36	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.72	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Naphthalene	ND	0.14	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
n-Propylbenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Styrene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,1,1,2-Tetrachloroethane	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,1,2,2-Tetrachloroethane	ND	0.036	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Tetrachloroethylene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Tetrahydrofuran	ND	0.72	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Toluene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,2,3-Trichlorobenzene	ND	0.36	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,2,4-Trichlorobenzene	ND	0.072	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,3,5-Trichlorobenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,1,1-Trichloroethane	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,1,2-Trichloroethane	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Trichloroethylene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Trichlorofluoromethane (Freon 11)	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,2,3-Trichloropropane	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.072	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,2,4-Trimethylbenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
1,3,5-Trimethylbenzene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Vinyl Chloride	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
m+p Xylene	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
o-Xylene	ND	0.072	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:01	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	102	70-130							
Toluene-d8	97.3	70-130							
4-Bromofluorobenzene	98.8	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (33.5-40)

Sampled: 11/21/2019 10:30

Sample ID: 19K1416-21

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
C19-C36 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Unadjusted C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Acenaphthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Acenaphthylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Benzo(a)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Benzo(a)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Benzo(b)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Benzo(g,h,i)perylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Benzo(k)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Chrysene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Dibenz(a,h)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Fluorene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Indeno(1,2,3-cd)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
2-Methylnaphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Naphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Phenanthrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW
Pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 18:57	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	73.8	40-140	
o-Terphenyl (OTP)	72.6	40-140	
2-Bromonaphthalene	96.0	40-140	
2-Fluorobiphenyl	99.5	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (33.5-40)

Sampled: 11/21/2019 10:30

Sample ID: 19K1416-21

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	13	0.66	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:53	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-5 (33.5-40)

Sampled: 11/21/2019 10:30

Sample ID: 19K1416-21

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	71.5		% Wt	1		SM 2540G	11/25/19	11/26/19 10:41	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-12 (0-10)

Sampled: 11/21/2019 11:10

Sample ID: 19K1416-22

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	1.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Acrylonitrile	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Benzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Bromobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Bromochloromethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Bromodichloromethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Bromoform	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Bromomethane	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
2-Butanone (MEK)	ND	0.76	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
tert-Butyl Alcohol (TBA)	ND	0.76	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
n-Butylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
sec-Butylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
tert-Butylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Carbon Disulfide	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Carbon Tetrachloride	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Chlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Chlorodibromomethane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Chloroethane	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Chloroform	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Chloromethane	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
2-Chlorotoluene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
4-Chlorotoluene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,2-Dibromoethane (EDB)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Dibromomethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,2-Dichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,3-Dichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,4-Dichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
trans-1,4-Dichloro-2-butene	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.076	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,1-Dichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,2-Dichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,1-Dichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
cis-1,2-Dichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
trans-1,2-Dichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,2-Dichloropropane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,3-Dichloropropane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
2,2-Dichloropropane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,1-Dichloropropene	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
cis-1,3-Dichloropropene	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
trans-1,3-Dichloropropene	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Diethyl Ether	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-12 (0-10)

Sampled: 11/21/2019 11:10

Sample ID: 19K1416-22

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,4-Dioxane	ND	1.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Ethylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Hexachlorobutadiene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
2-Hexanone (MBK)	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Isopropylbenzene (Cumene)	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Methyl Acetate	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Methyl Cyclohexane	ND	0.038	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Methylene Chloride	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Naphthalene	ND	0.076	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
n-Propylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Styrene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,1,1,2-Tetrachloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,1,2,2-Tetrachloroethane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Tetrachloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Tetrahydrofuran	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Toluene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,2,3-Trichlorobenzene	ND	0.19	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,2,4-Trichlorobenzene	ND	0.038	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,3,5-Trichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,1,1-Trichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,1,2-Trichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Trichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Trichlorofluoromethane (Freon 11)	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,2,3-Trichloropropane	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.038	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,2,4-Trimethylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
1,3,5-Trimethylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Vinyl Chloride	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
m+p Xylene	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
o-Xylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:28	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	101	70-130							
Toluene-d8	96.8	70-130							
4-Bromofluorobenzene	95.2	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-12 (0-10)

Sampled: 11/21/2019 11:10

Sample ID: 19K1416-22

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
C19-C36 Aliphatics	39	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Unadjusted C11-C22 Aromatics	49	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
C11-C22 Aromatics	39	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Acenaphthene	0.24	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Anthracene	0.36	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Benzo(a)anthracene	0.75	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Benzo(a)pyrene	0.62	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Benzo(b)fluoranthene	0.84	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Benzo(g,h,i)perylene	0.36	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Benzo(k)fluoranthene	0.30	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Chrysene	0.78	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Fluoranthene	1.9	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Fluorene	0.22	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Indeno(1,2,3-cd)pyrene	0.47	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Phenanthrene	1.2	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Pyrene	1.7	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 20:14	RMW
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	61.6	40-140							
o-Terphenyl (OTP)	65.6	40-140							
2-Bromonaphthalene	96.5	40-140							
2-Fluorobiphenyl	101	40-140							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-12 (0-10)

Sampled: 11/21/2019 11:10

Sample ID: 19K1416-22

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	8.5	1.9	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:59	MJH
Barium	49	1.9	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:59	MJH
Cadmium	0.25	0.19	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:59	MJH
Chromium	21	0.39	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:59	MJH
Lead	54	0.58	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:59	MJH
Mercury	0.077	0.027	mg/Kg dry	1		SW-846 7471B	11/26/19	11/27/19 10:42	CJV
Selenium	ND	3.9	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:59	MJH
Silver	ND	0.39	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 15:59	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-12 (0-10)

Sampled: 11/21/2019 11:10

Sample ID: 19K1416-22

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.9		% Wt	1		SM 2540G	11/25/19	11/26/19 10:41	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-18 (0-15)

Sampled: 11/21/2019 12:30

Sample ID: 19K1416-23

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	1.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Acrylonitrile	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Benzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Bromobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Bromochloromethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Bromodichloromethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Bromoform	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Bromomethane	ND	0.075	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
2-Butanone (MEK)	ND	0.75	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
tert-Butyl Alcohol (TBA)	ND	0.75	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
n-Butylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
sec-Butylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
tert-Butylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Carbon Disulfide	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Carbon Tetrachloride	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Chlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Chlorodibromomethane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Chloroethane	ND	0.075	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Chloroform	ND	0.075	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Chloromethane	ND	0.075	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
2-Chlorotoluene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
4-Chlorotoluene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,2-Dibromoethane (EDB)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Dibromomethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,2-Dichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,3-Dichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,4-Dichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
trans-1,4-Dichloro-2-butene	ND	0.075	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.075	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,1-Dichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,2-Dichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,1-Dichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
cis-1,2-Dichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
trans-1,2-Dichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,2-Dichloropropane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,3-Dichloropropane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
2,2-Dichloropropane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,1-Dichloropropene	ND	0.075	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
cis-1,3-Dichloropropene	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
trans-1,3-Dichloropropene	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Diethyl Ether	ND	0.075	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-18 (0-15)

Sampled: 11/21/2019 12:30

Sample ID: 19K1416-23

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,4-Dioxane	ND	1.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Ethylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Hexachlorobutadiene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
2-Hexanone (MBK)	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Isopropylbenzene (Cumene)	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Methyl Acetate	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Methyl Cyclohexane	ND	0.038	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Methylene Chloride	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Naphthalene	ND	0.075	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
n-Propylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Styrene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,1,1,2-Tetrachloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,1,2,2-Tetrachloroethane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Tetrachloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Tetrahydrofuran	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Toluene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,2,3-Trichlorobenzene	ND	0.19	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,2,4-Trichlorobenzene	ND	0.038	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,3,5-Trichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,1,1-Trichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,1,2-Trichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Trichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Trichlorofluoromethane (Freon 11)	ND	0.075	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,2,3-Trichloropropane	ND	0.075	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.038	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,2,4-Trimethylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
1,3,5-Trimethylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Vinyl Chloride	ND	0.075	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
m+p Xylene	ND	0.075	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
o-Xylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 14:54	MFF
Surrogates	% Recovery	Recovery Limits			Flag/Qual				
1,2-Dichloroethane-d4	92.4	70-130						11/27/19 14:54	
Toluene-d8	107	70-130						11/27/19 14:54	
4-Bromofluorobenzene	98.8	70-130						11/27/19 14:54	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-18 (0-15)

Sampled: 11/21/2019 12:30

Sample ID: 19K1416-23

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Unadjusted C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Benzo(a)anthracene	0.18	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Benzo(a)pyrene	0.17	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Benzo(b)fluoranthene	0.21	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Chrysene	0.20	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Fluoranthene	0.44	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Phenanthrene	0.36	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW
Pyrene	0.41	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:47	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	77.9	40-140	
o-Terphenyl (OTP)	80.7	40-140	
2-Bromonaphthalene	103	40-140	
2-Fluorobiphenyl	105	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-18 (0-15)

Sampled: 11/21/2019 12:30

Sample ID: 19K1416-23

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	5.0	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:04	MJH
Barium	42	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:04	MJH
Cadmium	ND	0.18	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:04	MJH
Chromium	21	0.36	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:04	MJH
Lead	7.1	0.54	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:04	MJH
Mercury	ND	0.028	mg/Kg dry	1		SW-846 7471B	11/26/19	11/27/19 10:44	CJV
Selenium	ND	3.6	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:04	MJH
Silver	ND	0.36	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:04	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-18 (0-15)

Sampled: 11/21/2019 12:30

Sample ID: 19K1416-23

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	91.3		% Wt	1		SM 2540G	11/25/19	11/26/19 10:41	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-20 (0-20)

Sampled: 11/21/2019 13:50

Sample ID: 19K1416-24

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	1.7	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Acrylonitrile	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.017	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Benzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Bromobenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Bromochloromethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Bromodichloromethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Bromoform	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Bromomethane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
2-Butanone (MEK)	ND	0.67	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
tert-Butyl Alcohol (TBA)	ND	0.67	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
n-Butylbenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
sec-Butylbenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
tert-Butylbenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.017	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Carbon Disulfide	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Carbon Tetrachloride	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Chlorobenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Chlorodibromomethane	ND	0.017	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Chloroethane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Chloroform	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Chloromethane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
2-Chlorotoluene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
4-Chlorotoluene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,2-Dibromoethane (EDB)	ND	0.017	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Dibromomethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,2-Dichlorobenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,3-Dichlorobenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,4-Dichlorobenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
trans-1,4-Dichloro-2-butene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.067	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,1-Dichloroethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,2-Dichloroethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,1-Dichloroethylene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
cis-1,2-Dichloroethylene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
trans-1,2-Dichloroethylene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,2-Dichloropropane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,3-Dichloropropane	ND	0.017	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
2,2-Dichloropropane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,1-Dichloropropene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
cis-1,3-Dichloropropene	ND	0.017	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
trans-1,3-Dichloropropene	ND	0.017	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Diethyl Ether	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-20 (0-20)

Sampled: 11/21/2019 13:50

Sample ID: 19K1416-24

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.017	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,4-Dioxane	ND	1.7	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Ethylbenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Hexachlorobutadiene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
2-Hexanone (MBK)	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Isopropylbenzene (Cumene)	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Methyl Acetate	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Methyl Cyclohexane	ND	0.034	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Methylene Chloride	ND	0.17	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Naphthalene	ND	0.067	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
n-Propylbenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Styrene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,1,1,2-Tetrachloroethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,1,2,2-Tetrachloroethane	ND	0.017	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Tetrachloroethylene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Tetrahydrofuran	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Toluene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,2,3-Trichlorobenzene	ND	0.17	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,2,4-Trichlorobenzene	ND	0.034	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,3,5-Trichlorobenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,1,1-Trichloroethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,1,2-Trichloroethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Trichloroethylene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Trichlorofluoromethane (Freon 11)	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,2,3-Trichloropropane	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.034	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,2,4-Trimethylbenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
1,3,5-Trimethylbenzene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Vinyl Chloride	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
m+p Xylene	ND	0.067	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
o-Xylene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:21	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	99.4	70-130							
Toluene-d8	93.1	70-130							
4-Bromofluorobenzene	97.3	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-20 (0-20)

Sampled: 11/21/2019 13:50

Sample ID: 19K1416-24

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Unadjusted C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 23:06	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	71.3	40-140	
o-Terphenyl (OTP)	82.7	40-140	
2-Bromonaphthalene	98.4	40-140	
2-Fluorobiphenyl	99.9	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-20 (0-20)

Sampled: 11/21/2019 13:50

Sample ID: 19K1416-24

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	6.3	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:10	MJH
Barium	35	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:10	MJH
Cadmium	ND	0.18	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:10	MJH
Chromium	21	0.36	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:10	MJH
Lead	5.5	0.55	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:10	MJH
Mercury	ND	0.027	mg/Kg dry	1		SW-846 7471B	11/26/19	11/27/19 10:45	CJV
Selenium	ND	3.6	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:10	MJH
Silver	ND	0.36	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:10	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/21/2019 13:50

Field Sample #: WC-20 (0-20)

Sample ID: 19K1416-24

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	88.7		% Wt	1		SM 2540G	11/25/19	11/26/19 10:42	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-13 (0-20)

Sampled: 11/21/2019 14:50

Sample ID: 19K1416-25

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	1.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Acrylonitrile	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Benzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Bromobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Bromochloromethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Bromodichloromethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Bromoform	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Bromomethane	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
2-Butanone (MEK)	ND	0.76	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
tert-Butyl Alcohol (TBA)	ND	0.76	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
n-Butylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
sec-Butylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
tert-Butylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Carbon Disulfide	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Carbon Tetrachloride	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Chlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Chlorodibromomethane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Chloroethane	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Chloroform	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Chloromethane	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
2-Chlorotoluene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
4-Chlorotoluene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,2-Dibromoethane (EDB)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Dibromomethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,2-Dichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,3-Dichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,4-Dichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
trans-1,4-Dichloro-2-butene	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.076	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,1-Dichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,2-Dichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,1-Dichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
cis-1,2-Dichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
trans-1,2-Dichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,2-Dichloropropane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,3-Dichloropropane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
2,2-Dichloropropane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,1-Dichloropropene	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
cis-1,3-Dichloropropene	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
trans-1,3-Dichloropropene	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Diethyl Ether	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-13 (0-20)

Sampled: 11/21/2019 14:50

Sample ID: 19K1416-25

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,4-Dioxane	ND	1.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Ethylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Hexachlorobutadiene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
2-Hexanone (MBK)	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Isopropylbenzene (Cumene)	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Methyl Acetate	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Methyl Cyclohexane	ND	0.038	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Methylene Chloride	ND	0.19	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Naphthalene	ND	0.076	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
n-Propylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Styrene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,1,1,2-Tetrachloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,1,2,2-Tetrachloroethane	ND	0.019	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Tetrachloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Tetrahydrofuran	ND	0.38	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Toluene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,2,3-Trichlorobenzene	ND	0.19	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,2,4-Trichlorobenzene	ND	0.038	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,3,5-Trichlorobenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,1,1-Trichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,1,2-Trichloroethane	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Trichloroethylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Trichlorofluoromethane (Freon 11)	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,2,3-Trichloropropane	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.038	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,2,4-Trimethylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
1,3,5-Trimethylbenzene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Vinyl Chloride	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
m+p Xylene	ND	0.076	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
o-Xylene	ND	0.038	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 15:47	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	101	70-130							
Toluene-d8	96.1	70-130							
4-Bromofluorobenzene	96.4	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-13 (0-20)

Sampled: 11/21/2019 14:50

Sample ID: 19K1416-25

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
C19-C36 Aliphatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Unadjusted C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
C11-C22 Aromatics	ND	11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Acenaphthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Acenaphthylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Benzo(a)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Benzo(a)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Benzo(b)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Benzo(g,h,i)perylene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Benzo(k)fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Chrysene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Dibenz(a,h)anthracene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Fluoranthene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Fluorene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Indeno(1,2,3-cd)pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
2-Methylnaphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Naphthalene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Phenanthrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW
Pyrene	ND	0.11	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	11/27/19 22:27	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	80.9	40-140	11/27/19 22:27
o-Terphenyl (OTP)	84.1	40-140	11/27/19 22:27
2-Bromonaphthalene	102	40-140	11/27/19 22:27
2-Fluorobiphenyl	103	40-140	11/27/19 22:27

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-13 (0-20)

Sampled: 11/21/2019 14:50

Sample ID: 19K1416-25

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	3.0	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:15	MJH
Barium	10	1.8	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:15	MJH
Cadmium	ND	0.18	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:15	MJH
Chromium	7.3	0.36	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:15	MJH
Lead	3.6	0.55	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:15	MJH
Mercury	ND	0.027	mg/Kg dry	1		SW-846 7471B	11/26/19	11/27/19 10:47	CJV
Selenium	ND	3.6	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:15	MJH
Silver	ND	0.36	mg/Kg dry	1		SW-846 6010D	11/27/19	12/2/19 16:15	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-13 (0-20)

Sampled: 11/21/2019 14:50

Sample ID: 19K1416-25

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	89.6		% Wt	1		SM 2540G	11/25/19	11/26/19 10:42	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-12 (33-40)

Sampled: 11/22/2019 12:30

Sample ID: 19K1416-26

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	3.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Acrylonitrile	ND	0.31	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Benzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Bromobenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Bromochloromethane	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Bromodichloromethane	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Bromoform	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Bromomethane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
2-Butanone (MEK)	ND	1.3	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
tert-Butyl Alcohol (TBA)	ND	1.3	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
n-Butylbenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
sec-Butylbenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
tert-Butylbenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Carbon Disulfide	ND	0.31	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Carbon Tetrachloride	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Chlorobenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Chlorodibromomethane	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Chloroethane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Chloroform	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Chloromethane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
2-Chlorotoluene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
4-Chlorotoluene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.31	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,2-Dibromoethane (EDB)	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Dibromomethane	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,2-Dichlorobenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,3-Dichlorobenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,4-Dichlorobenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
trans-1,4-Dichloro-2-butene	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.13	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,1-Dichloroethane	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,2-Dichloroethane	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,1-Dichloroethylene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
cis-1,2-Dichloroethylene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
trans-1,2-Dichloroethylene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,2-Dichloropropane	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,3-Dichloropropane	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
2,2-Dichloropropane	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,1-Dichloropropene	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
cis-1,3-Dichloropropene	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
trans-1,3-Dichloropropene	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Diethyl Ether	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-12 (33-40)

Sampled: 11/22/2019 12:30

Sample ID: 19K1416-26

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,4-Dioxane	ND	3.1	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Ethylbenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Hexachlorobutadiene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
2-Hexanone (MBK)	ND	0.63	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Isopropylbenzene (Cumene)	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Methyl Acetate	ND	0.63	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Methyl Cyclohexane	ND	0.063	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Methylene Chloride	ND	0.31	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.63	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Naphthalene	ND	0.13	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
n-Propylbenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Styrene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,1,1,2-Tetrachloroethane	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,1,2,2-Tetrachloroethane	ND	0.031	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Tetrachloroethylene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Tetrahydrofuran	ND	0.63	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Toluene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,2,3-Trichlorobenzene	ND	0.31	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,2,4-Trichlorobenzene	ND	0.063	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,3,5-Trichlorobenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,1,1-Trichloroethane	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,1,2-Trichloroethane	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Trichloroethylene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Trichlorofluoromethane (Freon 11)	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,2,3-Trichloropropane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.063	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,2,4-Trimethylbenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
1,3,5-Trimethylbenzene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Vinyl Chloride	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
m+p Xylene	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
o-Xylene	ND	0.063	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:14	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	102	70-130							
Toluene-d8	96.8	70-130							
4-Bromofluorobenzene	97.3	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-12 (33-40)

Sampled: 11/22/2019 12:30

Sample ID: 19K1416-26

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
C19-C36 Aliphatics	ND	13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Unadjusted C11-C22 Aromatics	ND	13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
C11-C22 Aromatics	ND	13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Acenaphthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Acenaphthylene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Anthracene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Benzo(a)anthracene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Benzo(a)pyrene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Benzo(b)fluoranthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Benzo(g,h,i)perylene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Benzo(k)fluoranthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Chrysene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Dibenz(a,h)anthracene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Fluoranthene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Fluorene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Indeno(1,2,3-cd)pyrene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
2-Methylnaphthalene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Naphthalene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Phenanthrene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Pyrene	ND	0.13	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 13:18	RMW
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
Chlorooctadecane (COD)	67.8	40-140							
o-Terphenyl (OTP)	60.7	40-140							
2-Bromonaphthalene	73.1	40-140							
2-Fluorobiphenyl	75.0	40-140							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-12 (33-40)

Sampled: 11/22/2019 12:30

Sample ID: 19K1416-26

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date	Date/Time	Analyst
							Prepared	Analyzed	
Lead	15	0.67	mg/Kg dry	1		SW-846 6010D	11/30/19	12/2/19 17:45	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-12 (33-40)

Sampled: 11/22/2019 12:30

Sample ID: 19K1416-26

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	71.7		% Wt	1		SM 2540G	11/25/19	11/26/19 10:42	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-4 (30-35)

Sampled: 11/22/2019 13:25

Sample ID: 19K1416-27

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	3.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Acrylonitrile	ND	0.39	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.039	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Benzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Bromobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Bromochloromethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Bromodichloromethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Bromoform	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Bromomethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
2-Butanone (MEK)	ND	1.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
tert-Butyl Alcohol (TBA)	ND	1.6	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
n-Butylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
sec-Butylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
tert-Butylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.039	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Carbon Disulfide	ND	0.39	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Carbon Tetrachloride	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Chlorobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Chlorodibromomethane	ND	0.039	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Chloroethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Chloroform	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Chloromethane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
2-Chlorotoluene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
4-Chlorotoluene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.39	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,2-Dibromoethane (EDB)	ND	0.039	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Dibromomethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,2-Dichlorobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,3-Dichlorobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,4-Dichlorobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
trans-1,4-Dichloro-2-butene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.16	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,1-Dichloroethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,2-Dichloroethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,1-Dichloroethylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
cis-1,2-Dichloroethylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
trans-1,2-Dichloroethylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,2-Dichloropropane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,3-Dichloropropane	ND	0.039	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
2,2-Dichloropropane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,1-Dichloropropene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
cis-1,3-Dichloropropene	ND	0.039	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
trans-1,3-Dichloropropene	ND	0.039	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Diethyl Ether	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-4 (30-35)

Sampled: 11/22/2019 13:25

Sample ID: 19K1416-27

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.039	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,4-Dioxane	ND	3.9	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Ethylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Hexachlorobutadiene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
2-Hexanone (MBK)	ND	0.79	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Isopropylbenzene (Cumene)	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Methyl Acetate	ND	0.79	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Methyl Cyclohexane	ND	0.079	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Methylene Chloride	ND	0.39	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.79	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Naphthalene	ND	0.16	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
n-Propylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Styrene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,1,1,2-Tetrachloroethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,1,2,2-Tetrachloroethane	ND	0.039	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Tetrachloroethylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Tetrahydrofuran	ND	0.79	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Toluene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,2,3-Trichlorobenzene	ND	0.39	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,2,4-Trichlorobenzene	ND	0.079	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,3,5-Trichlorobenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,1,1-Trichloroethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,1,2-Trichloroethane	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Trichloroethylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Trichlorofluoromethane (Freon 11)	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,2,3-Trichloropropane	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.079	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,2,4-Trimethylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
1,3,5-Trimethylbenzene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Vinyl Chloride	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
m+p Xylene	ND	0.16	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
o-Xylene	ND	0.079	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 16:40	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	103	70-130							
Toluene-d8	95.7	70-130							
4-Bromofluorobenzene	96.7	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-4 (30-35)

Sampled: 11/22/2019 13:25

Sample ID: 19K1416-27

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	25	15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
C19-C36 Aliphatics	230	15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Unadjusted C11-C22 Aromatics	110	15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
C11-C22 Aromatics	100	15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Acenaphthene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Acenaphthylene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Anthracene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Benzo(a)anthracene	0.72	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Benzo(a)pyrene	1.3	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Benzo(b)fluoranthene	0.40	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Benzo(g,h,i)perylene	0.20	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Benzo(k)fluoranthene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Chrysene	1.2	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Dibenz(a,h)anthracene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Fluoranthene	0.72	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Fluorene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Indeno(1,2,3-cd)pyrene	0.21	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
2-Methylnaphthalene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Naphthalene	ND	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Phenanthrene	0.42	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW
Pyrene	0.68	0.15	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 12:20	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	68.9	40-140	
o-Terphenyl (OTP)	76.0	40-140	
2-Bromonaphthalene	96.4	40-140	
2-Fluorobiphenyl	100	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/22/2019 13:25

Field Sample #: WC-4 (30-35)

Sample ID: 19K1416-27

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	89	0.76	mg/Kg dry	1		SW-846 6010D	11/30/19	12/2/19 17:23	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/22/2019 13:25

Field Sample #: WC-4 (30-35)

Sample ID: 19K1416-27

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	64.6		% Wt	1		SM 2540G	11/25/19	11/26/19 10:42	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-4 (35-40)

Sampled: 11/22/2019 13:30

Sample ID: 19K1416-28

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	3.4	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Acrylonitrile	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Benzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Bromobenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Bromochloromethane	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Bromodichloromethane	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Bromoform	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Bromomethane	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
2-Butanone (MEK)	ND	1.4	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
tert-Butyl Alcohol (TBA)	ND	1.4	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
n-Butylbenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
sec-Butylbenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
tert-Butylbenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Carbon Disulfide	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Carbon Tetrachloride	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Chlorobenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Chlorodibromomethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Chloroethane	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Chloroform	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Chloromethane	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
2-Chlorotoluene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
4-Chlorotoluene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,2-Dibromoethane (EDB)	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Dibromomethane	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,2-Dichlorobenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,3-Dichlorobenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,4-Dichlorobenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
trans-1,4-Dichloro-2-butene	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.14	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,1-Dichloroethane	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,2-Dichloroethane	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,1-Dichloroethylene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
cis-1,2-Dichloroethylene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
trans-1,2-Dichloroethylene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,2-Dichloropropane	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,3-Dichloropropane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
2,2-Dichloropropane	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,1-Dichloropropene	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
cis-1,3-Dichloropropene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
trans-1,3-Dichloropropene	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Diethyl Ether	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-4 (35-40)

Sampled: 11/22/2019 13:30

Sample ID: 19K1416-28

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,4-Dioxane	ND	3.4	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Ethylbenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Hexachlorobutadiene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
2-Hexanone (MBK)	ND	0.69	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Isopropylbenzene (Cumene)	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Methyl Acetate	ND	0.69	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Methyl Cyclohexane	ND	0.069	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Methylene Chloride	ND	0.34	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.69	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Naphthalene	ND	0.14	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
n-Propylbenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Styrene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,1,1,2-Tetrachloroethane	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,1,2,2-Tetrachloroethane	ND	0.034	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Tetrachloroethylene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Tetrahydrofuran	ND	0.69	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Toluene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,2,3-Trichlorobenzene	ND	0.34	mg/Kg dry	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,2,4-Trichlorobenzene	ND	0.069	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,3,5-Trichlorobenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,1,1-Trichloroethane	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,1,2-Trichloroethane	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Trichloroethylene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Trichlorofluoromethane (Freon 11)	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,2,3-Trichloropropane	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.069	mg/Kg dry	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,2,4-Trimethylbenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
1,3,5-Trimethylbenzene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Vinyl Chloride	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
m+p Xylene	ND	0.14	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
o-Xylene	ND	0.069	mg/Kg dry	1		SW-846 8260C-D	11/25/19	11/27/19 17:06	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	103	70-130						11/27/19 17:06	
Toluene-d8	97.5	70-130						11/27/19 17:06	
4-Bromofluorobenzene	96.7	70-130						11/27/19 17:06	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-4 (35-40)

Sampled: 11/22/2019 13:30

Sample ID: 19K1416-28

Sample Matrix: Soil

Petrolium Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
C19-C36 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Unadjusted C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Acenaphthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Acenaphthylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Benzo(a)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Benzo(a)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Benzo(b)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Benzo(g,h,i)perylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Benzo(k)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Chrysene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Dibenz(a,h)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Fluorene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Indeno(1,2,3-cd)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
2-Methylnaphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Naphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Phenanthrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW
Pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/24/19	12/3/19 10:44	RMW

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	68.8	40-140	
o-Terphenyl (OTP)	71.0	40-140	
2-Bromonaphthalene	92.5	40-140	
2-Fluorobiphenyl	96.0	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Sampled: 11/22/2019 13:30

Field Sample #: WC-4 (35-40)

Sample ID: 19K1416-28

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	14	0.69	mg/Kg dry	1		SW-846 6010D	11/30/19	12/2/19 17:51	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: WC-4 (35-40)

Sampled: 11/22/2019 13:30

Sample ID: 19K1416-28

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	69.6		% Wt	1		SM 2540G	11/25/19	11/26/19 10:42	adb

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: Trip Blank 1

Sampled: 11/22/2019 00:00

Sample ID: 19K1416-29

Sample Matrix: Trip Blank Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.5	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Acrylonitrile	ND	0.25	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Benzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Bromobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Bromochloromethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Bromodichloromethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Bromoform	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Bromomethane	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
2-Butanone (MEK)	ND	1.0	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
tert-Butyl Alcohol (TBA)	ND	1.0	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
n-Butylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
sec-Butylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
tert-Butylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Carbon Disulfide	ND	0.25	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Carbon Tetrachloride	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Chlorobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Chlorodibromomethane	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Chloroethane	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Chloroform	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Chloromethane	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
2-Chlorotoluene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
4-Chlorotoluene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.25	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,2-Dibromoethane (EDB)	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Dibromomethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,2-Dichlorobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,3-Dichlorobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,4-Dichlorobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
trans-1,4-Dichloro-2-butene	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.10	mg/Kg wet	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,1-Dichloroethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,2-Dichloroethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,1-Dichloroethylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
cis-1,2-Dichloroethylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
trans-1,2-Dichloroethylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,2-Dichloropropane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,3-Dichloropropane	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
2,2-Dichloropropane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,1-Dichloropropene	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
cis-1,3-Dichloropropene	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
trans-1,3-Dichloropropene	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Diethyl Ether	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1416

Date Received: 11/22/2019

Field Sample #: Trip Blank 1

Sampled: 11/22/2019 00:00

Sample ID: 19K1416-29

Sample Matrix: Trip Blank Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,4-Dioxane	ND	2.5	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Ethylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Hexachlorobutadiene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
2-Hexanone (MBK)	ND	0.50	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Isopropylbenzene (Cumene)	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Methyl Acetate	ND	0.50	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Methyl Cyclohexane	ND	0.050	mg/Kg wet	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Methylene Chloride	ND	0.25	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.50	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Naphthalene	ND	0.10	mg/Kg wet	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
n-Propylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Styrene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,1,1,2-Tetrachloroethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,1,2,2-Tetrachloroethane	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Tetrachloroethylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Tetrahydrofuran	ND	0.50	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Toluene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,2,3-Trichlorobenzene	ND	0.25	mg/Kg wet	1	L-04, V-05	SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,2,4-Trichlorobenzene	ND	0.050	mg/Kg wet	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,3,5-Trichlorobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,1,1-Trichloroethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,1,2-Trichloroethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Trichloroethylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Trichlorofluoromethane (Freon 11)	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,2,3-Trichloropropane	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.050	mg/Kg wet	1	V-05	SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,2,4-Trimethylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
1,3,5-Trimethylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Vinyl Chloride	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
m+p Xylene	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
o-Xylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/25/19	11/27/19 12:42	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	103	70-130							
Toluene-d8	98.7	70-130							
4-Bromofluorobenzene	95.9	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: SW-846 3546-MADEP-EPH-04-1.1

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
19K1416-21 [WC-5 (33.5-40)]	B246837	20.1	2.00	11/24/19
19K1416-22 [WC-12 (0-10)]	B246837	20.1	2.00	11/24/19
19K1416-23 [WC-18 (0-15)]	B246837	20.1	2.00	11/24/19
19K1416-24 [WC-20 (0-20)]	B246837	20.4	2.00	11/24/19
19K1416-25 [WC-13 (0-20)]	B246837	20.2	2.00	11/24/19
19K1416-26 [WC-12 (33-40)]	B246837	20.7	2.00	11/24/19
19K1416-27 [WC-4 (30-35)]	B246837	20.6	2.00	11/24/19
19K1416-28 [WC-4 (35-40)]	B246837	20.2	2.00	11/24/19

Prep Method: SW-846 3546-MADEP-EPH-04-1.1

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
19K1416-01 [WC-1 (0-5)]	B246957	20.6	2.00	11/25/19
19K1416-02 [WC-1 (20-25)]	B246957	20.7	2.00	11/25/19
19K1416-03 [WC-1 (34-40)]	B246957	20.5	2.00	11/25/19
19K1416-04 [WC-2 (25-30)]	B246957	20.7	2.00	11/25/19
19K1416-04RE1 [WC-2 (25-30)]	B246957	20.7	2.00	11/25/19
19K1416-05 [WC-2 (35-40)]	B246957	20.2	2.00	11/25/19
19K1416-06 [WC-3 (0-28)]	B246957	20.4	2.00	11/25/19
19K1416-07 [WC-3 (30-35)]	B246957	20.3	2.00	11/25/19
19K1416-08 [WC-3 (35-40)]	B246957	20.4	2.00	11/25/19
19K1416-09 [WC-7 (29-36)]	B246957	20.1	2.00	11/25/19
19K1416-09RE1 [WC-7 (29-36)]	B246957	20.1	2.00	11/25/19
19K1416-10 [WC-7 (36-40)]	B246957	20.8	2.00	11/25/19
19K1416-11 [WC-8 (0-29)]	B246957	20.1	2.00	11/25/19
19K1416-12 [WC-8 (29-38)]	B246957	20.8	2.00	11/25/19
19K1416-12RE1 [WC-8 (29-38)]	B246957	20.8	2.00	11/25/19
19K1416-13 [WC-8 (38-40)]	B246957	20.6	2.00	11/25/19
19K1416-14 [WC-10 (0-20)]	B246957	20.1	2.00	11/25/19
19K1416-15 [WC-DUP-1]	B246957	20.0	2.00	11/25/19
19K1416-15RE1 [WC-DUP-1]	B246957	20.0	2.00	11/25/19
19K1416-16 [WC-DUP-2]	B246957	20.0	2.00	11/25/19
19K1416-17 [WC-10 (35)]	B246957	20.0	2.00	11/25/19
19K1416-17RE1 [WC-10 (35)]	B246957	20.0	2.00	11/25/19
19K1416-18 [WC-10 (35-40)]	B246957	20.0	2.00	11/25/19
19K1416-19 [WC-5 (0-15)]	B246957	20.2	2.00	11/25/19
19K1416-20 [WC-5 (30-33.5)]	B246957	20.6	2.00	11/25/19

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
19K1416-01 [WC-1 (0-5)]	B246947	11/25/19
19K1416-02 [WC-1 (20-25)]	B246947	11/25/19
19K1416-03 [WC-1 (34-40)]	B246947	11/25/19
19K1416-04 [WC-2 (25-30)]	B246947	11/25/19
19K1416-05 [WC-2 (35-40)]	B246947	11/25/19
19K1416-06 [WC-3 (0-28)]	B246947	11/25/19
19K1416-07 [WC-3 (30-35)]	B246947	11/25/19
19K1416-08 [WC-3 (35-40)]	B246947	11/25/19
19K1416-09 [WC-7 (29-36)]	B246947	11/25/19
19K1416-10 [WC-7 (36-40)]	B246947	11/25/19
19K1416-11 [WC-8 (0-29)]	B246947	11/25/19
19K1416-12 [WC-8 (29-38)]	B246947	11/25/19

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
19K1416-13 [WC-8 (38-40)]	B246947	11/25/19
19K1416-14 [WC-10 (0-20)]	B246947	11/25/19
19K1416-15 [WC-DUP-1]	B246947	11/25/19
19K1416-16 [WC-DUP-2]	B246947	11/25/19
19K1416-17 [WC-10 (35)]	B246947	11/25/19
19K1416-18 [WC-10 (35-40)]	B246947	11/25/19
19K1416-19 [WC-5 (0-15)]	B246947	11/25/19
19K1416-20 [WC-5 (30-33.5)]	B246947	11/25/19
19K1416-21 [WC-5 (33.5-40)]	B246947	11/25/19
19K1416-22 [WC-12 (0-10)]	B246947	11/25/19
19K1416-23 [WC-18 (0-15)]	B246947	11/25/19
19K1416-24 [WC-20 (0-20)]	B246947	11/25/19
19K1416-25 [WC-13 (0-20)]	B246947	11/25/19
19K1416-26 [WC-12 (33-40)]	B246947	11/25/19
19K1416-27 [WC-4 (30-35)]	B246947	11/25/19
19K1416-28 [WC-4 (35-40)]	B246947	11/25/19

Prep Method: SW-846 3050B-SW-846 6010D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
19K1416-01 [WC-1 (0-5)]	B247130	1.55	50.0	11/26/19
19K1416-06 [WC-3 (0-28)]	B247130	1.51	50.0	11/26/19

Prep Method: SW-846 3050B-SW-846 6010D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
19K1416-02 [WC-1 (20-25)]	B247190	1.57	50.0	11/27/19
19K1416-03 [WC-1 (34-40)]	B247190	1.55	50.0	11/27/19
19K1416-04 [WC-2 (25-30)]	B247190	1.54	50.0	11/27/19
19K1416-05 [WC-2 (35-40)]	B247190	1.52	50.0	11/27/19
19K1416-07 [WC-3 (30-35)]	B247190	1.50	50.0	11/27/19

Prep Method: SW-846 3050B-SW-846 6010D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
19K1416-08 [WC-3 (35-40)]	B247191	1.57	50.0	11/27/19
19K1416-09 [WC-7 (29-36)]	B247191	1.47	50.0	11/27/19
19K1416-10 [WC-7 (36-40)]	B247191	1.55	50.0	11/27/19
19K1416-11 [WC-8 (0-29)]	B247191	1.52	50.0	11/27/19
19K1416-12 [WC-8 (29-38)]	B247191	1.50	50.0	11/27/19
19K1416-13 [WC-8 (38-40)]	B247191	1.56	50.0	11/27/19
19K1416-14 [WC-10 (0-20)]	B247191	1.55	50.0	11/27/19
19K1416-15 [WC-DUP-1]	B247191	1.50	50.0	11/27/19
19K1416-16 [WC-DUP-2]	B247191	1.52	50.0	11/27/19
19K1416-17 [WC-10 (35)]	B247191	1.56	50.0	11/27/19
19K1416-18 [WC-10 (35-40)]	B247191	1.58	50.0	11/27/19
19K1416-19 [WC-5 (0-15)]	B247191	1.53	50.0	11/27/19
19K1416-20 [WC-5 (30-33.5)]	B247191	1.51	50.0	11/27/19
19K1416-21 [WC-5 (33.5-40)]	B247191	1.59	50.0	11/27/19
19K1416-22 [WC-12 (0-10)]	B247191	1.46	50.0	11/27/19
19K1416-23 [WC-18 (0-15)]	B247191	1.53	50.0	11/27/19

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: SW-846 3050B-SW-846 6010D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
19K1416-24 [WC-20 (0-20)]	B247191	1.55	50.0	11/27/19
19K1416-25 [WC-13 (0-20)]	B247191	1.53	50.0	11/27/19

Prep Method: SW-846 3050B-SW-846 6010D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
19K1416-26 [WC-12 (33-40)]	B247281	1.57	50.0	11/30/19
19K1416-27 [WC-4 (30-35)]	B247281	1.52	50.0	11/30/19
19K1416-28 [WC-4 (35-40)]	B247281	1.56	50.0	11/30/19

Prep Method: SW-846 3050B-SW-846 6010D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
19K1416-11RE1 [WC-8 (0-29)]	B247983	1.53	50.0	12/10/19
19K1416-16RE1 [WC-DUP-2]	B247983	1.57	50.0	12/10/19

Prep Method: SW-846 7471-SW-846 7471B

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
19K1416-01 [WC-1 (0-5)]	B247115	0.581	50.0	11/26/19
19K1416-06 [WC-3 (0-28)]	B247115	0.585	50.0	11/26/19
19K1416-11 [WC-8 (0-29)]	B247115	0.613	50.0	11/26/19
19K1416-14 [WC-10 (0-20)]	B247115	0.610	50.0	11/26/19
19K1416-16 [WC-DUP-2]	B247115	0.593	50.0	11/26/19
19K1416-19 [WC-5 (0-15)]	B247115	0.614	50.0	11/26/19
19K1416-22 [WC-12 (0-10)]	B247115	0.616	50.0	11/26/19
19K1416-23 [WC-18 (0-15)]	B247115	0.586	50.0	11/26/19
19K1416-24 [WC-20 (0-20)]	B247115	0.620	50.0	11/26/19
19K1416-25 [WC-13 (0-20)]	B247115	0.612	50.0	11/26/19

Prep Method: SW-846 5035-SW-846 8260C-D

Lab Number [Field ID]	Batch	Sample Amount(g)	Methanol Volume(mL)	Methanol Aliquot(mL)	Final Volume(mL)	Date
19K1416-01 [WC-1 (0-5)]	B246934	5.79	5.56	1	50	11/25/19
19K1416-02 [WC-1 (20-25)]	B246934	8.21	6.49	1	50	11/25/19
19K1416-03 [WC-1 (34-40)]	B246934	8.89	7.51	1	50	11/25/19
19K1416-04 [WC-2 (25-30)]	B246934	7.17	7.66	1	50	11/25/19
19K1416-05 [WC-2 (35-40)]	B246934	8.69	7.47	1	50	11/25/19
19K1416-06 [WC-3 (0-28)]	B246934	9.33	6.11	1	50	11/25/19
19K1416-07 [WC-3 (30-35)]	B246934	7.81	5.53	1	50	11/25/19
19K1416-08 [WC-3 (35-40)]	B246934	9.15	7.85	1	50	11/25/19
19K1416-09 [WC-7 (29-36)]	B246934	7.95	7.96	1	50	11/25/19
19K1416-10 [WC-7 (36-40)]	B246934	8.76	7.36	1	50	11/25/19
19K1416-11 [WC-8 (0-29)]	B246934	8.33	5.92	1	50	11/25/19
19K1416-12 [WC-8 (29-38)]	B246934	8.06	8.01	1	50	11/25/19
19K1416-13 [WC-8 (38-40)]	B246934	9.64	8.02	1	50	11/25/19
19K1416-14 [WC-10 (0-20)]	B246934	7.84	5.77	1	50	11/25/19
19K1416-15 [WC-DUP-1]	B246934	7.56	7.80	1	50	11/25/19
19K1416-16 [WC-DUP-2]	B246934	8.42	6.04	1	50	11/25/19

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data

Prep Method: SW-846 5035-SW-846 8260C-D

Lab Number [Field ID]	Batch	Sample Amount(g)	Methanol Volume(mL)	Methanol Aliquot(mL)	Final Volume(mL)	Date
19K1416-17 [WC-10 (35)]	B246934	8.07	6.67	1	50	11/25/19
19K1416-18 [WC-10 (35-40)]	B246934	9.57	7.60	1	50	11/25/19
19K1416-19 [WC-5 (0-15)]	B246934	9.27	6.02	1	50	11/25/19
19K1416-20 [WC-5 (30-33.5)]	B246934	7.73	7.30	1	50	11/25/19

Prep Method: SW-846 5035-SW-846 8260C-D

Lab Number [Field ID]	Batch	Sample Amount(g)	Methanol Volume(mL)	Methanol Aliquot(mL)	Final Volume(mL)	Date
19K1416-21 [WC-5 (33.5-40)]	B246935	6.72	6.92	1	50	11/25/19
19K1416-22 [WC-12 (0-10)]	B246935	8.92	5.99	1	50	11/25/19
19K1416-23 [WC-18 (0-15)]	B246935	8.33	5.72	1	50	11/25/19
19K1416-24 [WC-20 (0-20)]	B246935	10.3	6.17	1	50	11/25/19
19K1416-25 [WC-13 (0-20)]	B246935	8.72	5.91	1	50	11/25/19
19K1416-26 [WC-12 (33-40)]	B246935	8.11	7.30	1	50	11/25/19
19K1416-27 [WC-4 (30-35)]	B246935	7.50	7.66	1	50	11/25/19
19K1416-28 [WC-4 (35-40)]	B246935	7.69	7.34	1	50	11/25/19
19K1416-29 [Trip Blank 1]	B246935	5.00	5.00	1	50	11/25/19

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B246934 - SW-846 5035
Blank (B246934-BLK1)

Prepared: 11/25/19 Analyzed: 11/30/19

Acetone	ND	2.5	mg/Kg wet
Acrylonitrile	ND	0.25	mg/Kg wet
tert-Amyl Methyl Ether (TAME)	ND	0.025	mg/Kg wet
Benzene	ND	0.050	mg/Kg wet
Bromobenzene	ND	0.050	mg/Kg wet
Bromochloromethane	ND	0.050	mg/Kg wet
Bromodichloromethane	ND	0.050	mg/Kg wet
Bromoform	ND	0.050	mg/Kg wet
Bromomethane	ND	0.10	mg/Kg wet
2-Butanone (MEK)	ND	1.0	mg/Kg wet
tert-Butyl Alcohol (TBA)	ND	1.0	mg/Kg wet
n-Butylbenzene	ND	0.050	mg/Kg wet
sec-Butylbenzene	ND	0.050	mg/Kg wet
tert-Butylbenzene	ND	0.050	mg/Kg wet
tert-Butyl Ethyl Ether (TBEE)	ND	0.025	mg/Kg wet
Carbon Disulfide	ND	0.25	mg/Kg wet
Carbon Tetrachloride	ND	0.050	mg/Kg wet
Chlorobenzene	ND	0.050	mg/Kg wet
Chlorodibromomethane	ND	0.025	mg/Kg wet
Chloroethane	ND	0.10	mg/Kg wet
Chloroform	ND	0.10	mg/Kg wet
Chloromethane	ND	0.10	mg/Kg wet
2-Chlorotoluene	ND	0.050	mg/Kg wet
4-Chlorotoluene	ND	0.050	mg/Kg wet
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.25	mg/Kg wet
1,2-Dibromoethane (EDB)	ND	0.025	mg/Kg wet
Dibromomethane	ND	0.050	mg/Kg wet
1,2-Dichlorobenzene	ND	0.050	mg/Kg wet
1,3-Dichlorobenzene	ND	0.050	mg/Kg wet
1,4-Dichlorobenzene	ND	0.050	mg/Kg wet
trans-1,4-Dichloro-2-butene	ND	0.10	mg/Kg wet
Dichlorodifluoromethane (Freon 12)	ND	0.10	mg/Kg wet
1,1-Dichloroethane	ND	0.050	mg/Kg wet
1,2-Dichloroethane	ND	0.050	mg/Kg wet
1,1-Dichloroethylene	ND	0.050	mg/Kg wet
cis-1,2-Dichloroethylene	ND	0.050	mg/Kg wet
trans-1,2-Dichloroethylene	ND	0.050	mg/Kg wet
Dichlorofluoromethane (Freon 21)	ND	0.050	mg/Kg wet
1,2-Dichloropropane	ND	0.050	mg/Kg wet
1,3-Dichloropropane	ND	0.025	mg/Kg wet
2,2-Dichloropropane	ND	0.050	mg/Kg wet
1,1-Dichloropropene	ND	0.10	mg/Kg wet
cis-1,3-Dichloropropene	ND	0.025	mg/Kg wet
trans-1,3-Dichloropropene	ND	0.025	mg/Kg wet
Diethyl Ether	ND	0.10	mg/Kg wet
Difluorochloromethane (Freon 22)	ND	0.050	mg/Kg wet
Diisopropyl Ether (DIPE)	ND	0.025	mg/Kg wet
1,4-Dioxane	ND	2.5	mg/Kg wet
Ethylbenzene	ND	0.050	mg/Kg wet
Hexachlorobutadiene	ND	0.050	mg/Kg wet
2-Hexanone (MBK)	ND	0.50	mg/Kg wet
Isopropylbenzene (Cumene)	ND	0.050	mg/Kg wet

V-05

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B246934 - SW-846 5035

Blank (B246934-BLK1)

Prepared: 11/25/19 Analyzed: 11/30/19

p-Isopropyltoluene (p-Cymene)	ND	0.050	mg/Kg wet							
Methyl Acetate	ND	0.50	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.050	mg/Kg wet							
Methyl Cyclohexane	ND	0.050	mg/Kg wet							V-05
Methylene Chloride	ND	0.25	mg/Kg wet							
4-Methyl-2-pentanone (MIBK)	ND	0.50	mg/Kg wet							
Naphthalene	ND	0.10	mg/Kg wet							V-05
n-Propylbenzene	ND	0.050	mg/Kg wet							
Styrene	ND	0.050	mg/Kg wet							
1,1,1,2-Tetrachloroethane	ND	0.050	mg/Kg wet							
1,1,2,2-Tetrachloroethane	ND	0.025	mg/Kg wet							
Tetrachloroethylene	ND	0.050	mg/Kg wet							
Tetrahydrofuran	ND	0.50	mg/Kg wet							
Toluene	ND	0.050	mg/Kg wet							
1,2,3-Trichlorobenzene	ND	0.25	mg/Kg wet							L-04, V-05
1,2,4-Trichlorobenzene	ND	0.050	mg/Kg wet							V-05
1,3,5-Trichlorobenzene	ND	0.050	mg/Kg wet							
1,1,1-Trichloroethane	ND	0.050	mg/Kg wet							
1,1,2-Trichloroethane	ND	0.050	mg/Kg wet							
Trichloroethylene	ND	0.050	mg/Kg wet							
Trichlorofluoromethane (Freon 11)	ND	0.10	mg/Kg wet							
1,2,3-Trichloropropane	ND	0.10	mg/Kg wet							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.050	mg/Kg wet							V-05
1,2,4-Trimethylbenzene	ND	0.050	mg/Kg wet							
1,3,5-Trimethylbenzene	ND	0.050	mg/Kg wet							
Vinyl Chloride	ND	0.10	mg/Kg wet							
m+p Xylene	ND	0.10	mg/Kg wet							
o-Xylene	ND	0.050	mg/Kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0244		mg/Kg wet	0.0250		97.8	70-130			
Surrogate: Toluene-d8	0.0250		mg/Kg wet	0.0250		100	70-130			
Surrogate: 4-Bromofluorobenzene	0.0235		mg/Kg wet	0.0250		94.0	70-130			

LCS (B246934-BS1)

Prepared: 11/25/19 Analyzed: 11/30/19

Acetone	0.108	0.057	mg/Kg wet	0.113		95.2	70-160			†
Acrylonitrile	0.0103	0.0057	mg/Kg wet	0.0113		90.8	70-130			
tert-Amyl Methyl Ether (TAME)	0.00962	0.00057	mg/Kg wet	0.0113		84.9	70-130			
Benzene	0.0115	0.0011	mg/Kg wet	0.0113		102	70-130			
Bromobenzene	0.0115	0.0011	mg/Kg wet	0.0113		102	70-130			
Bromochloromethane	0.0123	0.0011	mg/Kg wet	0.0113		109	70-130			
Bromodichloromethane	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130			
Bromoform	0.0110	0.0011	mg/Kg wet	0.0113		96.8	70-130			
Bromomethane	0.00978	0.0023	mg/Kg wet	0.0113		86.3	40-130		V-20	†
2-Butanone (MEK)	0.104	0.023	mg/Kg wet	0.113		92.1	70-160			†
tert-Butyl Alcohol (TBA)	0.106	0.023	mg/Kg wet	0.113		93.3	40-130			†
n-Butylbenzene	0.00983	0.0011	mg/Kg wet	0.0113		86.7	70-130			
sec-Butylbenzene	0.0112	0.0011	mg/Kg wet	0.0113		99.0	70-130			
tert-Butylbenzene	0.0114	0.0011	mg/Kg wet	0.0113		101	70-160			†
tert-Butyl Ethyl Ether (TBEE)	0.00991	0.00057	mg/Kg wet	0.0113		87.4	70-130			
Carbon Disulfide	0.0125	0.0057	mg/Kg wet	0.0113		110	70-130			
Carbon Tetrachloride	0.0100	0.0011	mg/Kg wet	0.0113		88.2	70-130			
Chlorobenzene	0.0123	0.0011	mg/Kg wet	0.0113		109	70-130			
Chlorodibromomethane	0.0114	0.00057	mg/Kg wet	0.0113		101	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246934 - SW-846 5035										
LCS (B246934-BS1)					Prepared: 11/25/19 Analyzed: 11/30/19					
Chloroethane	0.0111	0.0023	mg/Kg wet	0.0113		98.0	70-130			
Chloroform	0.0119	0.0023	mg/Kg wet	0.0113		105	70-130			
Chloromethane	0.0107	0.0023	mg/Kg wet	0.0113		94.1	70-130			V-20
2-Chlorotoluene	0.0117	0.0011	mg/Kg wet	0.0113		103	70-130			
4-Chlorotoluene	0.0115	0.0011	mg/Kg wet	0.0113		101	70-130			
1,2-Dibromo-3-chloropropane (DBCP)	0.00993	0.0057	mg/Kg wet	0.0113		87.6	70-130			
1,2-Dibromoethane (EDB)	0.0118	0.00057	mg/Kg wet	0.0113		104	70-130			
Dibromomethane	0.0116	0.0011	mg/Kg wet	0.0113		102	70-130			
1,2-Dichlorobenzene	0.0118	0.0011	mg/Kg wet	0.0113		104	70-130			
1,3-Dichlorobenzene	0.0126	0.0011	mg/Kg wet	0.0113		111	70-130			
1,4-Dichlorobenzene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130			
trans-1,4-Dichloro-2-butene	0.00960	0.0023	mg/Kg wet	0.0113		84.7	70-130			
Dichlorodifluoromethane (Freon 12)	0.00709	0.0023	mg/Kg wet	0.0113		62.6	40-160			V-05 †
1,1-Dichloroethane	0.0122	0.0011	mg/Kg wet	0.0113		108	70-130			
1,2-Dichloroethane	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130			
1,1-Dichloroethylene	0.0104	0.0011	mg/Kg wet	0.0113		91.6	70-130			
cis-1,2-Dichloroethylene	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130			
trans-1,2-Dichloroethylene	0.0113	0.0011	mg/Kg wet	0.0113		99.5	70-130			
Dichlorofluoromethane (Freon 21)	0.0114	0.0011	mg/Kg wet	0.0113		100	70-130			
1,2-Dichloropropane	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130			
1,3-Dichloropropane	0.0114	0.00057	mg/Kg wet	0.0113		101	70-130			
2,2-Dichloropropane	0.00961	0.0011	mg/Kg wet	0.0113		84.8	70-130			
1,1-Dichloropropene	0.0107	0.0023	mg/Kg wet	0.0113		94.0	70-130			
cis-1,3-Dichloropropene	0.0111	0.00057	mg/Kg wet	0.0113		97.9	70-130			
trans-1,3-Dichloropropene	0.0106	0.00057	mg/Kg wet	0.0113		93.6	70-130			
Diethyl Ether	0.0116	0.0023	mg/Kg wet	0.0113		102	70-130			
Difluorochloromethane (Freon 22)	0.0102	0.0011	mg/Kg wet	0.0113		89.9	70-130			
Diisopropyl Ether (DIPE)	0.0118	0.00057	mg/Kg wet	0.0113		104	70-130			
1,4-Dioxane	0.0945	0.057	mg/Kg wet	0.113		83.4	40-160			†
Ethylbenzene	0.0117	0.0011	mg/Kg wet	0.0113		103	70-130			
Hexachlorobutadiene	0.00944	0.0011	mg/Kg wet	0.0113		83.3	70-160			
2-Hexanone (MBK)	0.0997	0.011	mg/Kg wet	0.113		88.0	70-160			†
Isopropylbenzene (Cumene)	0.0114	0.0011	mg/Kg wet	0.0113		100	70-130			
p-Isopropyltoluene (p-Cymene)	0.0109	0.0011	mg/Kg wet	0.0113		96.6	70-130			
Methyl Acetate	0.0101	0.011	mg/Kg wet	0.0113		88.9	70-130			
Methyl tert-Butyl Ether (MTBE)	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130			
Methyl Cyclohexane	0.00881	0.0011	mg/Kg wet	0.0113		77.7	70-130			V-05
Methylene Chloride	0.0116	0.0057	mg/Kg wet	0.0113		103	40-160			†
4-Methyl-2-pentanone (MIBK)	0.102	0.011	mg/Kg wet	0.113		89.8	70-160			†
Naphthalene	0.00781	0.0023	mg/Kg wet	0.0113		68.9	40-130			V-05 †
n-Propylbenzene	0.0109	0.0011	mg/Kg wet	0.0113		95.8	70-130			
Styrene	0.0116	0.0011	mg/Kg wet	0.0113		102	70-130			
1,1,1,2-Tetrachloroethane	0.0127	0.0011	mg/Kg wet	0.0113		112	70-130			
1,1,2,2-Tetrachloroethane	0.0124	0.00057	mg/Kg wet	0.0113		109	70-130			
Tetrachloroethylene	0.0115	0.0011	mg/Kg wet	0.0113		102	70-130			
Tetrahydrofuran	0.0107	0.011	mg/Kg wet	0.0113		94.4	70-130			
Toluene	0.0114	0.0011	mg/Kg wet	0.0113		101	70-130			
1,2,3-Trichlorobenzene	0.00747	0.0057	mg/Kg wet	0.0113		65.9 *	70-130			V-05, L-04
1,2,4-Trichlorobenzene	0.00847	0.0011	mg/Kg wet	0.0113		74.7	70-130			V-05
1,3,5-Trichlorobenzene	0.00937	0.0011	mg/Kg wet	0.0113		82.7	70-130			
1,1,1-Trichloroethane	0.0108	0.0011	mg/Kg wet	0.0113		95.3	70-130			
1,1,2-Trichloroethane	0.0122	0.0011	mg/Kg wet	0.0113		107	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246934 - SW-846 5035										
LCS (B246934-BS1)				Prepared: 11/25/19 Analyzed: 11/30/19						
Trichloroethylene	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130			
Trichlorofluoromethane (Freon 11)	0.00824	0.0023	mg/Kg wet	0.0113		72.7	70-130			
1,2,3-Trichloropropane	0.0105	0.0023	mg/Kg wet	0.0113		92.5	70-130			
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.00881	0.0011	mg/Kg wet	0.0113		77.7	70-130			V-05
1,2,4-Trimethylbenzene	0.0118	0.0011	mg/Kg wet	0.0113		104	70-130			
1,3,5-Trimethylbenzene	0.0106	0.0011	mg/Kg wet	0.0113		93.4	70-130			
Vinyl Chloride	0.00942	0.0023	mg/Kg wet	0.0113		83.1	40-130			†
m+p Xylene	0.0232	0.0023	mg/Kg wet	0.0227		102	70-130			
o-Xylene	0.0123	0.0011	mg/Kg wet	0.0113		108	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0274		mg/Kg wet	0.0283		96.6	70-130			
Surrogate: Toluene-d8	0.0276		mg/Kg wet	0.0283		97.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.0270		mg/Kg wet	0.0283		95.1	70-130			
LCS Dup (B246934-BS1)				Prepared: 11/25/19 Analyzed: 11/30/19						
Acetone	0.0992	0.057	mg/Kg wet	0.113		87.6	70-160	8.37	25	†
Acrylonitrile	0.0104	0.0057	mg/Kg wet	0.0113		91.8	70-130	1.10	25	
tert-Amyl Methyl Ether (TAME)	0.00968	0.00057	mg/Kg wet	0.0113		85.4	70-130	0.587	25	
Benzene	0.0116	0.0011	mg/Kg wet	0.0113		102	70-130	0.687	25	
Bromobenzene	0.0116	0.0011	mg/Kg wet	0.0113		102	70-130	0.686	25	
Bromochloromethane	0.0126	0.0011	mg/Kg wet	0.0113		111	70-130	1.73	25	
Bromodichloromethane	0.0121	0.0011	mg/Kg wet	0.0113		106	70-130	1.51	25	
Bromoform	0.0106	0.0011	mg/Kg wet	0.0113		93.9	70-130	3.04	25	
Bromomethane	0.0114	0.0023	mg/Kg wet	0.0113		101	40-130	15.3	25	V-20 †
2-Butanone (MEK)	0.0991	0.023	mg/Kg wet	0.113		87.4	70-160	5.22	25	†
tert-Butyl Alcohol (TBA)	0.0949	0.023	mg/Kg wet	0.113		83.8	40-130	10.7	25	†
n-Butylbenzene	0.00985	0.0011	mg/Kg wet	0.0113		86.9	70-130	0.230	25	
sec-Butylbenzene	0.0115	0.0011	mg/Kg wet	0.0113		102	70-130	2.79	25	
tert-Butylbenzene	0.0119	0.0011	mg/Kg wet	0.0113		105	70-160	3.60	25	†
tert-Butyl Ethyl Ether (TBEE)	0.0101	0.00057	mg/Kg wet	0.0113		89.0	70-130	1.81	25	
Carbon Disulfide	0.0117	0.0057	mg/Kg wet	0.0113		103	70-130	6.55	25	
Carbon Tetrachloride	0.0103	0.0011	mg/Kg wet	0.0113		91.1	70-130	3.23	25	
Chlorobenzene	0.0126	0.0011	mg/Kg wet	0.0113		111	70-130	2.18	25	
Chlorodibromomethane	0.0114	0.00057	mg/Kg wet	0.0113		100	70-130	0.299	25	
Chloroethane	0.0120	0.0023	mg/Kg wet	0.0113		106	70-130	8.13	25	
Chloroform	0.0119	0.0023	mg/Kg wet	0.0113		105	70-130	0.00	25	
Chloromethane	0.0107	0.0023	mg/Kg wet	0.0113		94.5	70-130	0.424	25	V-20
2-Chlorotoluene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130	3.07	25	
4-Chlorotoluene	0.0115	0.0011	mg/Kg wet	0.0113		102	70-130	0.0985	25	
1,2-Dibromo-3-chloropropane (DBCP)	0.00983	0.0057	mg/Kg wet	0.0113		86.7	70-130	1.03	25	
1,2-Dibromoethane (EDB)	0.0121	0.00057	mg/Kg wet	0.0113		107	70-130	2.18	25	
Dibromomethane	0.0117	0.0011	mg/Kg wet	0.0113		103	70-130	0.681	25	
1,2-Dichlorobenzene	0.0124	0.0011	mg/Kg wet	0.0113		110	70-130	5.24	25	
1,3-Dichlorobenzene	0.0130	0.0011	mg/Kg wet	0.0113		115	70-130	3.46	25	
1,4-Dichlorobenzene	0.0123	0.0011	mg/Kg wet	0.0113		109	70-130	3.08	25	
trans-1,4-Dichloro-2-butene	0.00919	0.0023	mg/Kg wet	0.0113		81.1	70-130	4.34	25	
Dichlorodifluoromethane (Freon 12)	0.00722	0.0023	mg/Kg wet	0.0113		63.7	40-160	1.74	25	V-05 †
1,1-Dichloroethane	0.0123	0.0011	mg/Kg wet	0.0113		109	70-130	0.924	25	
1,2-Dichloroethane	0.0117	0.0011	mg/Kg wet	0.0113		103	70-130	1.92	25	
1,1-Dichloroethylene	0.0105	0.0011	mg/Kg wet	0.0113		92.7	70-130	1.19	25	
cis-1,2-Dichloroethylene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130	0.852	25	
trans-1,2-Dichloroethylene	0.0117	0.0011	mg/Kg wet	0.0113		103	70-130	3.84	25	
Dichlorofluoromethane (Freon 21)	0.0115	0.0011	mg/Kg wet	0.0113		101	70-130	1.19	25	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246934 - SW-846 5035										
LCS Dup (B246934-BSD1)					Prepared: 11/25/19 Analyzed: 11/30/19					
1,2-Dichloropropane	0.0122	0.0011	mg/Kg wet	0.0113		108	70-130	2.54	25	
1,3-Dichloropropane	0.0117	0.00057	mg/Kg wet	0.0113		103	70-130	2.26	25	
2,2-Dichloropropane	0.00958	0.0011	mg/Kg wet	0.0113		84.5	70-130	0.354	25	
1,1-Dichloropropene	0.0107	0.0023	mg/Kg wet	0.0113		94.6	70-130	0.636	25	
cis-1,3-Dichloropropene	0.0109	0.00057	mg/Kg wet	0.0113		96.5	70-130	1.44	25	
trans-1,3-Dichloropropene	0.0110	0.00057	mg/Kg wet	0.0113		97.1	70-130	3.67	25	
Diethyl Ether	0.0115	0.0023	mg/Kg wet	0.0113		102	70-130	0.294	25	
Difluorochloromethane (Freon 22)	0.0106	0.0011	mg/Kg wet	0.0113		93.6	70-130	4.03	25	
Diisopropyl Ether (DIPE)	0.0120	0.00057	mg/Kg wet	0.0113		106	70-130	1.61	25	
1,4-Dioxane	0.0891	0.057	mg/Kg wet	0.113		78.6	40-160	5.93	50	† ‡
Ethylbenzene	0.0116	0.0011	mg/Kg wet	0.0113		103	70-130	0.292	25	
Hexachlorobutadiene	0.00941	0.0011	mg/Kg wet	0.0113		83.0	70-160	0.361	25	
2-Hexanone (MBK)	0.0949	0.011	mg/Kg wet	0.113		83.8	70-160	4.90	25	†
Isopropylbenzene (Cumene)	0.0115	0.0011	mg/Kg wet	0.0113		101	70-130	0.892	25	
p-Isopropyltoluene (p-Cymene)	0.0112	0.0011	mg/Kg wet	0.0113		98.7	70-130	2.15	25	
Methyl Acetate	0.00993	0.011	mg/Kg wet	0.0113		87.6	70-130	1.47	25	
Methyl tert-Butyl Ether (MTBE)	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130	0.189	25	
Methyl Cyclohexane	0.00882	0.0011	mg/Kg wet	0.0113		77.8	70-130	0.129	25	V-05
Methylene Chloride	0.0128	0.0057	mg/Kg wet	0.0113		113	40-160	9.73	25	†
4-Methyl-2-pentanone (MIBK)	0.0983	0.011	mg/Kg wet	0.113		86.7	70-160	3.44	25	†
Naphthalene	0.00724	0.0023	mg/Kg wet	0.0113		63.9	40-130	7.53	25	V-05 †
n-Propylbenzene	0.0109	0.0011	mg/Kg wet	0.0113		95.9	70-130	0.104	25	
Styrene	0.0114	0.0011	mg/Kg wet	0.0113		100	70-130	1.68	25	
1,1,1,2-Tetrachloroethane	0.0126	0.0011	mg/Kg wet	0.0113		111	70-130	0.805	25	
1,1,2,2-Tetrachloroethane	0.0121	0.00057	mg/Kg wet	0.0113		107	70-130	2.22	25	
Tetrachloroethylene	0.0113	0.0011	mg/Kg wet	0.0113		99.5	70-130	2.09	25	
Tetrahydrofuran	0.0101	0.011	mg/Kg wet	0.0113		89.5	70-130	5.33	25	
Toluene	0.0117	0.0011	mg/Kg wet	0.0113		104	70-130	2.94	25	
1,2,3-Trichlorobenzene	0.00713	0.0057	mg/Kg wet	0.0113		62.9	* 70-130	4.66	25	V-05, L-04
1,2,4-Trichlorobenzene	0.00823	0.0011	mg/Kg wet	0.0113		72.6	70-130	2.85	25	V-05
1,3,5-Trichlorobenzene	0.00984	0.0011	mg/Kg wet	0.0113		86.8	70-130	4.84	25	
1,1,1-Trichloroethane	0.0108	0.0011	mg/Kg wet	0.0113		95.0	70-130	0.315	25	
1,1,2-Trichloroethane	0.0124	0.0011	mg/Kg wet	0.0113		109	70-130	1.76	25	
Trichloroethylene	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130	0.0949	25	
Trichlorofluoromethane (Freon 11)	0.00818	0.0023	mg/Kg wet	0.0113		72.2	70-130	0.690	25	
1,2,3-Trichloropropane	0.0108	0.0023	mg/Kg wet	0.0113		95.3	70-130	2.98	25	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.00879	0.0011	mg/Kg wet	0.0113		77.6	70-130	0.129	25	V-05
1,2,4-Trimethylbenzene	0.0121	0.0011	mg/Kg wet	0.0113		107	70-130	2.74	25	
1,3,5-Trimethylbenzene	0.0111	0.0011	mg/Kg wet	0.0113		97.7	70-130	4.50	25	
Vinyl Chloride	0.00951	0.0023	mg/Kg wet	0.0113		83.9	40-130	0.958	25	†
m+p Xylene	0.0232	0.0023	mg/Kg wet	0.0227		102	70-130	0.0977	25	
o-Xylene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130	2.25	25	
Surrogate: 1,2-Dichloroethane-d4	0.0273		mg/Kg wet	0.0283		96.2	70-130			
Surrogate: Toluene-d8	0.0280		mg/Kg wet	0.0283		98.8	70-130			
Surrogate: 4-Bromofluorobenzene	0.0268		mg/Kg wet	0.0283		94.7	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246935 - SW-846 5035										
Blank (B246935-BLK1)				Prepared: 11/25/19 Analyzed: 11/27/19						
Acetone	ND	2.5	mg/Kg wet							
Acrylonitrile	ND	0.25	mg/Kg wet							
tert-Amyl Methyl Ether (TAME)	ND	0.025	mg/Kg wet							
Benzene	ND	0.050	mg/Kg wet							
Bromobenzene	ND	0.050	mg/Kg wet							
Bromochloromethane	ND	0.050	mg/Kg wet							
Bromodichloromethane	ND	0.050	mg/Kg wet							
Bromoform	ND	0.050	mg/Kg wet							
Bromomethane	ND	0.10	mg/Kg wet							
2-Butanone (MEK)	ND	1.0	mg/Kg wet							
tert-Butyl Alcohol (TBA)	ND	1.0	mg/Kg wet							
n-Butylbenzene	ND	0.050	mg/Kg wet							
sec-Butylbenzene	ND	0.050	mg/Kg wet							
tert-Butylbenzene	ND	0.050	mg/Kg wet							
tert-Butyl Ethyl Ether (TBEE)	ND	0.025	mg/Kg wet							
Carbon Disulfide	ND	0.25	mg/Kg wet							
Carbon Tetrachloride	ND	0.050	mg/Kg wet							
Chlorobenzene	ND	0.050	mg/Kg wet							
Chlorodibromomethane	ND	0.025	mg/Kg wet							
Chloroethane	ND	0.10	mg/Kg wet							
Chloroform	ND	0.10	mg/Kg wet							
Chloromethane	ND	0.10	mg/Kg wet							
2-Chlorotoluene	ND	0.050	mg/Kg wet							
4-Chlorotoluene	ND	0.050	mg/Kg wet							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.25	mg/Kg wet							
1,2-Dibromoethane (EDB)	ND	0.025	mg/Kg wet							
Dibromomethane	ND	0.050	mg/Kg wet							
1,2-Dichlorobenzene	ND	0.050	mg/Kg wet							
1,3-Dichlorobenzene	ND	0.050	mg/Kg wet							
1,4-Dichlorobenzene	ND	0.050	mg/Kg wet							
trans-1,4-Dichloro-2-butene	ND	0.10	mg/Kg wet							
Dichlorodifluoromethane (Freon 12)	ND	0.10	mg/Kg wet							V-05
1,1-Dichloroethane	ND	0.050	mg/Kg wet							
1,2-Dichloroethane	ND	0.050	mg/Kg wet							
1,1-Dichloroethylene	ND	0.050	mg/Kg wet							
cis-1,2-Dichloroethylene	ND	0.050	mg/Kg wet							
trans-1,2-Dichloroethylene	ND	0.050	mg/Kg wet							
Dichlorofluoromethane (Freon 21)	ND	0.050	mg/Kg wet							
1,2-Dichloropropane	ND	0.050	mg/Kg wet							
1,3-Dichloropropane	ND	0.025	mg/Kg wet							
2,2-Dichloropropane	ND	0.050	mg/Kg wet							
1,1-Dichloropropene	ND	0.10	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.025	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.025	mg/Kg wet							
Diethyl Ether	ND	0.10	mg/Kg wet							
Difluorochloromethane (Freon 22)	ND	0.050	mg/Kg wet							
Diisopropyl Ether (DIPE)	ND	0.025	mg/Kg wet							
1,4-Dioxane	ND	2.5	mg/Kg wet							
Ethylbenzene	ND	0.050	mg/Kg wet							
Hexachlorobutadiene	ND	0.050	mg/Kg wet							
2-Hexanone (MBK)	ND	0.50	mg/Kg wet							
Isopropylbenzene (Cumene)	ND	0.050	mg/Kg wet							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B246935 - SW-846 5035

Blank (B246935-BLK1)

Prepared: 11/25/19 Analyzed: 11/27/19

p-Isopropyltoluene (p-Cymene)	ND	0.050	mg/Kg wet							
Methyl Acetate	ND	0.50	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.050	mg/Kg wet							
Methyl Cyclohexane	ND	0.050	mg/Kg wet							V-05
Methylene Chloride	ND	0.25	mg/Kg wet							
4-Methyl-2-pentanone (MIBK)	ND	0.50	mg/Kg wet							
Naphthalene	ND	0.10	mg/Kg wet							V-05
n-Propylbenzene	ND	0.050	mg/Kg wet							
Styrene	ND	0.050	mg/Kg wet							
1,1,1,2-Tetrachloroethane	ND	0.050	mg/Kg wet							
1,1,2,2-Tetrachloroethane	ND	0.025	mg/Kg wet							
Tetrachloroethylene	ND	0.050	mg/Kg wet							
Tetrahydrofuran	ND	0.50	mg/Kg wet							
Toluene	ND	0.050	mg/Kg wet							
1,2,3-Trichlorobenzene	ND	0.25	mg/Kg wet							L-04, V-05
1,2,4-Trichlorobenzene	ND	0.050	mg/Kg wet							V-05
1,3,5-Trichlorobenzene	ND	0.050	mg/Kg wet							
1,1,1-Trichloroethane	ND	0.050	mg/Kg wet							
1,1,2-Trichloroethane	ND	0.050	mg/Kg wet							
Trichloroethylene	ND	0.050	mg/Kg wet							
Trichlorofluoromethane (Freon 11)	ND	0.10	mg/Kg wet							
1,2,3-Trichloropropane	ND	0.10	mg/Kg wet							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.050	mg/Kg wet							V-05
1,2,4-Trimethylbenzene	ND	0.050	mg/Kg wet							
1,3,5-Trimethylbenzene	ND	0.050	mg/Kg wet							
Vinyl Chloride	ND	0.10	mg/Kg wet							
m+p Xylene	ND	0.10	mg/Kg wet							
o-Xylene	ND	0.050	mg/Kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0256		mg/Kg wet	0.0250		103	70-130			
Surrogate: Toluene-d8	0.0240		mg/Kg wet	0.0250		95.9	70-130			
Surrogate: 4-Bromofluorobenzene	0.0222		mg/Kg wet	0.0250		88.8	70-130			

LCS (B246935-BS1)

Prepared: 11/25/19 Analyzed: 11/27/19

Acetone	0.121	0.057	mg/Kg wet	0.113		107	70-160			†
Acrylonitrile	0.0102	0.0057	mg/Kg wet	0.0113		89.9	70-130			
tert-Amyl Methyl Ether (TAME)	0.00904	0.00057	mg/Kg wet	0.0113		79.8	70-130			
Benzene	0.0118	0.0011	mg/Kg wet	0.0113		104	70-130			
Bromobenzene	0.0115	0.0011	mg/Kg wet	0.0113		101	70-130			
Bromochloromethane	0.0127	0.0011	mg/Kg wet	0.0113		112	70-130			
Bromodichloromethane	0.0121	0.0011	mg/Kg wet	0.0113		107	70-130			
Bromoform	0.0108	0.0011	mg/Kg wet	0.0113		95.6	70-130			
Bromomethane	0.0108	0.0023	mg/Kg wet	0.0113		95.1	40-130		V-20	†
2-Butanone (MEK)	0.109	0.023	mg/Kg wet	0.113		95.9	70-160			†
tert-Butyl Alcohol (TBA)	0.0983	0.023	mg/Kg wet	0.113		86.7	40-130			†
n-Butylbenzene	0.0102	0.0011	mg/Kg wet	0.0113		90.0	70-130			
sec-Butylbenzene	0.0116	0.0011	mg/Kg wet	0.0113		103	70-130			
tert-Butylbenzene	0.0119	0.0011	mg/Kg wet	0.0113		105	70-160			†
tert-Butyl Ethyl Ether (TBEE)	0.00928	0.00057	mg/Kg wet	0.0113		81.9	70-130			
Carbon Disulfide	0.0129	0.0057	mg/Kg wet	0.0113		114	70-130			
Carbon Tetrachloride	0.0109	0.0011	mg/Kg wet	0.0113		96.4	70-130			
Chlorobenzene	0.0125	0.0011	mg/Kg wet	0.0113		110	70-130			
Chlorodibromomethane	0.0115	0.00057	mg/Kg wet	0.0113		102	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246935 - SW-846 5035										
LCS (B246935-BS1)										
				Prepared: 11/25/19 Analyzed: 11/27/19						
Chloroethane	0.0116	0.0023	mg/Kg wet	0.0113		102	70-130			
Chloroform	0.0124	0.0023	mg/Kg wet	0.0113		110	70-130			
Chloromethane	0.0106	0.0023	mg/Kg wet	0.0113		93.1	70-130			V-20
2-Chlorotoluene	0.0116	0.0011	mg/Kg wet	0.0113		103	70-130			
4-Chlorotoluene	0.0114	0.0011	mg/Kg wet	0.0113		100	70-130			
1,2-Dibromo-3-chloropropane (DBCP)	0.00986	0.0057	mg/Kg wet	0.0113		87.0	70-130			
1,2-Dibromoethane (EDB)	0.0121	0.00057	mg/Kg wet	0.0113		107	70-130			
Dibromomethane	0.0121	0.0011	mg/Kg wet	0.0113		106	70-130			
1,2-Dichlorobenzene	0.0125	0.0011	mg/Kg wet	0.0113		110	70-130			
1,3-Dichlorobenzene	0.0133	0.0011	mg/Kg wet	0.0113		117	70-130			
1,4-Dichlorobenzene	0.0123	0.0011	mg/Kg wet	0.0113		109	70-130			
trans-1,4-Dichloro-2-butene	0.00966	0.0023	mg/Kg wet	0.0113		85.2	70-130			
Dichlorodifluoromethane (Freon 12)	0.00775	0.0023	mg/Kg wet	0.0113		68.4	40-160			V-05 †
1,1-Dichloroethane	0.0126	0.0011	mg/Kg wet	0.0113		111	70-130			
1,2-Dichloroethane	0.0124	0.0011	mg/Kg wet	0.0113		110	70-130			
1,1-Dichloroethylene	0.0110	0.0011	mg/Kg wet	0.0113		97.5	70-130			
cis-1,2-Dichloroethylene	0.0125	0.0011	mg/Kg wet	0.0113		111	70-130			
trans-1,2-Dichloroethylene	0.0117	0.0011	mg/Kg wet	0.0113		103	70-130			
Dichlorofluoromethane (Freon 21)	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130			
1,2-Dichloropropane	0.0124	0.0011	mg/Kg wet	0.0113		109	70-130			
1,3-Dichloropropane	0.0114	0.00057	mg/Kg wet	0.0113		101	70-130			
2,2-Dichloropropane	0.0114	0.0011	mg/Kg wet	0.0113		100	70-130			
1,1-Dichloropropene	0.0108	0.0023	mg/Kg wet	0.0113		95.0	70-130			
cis-1,3-Dichloropropene	0.0114	0.00057	mg/Kg wet	0.0113		101	70-130			
trans-1,3-Dichloropropene	0.0109	0.00057	mg/Kg wet	0.0113		96.5	70-130			
Diethyl Ether	0.0123	0.0023	mg/Kg wet	0.0113		109	70-130			
Difluorochloromethane (Freon 22)	0.0107	0.0011	mg/Kg wet	0.0113		94.6	70-130			
Diisopropyl Ether (DIPE)	0.0121	0.00057	mg/Kg wet	0.0113		107	70-130			
1,4-Dioxane	0.0932	0.057	mg/Kg wet	0.113		82.2	40-160			†
Ethylbenzene	0.0117	0.0011	mg/Kg wet	0.0113		104	70-130			
Hexachlorobutadiene	0.00995	0.0011	mg/Kg wet	0.0113		87.8	70-160			
2-Hexanone (MBK)	0.0975	0.011	mg/Kg wet	0.113		86.0	70-160			†
Isopropylbenzene (Cumene)	0.0113	0.0011	mg/Kg wet	0.0113		99.7	70-130			
p-Isopropyltoluene (p-Cymene)	0.0114	0.0011	mg/Kg wet	0.0113		100	70-130			
Methyl Acetate	0.0106	0.011	mg/Kg wet	0.0113		93.1	70-130			
Methyl tert-Butyl Ether (MTBE)	0.0116	0.0011	mg/Kg wet	0.0113		103	70-130			
Methyl Cyclohexane	0.00908	0.0011	mg/Kg wet	0.0113		80.1	70-130			V-05
Methylene Chloride	0.0127	0.0057	mg/Kg wet	0.0113		112	40-160			†
4-Methyl-2-pentanone (MIBK)	0.101	0.011	mg/Kg wet	0.113		89.5	70-160			†
Naphthalene	0.00685	0.0023	mg/Kg wet	0.0113		60.4	40-130			V-05 †
n-Propylbenzene	0.0111	0.0011	mg/Kg wet	0.0113		98.0	70-130			
Styrene	0.0112	0.0011	mg/Kg wet	0.0113		99.1	70-130			
1,1,1,2-Tetrachloroethane	0.0128	0.0011	mg/Kg wet	0.0113		113	70-130			
1,1,2,2-Tetrachloroethane	0.0125	0.00057	mg/Kg wet	0.0113		110	70-130			
Tetrachloroethylene	0.0114	0.0011	mg/Kg wet	0.0113		101	70-130			
Tetrahydrofuran	0.0108	0.011	mg/Kg wet	0.0113		95.0	70-130			
Toluene	0.0117	0.0011	mg/Kg wet	0.0113		103	70-130			
1,2,3-Trichlorobenzene	0.00754	0.0057	mg/Kg wet	0.0113		66.5	* 70-130			L-04, V-05
1,2,4-Trichlorobenzene	0.00804	0.0011	mg/Kg wet	0.0113		70.9	70-130			V-05
1,3,5-Trichlorobenzene	0.00950	0.0011	mg/Kg wet	0.0113		83.8	70-130			
1,1,1-Trichloroethane	0.0113	0.0011	mg/Kg wet	0.0113		99.8	70-130			
1,1,2-Trichloroethane	0.0123	0.0011	mg/Kg wet	0.0113		109	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246935 - SW-846 5035										
LCS (B246935-BS1)				Prepared: 11/25/19 Analyzed: 11/27/19						
Trichloroethylene	0.0121	0.0011	mg/Kg wet	0.0113		107	70-130			
Trichlorofluoromethane (Freon 11)	0.00858	0.0023	mg/Kg wet	0.0113		75.7	70-130			
1,2,3-Trichloropropane	0.0108	0.0023	mg/Kg wet	0.0113		95.1	70-130			
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.00947	0.0011	mg/Kg wet	0.0113		83.6	70-130			V-05
1,2,4-Trimethylbenzene	0.0118	0.0011	mg/Kg wet	0.0113		104	70-130			
1,3,5-Trimethylbenzene	0.0106	0.0011	mg/Kg wet	0.0113		93.9	70-130			
Vinyl Chloride	0.00969	0.0023	mg/Kg wet	0.0113		85.5	40-130			†
m+p Xylene	0.0233	0.0023	mg/Kg wet	0.0227		103	70-130			
o-Xylene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0287		mg/Kg wet	0.0283		101	70-130			
Surrogate: Toluene-d8	0.0282		mg/Kg wet	0.0283		99.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.0267		mg/Kg wet	0.0283		94.3	70-130			
LCS Dup (B246935-BS1)				Prepared: 11/25/19 Analyzed: 11/27/19						
Acetone	0.114	0.057	mg/Kg wet	0.113		101	70-160	6.10	25	†
Acrylonitrile	0.0101	0.0057	mg/Kg wet	0.0113		88.8	70-130	1.23	25	
tert-Amyl Methyl Ether (TAME)	0.00898	0.00057	mg/Kg wet	0.0113		79.2	70-130	0.755	25	
Benzene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130	2.09	25	
Bromobenzene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130	3.96	25	
Bromochloromethane	0.0131	0.0011	mg/Kg wet	0.0113		116	70-130	3.07	25	
Bromodichloromethane	0.0121	0.0011	mg/Kg wet	0.0113		107	70-130	0.187	25	
Bromoform	0.0113	0.0011	mg/Kg wet	0.0113		100	70-130	4.60	25	
Bromomethane	0.0117	0.0023	mg/Kg wet	0.0113		103	40-130	8.07	25	V-20 †
2-Butanone (MEK)	0.104	0.023	mg/Kg wet	0.113		91.7	70-160	4.47	25	†
tert-Butyl Alcohol (TBA)	0.0952	0.023	mg/Kg wet	0.113		84.0	40-130	3.19	25	†
n-Butylbenzene	0.0106	0.0011	mg/Kg wet	0.0113		93.1	70-130	3.39	25	
sec-Butylbenzene	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130	2.12	25	
tert-Butylbenzene	0.0121	0.0011	mg/Kg wet	0.0113		107	70-160	1.98	25	†
tert-Butyl Ethyl Ether (TBEE)	0.00962	0.00057	mg/Kg wet	0.0113		84.9	70-130	3.60	25	
Carbon Disulfide	0.0120	0.0057	mg/Kg wet	0.0113		106	70-130	6.92	25	
Carbon Tetrachloride	0.0111	0.0011	mg/Kg wet	0.0113		98.2	70-130	1.85	25	
Chlorobenzene	0.0129	0.0011	mg/Kg wet	0.0113		113	70-130	2.77	25	
Chlorodibromomethane	0.0118	0.00057	mg/Kg wet	0.0113		104	70-130	1.85	25	
Chloroethane	0.0116	0.0023	mg/Kg wet	0.0113		102	70-130	0.0977	25	
Chloroform	0.0125	0.0023	mg/Kg wet	0.0113		111	70-130	1.00	25	
Chloromethane	0.0112	0.0023	mg/Kg wet	0.0113		98.4	70-130	5.54	25	V-20
2-Chlorotoluene	0.0122	0.0011	mg/Kg wet	0.0113		108	70-130	4.94	25	
4-Chlorotoluene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130	5.25	25	
1,2-Dibromo-3-chloropropane (DBCP)	0.00994	0.0057	mg/Kg wet	0.0113		87.7	70-130	0.801	25	
1,2-Dibromoethane (EDB)	0.0120	0.00057	mg/Kg wet	0.0113		106	70-130	0.942	25	
Dibromomethane	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130	1.42	25	
1,2-Dichlorobenzene	0.0127	0.0011	mg/Kg wet	0.0113		112	70-130	2.07	25	
1,3-Dichlorobenzene	0.0133	0.0011	mg/Kg wet	0.0113		117	70-130	0.341	25	
1,4-Dichlorobenzene	0.0127	0.0011	mg/Kg wet	0.0113		112	70-130	2.81	25	
trans-1,4-Dichloro-2-butene	0.00994	0.0023	mg/Kg wet	0.0113		87.7	70-130	2.89	25	
Dichlorodifluoromethane (Freon 12)	0.00800	0.0023	mg/Kg wet	0.0113		70.6	40-160	3.17	25	V-05 †
1,1-Dichloroethane	0.0130	0.0011	mg/Kg wet	0.0113		115	70-130	3.63	25	
1,2-Dichloroethane	0.0126	0.0011	mg/Kg wet	0.0113		111	70-130	1.18	25	
1,1-Dichloroethylene	0.0110	0.0011	mg/Kg wet	0.0113		97.3	70-130	0.205	25	
cis-1,2-Dichloroethylene	0.0128	0.0011	mg/Kg wet	0.0113		113	70-130	1.70	25	
trans-1,2-Dichloroethylene	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130	1.82	25	
Dichlorofluoromethane (Freon 21)	0.0123	0.0011	mg/Kg wet	0.0113		109	70-130	3.66	25	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246935 - SW-846 5035										
LCS Dup (B246935-BSD1)										
Prepared: 11/25/19 Analyzed: 11/27/19										
1,2-Dichloropropane	0.0126	0.0011	mg/Kg wet	0.0113		112	70-130	2.08	25	
1,3-Dichloropropane	0.0117	0.00057	mg/Kg wet	0.0113		104	70-130	2.54	25	
2,2-Dichloropropane	0.0112	0.0011	mg/Kg wet	0.0113		99.2	70-130	1.30	25	
1,1-Dichloropropene	0.0113	0.0023	mg/Kg wet	0.0113		99.8	70-130	4.93	25	
cis-1,3-Dichloropropene	0.0114	0.00057	mg/Kg wet	0.0113		100	70-130	0.199	25	
trans-1,3-Dichloropropene	0.0114	0.00057	mg/Kg wet	0.0113		100	70-130	3.76	25	
Diethyl Ether	0.0121	0.0023	mg/Kg wet	0.0113		107	70-130	1.77	25	
Difluorochloromethane (Freon 22)	0.0112	0.0011	mg/Kg wet	0.0113		99.2	70-130	4.75	25	
Diisopropyl Ether (DIPE)	0.0122	0.00057	mg/Kg wet	0.0113		108	70-130	0.465	25	
1,4-Dioxane	0.0959	0.057	mg/Kg wet	0.113		84.7	40-160	2.92	50	† ‡
Ethylbenzene	0.0121	0.0011	mg/Kg wet	0.0113		107	70-130	3.14	25	
Hexachlorobutadiene	0.0105	0.0011	mg/Kg wet	0.0113		92.4	70-160	5.11	25	
2-Hexanone (MBK)	0.0957	0.011	mg/Kg wet	0.113		84.4	70-160	1.92	25	†
Isopropylbenzene (Cumene)	0.0118	0.0011	mg/Kg wet	0.0113		104	70-130	4.13	25	
p-Isopropyltoluene (p-Cymene)	0.0113	0.0011	mg/Kg wet	0.0113		99.4	70-130	0.901	25	
Methyl Acetate	0.0100	0.011	mg/Kg wet	0.0113		88.5	70-130	5.07	25	
Methyl tert-Butyl Ether (MTBE)	0.0117	0.0011	mg/Kg wet	0.0113		103	70-130	0.486	25	
Methyl Cyclohexane	0.00927	0.0011	mg/Kg wet	0.0113		81.8	70-130	2.10	25	V-05
Methylene Chloride	0.0121	0.0057	mg/Kg wet	0.0113		107	40-160	4.67	25	†
4-Methyl-2-pentanone (MIBK)	0.0970	0.011	mg/Kg wet	0.113		85.6	70-160	4.38	25	†
Naphthalene	0.00712	0.0023	mg/Kg wet	0.0113		62.8	40-130	3.90	25	V-05 †
n-Propylbenzene	0.0113	0.0011	mg/Kg wet	0.0113		99.5	70-130	1.52	25	
Styrene	0.0117	0.0011	mg/Kg wet	0.0113		103	70-130	3.96	25	
1,1,1,2-Tetrachloroethane	0.0132	0.0011	mg/Kg wet	0.0113		116	70-130	2.79	25	
1,1,2,2-Tetrachloroethane	0.0122	0.00057	mg/Kg wet	0.0113		108	70-130	2.39	25	
Tetrachloroethylene	0.0119	0.0011	mg/Kg wet	0.0113		105	70-130	3.99	25	
Tetrahydrofuran	0.0111	0.011	mg/Kg wet	0.0113		97.7	70-130	2.80	25	
Toluene	0.0120	0.0011	mg/Kg wet	0.0113		106	70-130	2.20	25	
1,2,3-Trichlorobenzene	0.00742	0.0057	mg/Kg wet	0.0113		65.5	* 70-130	1.52	25	L-04, V-05
1,2,4-Trichlorobenzene	0.00796	0.0011	mg/Kg wet	0.0113		70.2	70-130	0.992	25	V-05
1,3,5-Trichlorobenzene	0.00959	0.0011	mg/Kg wet	0.0113		84.6	70-130	0.950	25	
1,1,1-Trichloroethane	0.0115	0.0011	mg/Kg wet	0.0113		101	70-130	1.49	25	
1,1,2-Trichloroethane	0.0125	0.0011	mg/Kg wet	0.0113		110	70-130	1.19	25	
Trichloroethylene	0.0123	0.0011	mg/Kg wet	0.0113		109	70-130	1.77	25	
Trichlorofluoromethane (Freon 11)	0.00874	0.0023	mg/Kg wet	0.0113		77.1	70-130	1.83	25	
1,2,3-Trichloropropane	0.0108	0.0023	mg/Kg wet	0.0113		95.1	70-130	0.00	25	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.00953	0.0011	mg/Kg wet	0.0113		84.1	70-130	0.596	25	V-05
1,2,4-Trimethylbenzene	0.0122	0.0011	mg/Kg wet	0.0113		108	70-130	3.58	25	
1,3,5-Trimethylbenzene	0.0114	0.0011	mg/Kg wet	0.0113		101	70-130	6.89	25	
Vinyl Chloride	0.0103	0.0023	mg/Kg wet	0.0113		90.5	40-130	5.68	25	†
m+p Xylene	0.0239	0.0023	mg/Kg wet	0.0227		105	70-130	2.35	25	
o-Xylene	0.0128	0.0011	mg/Kg wet	0.0113		113	70-130	6.78	25	
Surrogate: 1,2-Dichloroethane-d4	0.0285		mg/Kg wet	0.0283		101	70-130			
Surrogate: Toluene-d8	0.0280		mg/Kg wet	0.0283		99.0	70-130			
Surrogate: 4-Bromofluorobenzene	0.0275		mg/Kg wet	0.0283		96.9	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B246837 - SW-846 3546
Blank (B246837-BLK1)

Prepared: 11/24/19 Analyzed: 11/25/19

C9-C18 Aliphatics	ND	10	mg/Kg wet							
C19-C36 Aliphatics	ND	10	mg/Kg wet							
Unadjusted C11-C22 Aromatics	ND	10	mg/Kg wet							
C11-C22 Aromatics	ND	10	mg/Kg wet							
Acenaphthene	ND	0.10	mg/Kg wet							
Acenaphthylene	ND	0.10	mg/Kg wet							
Anthracene	ND	0.10	mg/Kg wet							
Benzo(a)anthracene	ND	0.10	mg/Kg wet							
Benzo(a)pyrene	ND	0.10	mg/Kg wet							
Benzo(b)fluoranthene	ND	0.10	mg/Kg wet							
Benzo(g,h,i)perylene	ND	0.10	mg/Kg wet							
Benzo(k)fluoranthene	ND	0.10	mg/Kg wet							
Chrysene	ND	0.10	mg/Kg wet							
Dibenz(a,h)anthracene	ND	0.10	mg/Kg wet							
Fluoranthene	ND	0.10	mg/Kg wet							
Fluorene	ND	0.10	mg/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	0.10	mg/Kg wet							
2-Methylnaphthalene	ND	0.10	mg/Kg wet							
Naphthalene	ND	0.10	mg/Kg wet							
Phenanthrene	ND	0.10	mg/Kg wet							
Pyrene	ND	0.10	mg/Kg wet							
n-Decane	ND	0.50	mg/Kg wet							
n-Docosane	ND	0.50	mg/Kg wet							
n-Dodecane	ND	0.50	mg/Kg wet							
n-Eicosane	ND	0.50	mg/Kg wet							
n-Hexacosane	ND	0.50	mg/Kg wet							
n-Hexadecane	ND	0.50	mg/Kg wet							
n-Hexatriacontane	ND	0.50	mg/Kg wet							
n-Nonadecane	ND	0.50	mg/Kg wet							
n-Nonane	ND	0.50	mg/Kg wet							
n-Octacosane	ND	0.50	mg/Kg wet							
n-Octadecane	ND	0.50	mg/Kg wet							
n-Tetracosane	ND	0.50	mg/Kg wet							
n-Tetradecane	ND	0.50	mg/Kg wet							
n-Triacontane	ND	0.50	mg/Kg wet							
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
Surrogate: Chlorooctadecane (COD)	3.39		mg/Kg wet	5.00		67.9	40-140			
Surrogate: o-Terphenyl (OTP)	3.32		mg/Kg wet	5.00		66.4	40-140			
Surrogate: 2-Bromonaphthalene	4.29		mg/Kg wet	5.00		85.7	40-140			
Surrogate: 2-Fluorobiphenyl	4.36		mg/Kg wet	5.00		87.2	40-140			

LCS (B246837-BS1)

Prepared: 11/24/19 Analyzed: 11/25/19

C9-C18 Aliphatics	19.0	10	mg/Kg wet	30.0		63.3	40-140			
C19-C36 Aliphatics	32.1	10	mg/Kg wet	40.0		80.3	40-140			
Unadjusted C11-C22 Aromatics	67.9	10	mg/Kg wet	85.0		79.8	40-140			
Acenaphthene	3.61	0.10	mg/Kg wet	5.00		72.2	40-140			
Acenaphthylene	3.29	0.10	mg/Kg wet	5.00		65.9	40-140			
Anthracene	3.91	0.10	mg/Kg wet	5.00		78.2	40-140			
Benzo(a)anthracene	4.08	0.10	mg/Kg wet	5.00		81.6	40-140			
Benzo(a)pyrene	4.00	0.10	mg/Kg wet	5.00		79.9	40-140			
Benzo(b)fluoranthene	4.08	0.10	mg/Kg wet	5.00		81.5	40-140			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B246837 - SW-846 3546

LCS (B246837-BS1)									
					Prepared: 11/24/19 Analyzed: 11/25/19				
Benzo(g,h,i)perylene	4.06	0.10	mg/Kg wet	5.00		81.3	40-140		
Benzo(k)fluoranthene	4.01	0.10	mg/Kg wet	5.00		80.2	40-140		
Chrysene	4.16	0.10	mg/Kg wet	5.00		83.2	40-140		
Dibenz(a,h)anthracene	4.14	0.10	mg/Kg wet	5.00		82.8	40-140		
Fluoranthene	3.96	0.10	mg/Kg wet	5.00		79.2	40-140		
Fluorene	3.62	0.10	mg/Kg wet	5.00		72.4	40-140		
Indeno(1,2,3-cd)pyrene	3.97	0.10	mg/Kg wet	5.00		79.4	40-140		
2-Methylnaphthalene	3.18	0.10	mg/Kg wet	5.00		63.5	40-140		
Naphthalene	2.99	0.10	mg/Kg wet	5.00		59.7	40-140		
Phenanthrene	3.90	0.10	mg/Kg wet	5.00		78.1	40-140		
Pyrene	4.11	0.10	mg/Kg wet	5.00		82.2	40-140		
n-Decane	2.21	0.50	mg/Kg wet	5.00		44.1	40-140		
n-Docosane	3.92	0.50	mg/Kg wet	5.00		78.4	40-140		
n-Dodecane	2.83	0.50	mg/Kg wet	5.00		56.5	40-140		
n-Eicosane	4.03	0.50	mg/Kg wet	5.00		80.6	40-140		
n-Hexacosane	3.94	0.50	mg/Kg wet	5.00		78.9	40-140		
n-Hexadecane	3.75	0.50	mg/Kg wet	5.00		75.0	40-140		
n-Hexatriacontane	3.40	0.50	mg/Kg wet	5.00		67.9	40-140		
n-Nonadecane	3.95	0.50	mg/Kg wet	5.00		79.0	40-140		
n-Nonane	1.46	0.50	mg/Kg wet	5.00		29.3	* 30-140		L-07
n-Octacosane	3.82	0.50	mg/Kg wet	5.00		76.5	40-140		
n-Octadecane	4.00	0.50	mg/Kg wet	5.00		80.1	40-140		
n-Tetracosane	3.91	0.50	mg/Kg wet	5.00		78.3	40-140		
n-Tetradecane	3.32	0.50	mg/Kg wet	5.00		66.4	40-140		
n-Triacontane	3.82	0.50	mg/Kg wet	5.00		76.4	40-140		
Naphthalene-aliphatic fraction	0.0423	0.10	mg/Kg wet	5.00		0.846	0-5		
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5		
Surrogate: Chlorooctadecane (COD)	7.09		mg/Kg wet	10.0		70.9	40-140		
Surrogate: o-Terphenyl (OTP)	7.75		mg/Kg wet	10.0		77.5	40-140		
Surrogate: 2-Bromonaphthalene	4.09		mg/Kg wet	5.00		81.8	40-140		
Surrogate: 2-Fluorobiphenyl	4.46		mg/Kg wet	5.00		89.2	40-140		

LCS Dup (B246837-BSD1)									
					Prepared: 11/24/19 Analyzed: 11/25/19				
C9-C18 Aliphatics	20.1	10	mg/Kg wet	30.0		66.9	40-140	5.46	25
C19-C36 Aliphatics	33.1	10	mg/Kg wet	40.0		82.8	40-140	3.00	25
Unadjusted C11-C22 Aromatics	63.6	10	mg/Kg wet	85.0		74.8	40-140	6.45	25
Acenaphthene	3.37	0.10	mg/Kg wet	5.00		67.4	40-140	6.96	25
Acenaphthylene	3.09	0.10	mg/Kg wet	5.00		61.7	40-140	6.49	25
Anthracene	3.63	0.10	mg/Kg wet	5.00		72.6	40-140	7.42	25
Benzo(a)anthracene	3.82	0.10	mg/Kg wet	5.00		76.4	40-140	6.56	25
Benzo(a)pyrene	3.80	0.10	mg/Kg wet	5.00		75.9	40-140	5.15	25
Benzo(b)fluoranthene	3.86	0.10	mg/Kg wet	5.00		77.2	40-140	5.42	25
Benzo(g,h,i)perylene	3.91	0.10	mg/Kg wet	5.00		78.2	40-140	3.79	25
Benzo(k)fluoranthene	3.79	0.10	mg/Kg wet	5.00		75.9	40-140	5.60	25
Chrysene	3.90	0.10	mg/Kg wet	5.00		78.1	40-140	6.41	25
Dibenz(a,h)anthracene	4.04	0.10	mg/Kg wet	5.00		80.8	40-140	2.47	25
Fluoranthene	3.68	0.10	mg/Kg wet	5.00		73.7	40-140	7.18	25
Fluorene	3.35	0.10	mg/Kg wet	5.00		67.0	40-140	7.70	25
Indeno(1,2,3-cd)pyrene	3.81	0.10	mg/Kg wet	5.00		76.2	40-140	4.08	25
2-Methylnaphthalene	3.05	0.10	mg/Kg wet	5.00		61.0	40-140	4.03	25
Naphthalene	2.95	0.10	mg/Kg wet	5.00		59.0	40-140	1.30	25
Phenanthrene	3.62	0.10	mg/Kg wet	5.00		72.4	40-140	7.54	25

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B246837 - SW-846 3546
LCS Dup (B246837-BSD1)

Prepared: 11/24/19 Analyzed: 11/25/19

Pyrene	3.82	0.10	mg/Kg wet	5.00		76.4	40-140	7.23	25	
n-Decane	2.29	0.50	mg/Kg wet	5.00		45.7	40-140	3.50	25	
n-Docosane	3.91	0.50	mg/Kg wet	5.00		78.1	40-140	0.373	25	
n-Dodecane	2.88	0.50	mg/Kg wet	5.00		57.7	40-140	1.99	25	
n-Eicosane	4.02	0.50	mg/Kg wet	5.00		80.5	40-140	0.139	25	
n-Hexacosane	3.93	0.50	mg/Kg wet	5.00		78.5	40-140	0.460	25	
n-Hexadecane	3.71	0.50	mg/Kg wet	5.00		74.1	40-140	1.23	25	
n-Hexatriacontane	3.39	0.50	mg/Kg wet	5.00		67.8	40-140	0.271	25	
n-Nonadecane	3.92	0.50	mg/Kg wet	5.00		78.4	40-140	0.666	25	
n-Nonane	1.53	0.50	mg/Kg wet	5.00		30.5	30-140	4.28	25	
n-Octacosane	3.81	0.50	mg/Kg wet	5.00		76.1	40-140	0.472	25	
n-Octadecane	3.98	0.50	mg/Kg wet	5.00		79.6	40-140	0.621	25	
n-Tetracosane	3.90	0.50	mg/Kg wet	5.00		78.0	40-140	0.299	25	
n-Tetradecane	3.28	0.50	mg/Kg wet	5.00		65.6	40-140	1.29	25	
n-Triacontane	3.80	0.50	mg/Kg wet	5.00		76.0	40-140	0.533	25	
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
Surrogate: Chlorooctadecane (COD)	3.65		mg/Kg wet	5.00		72.9	40-140			
Surrogate: o-Terphenyl (OTP)	3.54		mg/Kg wet	5.00		70.8	40-140			
Surrogate: 2-Bromonaphthalene	4.11		mg/Kg wet	5.00		82.3	40-140			
Surrogate: 2-Fluorobiphenyl	4.26		mg/Kg wet	5.00		85.1	40-140			

Batch B246957 - SW-846 3546
Blank (B246957-BLK1)

Prepared: 11/25/19 Analyzed: 12/02/19

C9-C18 Aliphatics	ND	9.9	mg/Kg wet							
C19-C36 Aliphatics	ND	9.9	mg/Kg wet							
Unadjusted C11-C22 Aromatics	ND	9.9	mg/Kg wet							
C11-C22 Aromatics	ND	9.9	mg/Kg wet							
Acenaphthene	ND	0.099	mg/Kg wet							
Acenaphthylene	ND	0.099	mg/Kg wet							
Anthracene	ND	0.099	mg/Kg wet							
Benzo(a)anthracene	ND	0.099	mg/Kg wet							
Benzo(a)pyrene	ND	0.099	mg/Kg wet							
Benzo(b)fluoranthene	ND	0.099	mg/Kg wet							
Benzo(g,h,i)perylene	ND	0.099	mg/Kg wet							
Benzo(k)fluoranthene	ND	0.099	mg/Kg wet							
Chrysene	ND	0.099	mg/Kg wet							
Dibenz(a,h)anthracene	ND	0.099	mg/Kg wet							
Fluoranthene	ND	0.099	mg/Kg wet							
Fluorene	ND	0.099	mg/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	0.099	mg/Kg wet							
2-Methylnaphthalene	ND	0.099	mg/Kg wet							
Naphthalene	ND	0.099	mg/Kg wet							
Phenanthrene	ND	0.099	mg/Kg wet							
Pyrene	ND	0.099	mg/Kg wet							
n-Decane	ND	0.50	mg/Kg wet							
n-Docosane	ND	0.50	mg/Kg wet							
n-Dodecane	ND	0.50	mg/Kg wet							
n-Eicosane	ND	0.50	mg/Kg wet							
n-Hexacosane	ND	0.50	mg/Kg wet							
n-Hexadecane	ND	0.50	mg/Kg wet							
n-Hexatriacontane	ND	0.50	mg/Kg wet							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246957 - SW-846 3546										
Blank (B246957-BLK1)										
Prepared: 11/25/19 Analyzed: 12/02/19										
n-Nonadecane	ND	0.50	mg/Kg wet							
n-Nonane	ND	0.50	mg/Kg wet							
n-Octacosane	ND	0.50	mg/Kg wet							
n-Octadecane	ND	0.50	mg/Kg wet							
n-Tetracosane	ND	0.50	mg/Kg wet							
n-Tetradecane	ND	0.50	mg/Kg wet							
n-Triacontane	ND	0.50	mg/Kg wet							
Naphthalene-aliphatic fraction	ND	0.099	mg/Kg wet							
2-Methylnaphthalene-aliphatic fraction	ND	0.099	mg/Kg wet							
Surrogate: Chlorooctadecane (COD)	3.71		mg/Kg wet	4.95		75.0	40-140			
Surrogate: o-Terphenyl (OTP)	3.59		mg/Kg wet	4.95		72.5	40-140			
Surrogate: 2-Bromonaphthalene	4.50		mg/Kg wet	4.95		90.9	40-140			
Surrogate: 2-Fluorobiphenyl	4.60		mg/Kg wet	4.95		92.9	40-140			
LCS (B246957-BS1)										
Prepared: 11/25/19 Analyzed: 12/02/19										
C9-C18 Aliphatics	22.4	9.9	mg/Kg wet	29.7		75.3	40-140			
C19-C36 Aliphatics	40.5	9.9	mg/Kg wet	39.6		102	40-140			
Unadjusted C11-C22 Aromatics	69.6	9.9	mg/Kg wet	84.2		82.7	40-140			
Acenaphthene	3.75	0.099	mg/Kg wet	4.95		75.7	40-140			
Acenaphthylene	3.48	0.099	mg/Kg wet	4.95		70.3	40-140			
Anthracene	3.96	0.099	mg/Kg wet	4.95		80.0	40-140			
Benzo(a)anthracene	4.10	0.099	mg/Kg wet	4.95		82.8	40-140			
Benzo(a)pyrene	3.94	0.099	mg/Kg wet	4.95		79.7	40-140			
Benzo(b)fluoranthene	4.04	0.099	mg/Kg wet	4.95		81.7	40-140			
Benzo(g,h,i)perylene	3.94	0.099	mg/Kg wet	4.95		79.6	40-140			
Benzo(k)fluoranthene	4.01	0.099	mg/Kg wet	4.95		80.9	40-140			
Chrysene	4.18	0.099	mg/Kg wet	4.95		84.4	40-140			
Dibenz(a,h)anthracene	4.01	0.099	mg/Kg wet	4.95		81.0	40-140			
Fluoranthene	4.11	0.099	mg/Kg wet	4.95		83.0	40-140			
Fluorene	3.87	0.099	mg/Kg wet	4.95		78.1	40-140			
Indeno(1,2,3-cd)pyrene	3.91	0.099	mg/Kg wet	4.95		79.0	40-140			
2-Methylnaphthalene	3.42	0.099	mg/Kg wet	4.95		69.0	40-140			
Naphthalene	3.19	0.099	mg/Kg wet	4.95		64.5	40-140			
Phenanthrene	4.09	0.099	mg/Kg wet	4.95		82.6	40-140			
Pyrene	4.20	0.099	mg/Kg wet	4.95		84.8	40-140			
n-Decane	2.52	0.50	mg/Kg wet	4.95		50.9	40-140			
n-Docosane	4.73	0.50	mg/Kg wet	4.95		95.5	40-140			
n-Dodecane	3.29	0.50	mg/Kg wet	4.95		66.5	40-140			
n-Eicosane	4.58	0.50	mg/Kg wet	4.95		92.6	40-140			
n-Hexacosane	4.83	0.50	mg/Kg wet	4.95		97.6	40-140			
n-Hexadecane	4.33	0.50	mg/Kg wet	4.95		87.5	40-140			
n-Hexatriacontane	4.05	0.50	mg/Kg wet	4.95		81.9	40-140			
n-Nonadecane	4.58	0.50	mg/Kg wet	4.95		92.6	40-140			
n-Nonane	1.64	0.50	mg/Kg wet	4.95		33.1	30-140			
n-Octacosane	4.71	0.50	mg/Kg wet	4.95		95.2	40-140			
n-Octadecane	4.57	0.50	mg/Kg wet	4.95		92.3	40-140			
n-Tetracosane	4.76	0.50	mg/Kg wet	4.95		96.1	40-140			
n-Tetradecane	3.99	0.50	mg/Kg wet	4.95		80.5	40-140			
n-Triacontane	4.75	0.50	mg/Kg wet	4.95		95.9	40-140			
Naphthalene-aliphatic fraction	ND	0.099	mg/Kg wet	4.95			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	0.099	mg/Kg wet	4.95			0-5			
Surrogate: Chlorooctadecane (COD)	4.48		mg/Kg wet	4.95		90.5	40-140			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246957 - SW-846 3546										
LCS (B246957-BS1)					Prepared: 11/25/19 Analyzed: 12/02/19					
Surrogate: o-Terphenyl (OTP)	3.98		mg/Kg wet	4.95		80.4	40-140			
Surrogate: 2-Bromonaphthalene	4.35		mg/Kg wet	4.95		88.0	40-140			
Surrogate: 2-Fluorobiphenyl	4.54		mg/Kg wet	4.95		91.8	40-140			
LCS Dup (B246957-BS1)					Prepared: 11/25/19 Analyzed: 12/02/19					
C9-C18 Aliphatics	21.2	10	mg/Kg wet	30.0		70.8	40-140	5.20	25	
C19-C36 Aliphatics	41.1	10	mg/Kg wet	40.0		103	40-140	1.45	25	
Unadjusted C11-C22 Aromatics	72.3	10	mg/Kg wet	85.0		85.1	40-140	3.84	25	
Acenaphthene	3.67	0.10	mg/Kg wet	5.00		73.4	40-140	2.08	25	
Acenaphthylene	3.36	0.10	mg/Kg wet	5.00		67.3	40-140	3.34	25	
Anthracene	4.22	0.10	mg/Kg wet	5.00		84.3	40-140	6.28	25	
Benzo(a)anthracene	4.33	0.10	mg/Kg wet	5.00		86.7	40-140	5.56	25	
Benzo(a)pyrene	4.17	0.10	mg/Kg wet	5.00		83.4	40-140	5.52	25	
Benzo(b)fluoranthene	4.29	0.10	mg/Kg wet	5.00		85.8	40-140	5.97	25	
Benzo(g,h,i)perylene	4.23	0.10	mg/Kg wet	5.00		84.5	40-140	6.99	25	
Benzo(k)fluoranthene	4.25	0.10	mg/Kg wet	5.00		85.0	40-140	5.92	25	
Chrysene	4.42	0.10	mg/Kg wet	5.00		88.5	40-140	5.73	25	
Dibenz(a,h)anthracene	4.33	0.10	mg/Kg wet	5.00		86.7	40-140	7.78	25	
Fluoranthene	4.36	0.10	mg/Kg wet	5.00		87.2	40-140	5.88	25	
Fluorene	3.97	0.10	mg/Kg wet	5.00		79.4	40-140	2.70	25	
Indeno(1,2,3-cd)pyrene	4.16	0.10	mg/Kg wet	5.00		83.2	40-140	6.09	25	
2-Methylnaphthalene	3.18	0.10	mg/Kg wet	5.00		63.5	40-140	7.24	25	
Naphthalene	2.97	0.10	mg/Kg wet	5.00		59.3	40-140	7.39	25	
Phenanthrene	4.35	0.10	mg/Kg wet	5.00		87.0	40-140	6.12	25	
Pyrene	4.45	0.10	mg/Kg wet	5.00		89.0	40-140	5.79	25	
n-Decane	2.29	0.50	mg/Kg wet	5.00		45.8	40-140	9.64	25	
n-Docosane	4.74	0.50	mg/Kg wet	5.00		94.9	40-140	0.346	25	
n-Dodecane	2.82	0.50	mg/Kg wet	5.00		56.3	40-140	15.5	25	
n-Eicosane	4.72	0.50	mg/Kg wet	5.00		94.3	40-140	2.84	25	
n-Hexacosane	4.93	0.50	mg/Kg wet	5.00		98.5	40-140	1.98	25	
n-Hexadecane	4.26	0.50	mg/Kg wet	5.00		85.2	40-140	1.72	25	
n-Hexatriacontane	4.29	0.50	mg/Kg wet	5.00		85.8	40-140	5.65	25	
n-Nonadecane	4.60	0.50	mg/Kg wet	5.00		92.1	40-140	0.417	25	
n-Nonane	1.59	0.50	mg/Kg wet	5.00		31.8	30-140	2.97	25	
n-Octacosane	4.85	0.50	mg/Kg wet	5.00		96.9	40-140	2.85	25	
n-Octadecane	4.58	0.50	mg/Kg wet	5.00		91.6	40-140	0.257	25	
n-Tetracosane	4.82	0.50	mg/Kg wet	5.00		96.5	40-140	1.33	25	
n-Tetradecane	3.59	0.50	mg/Kg wet	5.00		71.8	40-140	10.4	25	
n-Triacontane	4.94	0.50	mg/Kg wet	5.00		98.7	40-140	3.88	25	
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
Surrogate: Chlorooctadecane (COD)	4.26		mg/Kg wet	5.00		85.3	40-140			
Surrogate: o-Terphenyl (OTP)	4.21		mg/Kg wet	5.00		84.2	40-140			
Surrogate: 2-Bromonaphthalene	4.42		mg/Kg wet	5.00		88.3	40-140			
Surrogate: 2-Fluorobiphenyl	4.61		mg/Kg wet	5.00		92.3	40-140			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246957 - SW-846 3546										
Matrix Spike (B246957-MS1)	Source: 19K1416-01			Prepared: 11/25/19 Analyzed: 12/02/19						
C9-C18 Aliphatics	20.2	11	mg/Kg dry	32.7	3.53	50.9	40-140			
C19-C36 Aliphatics	51.8	11	mg/Kg dry	43.6	28.6	53.1	40-140			
Unadjusted C11-C22 Aromatics	84.6	11	mg/Kg dry	92.7	23.9	65.5	40-140			
Acenaphthene	3.66	0.11	mg/Kg dry	5.45	ND	67.1	40-140			
Acenaphthylene	3.35	0.11	mg/Kg dry	5.45	ND	61.4	40-140			
Anthracene	3.53	0.11	mg/Kg dry	5.45	ND	64.7	40-140			
Benzo(a)anthracene	3.87	0.11	mg/Kg dry	5.45	0.0699	69.8	40-140			
Benzo(a)pyrene	4.07	0.11	mg/Kg dry	5.45	0.125	72.4	40-140			
Benzo(b)fluoranthene	3.86	0.11	mg/Kg dry	5.45	0.127	68.5	40-140			
Benzo(g,h,i)perylene	3.54	0.11	mg/Kg dry	5.45	0.0759	63.6	40-140			
Benzo(k)fluoranthene	3.64	0.11	mg/Kg dry	5.45	ND	66.9	40-140			
Chrysene	3.99	0.11	mg/Kg dry	5.45	0.0943	71.5	40-140			
Dibenz(a,h)anthracene	3.54	0.11	mg/Kg dry	5.45	ND	65.0	40-140			
Fluoranthene	4.28	0.11	mg/Kg dry	5.45	0.191	75.0	40-140			
Fluorene	3.69	0.11	mg/Kg dry	5.45	ND	67.8	40-140			
Indeno(1,2,3-cd)pyrene	3.48	0.11	mg/Kg dry	5.45	0.0741	62.5	40-140			
2-Methylnaphthalene	3.30	0.11	mg/Kg dry	5.45	ND	60.6	40-140			
Naphthalene	3.08	0.11	mg/Kg dry	5.45	0.0603	55.4	40-140			
Phenanthrene	4.25	0.11	mg/Kg dry	5.45	0.137	75.4	40-140			
Pyrene	4.33	0.11	mg/Kg dry	5.45	0.202	75.7	40-140			
n-Nonane	1.30	0.55	mg/Kg dry	5.45	ND	23.9	* 30-140			MS-07A
Surrogate: Chlorooctadecane (COD)	3.55		mg/Kg dry	5.45		65.2	40-140			
Surrogate: o-Terphenyl (OTP)	3.61		mg/Kg dry	5.45		66.3	40-140			
Surrogate: 2-Bromonaphthalene	4.99		mg/Kg dry	5.45		91.5	40-140			
Surrogate: 2-Fluorobiphenyl	5.21		mg/Kg dry	5.45		95.7	40-140			
Matrix Spike Dup (B246957-MSD1)	Source: 19K1416-01			Prepared: 11/25/19 Analyzed: 12/02/19						
C9-C18 Aliphatics	21.7	11	mg/Kg dry	32.4	3.53	56.1	40-140	7.20	50	
C19-C36 Aliphatics	51.8	11	mg/Kg dry	43.2	28.6	53.8	40-140	0.161	50	
Unadjusted C11-C22 Aromatics	83.6	11	mg/Kg dry	91.8	23.9	65.0	40-140	1.23	50	
Acenaphthene	3.81	0.11	mg/Kg dry	5.40	ND	70.5	40-140	4.01	50	
Acenaphthylene	3.52	0.11	mg/Kg dry	5.40	ND	65.3	40-140	5.05	50	
Anthracene	3.61	0.11	mg/Kg dry	5.40	ND	66.9	40-140	2.33	50	
Benzo(a)anthracene	3.87	0.11	mg/Kg dry	5.40	0.0699	70.5	40-140	0.00534	50	
Benzo(a)pyrene	4.02	0.11	mg/Kg dry	5.40	0.125	72.2	40-140	1.13	50	
Benzo(b)fluoranthene	3.87	0.11	mg/Kg dry	5.40	0.127	69.4	40-140	0.316	50	
Benzo(g,h,i)perylene	3.68	0.11	mg/Kg dry	5.40	0.0759	66.9	40-140	3.88	50	
Benzo(k)fluoranthene	3.73	0.11	mg/Kg dry	5.40	0.0551	68.0	40-140	2.25	50	
Chrysene	3.98	0.11	mg/Kg dry	5.40	0.0943	72.0	40-140	0.196	50	
Dibenz(a,h)anthracene	3.74	0.11	mg/Kg dry	5.40	ND	69.3	40-140	5.43	50	
Fluoranthene	4.09	0.11	mg/Kg dry	5.40	0.191	72.2	40-140	4.47	50	
Fluorene	3.85	0.11	mg/Kg dry	5.40	ND	71.3	40-140	4.05	50	
Indeno(1,2,3-cd)pyrene	3.61	0.11	mg/Kg dry	5.40	0.0741	65.5	40-140	3.51	50	
2-Methylnaphthalene	3.51	0.11	mg/Kg dry	5.40	ND	65.0	40-140	5.95	50	
Naphthalene	3.26	0.11	mg/Kg dry	5.40	0.0603	59.2	40-140	5.60	50	
Phenanthrene	4.11	0.11	mg/Kg dry	5.40	0.137	73.6	40-140	3.23	50	
Pyrene	4.17	0.11	mg/Kg dry	5.40	0.202	73.5	40-140	3.73	50	
n-Nonane	1.40	0.54	mg/Kg dry	5.40	ND	25.9	* 30-140	6.80	50	MS-07A
Surrogate: Chlorooctadecane (COD)	3.62		mg/Kg dry	5.40		67.0	40-140			
Surrogate: o-Terphenyl (OTP)	3.74		mg/Kg dry	5.40		69.3	40-140			
Surrogate: 2-Bromonaphthalene	4.95		mg/Kg dry	5.40		91.7	40-140			
Surrogate: 2-Fluorobiphenyl	5.27		mg/Kg dry	5.40		97.7	40-140			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B247115 - SW-846 7471
Blank (B247115-BLK1)

Prepared: 11/26/19 Analyzed: 11/27/19

Mercury	ND	0.025	mg/Kg wet							
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LCS (B247115-BS1)

Prepared: 11/26/19 Analyzed: 11/27/19

Mercury	2.60	0.38	mg/Kg wet	2.93		88.8	71.3-128.7			
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LCS Dup (B247115-BSD1)

Prepared: 11/26/19 Analyzed: 11/27/19

Mercury	2.68	0.38	mg/Kg wet	2.93		91.4	71.3-128.7	2.92	20	
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Batch B247130 - SW-846 3050B
Blank (B247130-BLK1)

Prepared: 11/26/19 Analyzed: 11/27/19

Arsenic	ND	1.7	mg/Kg wet							
Barium	ND	1.7	mg/Kg wet							
Cadmium	ND	0.17	mg/Kg wet							
Chromium	ND	0.33	mg/Kg wet							
Lead	ND	0.50	mg/Kg wet							
Selenium	ND	3.3	mg/Kg wet							
Silver	ND	0.33	mg/Kg wet							

LCS (B247130-BS1)

Prepared: 11/26/19 Analyzed: 11/27/19

Arsenic	129	5.0	mg/Kg wet	143		89.9	82.4-116.8			
Barium	420	5.0	mg/Kg wet	415		101	81.7-118.5			
Cadmium	56.2	0.50	mg/Kg wet	56.2		100	82.2-117.5			
Chromium	94.8	0.99	mg/Kg wet	101		93.8	82-118.2			
Lead	117	1.5	mg/Kg wet	125		93.9	82.3-117.1			
Selenium	69.4	9.9	mg/Kg wet	77.9		89.1	79.3-120.7			
Silver	36.6	0.99	mg/Kg wet	34.3		107	79.3-120.7			

LCS Dup (B247130-BSD1)

Prepared: 11/26/19 Analyzed: 11/27/19

Arsenic	117	4.7	mg/Kg wet	143		81.8	* 82.4-116.8	9.50	30	L-07
Barium	384	4.7	mg/Kg wet	415		92.5	81.7-118.5	8.86	20	
Cadmium	50.9	0.47	mg/Kg wet	56.2		90.5	82.2-117.5	9.98	20	
Chromium	86.2	0.94	mg/Kg wet	101		85.4	82-118.2	9.41	30	
Lead	106	1.4	mg/Kg wet	125		85.0	82.3-117.1	9.99	30	
Selenium	64.1	9.4	mg/Kg wet	77.9		82.3	79.3-120.7	7.93	30	
Silver	33.2	0.94	mg/Kg wet	34.3		96.8	79.3-120.7	9.81	30	

MRL Check (B247130-MRL1)

Prepared: 11/26/19 Analyzed: 11/27/19

Lead	0.471	0.50	mg/Kg wet	0.500		94.2	80-120			
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Batch B247190 - SW-846 3050B
Blank (B247190-BLK1)

Prepared & Analyzed: 11/27/19

Lead	ND	0.50	mg/Kg wet							
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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247190 - SW-846 3050B										
LCS (B247190-BS1)				Prepared & Analyzed: 11/27/19						
Lead	105	1.5	mg/Kg wet	125		84.3	82.3-117.1			
LCS Dup (B247190-BSD1)				Prepared & Analyzed: 11/27/19						
Lead	109	1.5	mg/Kg wet	125		87.4	82.3-117.1	3.58	30	
Duplicate (B247190-DUP1)				Source: 19K1416-04		Prepared & Analyzed: 11/27/19				
Lead	125	0.77	mg/Kg dry		131			4.61	35	L-10
MRL Check (B247190-MRL1)				Prepared: 11/27/19 Analyzed: 12/02/19						
Lead	0.754	0.51	mg/Kg wet	0.507		149 *	80-120			L-10
Matrix Spike (B247190-MS1)				Source: 19K1416-04		Prepared: 11/27/19 Analyzed: 12/02/19				
Lead	158	0.77	mg/Kg dry	25.6	131	103	75-125			
Batch B247191 - SW-846 3050B										
Blank (B247191-BLK1)				Prepared: 11/27/19 Analyzed: 12/02/19						
Arsenic	ND	1.7	mg/Kg wet							
Barium	ND	1.7	mg/Kg wet							
Cadmium	ND	0.17	mg/Kg wet							
Chromium	ND	0.33	mg/Kg wet							
Lead	ND	0.50	mg/Kg wet							
Selenium	ND	3.3	mg/Kg wet							
Silver	ND	0.33	mg/Kg wet							
LCS (B247191-BS1)				Prepared: 11/27/19 Analyzed: 12/02/19						
Arsenic	129	5.0	mg/Kg wet	143		90.3	83.2-117.5			
Barium	403	5.0	mg/Kg wet	415		97.2	82.7-117.6			
Cadmium	51.8	0.50	mg/Kg wet	56.2		92.1	82.9-117.3			
Chromium	91.7	1.0	mg/Kg wet	101		90.8	82.4-116.8			
Lead	113	1.5	mg/Kg wet	125		90.2	82.4-116.8			
Selenium	63.4	10	mg/Kg wet	77.9		81.4	79.3-120.7			
Silver	34.7	1.0	mg/Kg wet	34.3		101	79.3-120.7			
LCS Dup (B247191-BSD1)				Prepared: 11/27/19 Analyzed: 12/02/19						
Arsenic	130	4.7	mg/Kg wet	143		90.9	83.2-117.5	0.681	30	
Barium	416	4.7	mg/Kg wet	415		100	82.7-117.6	3.19	20	
Cadmium	53.5	0.47	mg/Kg wet	56.2		95.2	82.9-117.3	3.34	20	
Chromium	92.6	0.95	mg/Kg wet	101		91.7	82.4-116.8	1.03	30	
Lead	112	1.4	mg/Kg wet	125		89.3	82.4-116.8	0.936	30	
Selenium	63.5	9.5	mg/Kg wet	77.9		81.6	79.3-120.7	0.236	30	
Silver	35.3	0.95	mg/Kg wet	34.3		103	79.3-120.7	1.81	30	

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QUALITY CONTROL
Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247191 - SW-846 3050B										
Duplicate (B247191-DUP1)	Source: 19K1416-20			Prepared: 11/27/19 Analyzed: 12/02/19						
Lead	77.0	0.68	mg/Kg dry		61.8			21.9	35	
MRL Check (B247191-MRL1)				Prepared: 11/27/19 Analyzed: 12/02/19						
Lead	0.469	0.50	mg/Kg wet	0.503		93.1	80-120			
Matrix Spike (B247191-MS1)	Source: 19K1416-20			Prepared: 11/27/19 Analyzed: 12/02/19						
Lead	101	0.70	mg/Kg dry	23.3	61.8	170 *	75-125			MS-11
Batch B247281 - SW-846 3050B										
Blank (B247281-BLK1)				Prepared: 11/30/19 Analyzed: 12/02/19						
Lead	ND	0.50	mg/Kg wet							
LCS (B247281-BS1)				Prepared: 11/30/19 Analyzed: 12/02/19						
Lead	109	1.5	mg/Kg wet	125		87.5	82.4-116.8			
LCS Dup (B247281-BSD1)				Prepared: 11/30/19 Analyzed: 12/02/19						
Lead	114	1.5	mg/Kg wet	125		91.3	82.4-116.8	4.31	30	
Duplicate (B247281-DUP1)	Source: 19K1416-27			Prepared: 11/30/19 Analyzed: 12/02/19						
Lead	84.3	0.76	mg/Kg dry		88.9			5.37	35	
MRL Check (B247281-MRL1)				Prepared: 11/30/19 Analyzed: 12/02/19						
Lead	0.416	0.51	mg/Kg wet	0.507		82.1	80-120			
Matrix Spike (B247281-MS1)	Source: 19K1416-27			Prepared: 11/30/19 Analyzed: 12/02/19						
Lead	112	0.74	mg/Kg dry	24.8	88.9	94.7	75-125			
Batch B247983 - SW-846 3050B										
Blank (B247983-BLK1)				Prepared & Analyzed: 12/10/19						
Arsenic	ND	1.7	mg/Kg wet							
Barium	ND	1.7	mg/Kg wet							
Cadmium	ND	0.17	mg/Kg wet							
Chromium	ND	0.33	mg/Kg wet							
Lead	ND	0.50	mg/Kg wet							
Selenium	ND	3.3	mg/Kg wet							
Silver	ND	0.33	mg/Kg wet							
LCS (B247983-BS1)				Prepared & Analyzed: 12/10/19						
Arsenic	117	5.0	mg/Kg wet	143		81.7 *	83.2-117.5			L-07
Barium	366	5.0	mg/Kg wet	415		88.1	82.7-117.6			
Cadmium	47.5	0.50	mg/Kg wet	56.2		84.6	82.9-117.3			
Chromium	85.2	1.0	mg/Kg wet	101		84.3	82.4-116.8			
Lead	106	1.5	mg/Kg wet	125		84.7	82.4-116.8			
Selenium	64.3	10	mg/Kg wet	77.9		82.5	79.3-120.7			
Silver	32.8	1.0	mg/Kg wet	34.3		95.6	81-119.2			

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QUALITY CONTROL
Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B247983 - SW-846 3050B
LCS (B247983-BS2) MRL1

Prepared & Analyzed: 12/10/19

Lead	0.526	0.47	mg/Kg wet	0.475		111	80-120			
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LCS Dup (B247983-BSD1)

Prepared & Analyzed: 12/10/19

Arsenic	124	4.8	mg/Kg wet	143		86.7	83.2-117.5	5.87	30	
Barium	391	4.8	mg/Kg wet	415		94.2	82.7-117.6	6.72	20	
Cadmium	50.6	0.48	mg/Kg wet	56.2		90.0	82.9-117.3	6.20	20	
Chromium	89.8	0.96	mg/Kg wet	101		88.9	82.4-116.8	5.28	30	
Lead	111	1.4	mg/Kg wet	125		88.4	82.4-116.8	4.33	30	
Selenium	66.2	9.6	mg/Kg wet	77.9		85.0	79.3-120.7	3.02	30	
Silver	35.4	0.96	mg/Kg wet	34.3		103	81-119.2	7.63	30	

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QUALITY CONTROL
Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B246947 - % Solids
Blank (B246947-BLK1)

Prepared: 11/25/19 Analyzed: 12/03/19

% Solids	0.00		% Wt							
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Blank (B246947-BLK2)

Prepared: 11/25/19 Analyzed: 12/03/19

% Solids	0.00		% Wt							
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Blank (B246947-BLK3)

Prepared: 11/25/19 Analyzed: 12/03/19

% Solids	0.00		% Wt							
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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
L-04	Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
L-10	The reporting limit verification for the AIHA lead program is outside of control limits for this element. Any reported result at or near the detection limit may be bias on the high side.
MS-07A	Matrix spike and spike duplicate recovery is outside of control limits. Analysis is in control based on laboratory fortified blank recovery. Possiblity of matrix effects that lead to low bias or non-homogeneous sample aliquot cannot be eliminated.
MS-11	Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a high bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
V-05	Continuing calibration verification (CCV) did not meet method specifications and was biased on the low side for this compound.
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>MADEP-EPH-04-1.1 in Soil</i>	
C9-C18 Aliphatics	CT,NC,ME,NH-P
C19-C36 Aliphatics	CT,NC,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,ME,NH-P
C11-C22 Aromatics	CT,NC,ME,NH-P
Acenaphthene	CT,NC,ME,NH-P
Acenaphthylene	CT,NC,ME,NH-P
Anthracene	CT,NC,ME,NH-P
Benzo(a)anthracene	CT,NC,ME,NH-P
Benzo(a)pyrene	CT,NC,ME,NH-P
Benzo(b)fluoranthene	CT,NC,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,ME,NH-P
Benzo(k)fluoranthene	CT,NC,ME,NH-P
Chrysene	CT,NC,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,ME,NH-P
Fluoranthene	CT,NC,ME,NH-P
Fluorene	CT,NC,ME
Indeno(1,2,3-cd)pyrene	CT,NC,ME,NH-P
2-Methylnaphthalene	CT,NC
Naphthalene	CT,NC,ME,NH-P
Phenanthrene	CT,NC,ME,NH-P
Pyrene	CT,NC,ME,NH-P
<i>MADEP-EPH-04-1.1 in Water</i>	
C9-C18 Aliphatics	CT,NC,ME,NH-P
C19-C36 Aliphatics	CT,NC,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,ME,NH-P
C11-C22 Aromatics	CT,NC,ME,NH-P
Acenaphthene	CT,NC,ME,NH-P
Acenaphthylene	CT,NC,ME,NH-P
Anthracene	CT,NC,ME,NH-P
Benzo(a)anthracene	CT,NC,ME,NH-P
Benzo(a)pyrene	CT,NC,ME,NH-P
Benzo(b)fluoranthene	CT,NC,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,ME,NH-P
Benzo(k)fluoranthene	CT,NC,ME,NH-P
Chrysene	CT,NC,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,ME,NH-P
Fluoranthene	CT,NC,ME,NH-P
Fluorene	CT,NC,ME
Indeno(1,2,3-cd)pyrene	CT,NC,ME,NH-P
2-Methylnaphthalene	CT,NC
Naphthalene	CT,NC,ME,NH-P
Phenanthrene	CT,NC,ME,NH-P
Pyrene	CT,NC,ME,NH-P
<i>SW-846 6010D in Product/Solid</i>	
Lead	CT,NH,NY,ME,VA,NC
<i>SW-846 6010D in Soil</i>	

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 6010D in Soil</i>	
Arsenic	CT,NH,NY,ME,VA,NC
Barium	CT,NH,NY,ME,VA,NC
Cadmium	CT,NH,NY,ME,VA,NC
Chromium	CT,NH,NY,ME,VA,NC
Lead	CT,NH,NY,AIHA,ME,VA,NC
Selenium	CT,NH,NY,ME,VA,NC
Silver	CT,NH,NY,ME,VA,NC
<i>SW-846 7471B in Soil</i>	
Mercury	CT,NH,NY,NC,ME,VA
<i>SW-846 8260C-D in Soil</i>	
Acetone	CT,NH,NY,ME,VA
Acrylonitrile	CT,NH,NY,ME,VA
Benzene	CT,NH,NY,ME,VA
Bromobenzene	NH,NY,ME,VA
Bromochloromethane	NH,NY,ME,VA
Bromodichloromethane	CT,NH,NY,ME,VA
Bromoform	CT,NH,NY,ME,VA
Bromomethane	CT,NH,NY,ME,VA
2-Butanone (MEK)	CT,NH,NY,ME,VA
n-Butylbenzene	CT,NH,NY,ME,VA
sec-Butylbenzene	CT,NH,NY,ME,VA
tert-Butylbenzene	CT,NH,NY,ME,VA
Carbon Disulfide	CT,NH,NY,ME,VA
Carbon Tetrachloride	CT,NH,NY,ME,VA
Chlorobenzene	CT,NH,NY,ME,VA
Chlorodibromomethane	CT,NH,NY,ME,VA
Chloroethane	CT,NH,NY,ME,VA
Chloroform	CT,NH,NY,ME,VA
Chloromethane	CT,NH,NY,ME,VA
2-Chlorotoluene	CT,NH,NY,ME,VA
4-Chlorotoluene	CT,NH,NY,ME,VA
1,2-Dibromo-3-chloropropane (DBCP)	NY
Dibromomethane	NH,NY,ME,VA
1,2-Dichlorobenzene	CT,NH,NY,ME,VA
1,3-Dichlorobenzene	CT,NH,NY,ME,VA
1,4-Dichlorobenzene	CT,NH,NY,ME,VA
Dichlorodifluoromethane (Freon 12)	NY,ME,VA
1,1-Dichloroethane	CT,NH,NY,ME,VA
1,2-Dichloroethane	CT,NH,NY,ME,VA
1,1-Dichloroethylene	CT,NH,NY,ME,VA
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA
1,2-Dichloropropane	CT,NH,NY,ME,VA
1,3-Dichloropropane	NH,NY,ME,VA
2,2-Dichloropropane	NH,NY,ME,VA
1,1-Dichloropropene	NH,NY,ME,VA

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8260C-D in Soil</i>	
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA
Ethylbenzene	CT,NH,NY,ME,VA
Hexachlorobutadiene	NH,NY,ME,VA
2-Hexanone (MBK)	CT,NH,NY,ME,VA
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA
p-Isopropyltoluene (p-Cymene)	NH,NY
Methyl tert-Butyl Ether (MTBE)	NY,VA
Methylene Chloride	CT,NH,NY,ME,VA
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA
Naphthalene	NH,NY,ME,VA
n-Propylbenzene	NH,NY
Styrene	CT,NH,NY,ME,VA
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA
Tetrachloroethylene	CT,NH,NY,ME,VA
Toluene	CT,NH,NY,ME,VA
1,2,4-Trichlorobenzene	NH,NY,ME,VA
1,1,1-Trichloroethane	CT,NH,NY,ME,VA
1,1,2-Trichloroethane	CT,NH,NY,ME,VA
Trichloroethylene	CT,NH,NY,ME,VA
Trichlorofluoromethane (Freon 11)	CT,NH,NY,VA
1,2,3-Trichloropropane	NH,NY,ME,VA
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA
Vinyl Chloride	CT,NH,NY,ME,VA
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA

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The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2022
MA	Massachusetts DEP	M-MA100	06/30/2020
CT	Connecticut Department of Public Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2020
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2020
RI	Rhode Island Department of Health	LAO00112	12/30/2019
NC	North Carolina Div. of Water Quality	652	12/31/2020
NJ	New Jersey DEP	MA007 NELAP	06/30/2020
FL	Florida Department of Health	E871027 NELAP	06/30/2020
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2020
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2020
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2020
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2020
NC-DW	North Carolina Department of Health	25703	07/31/2020
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2020

I Have Not Confirmed Sample Container
Numbers With Lab Staff Before Relinquishing
Over Samples _____



con-test®
ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False
Statement will be brought to the attention of the Client - State True or False

Client WFC

Received By PLF Date 11/22/19 Time 1830

How were the samples received? In Cooler T No Cooler _____ On Ice T No Ice _____
Direct from Sampling _____ Ambient _____ Melted Ice _____

Were samples within Temperature? 2-6°C T By Gun # 2 Actual Temp - 47.2.8°C
By Blank # _____ Actual Temp - _____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all Client T Analysis T Sampler Name T
pertinent Information? Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? _____

Are there Rushes? F Who was notified? _____

Are there Short Holds? F Who was notified? _____

Is there enough Volume? T

Is there Headspace where applicable? NA

Proper Media/Containers Used? T MS/MSD? F

Were trip blanks received? T Is splitting samples required? F

Do all samples have the proper pH? _____ On COC? T Acid NA Base NA

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-	<u>30</u>	250 mL Amb.		250 mL Plastic		4oz Amb/Clear	<u>29</u>
Bisulfate-		Flashpoint		Col./Bacteria		2oz Amb/Clear	
DI-		Other Glass		Other Plastic		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

December 3, 2019

Jedd Steinglass
Woodard & Curran - Portland, ME
41 Hutchins Drive
Portland, ME 04102

Project Location: Portland, ME
Client Job Number:
Project Number: 0232069
Laboratory Work Order Number: 19K1418

Enclosed are results of analyses for samples received by the laboratory on November 22, 2019. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Meghan E. Kelley". The signature is written in a cursive, flowing style.

Meghan E. Kelley
Project Manager

Table of Contents

Sample Summary	3
Case Narrative	4
Sample Results	7
19K1418-01	7
19K1418-02	13
Sample Preparation Information	15
QC Data	16
Volatile Organic Compounds by GC/MS	16
B247184	16
Petroleum Hydrocarbons Analyses - EPH	21
B247075	21
B247252	23
Metals Analyses (Total)	26
B246978	26
B246997	26
Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)	27
B246930	27
Flag/Qualifier Summary	28
Certifications	29
Chain of Custody/Sample Receipt	33

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332Woodard & Curran - Portland, ME
41 Hutchins Drive
Portland, ME 04102
ATTN: Jedd Steinglass

REPORT DATE: 12/3/2019

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 0232069

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 19K1418

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Portland, ME

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
PZ-1	19K1418-01	Ground Water		MADEP-EPH-04-1.1 SW-846 6020B SW-846 7470A SW-846 8260C-D SW-846 9014	
Trip Blank	19K1418-02	Trip Blank Water		SW-846 8260C-D	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

MADEP-EPH-04-1.1**Qualifications:****L-04**

Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.

Analyte & Samples(s) Qualified:**n-Decane**

B247252-BLK1, B247252-BS1, B247252-BSD1

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:**n-Nonane**

B247252-BS1

S-19

Surrogate recovery is outside of control limits, matrix interference suspected. Reanalysis yielded similar surrogate non-conformance.

Analyte & Samples(s) Qualified:**Chlorooctadecane (COD)**

19K1418-01[PZ-1], 19K1418-01RE1[PZ-1]

o-Terphenyl (OTP)

19K1418-01[PZ-1], 19K1418-01RE1[PZ-1]

SW-846 6020B**Qualifications:****B**

Analyte is found in the associated laboratory blank as well as in the sample.

Analyte & Samples(s) Qualified:**Chromium**

B246997-BLK1

SW-846 8260C-D**Qualifications:****DL-01**

Elevated reporting limits for all volatile compounds due to foaming sample matrix.

Analyte & Samples(s) Qualified:

19K1418-01[PZ-1]

L-04

Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.

Analyte & Samples(s) Qualified:**1,2,3-Trichlorobenzene**

19K1418-01[PZ-1], 19K1418-02[Trip Blank], B247184-BLK1, B247184-BS1, B247184-BSD1

V-05

Continuing calibration verification (CCV) did not meet method specifications and was biased on the low side for this compound.

Analyte & Samples(s) Qualified:**1,1,2-Trichloro-1,2,2-trifluoroethane**

19K1418-01[PZ-1], 19K1418-02[Trip Blank], B247184-BLK1, B247184-BS1, B247184-BSD1, S043243-CCV1

1,2,3-Trichlorobenzene

19K1418-01[PZ-1], 19K1418-02[Trip Blank], B247184-BLK1, B247184-BS1, B247184-BSD1, S043243-CCV1

1,2,4-Trichlorobenzene

19K1418-01[PZ-1], 19K1418-02[Trip Blank], B247184-BLK1, B247184-BS1, B247184-BSD1, S043243-CCV1

Dichlorodifluoromethane (Freon 12)

19K1418-01[PZ-1], 19K1418-02[Trip Blank], B247184-BLK1, B247184-BS1, B247184-BSD1, S043243-CCV1

Methyl Cyclohexane

19K1418-01[PZ-1], 19K1418-02[Trip Blank], B247184-BLK1, B247184-BS1, B247184-BSD1, S043243-CCV1

Naphthalene

19K1418-01[PZ-1], 19K1418-02[Trip Blank], B247184-BLK1, B247184-BS1, B247184-BSD1, S043243-CCV1

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:**Bromomethane**

B247184-BS1, B247184-BSD1, S043243-CCV1

Chloromethane

B247184-BS1, B247184-BSD1, S043243-CCV1

MADEP-EPH-04-1.1

SPE cartridge contamination with non-petroleum compounds, if present, is verified by GC/MS in each method blank per extraction batch and excluded from C 11-C22 aromatic range fraction in all samples in the batch. No significant modifications were made to the method.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1418

Date Received: 11/22/2019

Field Sample #: PZ-1

Sampled: 11/22/2019 10:50

Sample ID: 19K1418-01

Sample Matrix: Ground Water

Sample Flags: DL-01

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	250	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Acrylonitrile	ND	25	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
tert-Amyl Methyl Ether (TAME)	ND	2.5	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Benzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Bromobenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Bromochloromethane	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Bromodichloromethane	ND	2.5	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Bromoform	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Bromomethane	ND	10	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
2-Butanone (MEK)	ND	100	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
tert-Butyl Alcohol (TBA)	ND	100	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
n-Butylbenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
sec-Butylbenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
tert-Butylbenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	2.5	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Carbon Disulfide	ND	25	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Carbon Tetrachloride	ND	25	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Chlorobenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Chlorodibromomethane	ND	2.5	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Chloroethane	ND	10	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Chloroform	ND	10	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Chloromethane	ND	10	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
2-Chlorotoluene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
4-Chlorotoluene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	25	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,2-Dibromoethane (EDB)	ND	2.5	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Dibromomethane	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,2-Dichlorobenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,3-Dichlorobenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,4-Dichlorobenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
trans-1,4-Dichloro-2-butene	ND	10	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Dichlorodifluoromethane (Freon 12)	ND	10	µg/L	5	V-05	SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,1-Dichloroethane	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,2-Dichloroethane	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,1-Dichloroethylene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
cis-1,2-Dichloroethylene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
trans-1,2-Dichloroethylene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,2-Dichloropropane	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,3-Dichloropropane	ND	2.5	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
2,2-Dichloropropane	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,1-Dichloropropene	ND	10	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
cis-1,3-Dichloropropene	ND	2.5	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
trans-1,3-Dichloropropene	ND	2.5	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Diethyl Ether	ND	10	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1418

Date Received: 11/22/2019

Field Sample #: PZ-1

Sampled: 11/22/2019 10:50

Sample ID: 19K1418-01

Sample Matrix: Ground Water

Sample Flags: DL-01

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	2.5	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,4-Dioxane	ND	250	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Ethylbenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Hexachlorobutadiene	ND	3.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
2-Hexanone (MBK)	ND	50	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Isopropylbenzene (Cumene)	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
p-Isopropyltoluene (p-Cymene)	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Methyl Acetate	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Methyl tert-Butyl Ether (MTBE)	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Methyl Cyclohexane	ND	5.0	µg/L	5	V-05	SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Methylene Chloride	ND	25	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
4-Methyl-2-pentanone (MIBK)	ND	50	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Naphthalene	ND	10	µg/L	5	V-05	SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
n-Propylbenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Styrene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,1,1,2-Tetrachloroethane	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,1,2,2-Tetrachloroethane	ND	2.5	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Tetrachloroethylene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Tetrahydrofuran	ND	50	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Toluene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,2,3-Trichlorobenzene	ND	25	µg/L	5	L-04, V-05	SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,2,4-Trichlorobenzene	ND	5.0	µg/L	5	V-05	SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,3,5-Trichlorobenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,1,1-Trichloroethane	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,1,2-Trichloroethane	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Trichloroethylene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Trichlorofluoromethane (Freon 11)	ND	10	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,2,3-Trichloropropane	ND	10	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	5.0	µg/L	5	V-05	SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,2,4-Trimethylbenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
1,3,5-Trimethylbenzene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Vinyl Chloride	ND	10	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
m+p Xylene	ND	10	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
o-Xylene	ND	5.0	µg/L	5		SW-846 8260C-D	11/27/19	11/27/19 21:31	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	102	70-130							
Toluene-d8	96.7	70-130							
4-Bromofluorobenzene	90.1	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1418

Date Received: 11/22/2019

Field Sample #: PZ-1

Sampled: 11/22/2019 10:50

Sample ID: 19K1418-01

Sample Matrix: Ground Water

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	250	100	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
C9-C18 Aliphatics	200	96	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
C19-C36 Aliphatics	1500	100	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
C19-C36 Aliphatics	770	96	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Unadjusted C11-C22 Aromatics	270	96	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Unadjusted C11-C22 Aromatics	420	100	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
C11-C22 Aromatics	420	100	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
C11-C22 Aromatics	270	96	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Acenaphthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Acenaphthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Acenaphthylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Acenaphthylene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Benzo(a)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Benzo(a)anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Benzo(a)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Benzo(a)pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Benzo(b)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Benzo(b)fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Benzo(g,h,i)perylene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Benzo(g,h,i)perylene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Benzo(k)fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Benzo(k)fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Chrysene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Chrysene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Dibenz(a,h)anthracene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Dibenz(a,h)anthracene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Fluoranthene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Fluoranthene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Fluorene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Fluorene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Indeno(1,2,3-cd)pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
2-Methylnaphthalene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
2-Methylnaphthalene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Naphthalene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Naphthalene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Phenanthrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Phenanthrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Pyrene	ND	1.9	µg/L	1		MADEP-EPH-04-1.1	11/26/19	12/2/19 15:09	RMW
Pyrene	ND	2.0	µg/L	1		MADEP-EPH-04-1.1	11/27/19	12/1/19 21:40	RMW
Surrogates	% Recovery		Recovery Limits		Flag/Qual				
Chlorooctadecane (COD)	18.0	*	40-140		S-19		12/1/19 21:40		

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1418

Date Received: 11/22/2019

Field Sample #: PZ-1

Sampled: 11/22/2019 10:50

Sample ID: 19K1418-01

Sample Matrix: Ground Water

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Surrogates	% Recovery		Recovery Limits		Flag/Qual				
Chlorooctadecane (COD)	14.9	*	40-140		S-19		12/2/19	15:09	
o-Terphenyl (OTP)	24.7	*	40-140		S-19		12/2/19	15:09	
o-Terphenyl (OTP)	27.8	*	40-140		S-19		12/1/19	21:40	
2-Bromonaphthalene	94.9		40-140				12/1/19	21:40	
2-Bromonaphthalene	98.0		40-140				12/2/19	15:09	
2-Fluorobiphenyl	97.6		40-140				12/1/19	21:40	
2-Fluorobiphenyl	100		40-140				12/2/19	15:09	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1418

Date Received: 11/22/2019

Field Sample #: PZ-1

Sampled: 11/22/2019 10:50

Sample ID: 19K1418-01

Sample Matrix: Ground Water

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	210	4.0	µg/L	5		SW-846 6020B	11/25/19	11/26/19 12:13	QNW
Barium	2700	50	µg/L	5		SW-846 6020B	11/25/19	11/26/19 12:13	QNW
Cadmium	11	1.0	µg/L	5		SW-846 6020B	11/25/19	11/26/19 12:13	QNW
Chromium	1400	5.0	µg/L	5		SW-846 6020B	11/25/19	11/26/19 12:13	QNW
Copper	940	5.0	µg/L	5		SW-846 6020B	11/25/19	11/26/19 12:13	QNW
Lead	1200	2.5	µg/L	5		SW-846 6020B	11/25/19	11/26/19 12:13	QNW
Mercury	0.0041	0.00010	mg/L	1		SW-846 7470A	11/25/19	11/26/19 10:06	CJV
Nickel	870	25	µg/L	5		SW-846 6020B	11/25/19	11/26/19 12:13	QNW
Selenium	38	25	µg/L	5		SW-846 6020B	11/25/19	11/26/19 12:13	QNW
Silver	12	1.0	µg/L	5		SW-846 6020B	11/25/19	11/26/19 12:13	QNW
Zinc	3500	50	µg/L	5		SW-846 6020B	11/25/19	11/26/19 12:13	QNW

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1418

Date Received: 11/22/2019

Sampled: 11/22/2019 10:50

Field Sample #: PZ-1

Sample ID: 19K1418-01

Sample Matrix: Ground Water

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Cyanide	ND	0.010	mg/L	1		SW-846 9014	11/25/19	11/26/19 11:30	DJM

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1418

Date Received: 11/22/2019

Field Sample #: Trip Blank

Sampled: 11/22/2019 00:00

Sample ID: 19K1418-02

Sample Matrix: Trip Blank Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Acrylonitrile	ND	5.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Benzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Bromobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Bromochloromethane	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Bromodichloromethane	ND	0.50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Bromoform	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Bromomethane	ND	2.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
2-Butanone (MEK)	ND	20	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
tert-Butyl Alcohol (TBA)	ND	20	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
n-Butylbenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
sec-Butylbenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
tert-Butylbenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Carbon Disulfide	ND	5.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Carbon Tetrachloride	ND	5.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Chlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Chlorodibromomethane	ND	0.50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Chloroethane	ND	2.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Chloroform	ND	2.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Chloromethane	ND	2.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
2-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
4-Chlorotoluene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,2-Dibromoethane (EDB)	ND	0.50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Dibromomethane	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,2-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,3-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,4-Dichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
trans-1,4-Dichloro-2-butene	ND	2.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L	1	V-05	SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,1-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,2-Dichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,1-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
cis-1,2-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
trans-1,2-Dichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,3-Dichloropropane	ND	0.50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
2,2-Dichloropropane	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,1-Dichloropropene	ND	2.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
cis-1,3-Dichloropropene	ND	0.50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
trans-1,3-Dichloropropene	ND	0.50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Diethyl Ether	ND	2.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1418

Date Received: 11/22/2019

Field Sample #: Trip Blank

Sampled: 11/22/2019 00:00

Sample ID: 19K1418-02

Sample Matrix: Trip Blank Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,4-Dioxane	ND	50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Ethylbenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Hexachlorobutadiene	ND	0.60	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
2-Hexanone (MBK)	ND	10	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Isopropylbenzene (Cumene)	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
p-Isopropyltoluene (p-Cymene)	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Methyl Acetate	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Methyl tert-Butyl Ether (MTBE)	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Methyl Cyclohexane	ND	1.0	µg/L	1	V-05	SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Methylene Chloride	ND	5.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
4-Methyl-2-pentanone (MIBK)	ND	10	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Naphthalene	ND	2.0	µg/L	1	V-05	SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
n-Propylbenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Styrene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Tetrachloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Tetrahydrofuran	ND	10	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Toluene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,2,3-Trichlorobenzene	ND	5.0	µg/L	1	L-04, V-05	SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,2,4-Trichlorobenzene	ND	1.0	µg/L	1	V-05	SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,3,5-Trichlorobenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,1,1-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,1,2-Trichloroethane	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Trichloroethylene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,2,3-Trichloropropane	ND	2.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	1.0	µg/L	1	V-05	SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,2,4-Trimethylbenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
1,3,5-Trimethylbenzene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Vinyl Chloride	ND	2.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
m+p Xylene	ND	2.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
o-Xylene	ND	1.0	µg/L	1		SW-846 8260C-D	11/27/19	11/27/19 13:35	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	103	70-130							
Toluene-d8	98.0	70-130							
4-Bromofluorobenzene	89.2	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data**Prep Method: SW-846 3510C-MADEP-EPH-04-1.1**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19K1418-01 [PZ-1]	B247075	1040	2.00	11/26/19

Prep Method: SW-846 3510C-MADEP-EPH-04-1.1

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19K1418-01RE1 [PZ-1]	B247252	1000	2.00	11/27/19

Prep Method: SW-846 3005A-SW-846 6020B

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19K1418-01 [PZ-1]	B246997	50.0	50.0	11/25/19

Prep Method: SW-846 7470A Prep-SW-846 7470A

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19K1418-01 [PZ-1]	B246978	6.00	6.00	11/25/19

Prep Method: SW-846 5030B-SW-846 8260C-D

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19K1418-01 [PZ-1]	B247184	1	5.00	11/27/19
19K1418-02 [Trip Blank]	B247184	5	5.00	11/27/19

SW-846 9014

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
19K1418-01 [PZ-1]	B246930	50.0	50.0	11/25/19

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247184 - SW-846 5030B										
Blank (B247184-BLK1)				Prepared & Analyzed: 11/27/19						
Acetone	ND	50	µg/L							
Acrylonitrile	ND	5.0	µg/L							
tert-Amyl Methyl Ether (TAME)	ND	0.50	µg/L							
Benzene	ND	1.0	µg/L							
Bromobenzene	ND	1.0	µg/L							
Bromochloromethane	ND	1.0	µg/L							
Bromodichloromethane	ND	0.50	µg/L							
Bromoform	ND	1.0	µg/L							
Bromomethane	ND	2.0	µg/L							
2-Butanone (MEK)	ND	20	µg/L							
tert-Butyl Alcohol (TBA)	ND	20	µg/L							
n-Butylbenzene	ND	1.0	µg/L							
sec-Butylbenzene	ND	1.0	µg/L							
tert-Butylbenzene	ND	1.0	µg/L							
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	µg/L							
Carbon Disulfide	ND	5.0	µg/L							
Carbon Tetrachloride	ND	5.0	µg/L							
Chlorobenzene	ND	1.0	µg/L							
Chlorodibromomethane	ND	0.50	µg/L							
Chloroethane	ND	2.0	µg/L							
Chloroform	ND	2.0	µg/L							
Chloromethane	ND	2.0	µg/L							
2-Chlorotoluene	ND	1.0	µg/L							
4-Chlorotoluene	ND	1.0	µg/L							
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	µg/L							
1,2-Dibromoethane (EDB)	ND	0.50	µg/L							
Dibromomethane	ND	1.0	µg/L							
1,2-Dichlorobenzene	ND	1.0	µg/L							
1,3-Dichlorobenzene	ND	1.0	µg/L							
1,4-Dichlorobenzene	ND	1.0	µg/L							
trans-1,4-Dichloro-2-butene	ND	2.0	µg/L							
Dichlorodifluoromethane (Freon 12)	ND	2.0	µg/L							V-05
1,1-Dichloroethane	ND	1.0	µg/L							
1,2-Dichloroethane	ND	1.0	µg/L							
1,1-Dichloroethylene	ND	1.0	µg/L							
cis-1,2-Dichloroethylene	ND	1.0	µg/L							
trans-1,2-Dichloroethylene	ND	1.0	µg/L							
1,2-Dichloropropane	ND	1.0	µg/L							
1,3-Dichloropropane	ND	0.50	µg/L							
2,2-Dichloropropane	ND	1.0	µg/L							
1,1-Dichloropropene	ND	2.0	µg/L							
cis-1,3-Dichloropropene	ND	0.50	µg/L							
trans-1,3-Dichloropropene	ND	0.50	µg/L							
Diethyl Ether	ND	2.0	µg/L							
Diisopropyl Ether (DIPE)	ND	0.50	µg/L							
1,4-Dioxane	ND	50	µg/L							
Ethylbenzene	ND	1.0	µg/L							
Hexachlorobutadiene	ND	0.60	µg/L							
2-Hexanone (MBK)	ND	10	µg/L							
Isopropylbenzene (Cumene)	ND	1.0	µg/L							
p-Isopropyltoluene (p-Cymene)	ND	1.0	µg/L							
Methyl Acetate	ND	1.0	µg/L							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247184 - SW-846 5030B										
Blank (B247184-BLK1)										
Prepared & Analyzed: 11/27/19										
Methyl tert-Butyl Ether (MTBE)	ND	1.0	µg/L							
Methyl Cyclohexane	ND	1.0	µg/L							V-05
Methylene Chloride	ND	5.0	µg/L							
4-Methyl-2-pentanone (MIBK)	ND	10	µg/L							
Naphthalene	ND	2.0	µg/L							V-05
n-Propylbenzene	ND	1.0	µg/L							
Styrene	ND	1.0	µg/L							
1,1,1,2-Tetrachloroethane	ND	1.0	µg/L							
1,1,2,2-Tetrachloroethane	ND	0.50	µg/L							
Tetrachloroethylene	ND	1.0	µg/L							
Tetrahydrofuran	ND	10	µg/L							
Toluene	ND	1.0	µg/L							
1,2,3-Trichlorobenzene	ND	5.0	µg/L							L-04, V-05
1,2,4-Trichlorobenzene	ND	1.0	µg/L							V-05
1,3,5-Trichlorobenzene	ND	1.0	µg/L							
1,1,1-Trichloroethane	ND	1.0	µg/L							
1,1,2-Trichloroethane	ND	1.0	µg/L							
Trichloroethylene	ND	1.0	µg/L							
Trichlorofluoromethane (Freon 11)	ND	2.0	µg/L							
1,2,3-Trichloropropane	ND	2.0	µg/L							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	1.0	µg/L							V-05
1,2,4-Trimethylbenzene	ND	1.0	µg/L							
1,3,5-Trimethylbenzene	ND	1.0	µg/L							
Vinyl Chloride	ND	2.0	µg/L							
m+p Xylene	ND	2.0	µg/L							
o-Xylene	ND	1.0	µg/L							
Surrogate: 1,2-Dichloroethane-d4	25.6		µg/L	25.0		103	70-130			
Surrogate: Toluene-d8	24.0		µg/L	25.0		95.9	70-130			
Surrogate: 4-Bromofluorobenzene	22.2		µg/L	25.0		88.8	70-130			
LCS (B247184-BS1)										
Prepared & Analyzed: 11/27/19										
Acetone	107	50	µg/L	100		107	70-160			†
Acrylonitrile	8.99	5.0	µg/L	10.0		89.9	70-130			
tert-Amyl Methyl Ether (TAME)	7.98	0.50	µg/L	10.0		79.8	70-130			
Benzene	10.4	1.0	µg/L	10.0		104	70-130			
Bromobenzene	10.1	1.0	µg/L	10.0		101	70-130			
Bromochloromethane	11.2	1.0	µg/L	10.0		112	70-130			
Bromodichloromethane	10.7	0.50	µg/L	10.0		107	70-130			
Bromoform	9.56	1.0	µg/L	10.0		95.6	70-130			
Bromomethane	9.51	2.0	µg/L	10.0		95.1	40-160			V-20 †
2-Butanone (MEK)	95.9	20	µg/L	100		95.9	40-160			†
tert-Butyl Alcohol (TBA)	86.7	20	µg/L	100		86.7	40-160			†
n-Butylbenzene	9.00	1.0	µg/L	10.0		90.0	70-130			
sec-Butylbenzene	10.3	1.0	µg/L	10.0		103	70-130			
tert-Butylbenzene	10.5	1.0	µg/L	10.0		105	70-130			
tert-Butyl Ethyl Ether (TBEE)	8.19	0.50	µg/L	10.0		81.9	70-130			
Carbon Disulfide	11.4	5.0	µg/L	10.0		114	70-130			
Carbon Tetrachloride	9.64	5.0	µg/L	10.0		96.4	70-130			
Chlorobenzene	11.0	1.0	µg/L	10.0		110	70-130			
Chlorodibromomethane	10.2	0.50	µg/L	10.0		102	70-130			
Chloroethane	10.2	2.0	µg/L	10.0		102	70-130			
Chloroform	11.0	2.0	µg/L	10.0		110	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247184 - SW-846 5030B										
LCS (B247184-BS1)				Prepared & Analyzed: 11/27/19						
Chloromethane	9.31	2.0	µg/L	10.0		93.1	40-160			V-20 †
2-Chlorotoluene	10.3	1.0	µg/L	10.0		103	70-130			
4-Chlorotoluene	10.0	1.0	µg/L	10.0		100	70-130			
1,2-Dibromo-3-chloropropane (DBCP)	8.70	5.0	µg/L	10.0		87.0	70-130			
1,2-Dibromoethane (EDB)	10.7	0.50	µg/L	10.0		107	70-130			
Dibromomethane	10.6	1.0	µg/L	10.0		106	70-130			
1,2-Dichlorobenzene	11.0	1.0	µg/L	10.0		110	70-130			
1,3-Dichlorobenzene	11.7	1.0	µg/L	10.0		117	70-130			
1,4-Dichlorobenzene	10.9	1.0	µg/L	10.0		109	70-130			
trans-1,4-Dichloro-2-butene	8.52	2.0	µg/L	10.0		85.2	70-130			
Dichlorodifluoromethane (Freon 12)	6.84	2.0	µg/L	10.0		68.4	40-160			V-05 †
1,1-Dichloroethane	11.1	1.0	µg/L	10.0		111	70-130			
1,2-Dichloroethane	11.0	1.0	µg/L	10.0		110	70-130			
1,1-Dichloroethylene	9.75	1.0	µg/L	10.0		97.5	70-130			
cis-1,2-Dichloroethylene	11.1	1.0	µg/L	10.0		111	70-130			
trans-1,2-Dichloroethylene	10.3	1.0	µg/L	10.0		103	70-130			
1,2-Dichloropropane	10.9	1.0	µg/L	10.0		109	70-130			
1,3-Dichloropropane	10.1	0.50	µg/L	10.0		101	70-130			
2,2-Dichloropropane	10.0	1.0	µg/L	10.0		100	40-130			†
1,1-Dichloropropene	9.50	2.0	µg/L	10.0		95.0	70-130			
cis-1,3-Dichloropropene	10.1	0.50	µg/L	10.0		101	70-130			
trans-1,3-Dichloropropene	9.65	0.50	µg/L	10.0		96.5	70-130			
Diethyl Ether	10.8	2.0	µg/L	10.0		108	70-130			
Diisopropyl Ether (DIPE)	10.7	0.50	µg/L	10.0		107	70-130			
1,4-Dioxane	82.2	50	µg/L	100		82.2	40-130			†
Ethylbenzene	10.4	1.0	µg/L	10.0		104	70-130			
Hexachlorobutadiene	8.78	0.60	µg/L	10.0		87.8	70-130			
2-Hexanone (MBK)	86.0	10	µg/L	100		86.0	70-160			†
Isopropylbenzene (Cumene)	9.97	1.0	µg/L	10.0		99.7	70-130			
p-Isopropyltoluene (p-Cymene)	10.0	1.0	µg/L	10.0		100	70-130			
Methyl Acetate	9.31	1.0	µg/L	10.0		93.1	70-130			
Methyl tert-Butyl Ether (MTBE)	10.3	1.0	µg/L	10.0		103	70-130			
Methyl Cyclohexane	8.01	1.0	µg/L	10.0		80.1	70-130			V-05
Methylene Chloride	11.2	5.0	µg/L	10.0		112	70-130			
4-Methyl-2-pentanone (MIBK)	89.4	10	µg/L	100		89.4	70-160			†
Naphthalene	6.04	2.0	µg/L	10.0		60.4	40-130			V-05 †
n-Propylbenzene	9.80	1.0	µg/L	10.0		98.0	70-130			
Styrene	9.91	1.0	µg/L	10.0		99.1	70-130			
1,1,1,2-Tetrachloroethane	11.3	1.0	µg/L	10.0		113	70-130			
1,1,2,2-Tetrachloroethane	11.0	0.50	µg/L	10.0		110	70-130			
Tetrachloroethylene	10.1	1.0	µg/L	10.0		101	70-130			
Tetrahydrofuran	9.50	10	µg/L	10.0		95.0	70-130			
Toluene	10.3	1.0	µg/L	10.0		103	70-130			
1,2,3-Trichlorobenzene	6.65	5.0	µg/L	10.0		66.5	* 70-130			L-04, V-05
1,2,4-Trichlorobenzene	7.09	1.0	µg/L	10.0		70.9	70-130			V-05
1,3,5-Trichlorobenzene	8.38	1.0	µg/L	10.0		83.8	70-130			
1,1,1-Trichloroethane	9.98	1.0	µg/L	10.0		99.8	70-130			
1,1,2-Trichloroethane	10.9	1.0	µg/L	10.0		109	70-130			
Trichloroethylene	10.7	1.0	µg/L	10.0		107	70-130			
Trichlorofluoromethane (Freon 11)	7.57	2.0	µg/L	10.0		75.7	70-130			
1,2,3-Trichloropropane	9.51	2.0	µg/L	10.0		95.1	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247184 - SW-846 5030B										
LCS (B247184-BS1)				Prepared & Analyzed: 11/27/19						
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	8.36	1.0	µg/L	10.0		83.6	70-130			V-05
1,2,4-Trimethylbenzene	10.4	1.0	µg/L	10.0		104	70-130			
1,3,5-Trimethylbenzene	9.39	1.0	µg/L	10.0		93.9	70-130			
Vinyl Chloride	8.55	2.0	µg/L	10.0		85.5	40-160			†
m+p Xylene	20.6	2.0	µg/L	20.0		103	70-130			
o-Xylene	10.6	1.0	µg/L	10.0		106	70-130			
Surrogate: 1,2-Dichloroethane-d4	25.4		µg/L	25.0		101	70-130			
Surrogate: Toluene-d8	24.9		µg/L	25.0		99.6	70-130			
Surrogate: 4-Bromofluorobenzene	23.6		µg/L	25.0		94.3	70-130			
LCS Dup (B247184-BSD1)				Prepared & Analyzed: 11/27/19						
Acetone	101	50	µg/L	100		101	70-160	6.10	25	†
Acrylonitrile	8.88	5.0	µg/L	10.0		88.8	70-130	1.23	25	
tert-Amyl Methyl Ether (TAME)	7.92	0.50	µg/L	10.0		79.2	70-130	0.755	25	
Benzene	10.6	1.0	µg/L	10.0		106	70-130	2.09	25	
Bromobenzene	10.6	1.0	µg/L	10.0		106	70-130	3.96	25	
Bromochloromethane	11.6	1.0	µg/L	10.0		116	70-130	3.07	25	
Bromodichloromethane	10.7	0.50	µg/L	10.0		107	70-130	0.187	25	
Bromoform	10.0	1.0	µg/L	10.0		100	70-130	4.60	25	
Bromomethane	10.3	2.0	µg/L	10.0		103	40-160	8.07	25	V-20 †
2-Butanone (MEK)	91.7	20	µg/L	100		91.7	40-160	4.47	25	†
tert-Butyl Alcohol (TBA)	84.0	20	µg/L	100		84.0	40-160	3.19	25	†
n-Butylbenzene	9.31	1.0	µg/L	10.0		93.1	70-130	3.39	25	
sec-Butylbenzene	10.5	1.0	µg/L	10.0		105	70-130	2.12	25	
tert-Butylbenzene	10.7	1.0	µg/L	10.0		107	70-130	1.98	25	
tert-Butyl Ethyl Ether (TBEE)	8.49	0.50	µg/L	10.0		84.9	70-130	3.60	25	
Carbon Disulfide	10.6	5.0	µg/L	10.0		106	70-130	6.92	25	
Carbon Tetrachloride	9.82	5.0	µg/L	10.0		98.2	70-130	1.85	25	
Chlorobenzene	11.3	1.0	µg/L	10.0		113	70-130	2.77	25	
Chlorodibromomethane	10.4	0.50	µg/L	10.0		104	70-130	1.85	25	
Chloroethane	10.2	2.0	µg/L	10.0		102	70-130	0.0977	25	
Chloroform	11.1	2.0	µg/L	10.0		111	70-130	1.00	25	
Chloromethane	9.84	2.0	µg/L	10.0		98.4	40-160	5.54	25	V-20 †
2-Chlorotoluene	10.8	1.0	µg/L	10.0		108	70-130	4.94	25	
4-Chlorotoluene	10.6	1.0	µg/L	10.0		106	70-130	5.25	25	
1,2-Dibromo-3-chloropropane (DBCP)	8.77	5.0	µg/L	10.0		87.7	70-130	0.801	25	
1,2-Dibromoethane (EDB)	10.6	0.50	µg/L	10.0		106	70-130	0.942	25	
Dibromomethane	10.5	1.0	µg/L	10.0		105	70-130	1.42	25	
1,2-Dichlorobenzene	11.2	1.0	µg/L	10.0		112	70-130	2.07	25	
1,3-Dichlorobenzene	11.7	1.0	µg/L	10.0		117	70-130	0.341	25	
1,4-Dichlorobenzene	11.2	1.0	µg/L	10.0		112	70-130	2.81	25	
trans-1,4-Dichloro-2-butene	8.77	2.0	µg/L	10.0		87.7	70-130	2.89	25	
Dichlorodifluoromethane (Freon 12)	7.06	2.0	µg/L	10.0		70.6	40-160	3.17	25	V-05 †
1,1-Dichloroethane	11.5	1.0	µg/L	10.0		115	70-130	3.63	25	
1,2-Dichloroethane	11.1	1.0	µg/L	10.0		111	70-130	1.18	25	
1,1-Dichloroethylene	9.73	1.0	µg/L	10.0		97.3	70-130	0.205	25	
cis-1,2-Dichloroethylene	11.3	1.0	µg/L	10.0		113	70-130	1.70	25	
trans-1,2-Dichloroethylene	10.5	1.0	µg/L	10.0		105	70-130	1.82	25	
1,2-Dichloropropane	11.2	1.0	µg/L	10.0		112	70-130	2.08	25	
1,3-Dichloropropane	10.4	0.50	µg/L	10.0		104	70-130	2.54	25	
2,2-Dichloropropane	9.92	1.0	µg/L	10.0		99.2	40-130	1.30	25	†
1,1-Dichloropropene	9.98	2.0	µg/L	10.0		99.8	70-130	4.93	25	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247184 - SW-846 5030B										
LCS Dup (B247184-BSD1)				Prepared & Analyzed: 11/27/19						
cis-1,3-Dichloropropene	10.0	0.50	µg/L	10.0		100	70-130	0.199	25	
trans-1,3-Dichloropropene	10.0	0.50	µg/L	10.0		100	70-130	3.76	25	
Diethyl Ether	10.7	2.0	µg/L	10.0		107	70-130	1.77	25	
Diisopropyl Ether (DIPE)	10.8	0.50	µg/L	10.0		108	70-130	0.465	25	
1,4-Dioxane	84.6	50	µg/L	100		84.6	40-130	2.92	50	† ‡
Ethylbenzene	10.7	1.0	µg/L	10.0		107	70-130	3.14	25	
Hexachlorobutadiene	9.24	0.60	µg/L	10.0		92.4	70-130	5.11	25	
2-Hexanone (MBK)	84.4	10	µg/L	100		84.4	70-160	1.92	25	†
Isopropylbenzene (Cumene)	10.4	1.0	µg/L	10.0		104	70-130	4.13	25	
p-Isopropyltoluene (p-Cymene)	9.94	1.0	µg/L	10.0		99.4	70-130	0.901	25	
Methyl Acetate	8.85	1.0	µg/L	10.0		88.5	70-130	5.07	25	
Methyl tert-Butyl Ether (MTBE)	10.3	1.0	µg/L	10.0		103	70-130	0.486	25	
Methyl Cyclohexane	8.18	1.0	µg/L	10.0		81.8	70-130	2.10	25	V-05
Methylene Chloride	10.7	5.0	µg/L	10.0		107	70-130	4.67	25	
4-Methyl-2-pentanone (MIBK)	85.6	10	µg/L	100		85.6	70-160	4.38	25	†
Naphthalene	6.28	2.0	µg/L	10.0		62.8	40-130	3.90	25	V-05 †
n-Propylbenzene	9.95	1.0	µg/L	10.0		99.5	70-130	1.52	25	
Styrene	10.3	1.0	µg/L	10.0		103	70-130	3.96	25	
1,1,1,2-Tetrachloroethane	11.6	1.0	µg/L	10.0		116	70-130	2.79	25	
1,1,2,2-Tetrachloroethane	10.8	0.50	µg/L	10.0		108	70-130	2.39	25	
Tetrachloroethylene	10.5	1.0	µg/L	10.0		105	70-130	3.99	25	
Tetrahydrofuran	9.77	10	µg/L	10.0		97.7	70-130	2.80	25	
Toluene	10.6	1.0	µg/L	10.0		106	70-130	2.20	25	
1,2,3-Trichlorobenzene	6.55	5.0	µg/L	10.0		65.5 *	70-130	1.52	25	L-04, V-05
1,2,4-Trichlorobenzene	7.02	1.0	µg/L	10.0		70.2	70-130	0.992	25	V-05
1,3,5-Trichlorobenzene	8.46	1.0	µg/L	10.0		84.6	70-130	0.950	25	
1,1,1-Trichloroethane	10.1	1.0	µg/L	10.0		101	70-130	1.49	25	
1,1,2-Trichloroethane	11.0	1.0	µg/L	10.0		110	70-130	1.19	25	
Trichloroethylene	10.8	1.0	µg/L	10.0		108	70-130	1.77	25	
Trichlorofluoromethane (Freon 11)	7.71	2.0	µg/L	10.0		77.1	70-130	1.83	25	
1,2,3-Trichloropropane	9.51	2.0	µg/L	10.0		95.1	70-130	0.00	25	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	8.41	1.0	µg/L	10.0		84.1	70-130	0.596	25	V-05
1,2,4-Trimethylbenzene	10.8	1.0	µg/L	10.0		108	70-130	3.58	25	
1,3,5-Trimethylbenzene	10.1	1.0	µg/L	10.0		101	70-130	6.89	25	
Vinyl Chloride	9.05	2.0	µg/L	10.0		90.5	40-160	5.68	25	†
m+p Xylene	21.1	2.0	µg/L	20.0		105	70-130	2.35	25	
o-Xylene	11.3	1.0	µg/L	10.0		113	70-130	6.78	25	
Surrogate: 1,2-Dichloroethane-d4	25.2		µg/L	25.0		101	70-130			
Surrogate: Toluene-d8	24.7		µg/L	25.0		99.0	70-130			
Surrogate: 4-Bromofluorobenzene	24.2		µg/L	25.0		96.9	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B247075 - SW-846 3510C
Blank (B247075-BLK1)

Prepared: 11/26/19 Analyzed: 11/27/19

C9-C18 Aliphatics	ND	100	µg/L							
C19-C36 Aliphatics	ND	100	µg/L							
Unadjusted C11-C22 Aromatics	ND	100	µg/L							
C11-C22 Aromatics	ND	100	µg/L							
Acenaphthene	ND	2.0	µg/L							
Acenaphthylene	ND	2.0	µg/L							
Anthracene	ND	2.0	µg/L							
Benzo(a)anthracene	ND	2.0	µg/L							
Benzo(a)pyrene	ND	2.0	µg/L							
Benzo(b)fluoranthene	ND	2.0	µg/L							
Benzo(g,h,i)perylene	ND	2.0	µg/L							
Benzo(k)fluoranthene	ND	2.0	µg/L							
Chrysene	ND	2.0	µg/L							
Dibenz(a,h)anthracene	ND	2.0	µg/L							
Fluoranthene	ND	2.0	µg/L							
Fluorene	ND	2.0	µg/L							
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L							
2-Methylnaphthalene	ND	2.0	µg/L							
Naphthalene	ND	2.0	µg/L							
Phenanthrene	ND	2.0	µg/L							
Pyrene	ND	2.0	µg/L							
n-Decane	ND	10	µg/L							
n-Docosane	ND	10	µg/L							
n-Dodecane	ND	10	µg/L							
n-Eicosane	ND	10	µg/L							
n-Hexacosane	ND	10	µg/L							
n-Hexadecane	ND	10	µg/L							
n-Hexatriacontane	ND	10	µg/L							
n-Nonadecane	ND	10	µg/L							
n-Nonane	ND	10	µg/L							
n-Octacosane	ND	10	µg/L							
n-Octadecane	ND	10	µg/L							
n-Tetracosane	ND	10	µg/L							
n-Tetradecane	ND	10	µg/L							
n-Triacontane	ND	10	µg/L							
Naphthalene-aliphatic fraction	ND	2.0	µg/L							
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L							
Surrogate: Chlorooctadecane (COD)	81.4		µg/L	100		81.4	40-140			
Surrogate: o-Terphenyl (OTP)	75.5		µg/L	100		75.5	40-140			
Surrogate: 2-Bromonaphthalene	84.5		µg/L	100		84.5	40-140			
Surrogate: 2-Fluorobiphenyl	102		µg/L	100		102	40-140			

LCS (B247075-BS1)

Prepared: 11/26/19 Analyzed: 12/01/19

C9-C18 Aliphatics	414	100	µg/L	600		69.0	0-200			
C19-C36 Aliphatics	708	100	µg/L	800		88.5	0-200			
Unadjusted C11-C22 Aromatics	1310	100	µg/L	1700		76.9	0-200			
Acenaphthene	68.7	2.0	µg/L	100		68.7	40-140			
Acenaphthylene	63.5	2.0	µg/L	100		63.5	40-140			
Anthracene	74.1	2.0	µg/L	100		74.1	40-140			
Benzo(a)anthracene	77.6	2.0	µg/L	100		77.6	40-140			
Benzo(a)pyrene	75.3	2.0	µg/L	100		75.3	40-140			
Benzo(b)fluoranthene	77.0	2.0	µg/L	100		77.0	40-140			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B247075 - SW-846 3510C
LCS (B247075-BS1)

Prepared: 11/26/19 Analyzed: 12/01/19

Benzo(g,h,i)perylene	75.3	2.0	µg/L	100		75.3	40-140			
Benzo(k)fluoranthene	76.0	2.0	µg/L	100		76.0	40-140			
Chrysene	79.2	2.0	µg/L	100		79.2	40-140			
Dibenz(a,h)anthracene	77.5	2.0	µg/L	100		77.5	40-140			
Fluoranthene	76.8	2.0	µg/L	100		76.8	40-140			
Fluorene	71.1	2.0	µg/L	100		71.1	40-140			
Indeno(1,2,3-cd)pyrene	73.8	2.0	µg/L	100		73.8	40-140			
2-Methylnaphthalene	61.9	2.0	µg/L	100		61.9	40-140			
Naphthalene	57.9	2.0	µg/L	100		57.9	40-140			
Phenanthrene	75.7	2.0	µg/L	100		75.7	40-140			
Pyrene	78.7	2.0	µg/L	100		78.7	40-140			
n-Decane	50.3	10	µg/L	100		50.3	40-140			
n-Docosane	80.2	10	µg/L	100		80.2	40-140			
n-Dodecane	58.9	10	µg/L	100		58.9	40-140			
n-Eicosane	79.8	10	µg/L	100		79.8	40-140			
n-Hexacosane	82.6	10	µg/L	100		82.6	40-140			
n-Hexadecane	74.4	10	µg/L	100		74.4	40-140			
n-Hexatriacontane	74.2	10	µg/L	100		74.2	40-140			
n-Nonadecane	78.7	10	µg/L	100		78.7	40-140			
n-Nonane	39.1	10	µg/L	100		39.1	30-140			
n-Octacosane	81.3	10	µg/L	100		81.3	40-140			
n-Octadecane	78.6	10	µg/L	100		78.6	40-140			
n-Tetracosane	81.3	10	µg/L	100		81.3	40-140			
n-Tetradecane	69.0	10	µg/L	100		69.0	40-140			
n-Triacontane	82.9	10	µg/L	100		82.9	40-140			
Naphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
Surrogate: Chlorooctadecane (COD)	74.4		µg/L	100		74.4	40-140			
Surrogate: o-Terphenyl (OTP)	75.0		µg/L	100		75.0	40-140			
Surrogate: 2-Bromonaphthalene	91.4		µg/L	100		91.4	40-140			
Surrogate: 2-Fluorobiphenyl	93.6		µg/L	100		93.6	40-140			

LCS Dup (B247075-BS1)

Prepared: 11/26/19 Analyzed: 12/01/19

C9-C18 Aliphatics	376	100	µg/L	600		62.7	0-200	9.60		
C19-C36 Aliphatics	635	100	µg/L	800		79.3	0-200	10.9		
Unadjusted C11-C22 Aromatics	1210	100	µg/L	1700		71.3	0-200	7.47		
Acenaphthene	62.7	2.0	µg/L	100		62.7	40-140	9.09	25	
Acenaphthylene	58.2	2.0	µg/L	100		58.2	40-140	8.87	25	
Anthracene	67.2	2.0	µg/L	100		67.2	40-140	9.69	25	
Benzo(a)anthracene	70.9	2.0	µg/L	100		70.9	40-140	9.04	25	
Benzo(a)pyrene	69.0	2.0	µg/L	100		69.0	40-140	8.75	25	
Benzo(b)fluoranthene	70.2	2.0	µg/L	100		70.2	40-140	9.25	25	
Benzo(g,h,i)perylene	69.0	2.0	µg/L	100		69.0	40-140	8.61	25	
Benzo(k)fluoranthene	69.9	2.0	µg/L	100		69.9	40-140	8.44	25	
Chrysene	72.4	2.0	µg/L	100		72.4	40-140	8.98	25	
Dibenz(a,h)anthracene	71.1	2.0	µg/L	100		71.1	40-140	8.53	25	
Fluoranthene	70.2	2.0	µg/L	100		70.2	40-140	9.02	25	
Fluorene	64.0	2.0	µg/L	100		64.0	40-140	10.4	25	
Indeno(1,2,3-cd)pyrene	68.2	2.0	µg/L	100		68.2	40-140	8.00	25	
2-Methylnaphthalene	57.6	2.0	µg/L	100		57.6	40-140	7.13	25	
Naphthalene	55.1	2.0	µg/L	100		55.1	40-140	4.93	25	
Phenanthrene	68.4	2.0	µg/L	100		68.4	40-140	10.1	25	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B247075 - SW-846 3510C
LCS Dup (B247075-BSD1)

Prepared: 11/26/19 Analyzed: 12/01/19

Pyrene	71.8	2.0	µg/L	100		71.8	40-140	9.11	25	
n-Decane	46.9	10	µg/L	100		46.9	40-140	7.01	25	
n-Docosane	71.6	10	µg/L	100		71.6	40-140	11.4	25	
n-Dodecane	53.8	10	µg/L	100		53.8	40-140	8.90	25	
n-Eicosane	72.1	10	µg/L	100		72.1	40-140	10.2	25	
n-Hexacosane	72.7	10	µg/L	100		72.7	40-140	12.8	25	
n-Hexadecane	67.1	10	µg/L	100		67.1	40-140	10.3	25	
n-Hexatriacontane	65.3	10	µg/L	100		65.3	40-140	12.8	25	
n-Nonadecane	71.0	10	µg/L	100		71.0	40-140	10.4	25	
n-Nonane	36.8	10	µg/L	100		36.8	30-140	6.17	25	
n-Octacosane	71.0	10	µg/L	100		71.0	40-140	13.6	25	
n-Octadecane	70.9	10	µg/L	100		70.9	40-140	10.3	25	
n-Tetracosane	71.9	10	µg/L	100		71.9	40-140	12.2	25	
n-Tetradecane	62.0	10	µg/L	100		62.0	40-140	10.7	25	
n-Triacontane	72.0	10	µg/L	100		72.0	40-140	14.0	25	
Naphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
Surrogate: Chlorooctadecane (COD)	68.4		µg/L	100		68.4	40-140			
Surrogate: o-Terphenyl (OTP)	69.0		µg/L	100		69.0	40-140			
Surrogate: 2-Bromonaphthalene	97.7		µg/L	100		97.7	40-140			
Surrogate: 2-Fluorobiphenyl	102		µg/L	100		102	40-140			

Batch B247252 - SW-846 3510C
Blank (B247252-BLK1)

Prepared: 11/27/19 Analyzed: 12/01/19

C9-C18 Aliphatics	ND	100	µg/L							
C19-C36 Aliphatics	ND	100	µg/L							
Unadjusted C11-C22 Aromatics	ND	100	µg/L							
C11-C22 Aromatics	ND	100	µg/L							
Acenaphthene	ND	2.0	µg/L							
Acenaphthylene	ND	2.0	µg/L							
Anthracene	ND	2.0	µg/L							
Benzo(a)anthracene	ND	2.0	µg/L							
Benzo(a)pyrene	ND	2.0	µg/L							
Benzo(b)fluoranthene	ND	2.0	µg/L							
Benzo(g,h,i)perylene	ND	2.0	µg/L							
Benzo(k)fluoranthene	ND	2.0	µg/L							
Chrysene	ND	2.0	µg/L							
Dibenz(a,h)anthracene	ND	2.0	µg/L							
Fluoranthene	ND	2.0	µg/L							
Fluorene	ND	2.0	µg/L							
Indeno(1,2,3-cd)pyrene	ND	2.0	µg/L							
2-Methylnaphthalene	ND	2.0	µg/L							
Naphthalene	ND	2.0	µg/L							
Phenanthrene	ND	2.0	µg/L							
Pyrene	ND	2.0	µg/L							
n-Decane	ND	10	µg/L							L-04
n-Docosane	ND	10	µg/L							
n-Dodecane	ND	10	µg/L							
n-Eicosane	ND	10	µg/L							
n-Hexacosane	ND	10	µg/L							
n-Hexadecane	ND	10	µg/L							
n-Hexatriacontane	ND	10	µg/L							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247252 - SW-846 3510C										
Blank (B247252-BLK1)										
Prepared: 11/27/19 Analyzed: 12/01/19										
n-Nonadecane	ND	10	µg/L							
n-Nonane	ND	10	µg/L							
n-Octacosane	ND	10	µg/L							
n-Octadecane	ND	10	µg/L							
n-Tetracosane	ND	10	µg/L							
n-Tetradecane	ND	10	µg/L							
n-Triacontane	ND	10	µg/L							
Naphthalene-aliphatic fraction	ND	2.0	µg/L							
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L							
Surrogate: Chlorooctadecane (COD)	65.7		µg/L	100		65.7	40-140			
Surrogate: o-Terphenyl (OTP)	65.5		µg/L	100		65.5	40-140			
Surrogate: 2-Bromonaphthalene	88.5		µg/L	100		88.5	40-140			
Surrogate: 2-Fluorobiphenyl	90.7		µg/L	100		90.7	40-140			
LCS (B247252-BS1)										
Prepared: 11/27/19 Analyzed: 12/01/19										
C9-C18 Aliphatics	355	100	µg/L	600		59.2	0-200			
C19-C36 Aliphatics	703	100	µg/L	800		87.9	0-200			
Unadjusted C11-C22 Aromatics	1220	100	µg/L	1700		71.7	0-200			
Acenaphthene	57.8	2.0	µg/L	100		57.8	40-140			
Acenaphthylene	53.4	2.0	µg/L	100		53.4	40-140			
Anthracene	64.6	2.0	µg/L	100		64.6	40-140			
Benzo(a)anthracene	73.0	2.0	µg/L	100		73.0	40-140			
Benzo(a)pyrene	69.9	2.0	µg/L	100		69.9	40-140			
Benzo(b)fluoranthene	72.6	2.0	µg/L	100		72.6	40-140			
Benzo(g,h,i)perylene	70.7	2.0	µg/L	100		70.7	40-140			
Benzo(k)fluoranthene	71.7	2.0	µg/L	100		71.7	40-140			
Chrysene	74.6	2.0	µg/L	100		74.6	40-140			
Dibenz(a,h)anthracene	72.4	2.0	µg/L	100		72.4	40-140			
Fluoranthene	71.4	2.0	µg/L	100		71.4	40-140			
Fluorene	60.1	2.0	µg/L	100		60.1	40-140			
Indeno(1,2,3-cd)pyrene	69.4	2.0	µg/L	100		69.4	40-140			
2-Methylnaphthalene	51.3	2.0	µg/L	100		51.3	40-140			
Naphthalene	47.0	2.0	µg/L	100		47.0	40-140			
Phenanthrene	66.5	2.0	µg/L	100		66.5	40-140			
Pyrene	73.3	2.0	µg/L	100		73.3	40-140			
n-Decane	36.8	10	µg/L	100		36.8	* 40-140			L-04
n-Docosane	80.5	10	µg/L	100		80.5	40-140			
n-Dodecane	46.9	10	µg/L	100		46.9	40-140			
n-Eicosane	79.9	10	µg/L	100		79.9	40-140			
n-Hexacosane	82.5	10	µg/L	100		82.5	40-140			
n-Hexadecane	65.8	10	µg/L	100		65.8	40-140			
n-Hexatriacontane	71.0	10	µg/L	100		71.0	40-140			
n-Nonadecane	77.2	10	µg/L	100		77.2	40-140			
n-Nonane	28.1	10	µg/L	100		28.1	* 30-140			L-07
n-Octacosane	80.6	10	µg/L	100		80.6	40-140			
n-Octadecane	75.2	10	µg/L	100		75.2	40-140			
n-Tetracosane	81.4	10	µg/L	100		81.4	40-140			
n-Tetradecane	57.9	10	µg/L	100		57.9	40-140			
n-Triacontane	81.6	10	µg/L	100		81.6	40-140			
Naphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
Surrogate: Chlorooctadecane (COD)	74.8		µg/L	100		74.8	40-140			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247252 - SW-846 3510C										
LCS (B247252-BS1)					Prepared: 11/27/19 Analyzed: 12/01/19					
Surrogate: o-Terphenyl (OTP)	67.2		µg/L	100		67.2	40-140			
Surrogate: 2-Bromonaphthalene	90.9		µg/L	100		90.9	40-140			
Surrogate: 2-Fluorobiphenyl	96.0		µg/L	100		96.0	40-140			
LCS Dup (B247252-BS1)					Prepared: 11/27/19 Analyzed: 12/01/19					
C9-C18 Aliphatics	347	100	µg/L	600		57.9	0-200	2.21		
C19-C36 Aliphatics	650	100	µg/L	800		81.3	0-200	7.89		
Unadjusted C11-C22 Aromatics	1140	100	µg/L	1700		67.1	0-200	6.71		
Acenaphthene	56.8	2.0	µg/L	100		56.8	40-140	1.64	25	
Acenaphthylene	52.4	2.0	µg/L	100		52.4	40-140	1.85	25	
Anthracene	63.2	2.0	µg/L	100		63.2	40-140	2.13	25	
Benzo(a)anthracene	68.1	2.0	µg/L	100		68.1	40-140	6.93	25	
Benzo(a)pyrene	64.9	2.0	µg/L	100		64.9	40-140	7.36	25	
Benzo(b)fluoranthene	67.1	2.0	µg/L	100		67.1	40-140	7.79	25	
Benzo(g,h,i)perylene	65.6	2.0	µg/L	100		65.6	40-140	7.52	25	
Benzo(k)fluoranthene	66.6	2.0	µg/L	100		66.6	40-140	7.31	25	
Chrysene	69.6	2.0	µg/L	100		69.6	40-140	6.98	25	
Dibenz(a,h)anthracene	67.0	2.0	µg/L	100		67.0	40-140	7.66	25	
Fluoranthene	68.1	2.0	µg/L	100		68.1	40-140	4.67	25	
Fluorene	59.0	2.0	µg/L	100		59.0	40-140	1.80	25	
Indeno(1,2,3-cd)pyrene	64.1	2.0	µg/L	100		64.1	40-140	8.00	25	
2-Methylnaphthalene	51.3	2.0	µg/L	100		51.3	40-140	0.0819	25	
Naphthalene	48.2	2.0	µg/L	100		48.2	40-140	2.46	25	
Phenanthrene	64.8	2.0	µg/L	100		64.8	40-140	2.48	25	
Pyrene	69.5	2.0	µg/L	100		69.5	40-140	5.27	25	
n-Decane	39.7	10	µg/L	100		39.7	* 40-140	7.54	25	L-04
n-Docosane	72.7	10	µg/L	100		72.7	40-140	10.1	25	
n-Dodecane	47.8	10	µg/L	100		47.8	40-140	1.93	25	
n-Eicosane	70.5	10	µg/L	100		70.5	40-140	12.5	25	
n-Hexacosane	74.5	10	µg/L	100		74.5	40-140	10.3	25	
n-Hexadecane	62.5	10	µg/L	100		62.5	40-140	5.01	25	
n-Hexatriacontane	65.8	10	µg/L	100		65.8	40-140	7.69	25	
n-Nonadecane	70.4	10	µg/L	100		70.4	40-140	9.16	25	
n-Nonane	30.5	10	µg/L	100		30.5	30-140	8.16	25	
n-Octacosane	73.0	10	µg/L	100		73.0	40-140	9.87	25	
n-Octadecane	69.5	10	µg/L	100		69.5	40-140	7.89	25	
n-Tetracosane	73.2	10	µg/L	100		73.2	40-140	10.6	25	
n-Tetradecane	56.4	10	µg/L	100		56.4	40-140	2.49	25	
n-Triacontane	74.4	10	µg/L	100		74.4	40-140	9.24	25	
Naphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	2.0	µg/L	100			0-5			
Surrogate: Chlorooctadecane (COD)	66.9		µg/L	100		66.9	40-140			
Surrogate: o-Terphenyl (OTP)	64.7		µg/L	100		64.7	40-140			
Surrogate: 2-Bromonaphthalene	91.1		µg/L	100		91.1	40-140			
Surrogate: 2-Fluorobiphenyl	95.9		µg/L	100		95.9	40-140			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B246978 - SW-846 7470A Prep										
Blank (B246978-BLK1)				Prepared: 11/25/19 Analyzed: 11/26/19						
Mercury	ND	0.00010	mg/L							
LCS (B246978-BS1)				Prepared: 11/25/19 Analyzed: 11/26/19						
Mercury	0.00392	0.00010	mg/L	0.00400		98.1	80-120			
LCS Dup (B246978-BSD1)				Prepared: 11/25/19 Analyzed: 11/26/19						
Mercury	0.00408	0.00010	mg/L	0.00400		102	80-120	4.02	20	
Batch B246997 - SW-846 3005A										
Blank (B246997-BLK1)				Prepared: 11/25/19 Analyzed: 11/26/19						
Arsenic	ND	0.80	µg/L							
Barium	ND	10	µg/L							
Cadmium	ND	0.20	µg/L							
Chromium	ND	1.0	µg/L							B
Copper	ND	1.0	µg/L							
Lead	ND	0.50	µg/L							
Nickel	ND	5.0	µg/L							
Selenium	ND	5.0	µg/L							
Silver	ND	0.20	µg/L							
Zinc	ND	10	µg/L							
LCS (B246997-BS1)				Prepared: 11/25/19 Analyzed: 11/26/19						
Arsenic	495	8.0	µg/L	500		98.9	80-120			
Barium	484	100	µg/L	500		96.7	80-120			
Cadmium	496	2.0	µg/L	500		99.3	80-120			
Chromium	490	10	µg/L	500		98.1	80-120			
Copper	967	10	µg/L	1000		96.7	80-120			
Lead	510	5.0	µg/L	500		102	80-120			
Nickel	495	50	µg/L	500		98.9	80-120			
Selenium	495	50	µg/L	500		99.1	80-120			
Silver	502	2.0	µg/L	500		100	80-120			
Zinc	1000	100	µg/L	1000		100	80-120			
LCS Dup (B246997-BSD1)				Prepared: 11/25/19 Analyzed: 11/26/19						
Arsenic	491	8.0	µg/L	500		98.3	80-120	0.654	20	
Barium	486	100	µg/L	500		97.1	80-120	0.420	20	
Cadmium	491	2.0	µg/L	500		98.2	80-120	1.05	20	
Chromium	489	10	µg/L	500		97.8	80-120	0.295	20	
Copper	964	10	µg/L	1000		96.4	80-120	0.377	20	
Lead	503	5.0	µg/L	500		101	80-120	1.24	20	
Nickel	494	50	µg/L	500		98.8	80-120	0.168	20	
Selenium	493	50	µg/L	500		98.5	80-120	0.542	20	
Silver	496	2.0	µg/L	500		99.2	80-120	1.28	20	
Zinc	1010	100	µg/L	1000		101	80-120	0.519	20	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B246930 - SW-846 9014
Blank (B246930-BLK1)

Prepared: 11/25/19 Analyzed: 11/26/19

Cyanide	ND	0.010	mg/L							
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LCS (B246930-BS1)

Prepared: 11/25/19 Analyzed: 11/26/19

Cyanide	0.75	0.020	mg/L	0.744		101	80-120			
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LCS Dup (B246930-BSD1)

Prepared: 11/25/19 Analyzed: 11/26/19

Cyanide	0.77	0.020	mg/L	0.744		104	80-120	3.02	20	
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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B	Analyte is found in the associated laboratory blank as well as in the sample.
DL-01	Elevated reporting limits for all volatile compounds due to foaming sample matrix.
L-04	Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
S-19	Surrogate recovery is outside of control limits, matrix interference suspected. Reanalysis yielded similar surrogate non-conformance.
V-05	Continuing calibration verification (CCV) did not meet method specifications and was biased on the low side for this compound.
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>MADEP-EPH-04-1.1 in Soil</i>	
C9-C18 Aliphatics	CT,NC,ME,NH-P
C19-C36 Aliphatics	CT,NC,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,ME,NH-P
C11-C22 Aromatics	CT,NC,ME,NH-P
Acenaphthene	CT,NC,ME,NH-P
Acenaphthylene	CT,NC,ME,NH-P
Anthracene	CT,NC,ME,NH-P
Benzo(a)anthracene	CT,NC,ME,NH-P
Benzo(a)pyrene	CT,NC,ME,NH-P
Benzo(b)fluoranthene	CT,NC,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,ME,NH-P
Benzo(k)fluoranthene	CT,NC,ME,NH-P
Chrysene	CT,NC,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,ME,NH-P
Fluoranthene	CT,NC,ME,NH-P
Fluorene	CT,NC,ME
Indeno(1,2,3-cd)pyrene	CT,NC,ME,NH-P
2-Methylnaphthalene	CT,NC
Naphthalene	CT,NC,ME,NH-P
Phenanthrene	CT,NC,ME,NH-P
Pyrene	CT,NC,ME,NH-P
<i>MADEP-EPH-04-1.1 in Water</i>	
C9-C18 Aliphatics	CT,NC,ME,NH-P
C19-C36 Aliphatics	CT,NC,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,ME,NH-P
C11-C22 Aromatics	CT,NC,ME,NH-P
Acenaphthene	CT,NC,ME,NH-P
Acenaphthylene	CT,NC,ME,NH-P
Anthracene	CT,NC,ME,NH-P
Benzo(a)anthracene	CT,NC,ME,NH-P
Benzo(a)pyrene	CT,NC,ME,NH-P
Benzo(b)fluoranthene	CT,NC,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,ME,NH-P
Benzo(k)fluoranthene	CT,NC,ME,NH-P
Chrysene	CT,NC,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,ME,NH-P
Fluoranthene	CT,NC,ME,NH-P
Fluorene	CT,NC,ME
Indeno(1,2,3-cd)pyrene	CT,NC,ME,NH-P
2-Methylnaphthalene	CT,NC
Naphthalene	CT,NC,ME,NH-P
Phenanthrene	CT,NC,ME,NH-P
Pyrene	CT,NC,ME,NH-P
<i>SW-846 6020B in Water</i>	
Arsenic	CT,NH,NY,ME,VA,NC
Barium	CT,NH,NY,ME,VA,NC

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 6020B in Water	
Cadmium	CT,NH,NY,RI,ME,VA,NC
Chromium	CT,NH,NY,ME,VA,NC
Copper	CT,NH,NY,ME,VA,NC
Lead	CT,NH,NY,ME,VA,NC
Nickel	CT,NH,NY,ME,VA,NC
Selenium	CT,NH,NY,ME,VA,NC
Silver	CT,NH,NY,ME,VA,NC
Zinc	CT,NH,NY,ME,VA,NC
SW-846 7470A in Water	
Mercury	CT,NH,NY,NC,ME,VA
SW-846 8260C-D in Water	
Acetone	CT,ME,NH,VA,NY
Acrylonitrile	CT,ME,NH,VA,NY
tert-Amyl Methyl Ether (TAME)	ME,NH,VA,NY
Benzene	CT,ME,NH,VA,NY
Bromobenzene	ME,NY
Bromochloromethane	ME,NH,VA,NY
Bromodichloromethane	CT,ME,NH,VA,NY
Bromoform	CT,ME,NH,VA,NY
Bromomethane	CT,ME,NH,VA,NY
2-Butanone (MEK)	CT,ME,NH,VA,NY
tert-Butyl Alcohol (TBA)	ME,NH,VA,NY
n-Butylbenzene	ME,VA,NY
sec-Butylbenzene	ME,VA,NY
tert-Butylbenzene	ME,VA,NY
tert-Butyl Ethyl Ether (TBEE)	ME,NH,VA,NY
Carbon Disulfide	CT,ME,NH,VA,NY
Carbon Tetrachloride	CT,ME,NH,VA,NY
Chlorobenzene	CT,ME,NH,VA,NY
Chlorodibromomethane	CT,ME,NH,VA,NY
Chloroethane	CT,ME,NH,VA,NY
Chloroform	CT,ME,NH,VA,NY
Chloromethane	CT,ME,NH,VA,NY
2-Chlorotoluene	ME,NH,VA,NY
4-Chlorotoluene	ME,NH,VA,NY
1,2-Dibromo-3-chloropropane (DBCP)	ME,NY
1,2-Dibromoethane (EDB)	ME,NY
Dibromomethane	ME,NH,VA,NY
1,2-Dichlorobenzene	CT,ME,NH,VA,NY
1,3-Dichlorobenzene	CT,ME,NH,VA,NY
1,4-Dichlorobenzene	CT,ME,NH,VA,NY
trans-1,4-Dichloro-2-butene	ME,NH,VA,NY
Dichlorodifluoromethane (Freon 12)	ME,NH,VA,NY
1,1-Dichloroethane	CT,ME,NH,VA,NY
1,2-Dichloroethane	CT,ME,NH,VA,NY
1,1-Dichloroethylene	CT,ME,NH,VA,NY

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8260C-D in Water</i>	
cis-1,2-Dichloroethylene	ME,NY
trans-1,2-Dichloroethylene	CT,ME,NH,VA,NY
1,2-Dichloropropane	CT,ME,NH,VA,NY
1,3-Dichloropropane	ME,VA,NY
2,2-Dichloropropane	ME,NH,VA,NY
1,1-Dichloropropene	ME,NH,VA,NY
cis-1,3-Dichloropropene	CT,ME,NH,VA,NY
trans-1,3-Dichloropropene	CT,ME,NH,VA,NY
Diethyl Ether	ME,NY
Diisopropyl Ether (DIPE)	ME,NH,VA,NY
1,4-Dioxane	ME,NY
Ethylbenzene	CT,ME,NH,VA,NY
Hexachlorobutadiene	CT,ME,NH,VA,NY
2-Hexanone (MBK)	CT,ME,NH,VA,NY
Isopropylbenzene (Cumene)	ME,VA,NY
p-Isopropyltoluene (p-Cymene)	CT,ME,NH,VA,NY
Methyl Acetate	ME,NY
Methyl tert-Butyl Ether (MTBE)	CT,ME,NH,VA,NY
Methyl Cyclohexane	NY
Methylene Chloride	CT,ME,NH,VA,NY
4-Methyl-2-pentanone (MIBK)	CT,ME,NH,VA,NY
Naphthalene	ME,NH,VA,NY
n-Propylbenzene	CT,ME,NH,VA,NY
Styrene	CT,ME,NH,VA,NY
1,1,1,2-Tetrachloroethane	CT,ME,NH,VA,NY
1,1,2,2-Tetrachloroethane	CT,ME,NH,VA,NY
Tetrachloroethylene	CT,ME,NH,VA,NY
Toluene	CT,ME,NH,VA,NY
1,2,3-Trichlorobenzene	ME,NH,VA,NY
1,2,4-Trichlorobenzene	CT,ME,NH,VA,NY
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,ME,NH,VA,NY
1,1,2-Trichloroethane	CT,ME,NH,VA,NY
Trichloroethylene	CT,ME,NH,VA,NY
Trichlorofluoromethane (Freon 11)	CT,ME,NH,VA,NY
1,2,3-Trichloropropane	ME,NH,VA,NY
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	VA,NY
1,2,4-Trimethylbenzene	ME,VA,NY
1,3,5-Trimethylbenzene	ME,VA,NY
Vinyl Chloride	CT,ME,NH,VA,NY
m+p Xylene	CT,ME,NH,VA,NY
o-Xylene	CT,ME,NH,VA,NY
<i>SW-846 9014 in Water</i>	
Cyanide	NY,CT,NH,NC,ME,VA

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The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2022
MA	Massachusetts DEP	M-MA100	06/30/2020
CT	Connecticut Department of Public Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2020
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2020
RI	Rhode Island Department of Health	LAO00112	12/30/2019
NC	North Carolina Div. of Water Quality	652	12/31/2019
NJ	New Jersey DEP	MA007 NELAP	06/30/2020
FL	Florida Department of Health	E871027 NELAP	06/30/2020
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2020
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2019
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2020
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2020
NC-DW	North Carolina Department of Health	25703	07/31/2020
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2020

I Have Not Confirmed Sample Container
Numbers With Lab Staff Before Relinquishing
Over Samples _____



con-test®
ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False
Statement will be brought to the attention of the Client - State True or False

Client WSC

Received By RLF Date 11/22/19 Time 1830

How were the samples received? In Cooler T No Cooler On Ice T No Ice
Direct from Sampling Ambient Melted Ice

Were samples within Temperature? 2-6°C T By Gun # 2 Actual Temp - 4.7, 2.8°C
By Blank # Actual Temp -

Was Custody Seal Intact? LA Were Samples Tampered with? LA
Was COC Relinquished? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all Client T Analysis T Sampler Name T
pertinent Information? Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified?

Are there Rushes? F Who was notified?

Are there Short Holds? F Who was notified?

Is there enough Volume? T

Is there Headspace where applicable? F

Proper Media/Containers Used? T MS/MSD? F

Were trip blanks received? T Is splitting samples required? F

Do all samples have the proper pH? On COC? T Acid F Base F

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.	<u>2</u>	1 Liter Plastic		16 oz Amb.	
HCL-	<u>5</u>	500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic	<u>2</u>	4oz Amb/Clear	
Bisulfate-		Flashpoint		Col./Bacteria		2oz Amb/Clear	
DI-		Other Glass		Other Plastic		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:

All preserved samples for PZ-1 were neutral

December 9, 2019

Jedd Steinglass
Woodard & Curran - Portland, ME
41 Hutchins Drive
Portland, ME 04102

Project Location: Portland, ME
Client Job Number:
Project Number: 0232069
Laboratory Work Order Number: 19K1600

Enclosed are results of analyses for samples received by the laboratory on November 26, 2019. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Meghan E. Kelley". The signature is written in a cursive style with a large, flowing "M" and a long, sweeping "y" at the end.

Meghan E. Kelley
Project Manager

Table of Contents

Sample Summary	3
Case Narrative	4
Sample Results	6
19K1600-01	6
19K1600-02	11
Sample Preparation Information	13
QC Data	14
Volatile Organic Compounds by GC/MS	14
B247204	14
Petroleum Hydrocarbons Analyses - EPH	19
B247155	19
Metals Analyses (Total)	22
B247474	22
Flag/Qualifier Summary	23
Certifications	24
Chain of Custody/Sample Receipt	27

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Woodard & Curran - Portland, ME
41 Hutchins Drive
Portland, ME 04102
ATTN: Jedd Steinglass

REPORT DATE: 12/9/2019

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 0232069

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 19K1600

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Portland, ME

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WC-11 (35-40)	19K1600-01	Soil		MADEP-EPH-04-1.1 SM 2540G SW-846 6010D SW-846 8260C-D	
Trip Blank 2	19K1600-02	Trip Blank Soil		SW-846 8260C-D	

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CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

MADEP-EPH-04-1.1**Qualifications:**

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:**n-Nonane**

B247155-BSD1

SW-846 8260C-D**Qualifications:**

L-04

Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.

Analyte & Samples(s) Qualified:**1,2,3-Trichlorobenzene**

19K1600-01[WC-11 (35-40)], 19K1600-02[Trip Blank 2], B247204-BLK1, B247204-BS1, B247204-BSD1

1,2,4-Trichlorobenzene19K1600-01[WC-11 (35-40)], 19K1600-02[Trip Blank 2], B247204-BLK1, B247204-BS1, B247204-BSD1

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:**Chloromethane**B247204-BS1

V-05

Continuing calibration verification (CCV) did not meet method specifications and was biased on the low side for this compound.

Analyte & Samples(s) Qualified:**1,2,3-Trichlorobenzene**

19K1600-01[WC-11 (35-40)], 19K1600-02[Trip Blank 2], B247204-BLK1, B247204-BS1, B247204-BSD1, S043441-CCV1

1,2,4-Trichlorobenzene

19K1600-01[WC-11 (35-40)], 19K1600-02[Trip Blank 2], B247204-BLK1, B247204-BS1, B247204-BSD1, S043441-CCV1

Naphthalene

19K1600-01[WC-11 (35-40)], 19K1600-02[Trip Blank 2], B247204-BLK1, B247204-BS1, B247204-BSD1, S043441-CCV1

trans-1,4-Dichloro-2-butene19K1600-01[WC-11 (35-40)], 19K1600-02[Trip Blank 2], B247204-BLK1, B247204-BS1, B247204-BSD1, S043441-CCV1

V-20

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:**Bromochloromethane**

B247204-BS1, B247204-BSD1, S043441-CCV1

Bromomethane

B247204-BS1, B247204-BSD1, S043441-CCV1

Chloromethane

B247204-BS1, B247204-BSD1, S043441-CCV1

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MADEP-EPH-04-1.1

SPE cartridge contamination with non-petroleum compounds, if present, is verified by GC/MS in each method blank per extraction batch and excluded from C 11-C22 aromatic range fraction in all samples in the batch. No significant modifications were made to the method.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

A handwritten signature in black ink, appearing to read "Lisa Worthington", is written over a light gray rectangular background.

Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1600

Date Received: 11/26/2019

Field Sample #: WC-11 (35-40)

Sampled: 11/22/2019 15:00

Sample ID: 19K1600-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	3.3	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Acrylonitrile	ND	0.33	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.033	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Benzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Bromobenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Bromochloromethane	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Bromodichloromethane	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Bromoform	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Bromomethane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
2-Butanone (MEK)	ND	1.3	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
tert-Butyl Alcohol (TBA)	ND	1.3	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
n-Butylbenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
sec-Butylbenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
tert-Butylbenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.033	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Carbon Disulfide	ND	0.33	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Carbon Tetrachloride	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Chlorobenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Chlorodibromomethane	ND	0.033	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Chloroethane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Chloroform	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Chloromethane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
2-Chlorotoluene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
4-Chlorotoluene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.33	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,2-Dibromoethane (EDB)	ND	0.033	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Dibromomethane	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,2-Dichlorobenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,3-Dichlorobenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,4-Dichlorobenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
trans-1,4-Dichloro-2-butene	ND	0.13	mg/Kg dry	1	V-05	SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,1-Dichloroethane	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,2-Dichloroethane	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,1-Dichloroethylene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
cis-1,2-Dichloroethylene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
trans-1,2-Dichloroethylene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,2-Dichloropropane	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,3-Dichloropropane	ND	0.033	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
2,2-Dichloropropane	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,1-Dichloropropene	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
cis-1,3-Dichloropropene	ND	0.033	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
trans-1,3-Dichloropropene	ND	0.033	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Diethyl Ether	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1600

Date Received: 11/26/2019

Field Sample #: WC-11 (35-40)

Sampled: 11/22/2019 15:00

Sample ID: 19K1600-01

Sample Matrix: Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.033	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,4-Dioxane	ND	3.3	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Ethylbenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Hexachlorobutadiene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
2-Hexanone (MBK)	ND	0.66	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Isopropylbenzene (Cumene)	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Methyl Acetate	ND	0.66	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Methyl Cyclohexane	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Methylene Chloride	ND	0.33	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.66	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Naphthalene	ND	0.13	mg/Kg dry	1	V-05	SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
n-Propylbenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Styrene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,1,1,2-Tetrachloroethane	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,1,2,2-Tetrachloroethane	ND	0.033	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Tetrachloroethylene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Tetrahydrofuran	ND	0.66	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Toluene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,2,3-Trichlorobenzene	ND	0.33	mg/Kg dry	1	V-05, L-04	SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,2,4-Trichlorobenzene	ND	0.066	mg/Kg dry	1	V-05, L-04	SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,3,5-Trichlorobenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,1,1-Trichloroethane	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,1,2-Trichloroethane	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Trichloroethylene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Trichlorofluoromethane (Freon 11)	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,2,3-Trichloropropane	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,2,4-Trimethylbenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
1,3,5-Trimethylbenzene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Vinyl Chloride	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
m+p Xylene	ND	0.13	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
o-Xylene	ND	0.066	mg/Kg dry	1		SW-846 8260C-D	11/27/19	12/6/19 6:19	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	107	70-130							
Toluene-d8	99.2	70-130							
4-Bromofluorobenzene	98.4	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1600

Date Received: 11/26/2019

Field Sample #: WC-11 (35-40)

Sampled: 11/22/2019 15:00

Sample ID: 19K1600-01

Sample Matrix: Soil

Petroleum Hydrocarbons Analyses - EPH

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
C9-C18 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
C19-C36 Aliphatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Unadjusted C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
C11-C22 Aromatics	ND	14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Acenaphthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Acenaphthylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Benzo(a)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Benzo(a)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Benzo(b)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Benzo(g,h,i)perylene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Benzo(k)fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Chrysene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Dibenz(a,h)anthracene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Fluoranthene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Fluorene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Indeno(1,2,3-cd)pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
2-Methylnaphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Naphthalene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Phenanthrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD
Pyrene	ND	0.14	mg/Kg dry	1		MADEP-EPH-04-1.1	11/26/19	12/9/19 9:14	RDD

Surrogates	% Recovery	Recovery Limits	Flag/Qual
Chlorooctadecane (COD)	50.5	40-140	
o-Terphenyl (OTP)	50.7	40-140	
2-Bromonaphthalene	77.9	40-140	
2-Fluorobiphenyl	89.6	40-140	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1600

Date Received: 11/26/2019

Field Sample #: WC-11 (35-40)

Sampled: 11/22/2019 15:00

Sample ID: 19K1600-01

Sample Matrix: Soil

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	15	0.68	mg/Kg dry	1		SW-846 6010D	12/3/19	12/4/19 12:06	MJH

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1600

Date Received: 11/26/2019

Field Sample #: WC-11 (35-40)

Sampled: 11/22/2019 15:00

Sample ID: 19K1600-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	72.7		% Wt	1		SM 2540G	11/27/19	11/29/19 10:39	MJR

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1600

Date Received: 11/26/2019

Field Sample #: Trip Blank 2

Sampled: 11/22/2019 00:00

Sample ID: 19K1600-02

Sample Matrix: Trip Blank Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	2.5	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Acrylonitrile	ND	0.25	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
tert-Amyl Methyl Ether (TAME)	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Benzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Bromobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Bromochloromethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Bromodichloromethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Bromoform	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Bromomethane	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
2-Butanone (MEK)	ND	1.0	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
tert-Butyl Alcohol (TBA)	ND	1.0	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
n-Butylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
sec-Butylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
tert-Butylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Carbon Disulfide	ND	0.25	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Carbon Tetrachloride	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Chlorobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Chlorodibromomethane	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Chloroethane	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Chloroform	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Chloromethane	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
2-Chlorotoluene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
4-Chlorotoluene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.25	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,2-Dibromoethane (EDB)	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Dibromomethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,2-Dichlorobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,3-Dichlorobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,4-Dichlorobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
trans-1,4-Dichloro-2-butene	ND	0.10	mg/Kg wet	1	V-05	SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,1-Dichloroethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,2-Dichloroethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,1-Dichloroethylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
cis-1,2-Dichloroethylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
trans-1,2-Dichloroethylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,2-Dichloropropane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,3-Dichloropropane	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
2,2-Dichloropropane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,1-Dichloropropene	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
cis-1,3-Dichloropropene	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
trans-1,3-Dichloropropene	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Diethyl Ether	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 19K1600

Date Received: 11/26/2019

Field Sample #: Trip Blank 2

Sampled: 11/22/2019 00:00

Sample ID: 19K1600-02

Sample Matrix: Trip Blank Soil

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,4-Dioxane	ND	2.5	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Ethylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Hexachlorobutadiene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
2-Hexanone (MBK)	ND	0.50	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Isopropylbenzene (Cumene)	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
p-Isopropyltoluene (p-Cymene)	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Methyl Acetate	ND	0.50	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Methyl Cyclohexane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Methylene Chloride	ND	0.25	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.50	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Naphthalene	ND	0.10	mg/Kg wet	1	V-05	SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
n-Propylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Styrene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,1,1,2-Tetrachloroethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,1,2,2-Tetrachloroethane	ND	0.025	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Tetrachloroethylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Tetrahydrofuran	ND	0.50	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Toluene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,2,3-Trichlorobenzene	ND	0.25	mg/Kg wet	1	L-04, V-05	SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,2,4-Trichlorobenzene	ND	0.050	mg/Kg wet	1	L-04, V-05	SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,3,5-Trichlorobenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,1,1-Trichloroethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,1,2-Trichloroethane	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Trichloroethylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Trichlorofluoromethane (Freon 11)	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,2,3-Trichloropropane	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,2,4-Trimethylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
1,3,5-Trimethylbenzene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Vinyl Chloride	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
m+p Xylene	ND	0.10	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
o-Xylene	ND	0.050	mg/Kg wet	1		SW-846 8260C-D	11/27/19	12/6/19 0:35	MFF
Surrogates	% Recovery	Recovery Limits	Flag/Qual						
1,2-Dichloroethane-d4	100	70-130							
Toluene-d8	97.5	70-130							
4-Bromofluorobenzene	97.8	70-130							

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Sample Extraction Data**Prep Method: SW-846 3546-MADEP-EPH-04-1.1**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
19K1600-01 [WC-11 (35-40)]	B247155	20.0	2.00	11/26/19

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
19K1600-01 [WC-11 (35-40)]	B247164	11/27/19

Prep Method: SW-846 3050B-SW-846 6010D

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
19K1600-01 [WC-11 (35-40)]	B247474	1.52	50.0	12/03/19

Prep Method: SW-846 5035-SW-846 8260C-D

Lab Number [Field ID]	Batch	Sample Amount(g)	Methanol Volume(mL)	Methanol Aliquot(mL)	Final Volume(mL)	Date
19K1600-01 [WC-11 (35-40)]	B247204	7.28	6.99	1	50	11/27/19
19K1600-02 [Trip Blank 2]	B247204	5.00	5.00	1	50	11/27/19

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B247204 - SW-846 5035

Blank (B247204-BLK1)

Prepared: 11/27/19 Analyzed: 12/06/19

Acetone	ND	2.5	mg/Kg wet
Acrylonitrile	ND	0.25	mg/Kg wet
tert-Amyl Methyl Ether (TAME)	ND	0.025	mg/Kg wet
Benzene	ND	0.050	mg/Kg wet
Bromobenzene	ND	0.050	mg/Kg wet
Bromochloromethane	ND	0.050	mg/Kg wet
Bromodichloromethane	ND	0.050	mg/Kg wet
Bromoform	ND	0.050	mg/Kg wet
Bromomethane	ND	0.10	mg/Kg wet
2-Butanone (MEK)	ND	1.0	mg/Kg wet
tert-Butyl Alcohol (TBA)	ND	1.0	mg/Kg wet
n-Butylbenzene	ND	0.050	mg/Kg wet
sec-Butylbenzene	ND	0.050	mg/Kg wet
tert-Butylbenzene	ND	0.050	mg/Kg wet
tert-Butyl Ethyl Ether (TBEE)	ND	0.025	mg/Kg wet
Carbon Disulfide	ND	0.25	mg/Kg wet
Carbon Tetrachloride	ND	0.050	mg/Kg wet
Chlorobenzene	ND	0.050	mg/Kg wet
Chlorodibromomethane	ND	0.025	mg/Kg wet
Chloroethane	ND	0.10	mg/Kg wet
Chloroform	ND	0.10	mg/Kg wet
Chloromethane	ND	0.10	mg/Kg wet
2-Chlorotoluene	ND	0.050	mg/Kg wet
4-Chlorotoluene	ND	0.050	mg/Kg wet
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.25	mg/Kg wet
1,2-Dibromoethane (EDB)	ND	0.025	mg/Kg wet
Dibromomethane	ND	0.050	mg/Kg wet
1,2-Dichlorobenzene	ND	0.050	mg/Kg wet
1,3-Dichlorobenzene	ND	0.050	mg/Kg wet
1,4-Dichlorobenzene	ND	0.050	mg/Kg wet
trans-1,4-Dichloro-2-butene	ND	0.10	mg/Kg wet
Dichlorodifluoromethane (Freon 12)	ND	0.10	mg/Kg wet
1,1-Dichloroethane	ND	0.050	mg/Kg wet
1,2-Dichloroethane	ND	0.050	mg/Kg wet
1,1-Dichloroethylene	ND	0.050	mg/Kg wet
cis-1,2-Dichloroethylene	ND	0.050	mg/Kg wet
trans-1,2-Dichloroethylene	ND	0.050	mg/Kg wet
Dichlorofluoromethane (Freon 21)	ND	0.050	mg/Kg wet
1,2-Dichloropropane	ND	0.050	mg/Kg wet
1,3-Dichloropropane	ND	0.025	mg/Kg wet
2,2-Dichloropropane	ND	0.050	mg/Kg wet
1,1-Dichloropropene	ND	0.10	mg/Kg wet
cis-1,3-Dichloropropene	ND	0.025	mg/Kg wet
trans-1,3-Dichloropropene	ND	0.025	mg/Kg wet
Diethyl Ether	ND	0.10	mg/Kg wet
Difluorochloromethane (Freon 22)	ND	0.050	mg/Kg wet
Diisopropyl Ether (DIPE)	ND	0.025	mg/Kg wet
1,4-Dioxane	ND	2.5	mg/Kg wet
Ethylbenzene	ND	0.050	mg/Kg wet
Hexachlorobutadiene	ND	0.050	mg/Kg wet
2-Hexanone (MBK)	ND	0.50	mg/Kg wet
Isopropylbenzene (Cumene)	ND	0.050	mg/Kg wet

V-05

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B247204 - SW-846 5035

Blank (B247204-BLK1)

Prepared: 11/27/19 Analyzed: 12/06/19

p-Isopropyltoluene (p-Cymene)	ND	0.050	mg/Kg wet							
Methyl Acetate	ND	0.50	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.050	mg/Kg wet							
Methyl Cyclohexane	ND	0.050	mg/Kg wet							
Methylene Chloride	ND	0.25	mg/Kg wet							
4-Methyl-2-pentanone (MIBK)	ND	0.50	mg/Kg wet							
Naphthalene	ND	0.10	mg/Kg wet							V-05
n-Propylbenzene	ND	0.050	mg/Kg wet							
Styrene	ND	0.050	mg/Kg wet							
1,1,1,2-Tetrachloroethane	ND	0.050	mg/Kg wet							
1,1,2,2-Tetrachloroethane	ND	0.025	mg/Kg wet							
Tetrachloroethylene	ND	0.050	mg/Kg wet							
Tetrahydrofuran	ND	0.50	mg/Kg wet							
Toluene	ND	0.050	mg/Kg wet							
1,2,3-Trichlorobenzene	ND	0.25	mg/Kg wet							L-04, V-05
1,2,4-Trichlorobenzene	ND	0.050	mg/Kg wet							L-04, V-05
1,3,5-Trichlorobenzene	ND	0.050	mg/Kg wet							
1,1,1-Trichloroethane	ND	0.050	mg/Kg wet							
1,1,2-Trichloroethane	ND	0.050	mg/Kg wet							
Trichloroethylene	ND	0.050	mg/Kg wet							
Trichlorofluoromethane (Freon 11)	ND	0.10	mg/Kg wet							
1,2,3-Trichloropropane	ND	0.10	mg/Kg wet							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.050	mg/Kg wet							
1,2,4-Trimethylbenzene	ND	0.050	mg/Kg wet							
1,3,5-Trimethylbenzene	ND	0.050	mg/Kg wet							
Vinyl Chloride	ND	0.10	mg/Kg wet							
m+p Xylene	ND	0.10	mg/Kg wet							
o-Xylene	ND	0.050	mg/Kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0250		mg/Kg wet	0.0250		100	70-130			
Surrogate: Toluene-d8	0.0267		mg/Kg wet	0.0250		107	70-130			
Surrogate: 4-Bromofluorobenzene	0.0250		mg/Kg wet	0.0250		100	70-130			

LCS (B247204-BS1)

Prepared: 11/27/19 Analyzed: 12/05/19

Acetone	0.0963	0.050	mg/Kg wet	0.113		84.9	70-160			†
Acrylonitrile	0.00972	0.0050	mg/Kg wet	0.0113		85.8	70-130			
tert-Amyl Methyl Ether (TAME)	0.00860	0.00050	mg/Kg wet	0.0113		75.9	70-130			
Benzene	0.0112	0.0010	mg/Kg wet	0.0113		98.6	70-130			
Bromobenzene	0.0102	0.0010	mg/Kg wet	0.0113		90.4	70-130			
Bromochloromethane	0.0119	0.0010	mg/Kg wet	0.0113		105	70-130			V-20
Bromodichloromethane	0.0111	0.0010	mg/Kg wet	0.0113		97.6	70-130			
Bromoform	0.00952	0.0010	mg/Kg wet	0.0113		84.0	70-130			
Bromomethane	0.0140	0.0020	mg/Kg wet	0.0113		124	40-130			V-20 †
2-Butanone (MEK)	0.0978	0.020	mg/Kg wet	0.113		86.3	70-160			†
tert-Butyl Alcohol (TBA)	0.0999	0.020	mg/Kg wet	0.113		88.2	40-130			†
n-Butylbenzene	0.0100	0.0010	mg/Kg wet	0.0113		88.2	70-130			
sec-Butylbenzene	0.0112	0.0010	mg/Kg wet	0.0113		98.9	70-130			
tert-Butylbenzene	0.0112	0.0010	mg/Kg wet	0.0113		98.4	70-160			†
tert-Butyl Ethyl Ether (TBEE)	0.00942	0.00050	mg/Kg wet	0.0113		83.1	70-130			
Carbon Disulfide	0.114	0.0050	mg/Kg wet	0.113		100	70-130			
Carbon Tetrachloride	0.0114	0.0010	mg/Kg wet	0.0113		101	70-130			
Chlorobenzene	0.0114	0.0010	mg/Kg wet	0.0113		100	70-130			
Chlorodibromomethane	0.0108	0.00050	mg/Kg wet	0.0113		95.3	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247204 - SW-846 5035										
LCS (B247204-BS1)										
Prepared: 11/27/19 Analyzed: 12/05/19										
Chloroethane	0.0114	0.0020	mg/Kg wet	0.0113		101	70-130			
Chloroform	0.0116	0.0020	mg/Kg wet	0.0113		102	70-130			
Chloromethane	0.0155	0.0020	mg/Kg wet	0.0113		136	* 70-130			L-07, V-20
2-Chlorotoluene	0.0106	0.0010	mg/Kg wet	0.0113		93.2	70-130			
4-Chlorotoluene	0.0103	0.0010	mg/Kg wet	0.0113		91.0	70-130			
1,2-Dibromo-3-chloropropane (DBCP)	0.00917	0.0050	mg/Kg wet	0.0113		80.9	70-130			
1,2-Dibromoethane (EDB)	0.0110	0.00050	mg/Kg wet	0.0113		97.1	70-130			
Dibromomethane	0.0105	0.0010	mg/Kg wet	0.0113		92.6	70-130			
1,2-Dichlorobenzene	0.0109	0.0010	mg/Kg wet	0.0113		96.4	70-130			
1,3-Dichlorobenzene	0.0113	0.0010	mg/Kg wet	0.0113		99.5	70-130			
1,4-Dichlorobenzene	0.0109	0.0010	mg/Kg wet	0.0113		96.1	70-130			
trans-1,4-Dichloro-2-butene	0.00816	0.0020	mg/Kg wet	0.0113		72.0	70-130			V-05
Dichlorodifluoromethane (Freon 12)	0.0106	0.0020	mg/Kg wet	0.0113		93.1	40-160			†
1,1-Dichloroethane	0.0114	0.0010	mg/Kg wet	0.0113		100	70-130			
1,2-Dichloroethane	0.0114	0.0010	mg/Kg wet	0.0113		100	70-130			
1,1-Dichloroethylene	0.0120	0.0010	mg/Kg wet	0.0113		106	70-130			
cis-1,2-Dichloroethylene	0.0117	0.0010	mg/Kg wet	0.0113		103	70-130			
trans-1,2-Dichloroethylene	0.0113	0.0010	mg/Kg wet	0.0113		99.7	70-130			
Dichlorofluoromethane (Freon 21)	0.0119	0.0010	mg/Kg wet	0.0113		105	70-130			
1,2-Dichloropropane	0.0115	0.0010	mg/Kg wet	0.0113		101	70-130			
1,3-Dichloropropane	0.0112	0.00050	mg/Kg wet	0.0113		98.6	70-130			
2,2-Dichloropropane	0.00926	0.0010	mg/Kg wet	0.0113		81.7	70-130			
1,1-Dichloropropene	0.0122	0.0020	mg/Kg wet	0.0113		108	70-130			
cis-1,3-Dichloropropene	0.0107	0.00050	mg/Kg wet	0.0113		94.3	70-130			
trans-1,3-Dichloropropene	0.0100	0.00050	mg/Kg wet	0.0113		88.7	70-130			
Diethyl Ether	0.0108	0.0020	mg/Kg wet	0.0113		95.6	70-130			
Difluorochloromethane (Freon 22)	0.0116	0.0010	mg/Kg wet	0.0113		103	70-130			
Diisopropyl Ether (DIPE)	0.0110	0.00050	mg/Kg wet	0.0113		97.1	70-130			
1,4-Dioxane	0.0896	0.050	mg/Kg wet	0.113		79.0	40-160			†
Ethylbenzene	0.0109	0.0010	mg/Kg wet	0.0113		96.4	70-130			
Hexachlorobutadiene	0.00971	0.0010	mg/Kg wet	0.0113		85.7	70-160			
2-Hexanone (MBK)	0.0937	0.010	mg/Kg wet	0.113		82.7	70-160			†
Isopropylbenzene (Cumene)	0.0111	0.0010	mg/Kg wet	0.0113		97.9	70-130			
p-Isopropyltoluene (p-Cymene)	0.0106	0.0010	mg/Kg wet	0.0113		93.5	70-130			
Methyl Acetate	0.0108	0.010	mg/Kg wet	0.0113		95.6	70-130			
Methyl tert-Butyl Ether (MTBE)	0.0103	0.0010	mg/Kg wet	0.0113		90.9	70-130			
Methyl Cyclohexane	0.0112	0.0010	mg/Kg wet	0.0113		98.5	70-130			
Methylene Chloride	0.0115	0.0050	mg/Kg wet	0.0113		101	40-160			†
4-Methyl-2-pentanone (MIBK)	0.0965	0.010	mg/Kg wet	0.113		85.1	70-160			†
Naphthalene	0.00622	0.0020	mg/Kg wet	0.0113		54.9	40-130			V-05 †
n-Propylbenzene	0.0106	0.0010	mg/Kg wet	0.0113		93.8	70-130			
Styrene	0.0101	0.0010	mg/Kg wet	0.0113		89.2	70-130			
1,1,1,2-Tetrachloroethane	0.0113	0.0010	mg/Kg wet	0.0113		99.4	70-130			
1,1,2,2-Tetrachloroethane	0.0112	0.00050	mg/Kg wet	0.0113		98.6	70-130			
Tetrachloroethylene	0.0116	0.0010	mg/Kg wet	0.0113		102	70-130			
Tetrahydrofuran	0.0104	0.010	mg/Kg wet	0.0113		91.8	70-130			
Toluene	0.0110	0.0010	mg/Kg wet	0.0113		96.7	70-130			
1,2,3-Trichlorobenzene	0.00661	0.0050	mg/Kg wet	0.0113		58.3	* 70-130			V-05, L-04
1,2,4-Trichlorobenzene	0.00705	0.0010	mg/Kg wet	0.0113		62.2	* 70-130			V-05, L-04
1,3,5-Trichlorobenzene	0.00908	0.0010	mg/Kg wet	0.0113		80.1	70-130			
1,1,1-Trichloroethane	0.0116	0.0010	mg/Kg wet	0.0113		102	70-130			
1,1,2-Trichloroethane	0.0113	0.0010	mg/Kg wet	0.0113		99.4	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247204 - SW-846 5035										
LCS (B247204-BS1)				Prepared: 11/27/19 Analyzed: 12/05/19						
Trichloroethylene	0.0118	0.0010	mg/Kg wet	0.0113		104	70-130			
Trichlorofluoromethane (Freon 11)	0.0122	0.0020	mg/Kg wet	0.0113		107	70-130			
1,2,3-Trichloropropane	0.0105	0.0020	mg/Kg wet	0.0113		92.9	70-130			
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0115	0.0010	mg/Kg wet	0.0113		102	70-130			
1,2,4-Trimethylbenzene	0.0114	0.0010	mg/Kg wet	0.0113		101	70-130			
1,3,5-Trimethylbenzene	0.00997	0.0010	mg/Kg wet	0.0113		88.0	70-130			
Vinyl Chloride	0.0121	0.0020	mg/Kg wet	0.0113		107	40-130			†
m+p Xylene	0.0218	0.0020	mg/Kg wet	0.0227		96.1	70-130			
o-Xylene	0.0112	0.0010	mg/Kg wet	0.0113		98.8	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0256		mg/Kg wet	0.0283		90.5	70-130			
Surrogate: Toluene-d8	0.0248		mg/Kg wet	0.0283		87.6	70-130			
Surrogate: 4-Bromofluorobenzene	0.0240		mg/Kg wet	0.0283		84.9	70-130			
LCS Dup (B247204-BSD1)				Prepared: 11/27/19 Analyzed: 12/05/19						
Acetone	0.0992	0.050	mg/Kg wet	0.113		87.6	70-160	3.03	25	†
Acrylonitrile	0.00991	0.0050	mg/Kg wet	0.0113		87.4	70-130	1.94	25	
tert-Amyl Methyl Ether (TAME)	0.00860	0.00050	mg/Kg wet	0.0113		75.9	70-130	0.00	25	
Benzene	0.0108	0.0010	mg/Kg wet	0.0113		95.5	70-130	3.18	25	
Bromobenzene	0.0100	0.0010	mg/Kg wet	0.0113		88.4	70-130	2.27	25	
Bromochloromethane	0.0113	0.0010	mg/Kg wet	0.0113		99.4	70-130	5.78	25	V-20
Bromodichloromethane	0.0109	0.0010	mg/Kg wet	0.0113		95.9	70-130	1.73	25	
Bromoform	0.00992	0.0010	mg/Kg wet	0.0113		87.5	70-130	4.12	25	
Bromomethane	0.0138	0.0020	mg/Kg wet	0.0113		122	40-130	1.29	25	V-20 †
2-Butanone (MEK)	0.102	0.020	mg/Kg wet	0.113		90.3	70-160	4.60	25	†
tert-Butyl Alcohol (TBA)	0.106	0.020	mg/Kg wet	0.113		93.5	40-130	5.91	25	†
n-Butylbenzene	0.0100	0.0010	mg/Kg wet	0.0113		88.2	70-130	0.00	25	
sec-Butylbenzene	0.0111	0.0010	mg/Kg wet	0.0113		97.8	70-130	1.17	25	
tert-Butylbenzene	0.0115	0.0010	mg/Kg wet	0.0113		101	70-160	2.92	25	†
tert-Butyl Ethyl Ether (TBEE)	0.00928	0.00050	mg/Kg wet	0.0113		81.9	70-130	1.50	25	
Carbon Disulfide	0.109	0.0050	mg/Kg wet	0.113		96.5	70-130	3.97	25	
Carbon Tetrachloride	0.0112	0.0010	mg/Kg wet	0.0113		98.7	70-130	1.95	25	
Chlorobenzene	0.0110	0.0010	mg/Kg wet	0.0113		97.5	70-130	2.85	25	
Chlorodibromomethane	0.0103	0.00050	mg/Kg wet	0.0113		91.2	70-130	4.35	25	
Chloroethane	0.0113	0.0020	mg/Kg wet	0.0113		99.5	70-130	1.23	25	
Chloroform	0.0112	0.0020	mg/Kg wet	0.0113		99.2	70-130	3.24	25	
Chloromethane	0.0143	0.0020	mg/Kg wet	0.0113		126	70-130	8.00	25	V-20
2-Chlorotoluene	0.0105	0.0010	mg/Kg wet	0.0113		92.3	70-130	0.951	25	
4-Chlorotoluene	0.0104	0.0010	mg/Kg wet	0.0113		92.0	70-130	1.16	25	
1,2-Dibromo-3-chloropropane (DBCP)	0.00933	0.0050	mg/Kg wet	0.0113		82.3	70-130	1.73	25	
1,2-Dibromoethane (EDB)	0.0107	0.00050	mg/Kg wet	0.0113		94.5	70-130	2.67	25	
Dibromomethane	0.0110	0.0010	mg/Kg wet	0.0113		97.3	70-130	5.02	25	
1,2-Dichlorobenzene	0.0104	0.0010	mg/Kg wet	0.0113		91.6	70-130	5.07	25	
1,3-Dichlorobenzene	0.0110	0.0010	mg/Kg wet	0.0113		97.5	70-130	2.06	25	
1,4-Dichlorobenzene	0.0107	0.0010	mg/Kg wet	0.0113		94.5	70-130	1.67	25	
trans-1,4-Dichloro-2-butene	0.00829	0.0020	mg/Kg wet	0.0113		73.1	70-130	1.58	25	V-05
Dichlorodifluoromethane (Freon 12)	0.00911	0.0020	mg/Kg wet	0.0113		80.4	40-160	14.6	25	†
1,1-Dichloroethane	0.0108	0.0010	mg/Kg wet	0.0113		94.9	70-130	5.51	25	
1,2-Dichloroethane	0.0112	0.0010	mg/Kg wet	0.0113		99.3	70-130	0.885	25	
1,1-Dichloroethylene	0.0112	0.0010	mg/Kg wet	0.0113		98.9	70-130	7.14	25	
cis-1,2-Dichloroethylene	0.0111	0.0010	mg/Kg wet	0.0113		97.6	70-130	5.54	25	
trans-1,2-Dichloroethylene	0.0111	0.0010	mg/Kg wet	0.0113		98.3	70-130	1.43	25	
Dichlorofluoromethane (Freon 21)	0.0111	0.0010	mg/Kg wet	0.0113		97.6	70-130	7.15	25	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247204 - SW-846 5035										
LCS Dup (B247204-BSD1)					Prepared: 11/27/19 Analyzed: 12/05/19					
1,2-Dichloropropane	0.0109	0.0010	mg/Kg wet	0.0113		96.4	70-130	4.83	25	
1,3-Dichloropropane	0.0110	0.00050	mg/Kg wet	0.0113		96.9	70-130	1.81	25	
2,2-Dichloropropane	0.00918	0.0010	mg/Kg wet	0.0113		81.0	70-130	0.868	25	
1,1-Dichloropropene	0.0115	0.0020	mg/Kg wet	0.0113		101	70-130	6.34	25	
cis-1,3-Dichloropropene	0.0105	0.00050	mg/Kg wet	0.0113		92.5	70-130	1.98	25	
trans-1,3-Dichloropropene	0.00963	0.00050	mg/Kg wet	0.0113		85.0	70-130	4.27	25	
Diethyl Ether	0.0104	0.0020	mg/Kg wet	0.0113		91.7	70-130	4.24	25	
Difluorochloromethane (Freon 22)	0.0112	0.0010	mg/Kg wet	0.0113		98.6	70-130	4.12	25	
Diisopropyl Ether (DIPE)	0.0105	0.00050	mg/Kg wet	0.0113		92.9	70-130	4.46	25	
1,4-Dioxane	0.0942	0.050	mg/Kg wet	0.113		83.1	40-160	5.00	50	† ‡
Ethylbenzene	0.0109	0.0010	mg/Kg wet	0.0113		96.0	70-130	0.459	25	
Hexachlorobutadiene	0.00949	0.0010	mg/Kg wet	0.0113		83.7	70-160	2.29	25	
2-Hexanone (MBK)	0.0984	0.010	mg/Kg wet	0.113		86.8	70-160	4.85	25	†
Isopropylbenzene (Cumene)	0.0109	0.0010	mg/Kg wet	0.0113		96.3	70-130	1.64	25	
p-Isopropyltoluene (p-Cymene)	0.0106	0.0010	mg/Kg wet	0.0113		93.2	70-130	0.378	25	
Methyl Acetate	0.0109	0.010	mg/Kg wet	0.0113		96.4	70-130	0.919	25	
Methyl tert-Butyl Ether (MTBE)	0.0101	0.0010	mg/Kg wet	0.0113		88.8	70-130	2.36	25	
Methyl Cyclohexane	0.00999	0.0010	mg/Kg wet	0.0113		88.1	70-130	11.1	25	
Methylene Chloride	0.0111	0.0050	mg/Kg wet	0.0113		98.1	40-160	3.19	25	†
4-Methyl-2-pentanone (MIBK)	0.101	0.010	mg/Kg wet	0.113		89.3	70-160	4.74	25	†
Naphthalene	0.00678	0.0020	mg/Kg wet	0.0113		59.8	40-130	8.62	25	V-05 †
n-Propylbenzene	0.0105	0.0010	mg/Kg wet	0.0113		92.6	70-130	1.23	25	
Styrene	0.0105	0.0010	mg/Kg wet	0.0113		92.6	70-130	3.78	25	
1,1,1,2-Tetrachloroethane	0.0110	0.0010	mg/Kg wet	0.0113		97.4	70-130	1.97	25	
1,1,2,2-Tetrachloroethane	0.0113	0.00050	mg/Kg wet	0.0113		99.7	70-130	1.16	25	
Tetrachloroethylene	0.0111	0.0010	mg/Kg wet	0.0113		97.6	70-130	4.77	25	
Tetrahydrofuran	0.0104	0.010	mg/Kg wet	0.0113		91.6	70-130	0.192	25	
Toluene	0.0109	0.0010	mg/Kg wet	0.0113		95.8	70-130	0.917	25	
1,2,3-Trichlorobenzene	0.00658	0.0050	mg/Kg wet	0.0113		58.1	* 70-130	0.455	25	L-04, V-05
1,2,4-Trichlorobenzene	0.00730	0.0010	mg/Kg wet	0.0113		64.4	* 70-130	3.48	25	L-04, V-05
1,3,5-Trichlorobenzene	0.00881	0.0010	mg/Kg wet	0.0113		77.7	70-130	3.02	25	
1,1,1-Trichloroethane	0.0110	0.0010	mg/Kg wet	0.0113		97.3	70-130	4.61	25	
1,1,2-Trichloroethane	0.0112	0.0010	mg/Kg wet	0.0113		98.6	70-130	0.802	25	
Trichloroethylene	0.0114	0.0010	mg/Kg wet	0.0113		101	70-130	3.70	25	
Trichlorofluoromethane (Freon 11)	0.0113	0.0020	mg/Kg wet	0.0113		100	70-130	7.15	25	
1,2,3-Trichloropropane	0.0101	0.0020	mg/Kg wet	0.0113		89.0	70-130	4.27	25	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0103	0.0010	mg/Kg wet	0.0113		90.8	70-130	11.3	25	
1,2,4-Trimethylbenzene	0.0112	0.0010	mg/Kg wet	0.0113		99.2	70-130	1.85	25	
1,3,5-Trimethylbenzene	0.00992	0.0010	mg/Kg wet	0.0113		87.5	70-130	0.503	25	
Vinyl Chloride	0.0116	0.0020	mg/Kg wet	0.0113		103	40-130	4.21	25	†
m+p Xylene	0.0215	0.0020	mg/Kg wet	0.0227		94.7	70-130	1.43	25	
o-Xylene	0.0109	0.0010	mg/Kg wet	0.0113		96.4	70-130	2.53	25	
Surrogate: 1,2-Dichloroethane-d4	0.0250		mg/Kg wet	0.0283		88.1	70-130			
Surrogate: Toluene-d8	0.0247		mg/Kg wet	0.0283		87.1	70-130			
Surrogate: 4-Bromofluorobenzene	0.0237		mg/Kg wet	0.0283		83.7	70-130			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B247155 - SW-846 3546
Blank (B247155-BLK1)

Prepared: 11/26/19 Analyzed: 12/03/19

C9-C18 Aliphatics	ND	10	mg/Kg wet							
C19-C36 Aliphatics	ND	10	mg/Kg wet							
Unadjusted C11-C22 Aromatics	ND	10	mg/Kg wet							
C11-C22 Aromatics	ND	10	mg/Kg wet							
Acenaphthene	ND	0.10	mg/Kg wet							
Acenaphthylene	ND	0.10	mg/Kg wet							
Anthracene	ND	0.10	mg/Kg wet							
Benzo(a)anthracene	ND	0.10	mg/Kg wet							
Benzo(a)pyrene	ND	0.10	mg/Kg wet							
Benzo(b)fluoranthene	ND	0.10	mg/Kg wet							
Benzo(g,h,i)perylene	ND	0.10	mg/Kg wet							
Benzo(k)fluoranthene	ND	0.10	mg/Kg wet							
Chrysene	ND	0.10	mg/Kg wet							
Dibenz(a,h)anthracene	ND	0.10	mg/Kg wet							
Fluoranthene	ND	0.10	mg/Kg wet							
Fluorene	ND	0.10	mg/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	0.10	mg/Kg wet							
2-Methylnaphthalene	ND	0.10	mg/Kg wet							
Naphthalene	ND	0.10	mg/Kg wet							
Phenanthrene	ND	0.10	mg/Kg wet							
Pyrene	ND	0.10	mg/Kg wet							
n-Decane	ND	0.50	mg/Kg wet							
n-Docosane	ND	0.50	mg/Kg wet							
n-Dodecane	ND	0.50	mg/Kg wet							
n-Eicosane	ND	0.50	mg/Kg wet							
n-Hexacosane	ND	0.50	mg/Kg wet							
n-Hexadecane	ND	0.50	mg/Kg wet							
n-Hexatriacontane	ND	0.50	mg/Kg wet							
n-Nonadecane	ND	0.50	mg/Kg wet							
n-Nonane	ND	0.50	mg/Kg wet							
n-Octacosane	ND	0.50	mg/Kg wet							
n-Octadecane	ND	0.50	mg/Kg wet							
n-Tetracosane	ND	0.50	mg/Kg wet							
n-Tetradecane	ND	0.50	mg/Kg wet							
n-Triacontane	ND	0.50	mg/Kg wet							
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet							
Surrogate: Chlorooctadecane (COD)	3.77		mg/Kg wet	5.00		75.3	40-140			
Surrogate: o-Terphenyl (OTP)	3.86		mg/Kg wet	5.00		77.1	40-140			
Surrogate: 2-Bromonaphthalene	4.70		mg/Kg wet	5.00		94.0	40-140			
Surrogate: 2-Fluorobiphenyl	4.83		mg/Kg wet	5.00		96.5	40-140			

LCS (B247155-BS1)

Prepared: 11/26/19 Analyzed: 12/03/19

C9-C18 Aliphatics	21.6	10	mg/Kg wet	30.0		71.9	40-140			
C19-C36 Aliphatics	39.0	10	mg/Kg wet	40.0		97.4	40-140			
Unadjusted C11-C22 Aromatics	75.0	10	mg/Kg wet	85.0		88.3	40-140			
Acenaphthene	4.04	0.10	mg/Kg wet	5.00		80.8	40-140			
Acenaphthylene	3.74	0.10	mg/Kg wet	5.00		74.8	40-140			
Anthracene	4.22	0.10	mg/Kg wet	5.00		84.4	40-140			
Benzo(a)anthracene	4.23	0.10	mg/Kg wet	5.00		84.6	40-140			
Benzo(a)pyrene	4.09	0.10	mg/Kg wet	5.00		81.7	40-140			
Benzo(b)fluoranthene	4.17	0.10	mg/Kg wet	5.00		83.4	40-140			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B247155 - SW-846 3546
LCS (B247155-BS1)

Prepared: 11/26/19 Analyzed: 12/03/19

Benzo(g,h,i)perylene	4.11	0.10	mg/Kg wet	5.00		82.1	40-140			
Benzo(k)fluoranthene	4.14	0.10	mg/Kg wet	5.00		82.8	40-140			
Chrysene	4.31	0.10	mg/Kg wet	5.00		86.3	40-140			
Dibenz(a,h)anthracene	4.21	0.10	mg/Kg wet	5.00		84.2	40-140			
Fluoranthene	4.29	0.10	mg/Kg wet	5.00		85.8	40-140			
Fluorene	4.16	0.10	mg/Kg wet	5.00		83.1	40-140			
Indeno(1,2,3-cd)pyrene	4.02	0.10	mg/Kg wet	5.00		80.4	40-140			
2-Methylnaphthalene	3.72	0.10	mg/Kg wet	5.00		74.3	40-140			
Naphthalene	3.47	0.10	mg/Kg wet	5.00		69.5	40-140			
Phenanthrene	4.36	0.10	mg/Kg wet	5.00		87.2	40-140			
Pyrene	4.37	0.10	mg/Kg wet	5.00		87.3	40-140			
n-Decane	2.52	0.50	mg/Kg wet	5.00		50.3	40-140			
n-Docosane	4.26	0.50	mg/Kg wet	5.00		85.2	40-140			
n-Dodecane	3.16	0.50	mg/Kg wet	5.00		63.2	40-140			
n-Eicosane	4.19	0.50	mg/Kg wet	5.00		83.7	40-140			
n-Hexacosane	4.31	0.50	mg/Kg wet	5.00		86.2	40-140			
n-Hexadecane	4.10	0.50	mg/Kg wet	5.00		82.0	40-140			
n-Hexatriacontane	3.89	0.50	mg/Kg wet	5.00		77.7	40-140			
n-Nonadecane	4.22	0.50	mg/Kg wet	5.00		84.4	40-140			
n-Nonane	1.71	0.50	mg/Kg wet	5.00		34.2	30-140			
n-Octacosane	4.21	0.50	mg/Kg wet	5.00		84.2	40-140			
n-Octadecane	4.25	0.50	mg/Kg wet	5.00		85.1	40-140			
n-Tetracosane	4.26	0.50	mg/Kg wet	5.00		85.2	40-140			
n-Tetradecane	3.78	0.50	mg/Kg wet	5.00		75.7	40-140			
n-Triacontane	4.27	0.50	mg/Kg wet	5.00		85.4	40-140			
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
Surrogate: Chlorooctadecane (COD)	4.09		mg/Kg wet	5.00		81.9	40-140			
Surrogate: o-Terphenyl (OTP)	4.26		mg/Kg wet	5.00		85.1	40-140			
Surrogate: 2-Bromonaphthalene	4.92		mg/Kg wet	5.00		98.4	40-140			
Surrogate: 2-Fluorobiphenyl	5.15		mg/Kg wet	5.00		103	40-140			

LCS Dup (B247155-BS1)

Prepared: 11/26/19 Analyzed: 12/03/19

C9-C18 Aliphatics	19.1	10	mg/Kg wet	30.0		63.7	40-140	12.1	25	
C19-C36 Aliphatics	36.9	10	mg/Kg wet	40.0		92.3	40-140	5.43	25	
Unadjusted C11-C22 Aromatics	73.5	10	mg/Kg wet	85.0		86.4	40-140	2.10	25	
Acenaphthene	3.74	0.10	mg/Kg wet	5.00		74.8	40-140	7.63	25	
Acenaphthylene	3.42	0.10	mg/Kg wet	5.00		68.3	40-140	9.09	25	
Anthracene	4.31	0.10	mg/Kg wet	5.00		86.1	40-140	1.96	25	
Benzo(a)anthracene	4.34	0.10	mg/Kg wet	5.00		86.7	40-140	2.56	25	
Benzo(a)pyrene	4.19	0.10	mg/Kg wet	5.00		83.7	40-140	2.45	25	
Benzo(b)fluoranthene	4.27	0.10	mg/Kg wet	5.00		85.4	40-140	2.40	25	
Benzo(g,h,i)perylene	4.20	0.10	mg/Kg wet	5.00		83.9	40-140	2.16	25	
Benzo(k)fluoranthene	4.23	0.10	mg/Kg wet	5.00		84.7	40-140	2.19	25	
Chrysene	4.43	0.10	mg/Kg wet	5.00		88.6	40-140	2.62	25	
Dibenz(a,h)anthracene	4.32	0.10	mg/Kg wet	5.00		86.4	40-140	2.63	25	
Fluoranthene	4.39	0.10	mg/Kg wet	5.00		87.8	40-140	2.29	25	
Fluorene	4.04	0.10	mg/Kg wet	5.00		80.8	40-140	2.86	25	
Indeno(1,2,3-cd)pyrene	4.12	0.10	mg/Kg wet	5.00		82.4	40-140	2.47	25	
2-Methylnaphthalene	3.22	0.10	mg/Kg wet	5.00		64.4	40-140	14.3	25	
Naphthalene	3.05	0.10	mg/Kg wet	5.00		61.0	40-140	13.1	25	
Phenanthrene	4.42	0.10	mg/Kg wet	5.00		88.3	40-140	1.29	25	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Petroleum Hydrocarbons Analyses - EPH - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247155 - SW-846 3546										
LCS Dup (B247155-BSD1)					Prepared: 11/26/19 Analyzed: 12/03/19					
Pyrene	4.47	0.10	mg/Kg wet	5.00		89.5	40-140	2.43	25	
n-Decane	2.11	0.50	mg/Kg wet	5.00		42.2	40-140	17.6	25	
n-Docosane	4.06	0.50	mg/Kg wet	5.00		81.2	40-140	4.84	25	
n-Dodecane	2.60	0.50	mg/Kg wet	5.00		51.9	40-140	19.6	25	
n-Eicosane	3.98	0.50	mg/Kg wet	5.00		79.6	40-140	4.98	25	
n-Hexacosane	4.09	0.50	mg/Kg wet	5.00		81.9	40-140	5.18	25	
n-Hexadecane	3.82	0.50	mg/Kg wet	5.00		76.4	40-140	7.00	25	
n-Hexatriacontane	3.74	0.50	mg/Kg wet	5.00		74.8	40-140	3.85	25	
n-Nonadecane	4.01	0.50	mg/Kg wet	5.00		80.3	40-140	5.03	25	
n-Nonane	1.45	0.50	mg/Kg wet	5.00		29.1	* 30-140	16.3	25	L-07
n-Octacosane	3.99	0.50	mg/Kg wet	5.00		79.9	40-140	5.23	25	
n-Octadecane	4.04	0.50	mg/Kg wet	5.00		80.8	40-140	5.18	25	
n-Tetracosane	4.06	0.50	mg/Kg wet	5.00		81.2	40-140	4.86	25	
n-Tetradecane	3.26	0.50	mg/Kg wet	5.00		65.1	40-140	15.0	25	
n-Triacontane	4.07	0.50	mg/Kg wet	5.00		81.4	40-140	4.86	25	
Naphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
2-Methylnaphthalene-aliphatic fraction	ND	0.10	mg/Kg wet	5.00			0-5			
Surrogate: Chlorooctadecane (COD)	3.79		mg/Kg wet	5.00		75.8	40-140			
Surrogate: o-Terphenyl (OTP)	4.29		mg/Kg wet	5.00		85.7	40-140			
Surrogate: 2-Bromonaphthalene	5.05		mg/Kg wet	5.00		101	40-140			
Surrogate: 2-Fluorobiphenyl	5.32		mg/Kg wet	5.00		106	40-140			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B247474 - SW-846 3050B										
Blank (B247474-BLK1)				Prepared: 12/03/19 Analyzed: 12/04/19						
Lead	ND	0.50	mg/Kg wet							
LCS (B247474-BS1)				Prepared: 12/03/19 Analyzed: 12/04/19						
Lead	113	1.5	mg/Kg wet	125		90.6	82.4-116.8			
LCS Dup (B247474-BSD1)				Prepared: 12/03/19 Analyzed: 12/04/19						
Lead	107	1.4	mg/Kg wet	125		86.0	82.4-116.8	5.28	30	
MRL Check (B247474-MRL1)				Prepared: 12/03/19 Analyzed: 12/04/19						
Lead	0.547	0.50	mg/Kg wet	0.502		109	80-120			

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332**FLAG/QUALIFIER SUMMARY**

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
L-04	Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
V-05	Continuing calibration verification (CCV) did not meet method specifications and was biased on the low side for this compound.
V-20	Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
<i>MADEP-EPH-04-1.1 in Soil</i>	
C9-C18 Aliphatics	CT,NC,ME,NH-P
C19-C36 Aliphatics	CT,NC,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,ME,NH-P
C11-C22 Aromatics	CT,NC,ME,NH-P
Acenaphthene	CT,NC,ME,NH-P
Acenaphthylene	CT,NC,ME,NH-P
Anthracene	CT,NC,ME,NH-P
Benzo(a)anthracene	CT,NC,ME,NH-P
Benzo(a)pyrene	CT,NC,ME,NH-P
Benzo(b)fluoranthene	CT,NC,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,ME,NH-P
Benzo(k)fluoranthene	CT,NC,ME,NH-P
Chrysene	CT,NC,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,ME,NH-P
Fluoranthene	CT,NC,ME,NH-P
Fluorene	CT,NC,ME
Indeno(1,2,3-cd)pyrene	CT,NC,ME,NH-P
2-Methylnaphthalene	CT,NC
Naphthalene	CT,NC,ME,NH-P
Phenanthrene	CT,NC,ME,NH-P
Pyrene	CT,NC,ME,NH-P
<i>MADEP-EPH-04-1.1 in Water</i>	
C9-C18 Aliphatics	CT,NC,ME,NH-P
C19-C36 Aliphatics	CT,NC,ME,NH-P
Unadjusted C11-C22 Aromatics	CT,NC,ME,NH-P
C11-C22 Aromatics	CT,NC,ME,NH-P
Acenaphthene	CT,NC,ME,NH-P
Acenaphthylene	CT,NC,ME,NH-P
Anthracene	CT,NC,ME,NH-P
Benzo(a)anthracene	CT,NC,ME,NH-P
Benzo(a)pyrene	CT,NC,ME,NH-P
Benzo(b)fluoranthene	CT,NC,ME,NH-P
Benzo(g,h,i)perylene	CT,NC,ME,NH-P
Benzo(k)fluoranthene	CT,NC,ME,NH-P
Chrysene	CT,NC,ME,NH-P
Dibenz(a,h)anthracene	CT,NC,ME,NH-P
Fluoranthene	CT,NC,ME,NH-P
Fluorene	CT,NC,ME
Indeno(1,2,3-cd)pyrene	CT,NC,ME,NH-P
2-Methylnaphthalene	CT,NC
Naphthalene	CT,NC,ME,NH-P
Phenanthrene	CT,NC,ME,NH-P
Pyrene	CT,NC,ME,NH-P
<i>SW-846 6010D in Soil</i>	
Lead	CT,NH,NY,AIHA,ME,VA,NC
<i>SW-846 8260C-D in Soil</i>	

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8260C-D in Soil</i>	
Acetone	CT,NH,NY,ME,VA
Acrylonitrile	CT,NH,NY,ME,VA
Benzene	CT,NH,NY,ME,VA
Bromobenzene	NH,NY,ME,VA
Bromochloromethane	NH,NY,ME,VA
Bromodichloromethane	CT,NH,NY,ME,VA
Bromoform	CT,NH,NY,ME,VA
Bromomethane	CT,NH,NY,ME,VA
2-Butanone (MEK)	CT,NH,NY,ME,VA
n-Butylbenzene	CT,NH,NY,ME,VA
sec-Butylbenzene	CT,NH,NY,ME,VA
tert-Butylbenzene	CT,NH,NY,ME,VA
Carbon Disulfide	CT,NH,NY,ME,VA
Carbon Tetrachloride	CT,NH,NY,ME,VA
Chlorobenzene	CT,NH,NY,ME,VA
Chlorodibromomethane	CT,NH,NY,ME,VA
Chloroethane	CT,NH,NY,ME,VA
Chloroform	CT,NH,NY,ME,VA
Chloromethane	CT,NH,NY,ME,VA
2-Chlorotoluene	CT,NH,NY,ME,VA
4-Chlorotoluene	CT,NH,NY,ME,VA
1,2-Dibromo-3-chloropropane (DBCP)	NY
Dibromomethane	NH,NY,ME,VA
1,2-Dichlorobenzene	CT,NH,NY,ME,VA
1,3-Dichlorobenzene	CT,NH,NY,ME,VA
1,4-Dichlorobenzene	CT,NH,NY,ME,VA
Dichlorodifluoromethane (Freon 12)	NY,ME,VA
1,1-Dichloroethane	CT,NH,NY,ME,VA
1,2-Dichloroethane	CT,NH,NY,ME,VA
1,1-Dichloroethylene	CT,NH,NY,ME,VA
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA
1,2-Dichloropropane	CT,NH,NY,ME,VA
1,3-Dichloropropane	NH,NY,ME,VA
2,2-Dichloropropane	NH,NY,ME,VA
1,1-Dichloropropene	NH,NY,ME,VA
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA
Ethylbenzene	CT,NH,NY,ME,VA
Hexachlorobutadiene	NH,NY,ME,VA
2-Hexanone (MBK)	CT,NH,NY,ME,VA
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA
p-Isopropyltoluene (p-Cymene)	NH,NY
Methyl tert-Butyl Ether (MTBE)	NY,VA
Methylene Chloride	CT,NH,NY,ME,VA
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA
Naphthalene	NH,NY,ME,VA

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260C-D in Soil	
n-Propylbenzene	NH,NY
Styrene	CT,NH,NY,ME,VA
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA
Tetrachloroethylene	CT,NH,NY,ME,VA
Toluene	CT,NH,NY,ME,VA
1,2,4-Trichlorobenzene	NH,NY,ME,VA
1,1,1-Trichloroethane	CT,NH,NY,ME,VA
1,1,2-Trichloroethane	CT,NH,NY,ME,VA
Trichloroethylene	CT,NH,NY,ME,VA
Trichlorofluoromethane (Freon 11)	CT,NH,NY,VA
1,2,3-Trichloropropane	NH,NY,ME,VA
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA
Vinyl Chloride	CT,NH,NY,ME,VA
m+p Xylene	CT,NH,NY,ME,VA
o-Xylene	CT,NH,NY,ME,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2022
MA	Massachusetts DEP	M-MA100	06/30/2020
CT	Connecticut Department of Public Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2020
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2020
RI	Rhode Island Department of Health	LAO00112	12/30/2019
NC	North Carolina Div. of Water Quality	652	12/31/2019
NJ	New Jersey DEP	MA007 NELAP	06/30/2020
FL	Florida Department of Health	E871027 NELAP	06/30/2020
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2020
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2019
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2020
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2020
NC-DW	North Carolina Department of Health	25703	07/31/2020
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2020



777075189624



Delivered
Tuesday 11/26/2019 at 9:17 am

**DELIVERED**

Signed for by: R.PETRAITIS

GET STATUS UPDATES**OBTAIN PROOF OF DELIVERY**

FROM
Portland, ME US

TO
EAST LONGMEADOW, MA US

Shipment Facts

TRACKING NUMBER
777075189624

SERVICE
FedEx Priority Overnight

WEIGHT
10 lbs / 4.54 kgs

DIMENSIONS
15x11x11 in.

DELIVERED TO
Shipping/Receiving

TOTAL PIECES
1

TOTAL SHIPMENT WEIGHT
10 lbs / 4.54 kgs

TERMS
Recipient

SHIPPER REFERENCE
232069.00.001.0003

PACKAGING
Your Packaging

SPECIAL HANDLING SECTION
Deliver Weekday, Additional Handling
Surcharge

STANDARD TRANSIT
 11/26/2019 by 10:30 am

SHIP DATE
 Mon 11/25/2019

ACTUAL DELIVERY
Tue 11/26/2019 9:17 am

Travel History

			Local Scan Time	
Tuesday, 11/26/2019				
9:17 am	EAST LONGMEADOW, MA	Delivered		
8:14 am	WINDSOR LOCKS, CT	On FedEx vehicle for delivery		
8:05 am	WINDSOR LOCKS, CT	At local FedEx facility		

I Have Not Confirmed Sample Container
Numbers With Lab Staff Before Relinquishing
Over Samples _____



con-test®
ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False
Statement will be brought to the attention of the Client - State True or False

Client WTC

Received By RSP Date 11/26/19 Time 9:2

How were the samples received? In Cooler T No Cooler _____ On Ice T No Ice _____
Direct from Sampling _____ Ambient _____ Melted Ice _____

Were samples within Temperature? 2-6°C T By Gun # 2 Actual Temp - 2.7
By Blank # _____ Actual Temp - _____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all Client T Analysis T Sampler Name T
pertinent Information? Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? _____

Are there Rushes? F Who was notified? _____

Are there Short Holds? F Who was notified? _____

Is there enough Volume? T

Is there Headspace where applicable? F

Proper Media/Containers Used? T MS/MSD? f

Were trip blanks received? T Is splitting samples required? f

Do all samples have the proper pH? NA Acid _____ Base _____

Vials	#	Containers:	#	#	#	#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic		8oz (Amb) Clear
Meoh-	<u>2</u>	250 mL Amb.		250 mL Plastic		4oz Amb/Clear
Bisulfate-		Flashpoint		Col./Bacteria		2oz Amb/Clear
DI-		Other Glass		Other Plastic		Encore
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:
Sulfuric-		Perchlorate		Ziplock		

Unused Media

Vials	#	Containers:	#	#	#	#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear
DI-		Other Plastic		Other Glass		Encore
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:
Sulfuric-		Perchlorate		Ziplock		

Comments:

Only Methanol vials received for VOCs.

February 6, 2020

Jedd Steinglass
Woodard & Curran - Portland, ME
41 Hutchins Drive
Portland, ME 04102

Project Location: Portland, ME
Client Job Number:
Project Number: 0232069
Laboratory Work Order Number: 20A1325

Enclosed are results of analyses for samples received by the laboratory on January 30, 2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, reading "Meghan E. Kelley". The signature is written in a cursive, flowing style.

Meghan E. Kelley
Project Manager

Table of Contents

Sample Summary	3
Case Narrative	4
Sample Results	5
20A1325-01	5
20A1325-02	7
20A1325-03	9
Sample Preparation Information	11
QC Data	12
TCLP - Metals Analyses	12
B251696	12
Flag/Qualifier Summary	13
Certifications	14
Chain of Custody/Sample Receipt	15

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Woodard & Curran - Portland, ME
41 Hutchins Drive
Portland, ME 04102
ATTN: Jedd Steinglass

REPORT DATE: 2/6/2020

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 0232069

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 20A1325

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Portland, ME

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
WC-2 (25-30)	20A1325-01	Soil		SM 2540G SW-846 6010D	
WC-7 (29-36)	20A1325-02	Soil		SM 2540G SW-846 6010D	
WC-DUP-1	20A1325-03	Soil		SM 2540G SW-846 6010D	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

A handwritten signature in black ink, appearing to read "Lisa Worthington", is written over a light pink rectangular background.

Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 20A1325

Date Received: 1/30/2020

Field Sample #: WC-2 (25-30)

Sampled: 11/19/2019 13:50

Sample ID: 20A1325-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	62.9		% Wt	1		SM 2540G	2/2/20	2/2/20 7:54	JS

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 20A1325

Date Received: 1/30/2020

Field Sample #: WC-2 (25-30)

Sampled: 11/19/2019 13:50

Sample ID: 20A1325-01

Sample Matrix: Soil

TCLP - Metals Analyses

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	ND	0.11	mg/L	1		SW-846 6010D	2/6/20	2/6/20 12:52	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 20A1325

Date Received: 1/30/2020

Field Sample #: WC-7 (29-36)

Sampled: 11/20/2019 10:55

Sample ID: 20A1325-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	62.8		% Wt	1		SM 2540G	2/2/20	2/2/20 7:54	JS

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 20A1325

Date Received: 1/30/2020

Field Sample #: WC-7 (29-36)

Sampled: 11/20/2019 10:55

Sample ID: 20A1325-02

Sample Matrix: Soil

TCLP - Metals Analyses

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	ND	0.11	mg/L	1		SW-846 6010D	2/6/20	2/6/20 12:59	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 20A1325

Date Received: 1/30/2020

Field Sample #: WC-DUP-1

Sampled: 11/20/2019 00:00

Sample ID: 20A1325-03

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	62.9		% Wt	1		SM 2540G	2/2/20	2/2/20 7:54	JS

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Portland, ME

Sample Description:

Work Order: 20A1325

Date Received: 1/30/2020

Field Sample #: WC-DUP-1

Sampled: 11/20/2019 00:00

Sample ID: 20A1325-03

Sample Matrix: Soil

TCLP - Metals Analyses

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	ND	0.11	mg/L	1		SW-846 6010D	2/6/20	2/6/20 13:05	TBC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332**Sample Extraction Data****Prep Method: % Solids-SM 2540G**

Lab Number [Field ID]	Batch	Date
20A1325-01 [WC-2 (25-30)]	B251372	02/02/20
20A1325-02 [WC-7 (29-36)]	B251372	02/02/20
20A1325-03 [WC-DUP-1]	B251372	02/02/20

Prep Method: SW-846 3015A-SW-846 6010D**Leachates were extracted on 2/5/2020 per SW-846 1311 in Batch B251611**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
20A1325-01 [WC-2 (25-30)]	B251696	45.0	50.0	02/06/20
20A1325-02 [WC-7 (29-36)]	B251696	45.0	50.0	02/06/20
20A1325-03 [WC-DUP-1]	B251696	45.0	50.0	02/06/20

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

QUALITY CONTROL
TCLP - Metals Analyses - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B251696 - SW-846 3015A										
Blank (B251696-BLK1)				Prepared & Analyzed: 02/06/20						
Lead	ND	0.11	mg/L							
LCS (B251696-BS1)				Prepared & Analyzed: 02/06/20						
Lead	0.538	0.11	mg/L	0.556		96.9	80-120			
LCS Dup (B251696-BSD1)				Prepared & Analyzed: 02/06/20						
Lead	0.626	0.11	mg/L	0.556		113	80-120	15.0	20	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
---------	----------------

SW-846 6010D in Water

Lead NY,CT,ME,NC,NH,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2022
MA	Massachusetts DEP	M-MA100	06/30/2020
CT	Connecticut Department of Public Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2020
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2021
RI	Rhode Island Department of Health	LAO00112	12/30/2020
NC	North Carolina Div. of Water Quality	652	12/31/2020
NJ	New Jersey DEP	MA007 NELAP	06/30/2020
FL	Florida Department of Health	E871027 NELAP	06/30/2020
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2020
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2020
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2020
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2020
NC-DW	North Carolina Department of Health	25703	07/31/2020
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2020



Phone: 413-525-2332
Fax: 413-525-6405

Email: info@contestlabs.com

Address: 41 Hutchinson Dr
Portland, ME

Phone: 207-774-2112

Project Location: Portland, ME

Project Number: 0032069

Project Manager: David Sterling

Con-Test Quote Name/Number:

Invoice Recipient: Jack Sterling

Sampled By: Nathan Kats

http://www.contestlabs.com

39 Spruce Street
East Longmeadow, MA 01028

Doc # 381 Rev 2_06262019

Page 3 of 3

CHAIN OF CUSTODY RECORD

7-Day PRAS 10-Day (sid) 10-Day Due Date: ☐ Field Filtered Lab to Filter

1-Day 3-Day 4-Day Due Date: ☐ Field Filtered Lab to Filter

Format: PDF ☒ EXCEL ☒

CLP Like Data Pkg Required: ☐

Small To: ☐

Fax To #: ☐

ANALYSIS REQUESTED

Con-Test Work Order #	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE
21	WC-5(23.5-40)	11/21/19	1030	COMP	S	U	M	I			
22	WC-12(10-10)	11/21/19	1110		S						
23	WC-18(0-15)	11/21/19	1230		S						
24	WC-20(0-20)	11/21/19	1350		S						
25	WC-13(10-20)	11/21/19	1450		S						
26	WC-12(33-40)	11/21/19	1230		S						
27	WC-4(30-35)	11/21/19	1325		S						
28	WC-4(35-40)	11/21/19	1330		S						
29	TRIP BLANK 1	11/21/19									

Relinquished by (signature)

Received by (signature)

Relinquished by (signature)

Received by (signature)

Relinquished by (signature)

Received by (signature)

Relinquished by (signature)

Received by (signature)

Lab Comments:

Client Comments:

See page 1

Special Requirements

MA MCP Required ☐

MCP Certification Form Required ☐

CT RCP Required ☐

RCP Certification Form Required ☐

MA State Dw Required ☐

PWSID #

Project Entity

Government

Federal

City

Municipality

21 J

Brownfield

MWRA

School

MBTA

WRTA

Chromatogram

AHA-LAP LLC

PCE ONLY

Soxhlet

Non Soxhlet

Disclaimer: Con-Test Labs is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Con-Test values your partnership on each project and will try to assist with missing information, but will not be held accountable.

I Have Not Confirmed Sample Container Numbers With Lab Staff Before Relinquishing Over Samples _____



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ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client

WFC

Received By

PLF

Date

11/22/19

Time

18:30

How were the samples received?

In Cooler

T

No Cooler

On Ice

T

No Ice

Direct from Sampling

Ambient

Melted Ice

Were samples within Temperature? 2-6°C

T

By Gun #

2

Actual Temp - 47.28°C

By Blank #

Actual Temp -

Was Custody Seal Intact?

NA

Were Samples Tampered with?

NA

Was COC Relinquished?

T

Does Chain Agree With Samples?

T

Are there broken/leaking/loose caps on any samples?

F

Is COC in ink/ Legible?

T

Were samples received within holding time?

T

Did COC include all pertinent Information?

Client

T

Analysis

T

Sampler Name

T

Project

T

ID's

T

Collection Dates/Times

T

Are Sample labels filled out and legible?

T

Are there Lab to Filters?

F

Who was notified?

Are there Rushes?

F

Who was notified?

Are there Short Holds?

F

Who was notified?

Is there enough Volume?

T

Is there Headspace where applicable?

NA

MS/MSD?

F

Proper Media/Containers Used?

T

Is splitting samples required?

F

Were trip blanks received?

T

On COC?

T

Do all samples have the proper pH?

Acid

NA

Base

NA

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	<u>29</u>
Meoh-	<u>30</u>	250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Flashpoint		Col./Bacteria		2oz Amb/Clear	
DI-		Other Glass		Other Plastic		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Unused Media

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.	
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear	
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear	
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear	
DI-		Other Plastic		Other Glass		Encore	
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:	
Sulfuric-		Perchlorate		Ziplock			

Comments:



woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

APPENDIX C: CSO REGULATOR STRUCTURAL ASSESSMENT MEMORANDUM

DRAFT



MEMORANDUM

TO: Glenn Adams, P.E. – Senior Project Manager, Sargent Corporation
FROM: Jim Sturgis, P.E. – Senior Structural Engineer, Woodard & Curran
DATE: November 22, 2019
RE: City of Portland Back Cove South Storage Facility
Structural Condition Assessment of CSO Regulators 16A, 16B, 17, & 18

Introduction

As requested by the City of Portland in conjunction with Sargent Corporation, Woodard & Curran Senior Structural Engineer Jim Sturgis has conducted confined-space entry (CSE) structural condition assessments of the following four existing regulator manhole structures:

- CSO 18 Regulator – Franklin Street Tidegate Structure located at the intersection of Marginal Way & Franklin Street (inspected 4 am on 10/09/19)
- CSO 17 Regulator – Preble Street Overflow & Tidegate Structure located at the intersection of Marginal Way & Preble Street (inspected 6 am on 10/09/19)
- CSO 16A Regulator – Forest-Bedford Street Overflow Chamber located at the intersection of Forest Avenue & Bedford Street (inspected 4 am on 10/18/19)
- CSO 16B Regulator – Bank Road Diversion Chamber located at the intersection of Deerfield Road & Preble Street Extension (inspected 6 am on 10/18/19)

The purpose of this structural condition assessment was to identify areas that have structural deficiencies, to assess the structural integrity of each structure and to assess the suitability of each structure for continued long-term use. Each inspection was made using CSE procedures working with Cory Buck from Sargent Corporation and a Portland Police detail to help protect the open manholes. Woodard & Curran Civil Project Engineer Kevin Trainor, P.E. was present to provide assistance with the first two inspections on 10/09/19. Lighting was provided by hand-held flashlight and a head lamp. Each structure was in service at the time of inspection and no pre-cleaning of surfaces was performed. As a result, each inspection was conducted under conditions with limited options for safe footing and observations were limited by flowing wastewater, lack of light, leaking gates, dirt, debris, and sludge deposits that concealed viewing of structure surfaces. This assessment is limited to the condition of structural items only. Other disciplines such as civil, electrical and mechanical are not addressed in this Memorandum. No structural calculations or structural code reviews have been performed to determine if the existing structure meets current building code requirements for wind, seismic, geotechnical, or other load criteria.

This Memorandum will provide existing conditions, observations, recommendations, and photos for each structure.

Existing Construction

Drawing information provided for each structure included schematic drawings for all regulator structures and structural as-builts for only CSO Regulators 16B, 17, and 18. The following section provides description of the existing construction for each CSO Regulator structure:

CSO 18 Regulator – Franklin Street Tidegate Structure:

Structural assessment was conducted for only the portion of the CSO 18 Regulator upstream of the tide gate, as the downstream portion was partially full of water. Constructed in approximately 1964 per record drawings, the upstream portion of CSO 18 Regulator is a rectangular cast-in-place concrete chamber with approximate dimensions of 6' wide x 15'-4" long x 6' high with a circular brick access riser to a cast iron frame & cover at street level. The upstream structure has the following features: 72" RC inlet, 12" VCP outlet, 36" RC interceptor which is shown on record drawings passing below the structure (not visible within chamber), an 18" tall brick weir wall, and a steel tide gate. Record drawings show a 30" RC storm drain inlet, 12" storm drain inlet, and 72" RC outlet downstream of the tide gate, but this could not be confirmed. The floor, walls, and cover slab of the rectangular chamber are cast-in-place concrete. The brick weir wall, which has cement parging on the face of the brick, has a 4" PVC through pipe with its invert approximately 9" above the chamber floor, which was apparently provided to allow trapped water to drain back upstream. This weir wall is not shown on record drawings, so it appears that was added at some point after original construction. The walls of this structure were coated with up to an inch of dirt and sludge, which concealed structural surfaces and limited ability to properly assess condition. The below photos provide a general understanding of the structure:



View looking downstream toward tide gate



View looking upstream at 72" RC inlet

CSO 17 Regulator – Preble Street Overflow & Tidegate Structure:

Structural assessment was conducted for only the portion of the CSO 17 Regulator upstream of the tide gate, as the downstream portion was partially full of water. Constructed in approximately 1963 per Record Drawings, the upstream portion of CSO 17 Regulator is an irregular-shaped cast-in-place, pile-supported, reinforced concrete chamber with a precast access riser to a cast iron frame & cover at street level. Entry into the lower chamber is through a saw-cut rectangular opening made in the concrete chamber cover slab. The upstream structure has the following features: 96" RC inlet, 36" brick inlet, 36" RC outlet with a steel cover plate reducer, 30" SD inlet, and a metal-reinforced rubber tide gate. The tide gate appears to have a raised sill or shelf approximately 34" above the floor. Record drawings show a 9' x 7.5' rectangular storm overflow conduit downstream of the tide gate, but this could not be confirmed. There is also an approximately 54" diameter overhead pipe wrapped in filter fabric with invert approximately 4' above the chamber floor and projecting partially down into the chamber through the chamber cover slab; this pipe is not shown on the System Base Mapping Schematic of this structure provided by the City, but this is a separated storm drain that was recently installed according to the City. The floor, walls, and cover slab of the chamber are cast-in-place concrete. The below photos provide a general understanding of the structure:



Looking downstream tide gate and 30" SD Inlet



Looking downstream at 36" RC outlet



Looking upstream at 96" RC Inlet



Looking upstream at overhead storm drain

CSO 16A Regulator – Forest-Bedford Street Overflow Chamber:

CSO 16A Regulator is a circular brick manhole structure of with consistent diameter that reduces to a cast iron frame & cover at street level. Constructed in 1947, the manhole structure has the following features: 30" VCP inlet, 30" VCP outlet, 8" PVC inlet, parged brick weir wall, and 30" VC outlet downstream from weir wall. The floor and walls of the circular manhole are brick masonry, with a small portion of the manhole invert constructed of concrete. The below photos provide a general understanding of this structure:



View looking down into brick manhole



View looking upstream at 30" VCP inlet

CSO 16B Regulator – Bank Road Diversion Chamber:

CSO 16A Regulator is a rectangular cast-in-place concrete chamber approximately 6' wide x 9' long x 5'-6" high with a masonry riser to a cast iron frame & cover at street level. Constructed in 1972, the manhole structure has the following features: 24" RCP inlet, 12" VCP outlet with steel cover plate reducer, masonry weir wall, and 24" outlet downstream from weir wall. The floor, walls, and cover slab of the chamber are cast-in-place concrete with a brick masonry invert channel. The below photos provide a general understanding of the structure:



View looking down into concrete chamber



View looking upstream at 24" RCP inlet

Observations

The following section provides a summary of observations made for each CSO Regulator structure:

Observations for CSO 18 Regulator – Franklin Street Tidegate Structure:

- Concrete floor: covered with water and dirt; appears to be in fair & sound condition.
- Concrete walls: covered with dirt and grime; appears to be in fair & sound condition.
- Concrete cover slab: covered with dirt and grime; appears to be in fair & sound condition; some damp areas may be evidence of minor infiltration, but no active leakage was observed.
- Brick weir wall: fair & sound condition.

- Brick access riser: covered with dirt and debris; condition could not be confirmed, but no areas of major disrepair were observed.
- Metal tide gate in closed position: fair condition; apparent active seepage under gate.
- 72" RC Inlet: fair condition, flowing freely.
- 12" VCP outlet: fair condition, flowing freely.
- 12" channel invert: fair & sound condition.

The below photos provide further description of observations for CSO 18 Regulator:



View looking upstream toward 72" RC inlet



Concrete ceiling slab with minor infiltration

Observations for CSO 17 Regulator – Preble Street Overflow & Tidegate Structure:

- Concrete floor: covered with water and dirt; appears to be in fair & sound condition.
- Concrete invert channel: full of water and sewage; appears to be in fair condition with some random cracking.
- Concrete walls (general): access was limited to hammer sound, but walls appear to be in fair condition.
- Concrete walls around 30" storm drain inlet: **approximately 30 SF of cracked, hollow, delaminated, unsound concrete to unknown depth (assume 2" to 4") all around pipe. Wall thickness per record drawings varies 6" to 12". See photos below:**



- Cover slab access opening: **concrete spalling and exposed rebar at perimeter of saw-cut slab opening (assume 8 SF of spall repair). Exposed rebar ends present a safety hazard for entrants into this structure as person passes through opening. See photos below:**



- Concrete cover slab: fair & sound condition; no active leakage was observed.
- Precast concrete cone access riser: fair & sound condition.
- 96" RC inlet: fair condition, flowing freely.
- 36" brick inlet: fair condition, flowing freely.
- 54" +/- overhead storm drain wrapped in filter fabric: condition could not be confirmed, but no obvious signs of disrepair or structural concern.
- 36" RC outlet: **unknown condition; flow blocked by debris; there is a heavily-corroded steel plate over the pipe outlet restricting flow down to an approximately 18" square opening. See photos below:**



- 30" storm drain inlet: fair & sound condition, **but pipe appears to be fully plugged with dirt & debris. See photos below:**



- Metal-reinforced rubber tide gate: **in closed position with major active leakage under gate sill or shelf located 34" above chamber floor. See photos below:**



Observations for CSO 16A Regulator – Forest-Bedford Street Overflow Chamber:

- Brick floor: covered with water and dirt; appears to be in fair & sound condition.
- Brick walls & access riser: fair & sound condition; **some mortar joints have gaps and missing mortar. See photos below:**



- Brick weir wall: parged with mortar; fair & sound condition.
- 30" VCP inlet: fair condition, flowing freely.
- 30" VCP outlet (downstream of weir wall): fair & sound condition.
- 30" outlet (upstream of weir wall): fair condition, flowing freely; **several void areas in masonry around pipe perimeter; unknown pipe lining material has cracks/splits in finish. See photos below:**



- 8" PVC inlet: pipe in fair condition; **multiple localized leaks in area around pipe with visible seepage; brick invert at pipe outlet is broken apart and crumbled. See photos below:**



Observations for CSO 16B Regulator – Bank Road Diversion Chamber:

- Concrete cover slab: fair & sound condition; no active leakage was observed.
- Concrete walls: fair & sound condition; no active leakage was observed.
- Brick shelf around invert: fair & sound condition.
- Brick invert: full of sewer; condition unknown.
- Masonry access riser: fair & sound condition.
- 24" RCP inlet: fair & sound condition.
- 24" outlet: fair & sound condition.

- 12" +/- VCP outlet (upstream of weir wall): pipe is mostly blocked by a steel plate in fair condition mounted so bottom of plate is approximately at pipe centerline. See photos below:



- Masonry weir wall: fair & sound condition; top of wall has two metal plates on either side directing overflow to a center opening approximately 16" wide. See photos below:



Recommendations

In general, the structures were found to be in sound condition with no significant signs of structural weakness or structural integrity. However, there were several repair and maintenance items identified that should be addressed to extend the design life of these regulator structures and to minimize the potential that current repair issues develop into major structural integrity concerns in the future. Recommendations are provided below for each regulator structure along with a priority level (low, medium, or high) to assist the City for planning purposes.

Recommendations for CSO 18 Regulator – Franklin Street Tidegate Structure:

- General [*Medium Priority*]: Due to the amount of dirt and grime coating the structure walls and cover slab, it is recommended that all surfaces be pressure washed to remove all material from concrete or brick surfaces and the structure re-inspected. Although no obvious signs of structural defects were observed, much of the surface areas were concealed from view preventing the ability to perform a proper condition assessment.

- Concrete cover slab [*Medium Priority*]: until the underside of the concrete cover slab is cleaned, it is not possible to provide useful recommendations for any needed repairs to correct the potential minor infiltration observed because the source is not clear (cracks, spalls, etc.). Although no obvious signs of active infiltration were observed, minor signs of moisture and dampness were observed on the dirty concrete surfaces.
- Metal tide gate [*High Priority*]: This gate is scheduled to be demolished once new tide gates are installed downstream.

Recommendations for CSO 17 Regulator – Preble Street Overflow & Tidegate Structure:

- Concrete walls around 30" storm drain inlet [*High Priority*]: provide spall repair to approximately 30 SF of cracked, hollow, delaminated, unsound concrete to unknown depth (assume 2" to 4") all around pipe. Wall thickness per record drawings varies 6" to 12". Saw-cut Spall Repair Procedure:
 - Delineate limits of hollow areas into rectangular shaped repair areas.
 - Saw-cut repair area perimeter to a depth of approximately 1/2" deep, using extreme caution not to cut existing rebar (locate rebar depth before cutting).
 - Use extreme caution not to be too aggressive with chipping, as wall thickness is limited and avoid chipping through full thickness of concrete especially where wall is holding back soil. Notify Engineer immediately if chipping extends more than 3" into wall.
 - Remove all unsound concrete (see note above) as required to achieve a solid concrete substrate.
 - Any exposed rebar shall be cleaned and inspected to ensure bar is full diameter and has not lost thickness due to corrosion. Notify Engineer immediately if reduced bar diameter is observed. Prime sound, full-dimension rebar with corrosion inhibitor equal to Sika Armatec 110 EpoCem.
 - Where exposed rebar is observed, chip out concrete around full diameter of bars to achieve a minimum clearance of 1/2" on all sides.
 - Infill and restore lost thickness in repair areas to match original form dimensions flush with existing adjacent concrete surfaces using high-performance repair mortar equal to Sikatop 123 Plus or MasterEmaco product equivalent. All surface preparation, application, and curing shall be in accordance with manufacturer's recommendations.
- Cover slab access opening [*High Priority*]: repair concrete spalling and exposed rebar at perimeter of saw-cut slab opening (assume 8 SF of spall repair). Any exposed rebar ends shall be cut back a minimum 2" back from the face of repaired areas. See Saw-cut Spall Repair Procedure above for spall repair requirements and specifications.
- 36" RC outlet [*High Priority*]: unknown condition as plate covers up pipe; flow blocked by debris; the existing heavily-corroded steel plate over the pipe outlet restricting flow down to an approximately 18" square opening should be removed. As directed by the City, replace the plate in kind, but with a new Type 6061-T6 aluminum plate with 316 stainless steel adhesive anchors. Opening size in plate shall match existing unless otherwise directed by the City.
- 30" storm drain inlet [*High Priority*]: the pipe appears to be fully plugged with dirt & debris. This line should be cleaned out to ensure it is flowing freely.
- Metal-reinforced rubber tide gate [*High Priority*]: This has major leakage and is scheduled to be demolished once new tide gates are installed downstream.

Recommendations for CSO 16A Regulator – Forest-Bedford Street Overflow Chamber:

- Brick walls & access riser [*Low Priority*]: fair & sound condition; some mortar joints have gaps and missing mortar. It is recommended that a brick mason pressure wash the brick surfaces, inspect, and repoint any mortar joints that are not fully intact.
- 30" outlet (upstream of weir wall) [*Low Priority*]: There are several void areas in masonry around pipe perimeter; it is recommended that a brick mason inspect and infill these void spaces with brick masonry to ensure the integrity of the brick construction around this pipe is sound and intact. Also, the unknown pipe lining material has cracks/splits in finish. These areas should be inspected more closely to verify integrity of the pipe lining and corrective action to seal these cracks and splits with the appropriate material should be considered.
- 8" PVC inlet: pipe in fair condition [*High Priority*]: There are multiple localized leaks in area around pipe with visible seepage; pressure wash these areas, re-inspect, and use polyurethane grout injection or other means to address seepage from multiple areas. Polyurethane injection shall be performed using Mountain Grout SLV with Accelerator or approved equal, application as per manufacturer's recommendations. The brick invert at pipe outlet is broken apart and crumbled; this should be rebuilt by a brick mason to ensure free flow with no open voids and a stable brick invert downstream of the PVC pipe. Flow will need to be stopped temporarily as required.

Recommendations for CSO 16B Regulator – Bank Road Diversion Chamber:

- 12" +/- VCP outlet (upstream of weir wall) [*Low Priority*]: pipe is mostly blocked by a steel plate in fair condition with a small opening mostly under water. Confirm with the City if this plate and the opening size for the plate should be kept in place moving forward. If directed by the City, replace the plate in kind, but with a new Type 6061-T6 aluminum plate with 316 stainless steel adhesive anchors. Opening size in plate shall match existing unless otherwise directed by the City.
- Masonry weir wall [*Low Priority*]: fair & sound condition; top of wall has two metal plates on either side directing overflow to a center opening approximately 16" wide. Confirm with the City that the opening between these plates is preferred or if any changes are desired.

**APPENDIX D: BACK COVE SOUTH STORAGE FACILITY HYDRAULIC ANALYSIS
TECHNICAL MEMORANDUM**

TECHNICAL MEMORANDUM

TO: Brad Roland, P.E. Portland Department of Public Works
Owens McCullough, P.E., Sebago Technics, Inc.
Kate Mignon, P.E. & Greg Heath, P.E., AECOM

PREPARED BY: Kevin Trainor, P.E.

REVIEWED BY: Megan McDevitt, P.E.; Benjamin Bass, Ph.D., CFM

DATE: February 7, 2020

RE: Back Cove South Storage Facility Hydraulic Analysis

This memorandum documents the existing and proposed condition hydraulic model development for the Back Cove South Storage Facility (BCSSF) project and is intended to supplement the Basis of Design Report prepared by Woodard & Curran and Sargent Corporation, dated February 2020. Analysis was performed based on the BCSSF design as shown on the Draft BODR plans dated February 2020. The following sections describe the model boundary conditions, simulation results, and conclusions.

1. HYDRAULIC ANALYSIS APPROACH

The hydraulics of the existing CSOs 16, 17, and 18 and the proposed storage tanks and conveyance piping were simulated using the Environmental Protection Agency (EPA) Storm Water Management Model (SWMM) version 5.1.013 within the PCSWMM software package. The following sections describe the selection of inflow and tailwater boundary conditions, model layout, parameter selection, and simulation scenarios.

1.1 Boundary Conditions

The following sections summarize the inflow boundary conditions and tailwater boundary conditions analyzed.

1.1.1 Inflow Boundary Condition

Two flow input boundary conditions provided by the City were analyzed, identified as the highest peak flow in a typical year by CSO outfall and maximum peak flows by CSO outfall. Design flowrates utilized in the model are from the RFP and are summarized in Tables 1-1 and 1-2

Table 1-1: Highest Peak Flow in Typical Year by CSO Outfall (Source: RFP Table 3-1)

CSO Outfall	Highest Peak Flow in Typical Year (MGD)	Highest Peak Flow in Typical Year (cfs)
16	18	27.9
17	113	174.8
18	25	38.7
Total	156	241.4

Table 1-2: Maximum Peak Flows by CSO Outfall (Source: RFP Table 3-2)

CSO Outfall	Peak Flow (MGD)	Peak Flow (cfs)
16	52	80.5
17	270	417.75
18	134	207.3
Total	456	705.55

1.1.2 Tailwater Boundary Condition

Two tailwater boundary conditions were analyzed as part of this hydraulic analysis:

- Free outfall
- Mean Higher High Water (Elevation 5.35 feet City Datum)

1.2 Model Layout

The existing CSOs were simulated based on data from existing drawings provided by the City of Portland and subsequent field survey data collected by Sargent in October of 2019. Existing CSO outfall pipe elevations and sizes were confirmed and compared to existing condition survey from recent projects in the area, including the Bedford Street Sewer Separation Project, the State Street Infrastructure Improvements Project, and the Preble Street/Kennebec Street/Somerset Street Sewer Separation Project. Where elevation or dimensional data differed, the most recent field data was used.

1.3 Model Parameters & Setup

The following summarizes the simulation options selected for this model:

- Simulations were performed in dynamic wave routing mode
- The routing time step was 0.5 seconds
- The reporting time step was 5 seconds
- Design flowrates were applied as inflow timeseries at model nodes representing the existing CSOs downstream of the CSO regulator structures. The inflow timeseries for maximum peak flow (RFP Table 3-2) values were ramped to the design flows over a period of five minutes to simulate the initiation of a CSO event and reduce unrealistic artifacts of instantaneous high flowrates.

Additional model parameters are summarized in Table 1-3.

Table 1-3: Model Parameters

Model Element	Parameter	Value
New pipes	Manning's n	0.013
Existing RCP	Manning's n	0.015
Existing CMP	Manning's n	0.018
Manholes	Minor loss (K)	1.0
Diversion Structures	Minor loss (K)	1.5
Tank Connections	Exit loss (K)	1.0
Outfalls	Exit loss (K)	1.0

1.4 Simulation Scenarios

Simulation scenarios are summarized in Table 1-4.

Table 1-4: SWMM Simulation Scenarios

Scenario	Design Flow	Tailwater Condition
Scenario 1	RFP Table 3-1: Highest Peak Flow in Typical Year	Free outfall tailwater – Tideflex valve preventing backflow from Back Cove
Scenario 2	RFP Table 3-2: Maximum Peak Flows	MHHW (el 5.35)

2. SIMULATION RESULTS

Hydraulic grade lines along profiles of interest are illustrated in the following figures:

- Figures 2-1, 2-2, and 2-3 show the HGL in each CSO from regulator to outfall during Scenario 1 at the timestep 3.5 MG of storage is reached;
- Figures 2-4, 2-5, and 2-6 show the HGL in the conveyance piping for each CSO from diversion structure to Tank 1 during Scenario 1 at the timestep 3.5 MG of storage is reached; and
- Figures 2-7, 2-8, and 2-9 show the peak HGL comparison of existing versus proposed conditions in each CSO from regulator to outfall during Scenario 2.

2.1 Simulation Results for Conduits from CSO Regulator to CSO Outfall During Scenario 1

Figure 2-1 illustrates the HGL from DMH-7158 upstream of the proposed CSO 16 Diversion Structure to the CSO 16 outfall, showing no overflow occurs at CSO 16 prior to the tanks reaching the design water surface elevation and 3.5 MG of storage. The proposed diversion structure location is highlighted in yellow, conduit flow is indicated across the top, and junction inverts and water surface elevation are shown across the bottom of the figure. Note that conduits downstream of the CSO 16 Diversion Structure see no flow at this timestep.

Figure 2-1: HGL for CSO 16 at Peak Flows During Typical Year (from RFP Table 3-1) at 3.5 MG Storage

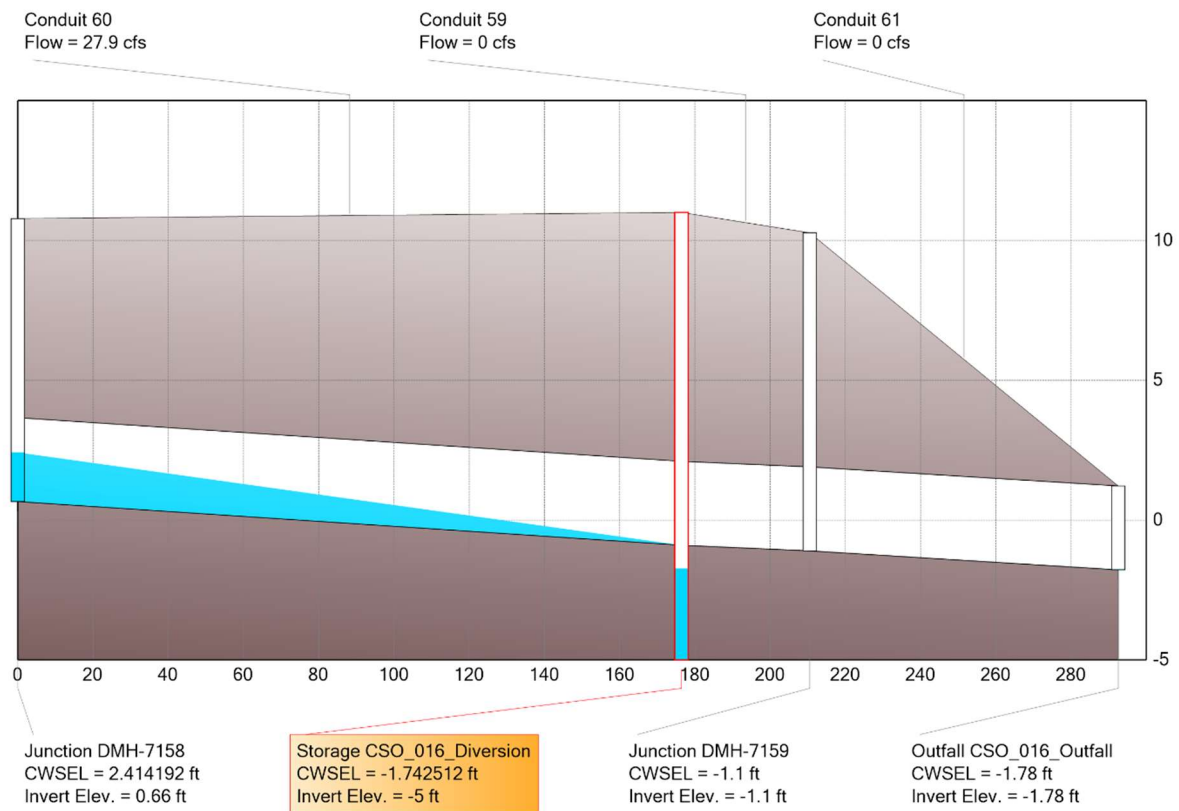
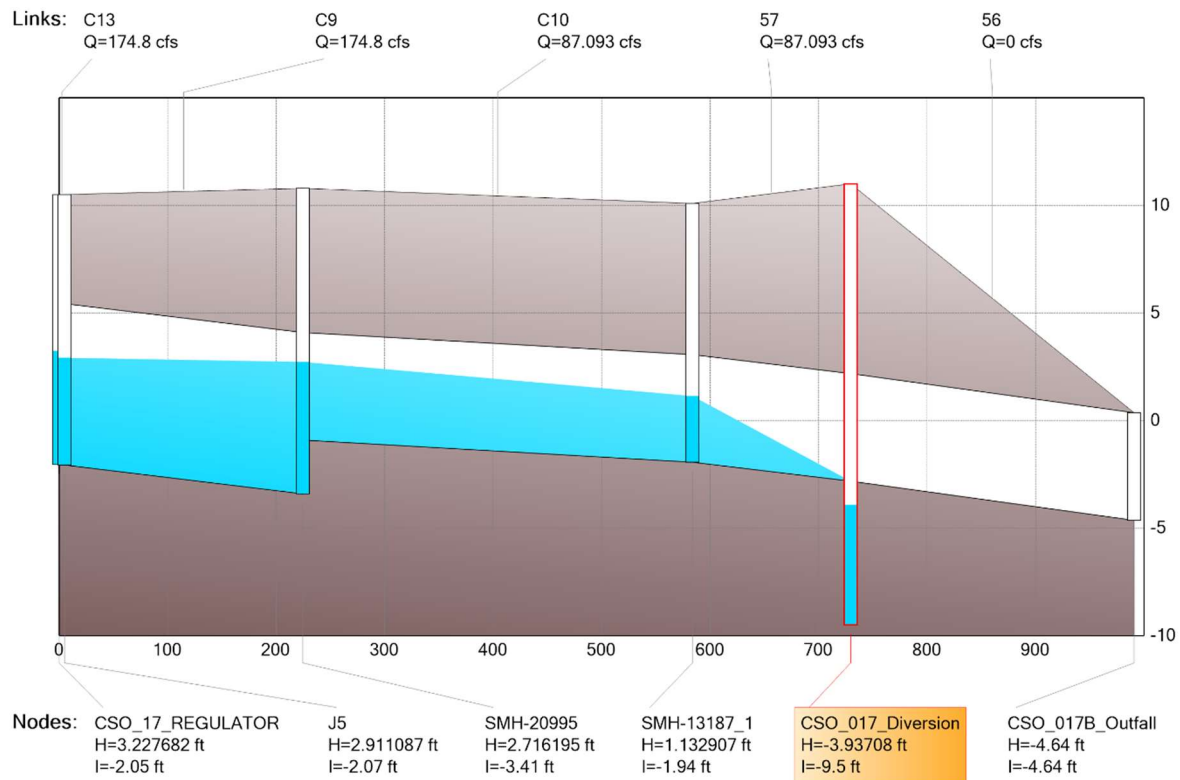


Figure 2-2 illustrates the HGL from the CSO 17 Regulator Structure to the CSO 17 Outfall, showing no overflow occurs at CSO 17 prior to the tanks reaching the design water surface elevation and 3.5 MG of storage. The proposed diversion structure location is highlighted in yellow, conduit flow is indicated across the top, and junction inverts and water surface elevation are shown across the bottom of the figure. Note that conduits downstream of the CSO 17 Diversion Structure see no flow at this timestep.

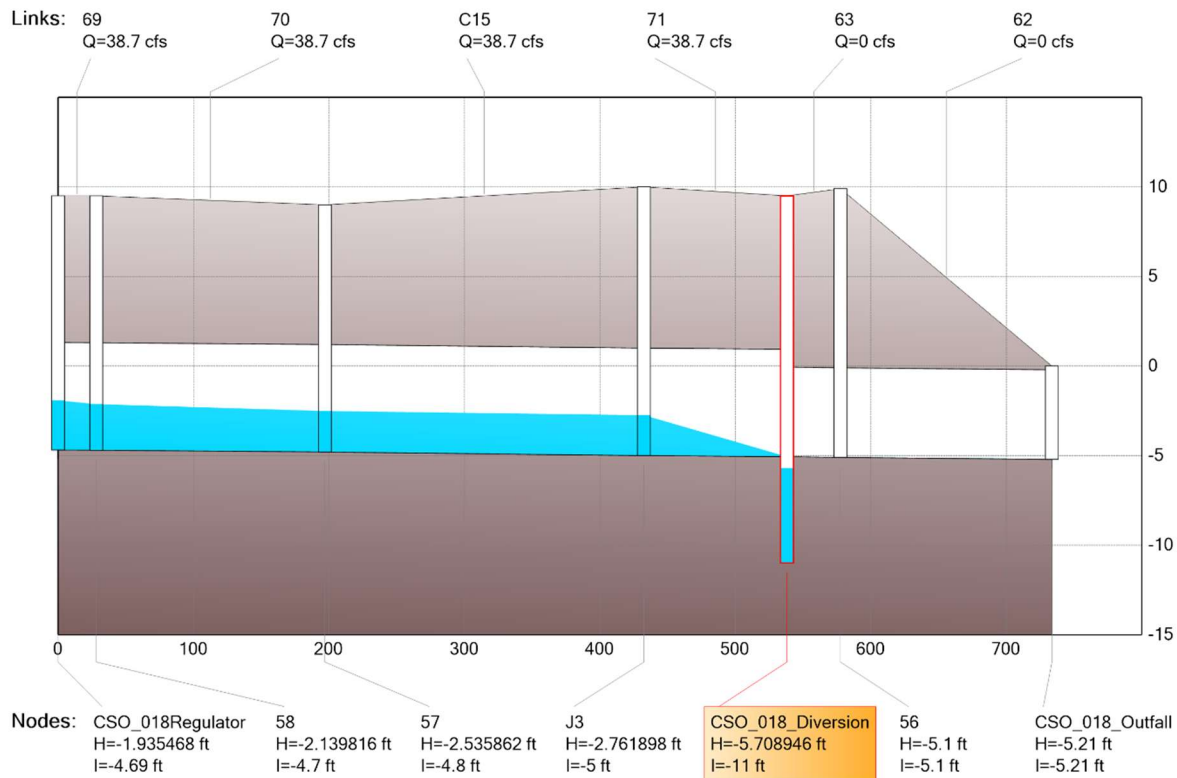
Figure 2-2: HGL for CSO 17 at Peak Flows During Typical Year (from RFP Table 3-1) at 3.5 MG Storage



The outfall conduit for CSO 17 leaves the regulator structure as a 9-foot by 7.5-foot box culvert. Near the I-295 overpass, flow splits into two conduits in a long concrete structure with a rectangular cross-section of varying clear area. According to MEDOT plans dated August 1970, flow was originally split into two 84-inch corrugated metal pipe (CMP) conduits that presumably matched the bottom elevation of the rectangular conduit. Based on information provided by the City of Portland, in the intervening years the 84-inch CMP was lined with 60-inch reinforced concrete pipe (RCP). The invert elevations of SMH-20995 and SMH-13187_1 were confirmed by Sargent Corporation during field survey. The proposed BCSSF will intercept CSO flow from CSO 17 at a point where flow is divided between two 60-inch conduits. Flows shown in Figure 2-2 for conduits C10 and 57 are based on dual barrels in this location, each accounting for approximately half of the total flow.

Figure 2-3 illustrates the HGL from the CSO 18 Regulator Structure to the CSO 18 Outfall, showing no overflow occurs at CSO 18 prior to the tanks reaching the design water surface elevation and 3.5 MG of storage. The proposed diversion structure location is highlighted in yellow, conduit flow is indicated across the top, and junction inverts and water surface elevation are shown across the bottom of the figure. The pipe downstream of the diversion structure consists of dual 60-inch conduits to facilitate overflow from CSOs 16 and 17 during maximum peak flows (RFP Table 3-2). Note that conduits downstream of the CSO 18 Diversion Structure see no flow at this timestep.

Figure 2-3: HGL for CSO 18 at Peak Flows During Typical Year (from RFP Table 3-1) at 3.5 MG Storage



2.2 Simulation Results for Conduits from Proposed Diversion Structures to Tank 1

Figure 2-4 illustrates model simulation results showing the HGL from the CSO 16 Diversion Structure to Tank 1 at the point 3.5 MG of storage is reached. The proposed diversion structure location is highlighted in yellow, conduit flow is indicated across the top, and junction inverts and water surface elevation are shown across the bottom of the figure.

Figure 2-4: HGL for CSO 16 Conveyance Piping to Tanks at 3.5 MG Storage at Peak Flows During Typical Year (from RFP Table 3-1)

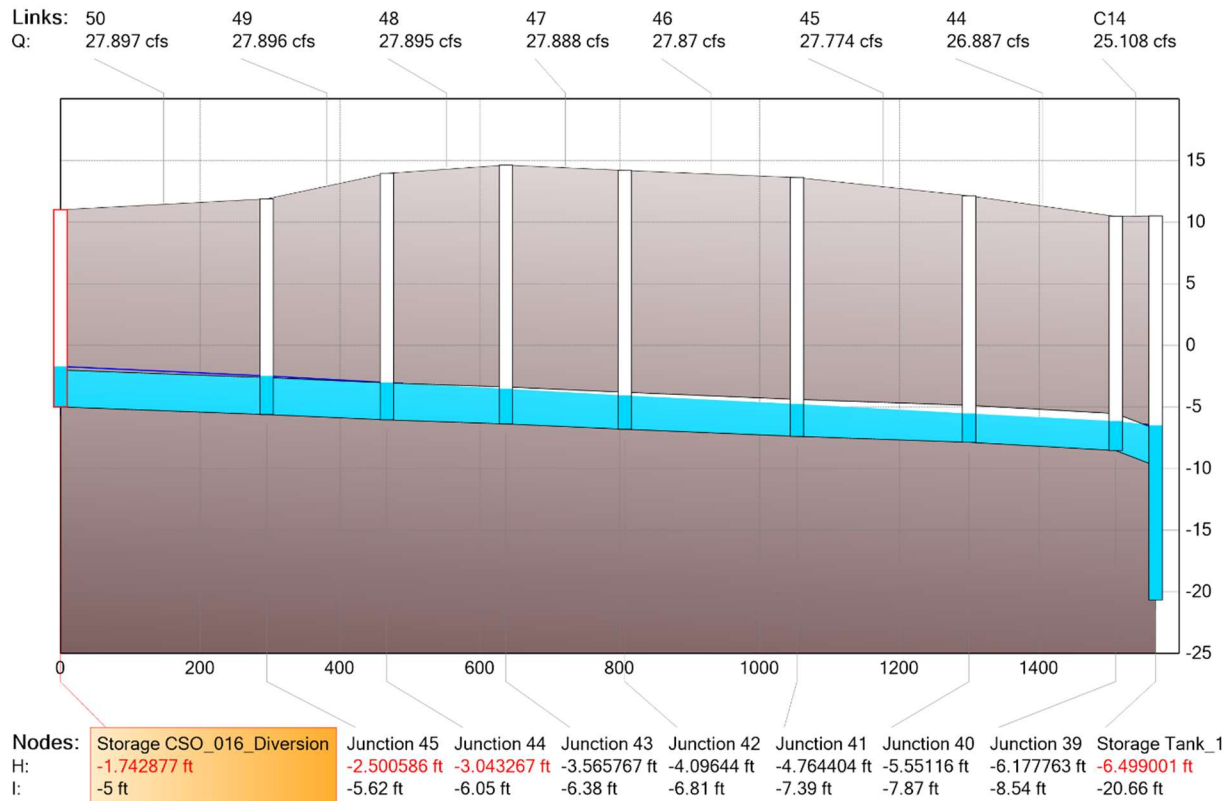


Figure 2-4 demonstrates that the CSO 16 Conveyance Piping conveys the highest peak flow in a typical year by gravity to Tank 1 up until the design Water Surface Elevation (WSE) is achieved.

Figure 2-5 illustrates model simulation results showing the HGL from the CSO 17 Diversion Structure to Tank 1 at the point 3.5 MG of storage is reached. The proposed diversion structure location is highlighted in yellow, conduit flow is indicated across the top, and junction inverts and water surface elevation are shown across the bottom of the figure.

Figure 2-5: HGL for CSO 17 Conveyance Piping to Tanks at 3.5 MG Storage at Peak Flows During Typical Year (from RFP Table 3-1)

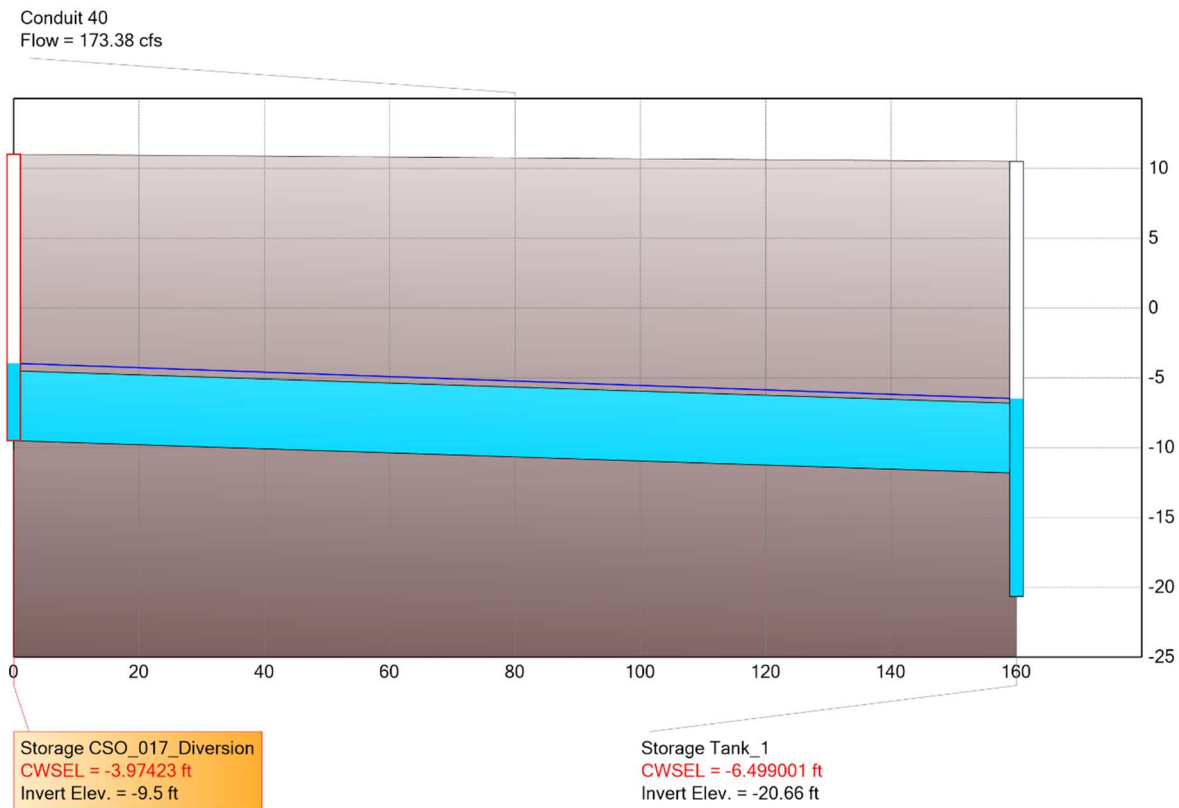


Figure 2-5 demonstrates that the CSO 17 Conveyance Piping conveys the highest peak flow in a typical year by gravity to Tank 1 up until the design WSE is achieved.

Figure 2-6 illustrates model simulation results showing the HGL from the CSO 18 Diversion Structure to Tank 1 at the point 3.5 MG of storage is reached. The proposed diversion structure location is highlighted in yellow, conduit flow is indicated across the top, and junction inverts and water surface elevation are shown across the bottom of the figure.

Figure 2-6: HGL for CSO 18 Conveyance Piping to Tanks at 3.5 MG Storage at Peak Flows During Typical Year (from RFP Table 3-1)

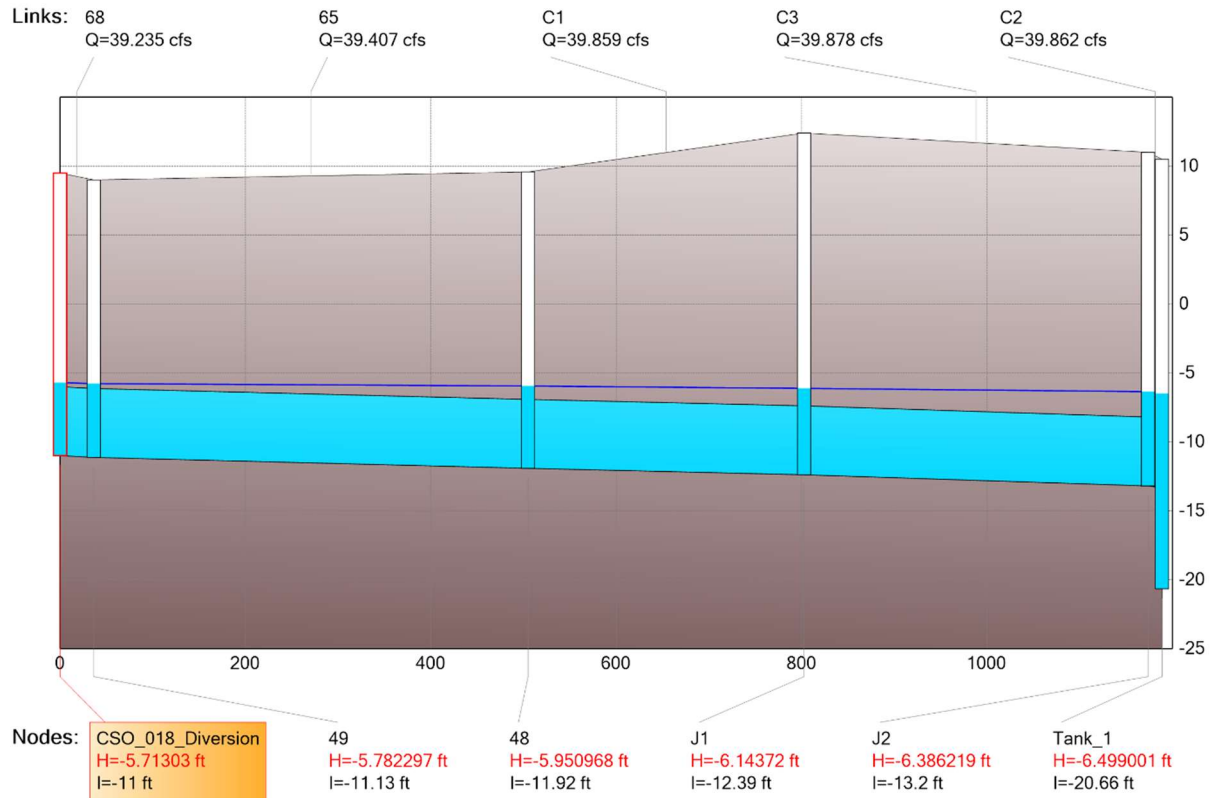


Figure 2-6 demonstrates that the CSO 18 Conveyance Piping conveys the highest peak flow in a typical year by gravity to Tank 1 up until the design WSE is achieved.

2.3 Simulation Results for Conduits from CSO Regulators to Outfall During Scenario 2

Modeling of the proposed system as currently designed indicates a modest improvement of the hydraulic grade line of each CSO over existing conditions during Scenario 2 as demonstrated by Figures 2-7, 2-8, and 2-9. The following figures show HGLs for each CSO comparing existing conditions to proposed conditions during Scenario 2, maximum peak flows and a tailwater of MHHW (el 5.35). These figures are intended to show that the proposed BCSSF will not negatively affect the HGL upstream of the CSO Regulator Structures. Results of these simulations indicate that the existing CSO pipes do not have the capacity to convey the design flows in Scenario 2, and flooding may occur at or upstream of the CSO Regulator Structures. Following construction of the BCSSF, this condition will improve, but will not be eliminated.

Figure 2-7 illustrates the comparison of HGLs for existing conditions (red line) and proposed conditions (blue line) for diversion and conveyance systems at CSO 16 during Scenario 2. The outfall for CSO 16 discharges flow from two CSO regulator structures. RFP Table 3-2 only provided one flow rate for CSO 16; therefore, that flow rate was applied to DMH-7158. Based on the profile of CSO 16, the HGL will exceed the ground surface at DMH-7158 under existing conditions and will continue to do so in the proposed condition under this scenario. This is a limitation of the existing system and not a result of the proposed BCSSF project.

Figure 2-7: HGLs for CSO 16 at Maximum Peak Flows (from RFP Table 3-2) at MHHW

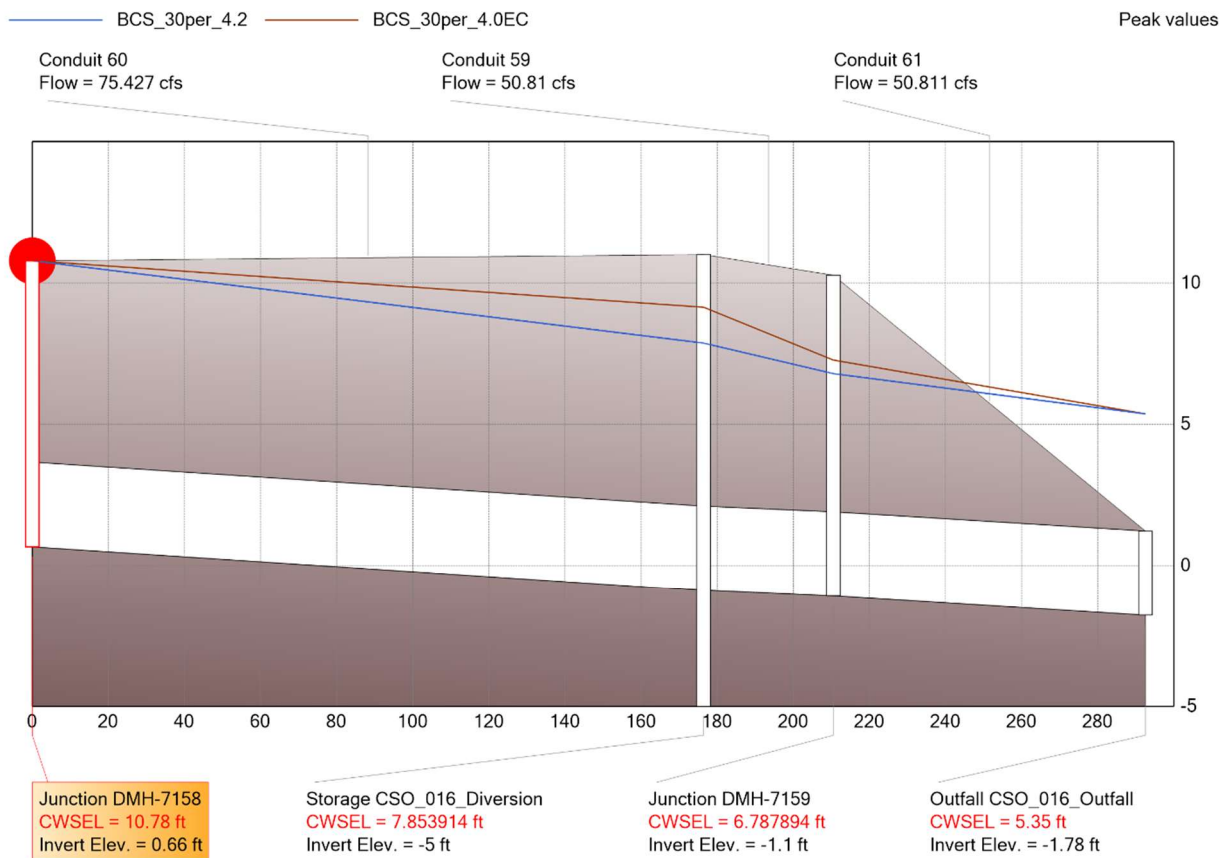


Figure 2-8 illustrates the comparison of HGLs for existing conditions (red line) and proposed conditions (blue line) for diversion and conveyance systems at CSO 17 during Scenario 2. Based on the profile of CSO 17, the HGL will exceed the ground surface at the CSO 17 regulator structure under existing conditions and will continue to do so in the proposed condition under Scenario 2. This is a limitation of the existing system and not a result of the proposed BCSSF project.

Figure 2-8: HGLs for CSO 17 at Maximum Peak Flows (from RFP Table 3-2) at MHHW

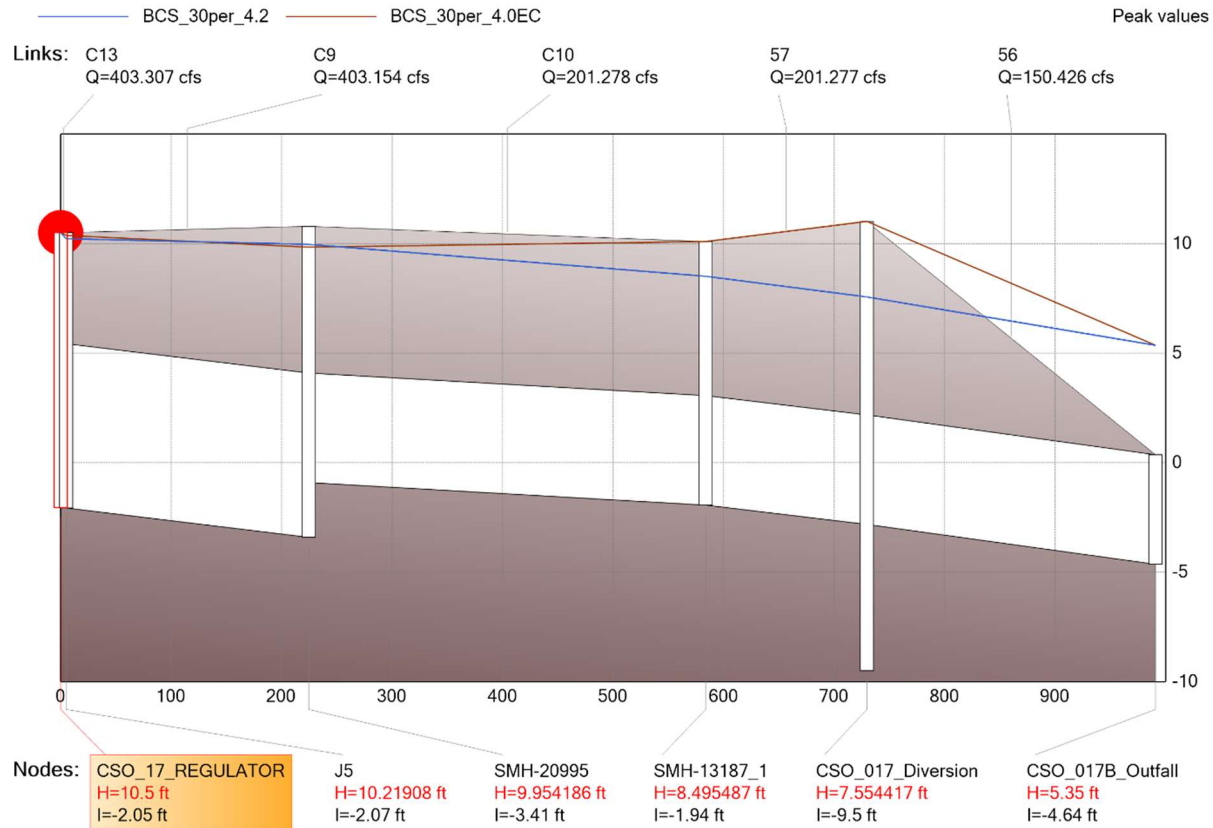
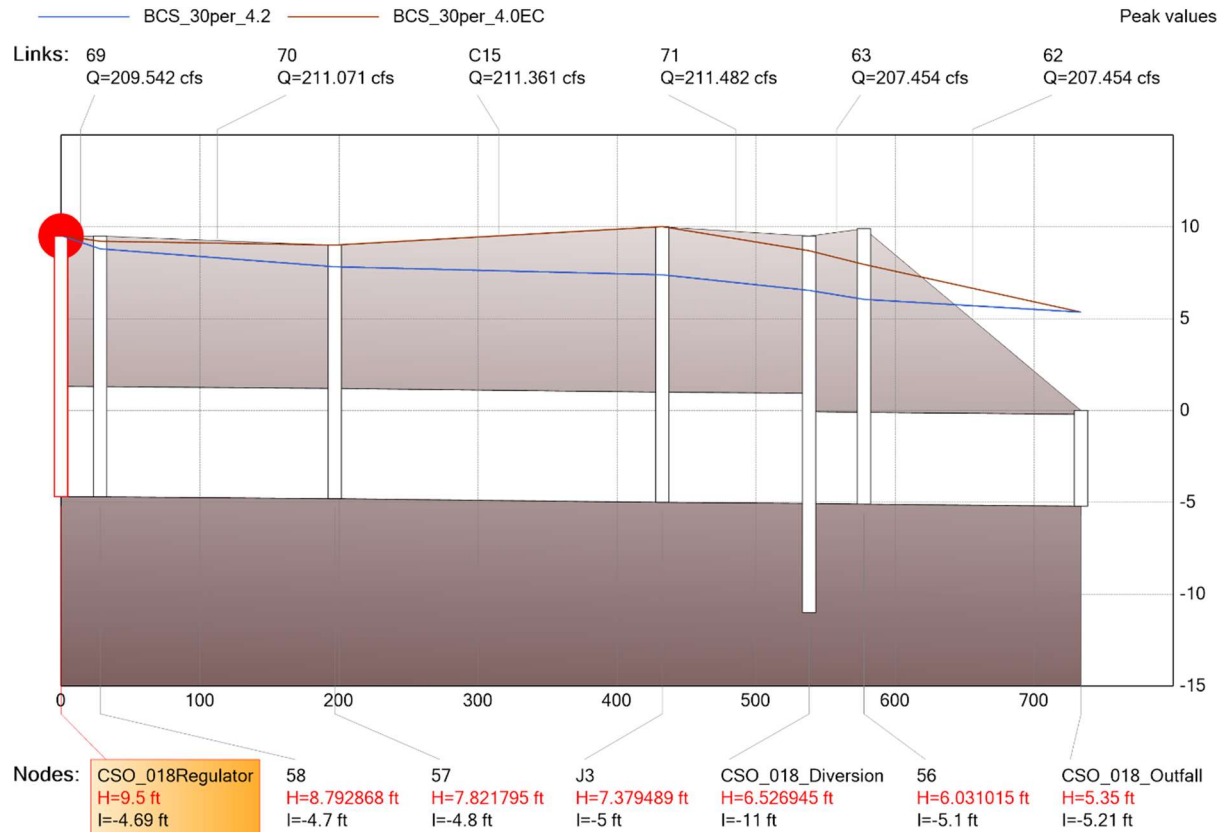


Figure 2-9 illustrates the comparison of HGLs for existing conditions (red line) and proposed conditions (blue line) for diversion and conveyance systems at CSO 18 during Scenario 2. Based on the profile of CSO 18, the HGL will exceed the ground surface at the CSO 18 regulator structure under existing conditions and will continue to do so in the proposed condition under this flow scenario. This is a limitation of the existing system and not a result of the proposed BCSSF project.

Figure 2-9: HGLs for CSO 18 at Maximum Peak Flows (from RFP Table 3-2) at MHHW



3. CONCLUSIONS & RECOMMENDATION

The analysis performed to date supports the following conclusions:

1. The proposed BCSSF will provide 3.5 MG of combined sewer storage prior to the initiation of a CSO event at CSO 16, 17, or 18 under Scenario 1, and
2. The proposed BCSSF will not have an adverse impact on the HGL at the existing CSO Regulator Structures.

Based on this analysis, we recommend advancing design based on this layout and evaluating the proposed Diversion Structures using computational fluid dynamics.

APPENDIX E: EQUIPMENT LIST, INFORMATION AND DRAWINGS

APPENDIX E-1. EQUIPMENT LIST

Table E-1 includes a list of major equipment and key details. The basis of design for the equipment is discussed separately in the sections indicated in the table below.

Table E-1: Equipment List

General Description	Manu.	Model	No. Units	Materials	Appurtenances	Section
Submersible Tank Dewatering Pumps	Vaughan	Chopper Pump Model S4S-100 Variable Speed Pump. 25 HP, 1755 rpm, 460 volt, 3 phase, 60 Hz	Four (4) plus one (1) spare	Casing: Ductile Iron Cutter Bar, Cutter Nut, Impeller, Shaft, Upper Cutter: Cast Alloy Steel Coating: Epoxy	Discharge Elbow, Base, Guide Rail System	Section 7.4 Tank Dewatering Pumping System
Tipping Buckets	Grande	ACU-TIP Model GAT-135	Eight (8)	Bucket, side wall support, hardware: Stainless Steel 316L Stoppers: Buna-N	Side wall supports, integral rubber bumpers, bearings, anchors, non-contact proximity switches	Section 7.6 Tipping Bucket Requirements

Appendix E-1: Vaughan Submersible Pump

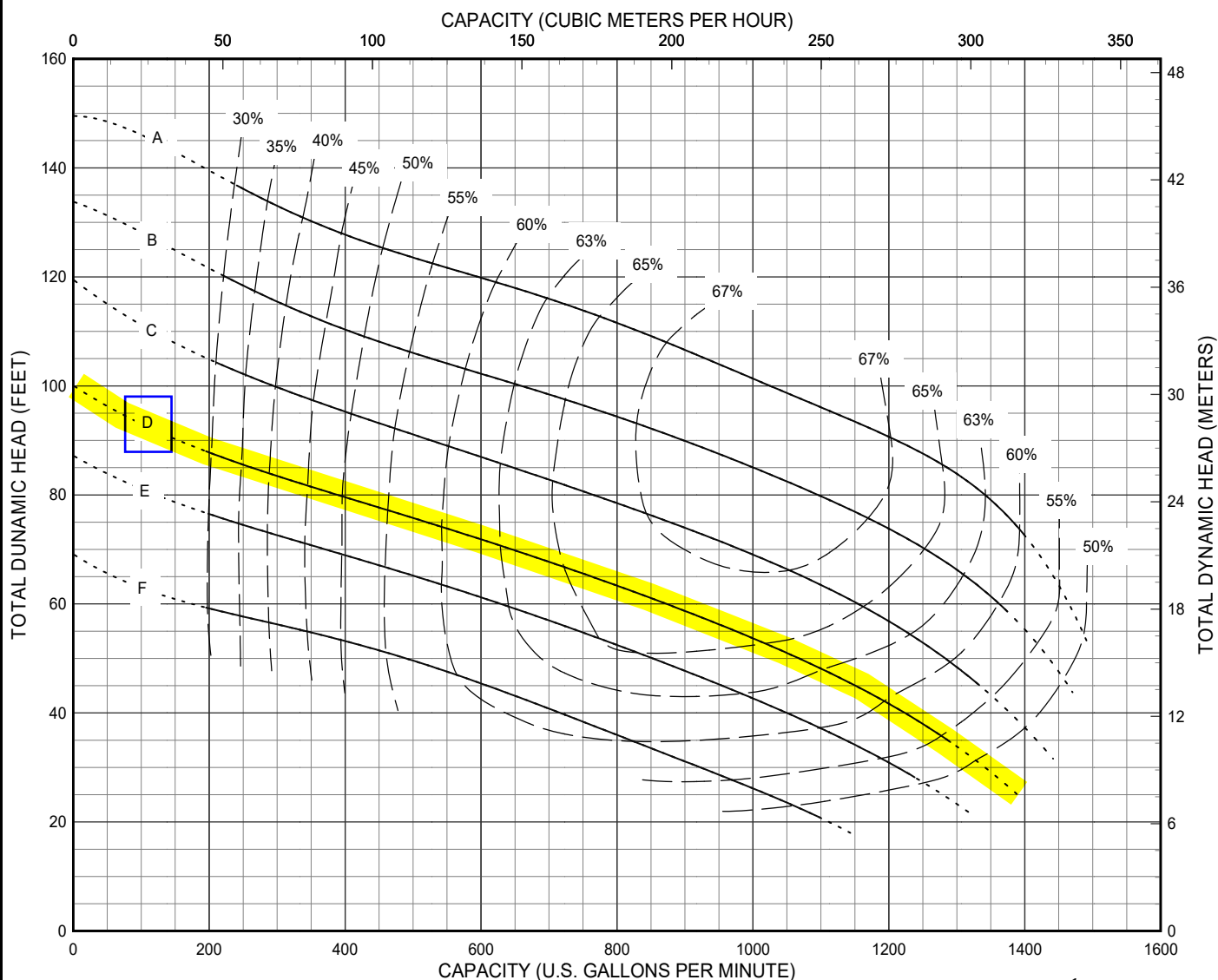


**Models:
S4S**

**3-Blade Impeller
4" Discharge**

CURVE	POWER (HP/KW)	SPEED (RPM)	IMPELLER DIAMETER
A	50 / 37	1770	11.80" (300mm)
B	40 / 30	1740	11.30" (287mm)
C	30 / 22	1755	10.60" (269mm)
D	25 / 18.5	1755	10.00" (254mm)
E	20 / 15	1750	9.50" (241mm)
F	15 / 11	1755	8.80" (224mm)

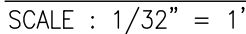
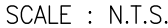
DO NOT OPERATE PUMP IN DOTTED PORTION OF CURVES. PUMPS MAY EXCEED HP SHOWN IF OPERATED IN DOTTED PORTION OF CURVE. CURVES ARE SUBJECT TO CHANGE WITHOUT NOTICE. EFFICIENCIES SHOWN ARE NOMINAL BOWL. GUARANTEED MINIMUM EFFICIENCIES PER H.I. LEVEL A.



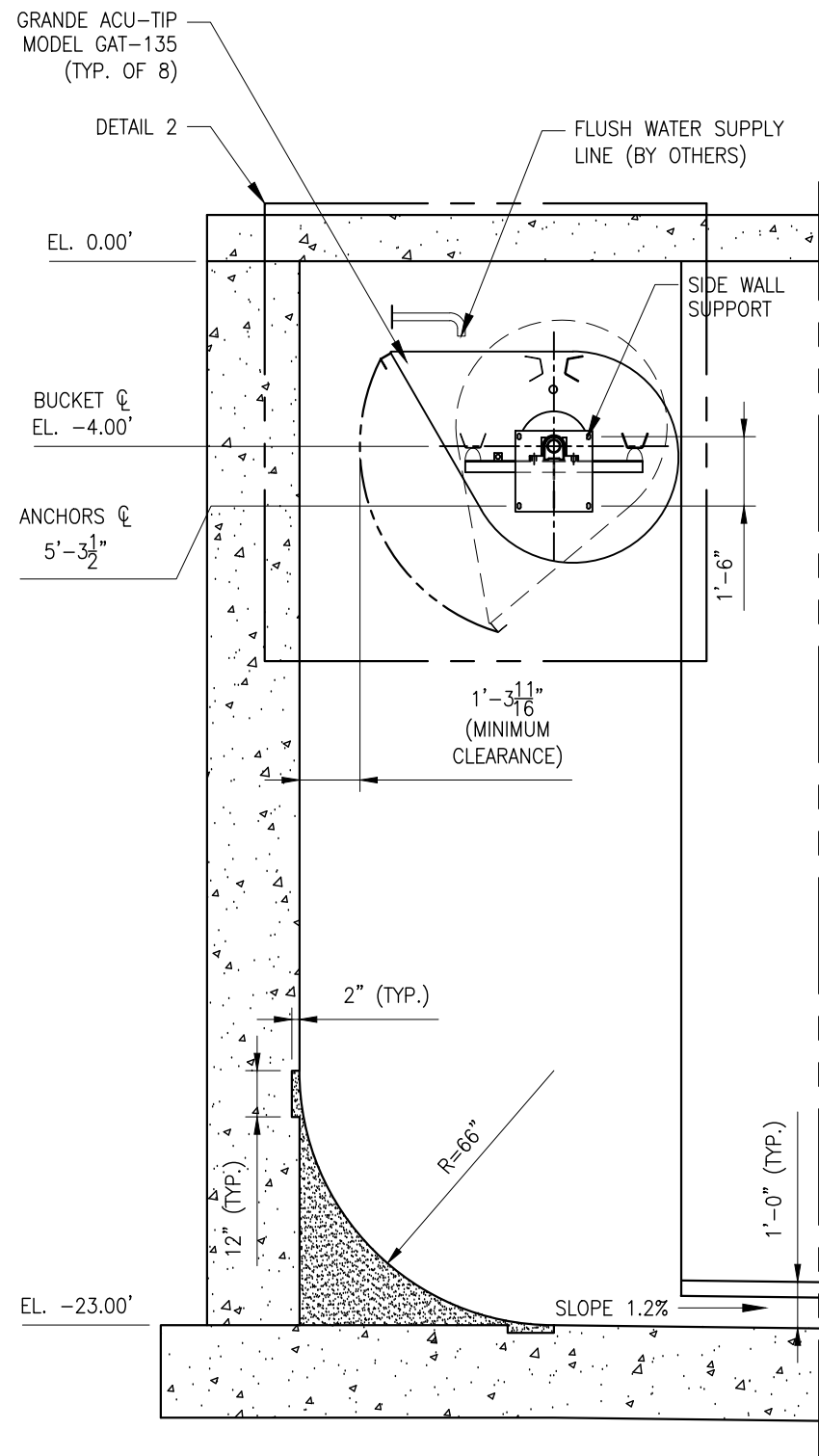
Appendix E-2: Grande Tipping Buckets

N

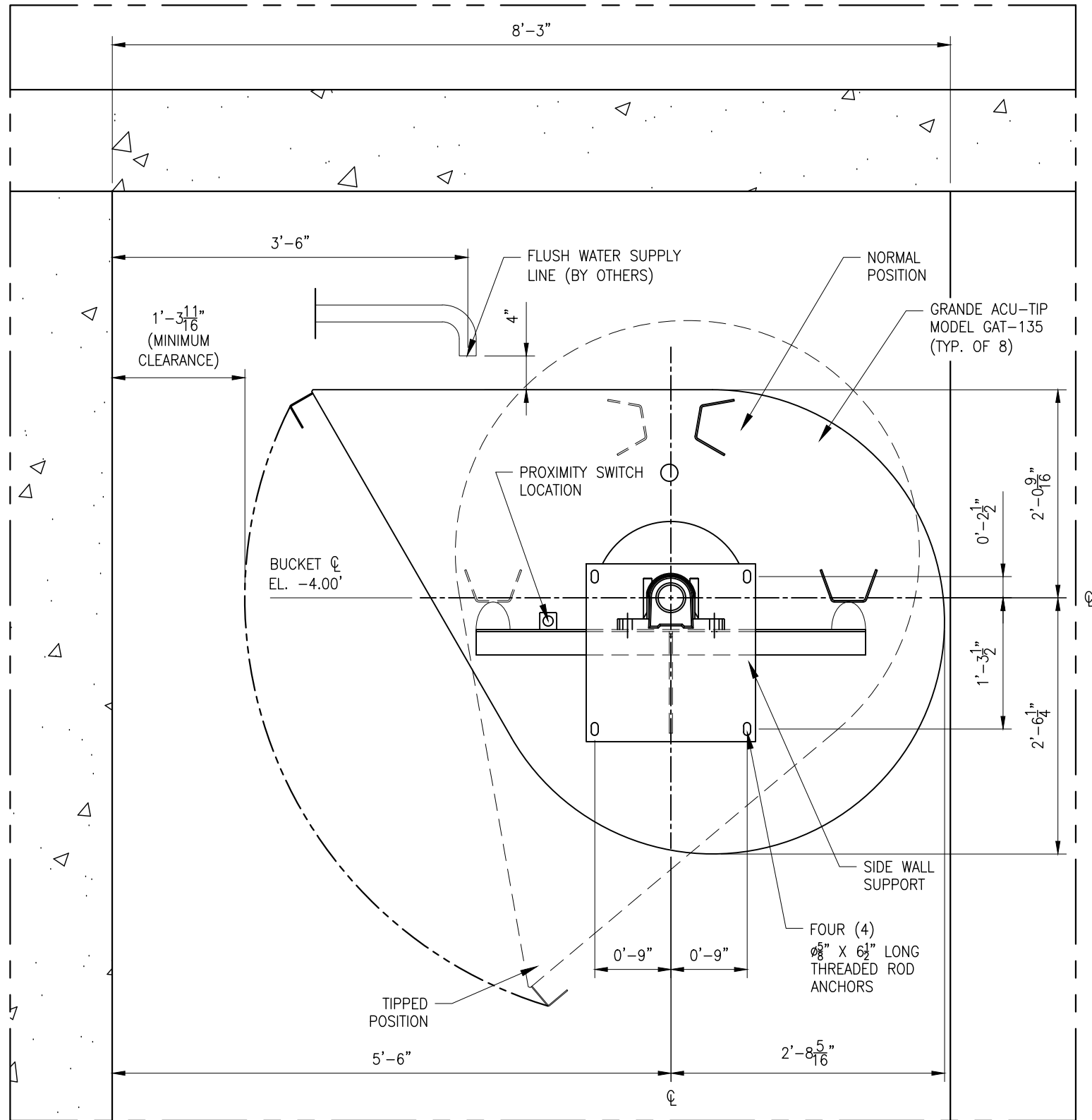
- 1- GRANDE WATER MANAGEMENT SYSTEMS (GWMS) WILL SUPPLY EIGHT (8) ACU-TIP MODEL GAT-135 FABRICATED IN SS 316L, AS SPECIFIED.
- 2- THE ACU-TIP MODEL GAT-135 WILL HOLD APPROXIMATELY 3038 GALLONS OF WATER (406ft³).
- 3- THE SUMP NEEDS TO ACCOMMODATE A MINIMUM FLUSH VOLUME OF 1310ft³ INCLUDING 2" OF DEPOSITION.
- 4- GWMS WILL SUPPLY SIXTEEN (16) SIDE OF WALL SUPPORTS IN SS 316L, AS SPECIFIED.
- 5- SEE DRAWING P-002 FOR SECTION A.
- 6- ALL DIMENSIONS ARE IN IMPERIAL UNITS.
- 7- CONCRETE STRUCTURAL DIMENSION MUST BE RESPECTED TO A TOLERANCE OF $\pm \frac{1}{4}$ ".
- 8- THE BEARINGS ARE FACTORY INSTALLED ON THE END SHAFTS AND PERMANENTLY LUBRICATED.
- 9- GWMS WILL SUPPLY ALL REQUIRED ANCHORING IN SS 316, AS SPECIFIED.



www.grandeinc.com
TOLL FREE: 1-855-315-1115



SECTION A-A
SCALE : 1/4" = 1'-0"



DETAIL 2
SCALE : 3/4" = 1'-0"



Montreal, Wednesday, November 6th, 2019

Ben Rogers, PE
Woodard & Curran
33 Broad Street, Floor 7
Providence RI, 02903

Subject: Grande Tipping Bucket Bearings

Grande Water Management Systems (GWMS) has been manufacturing tipping buckets since 1996, and we have over 300 tipping buckets in operation throughout North America. GWMS understands that often these buckets are installed in similar conditions to those that will be present at the Back Cove South Storage Facility, where the tanks are covered and inaccessible, and the buckets would be difficult to access for maintenance, and/or to remove in the event of any mechanical issues. Therefore, it has been GWMS' goal to design the buckets as robust as possible such that major and minor maintenance are limited to the fullest extent possible.

A typical maintenance item in rotating machinery is the greasing of bearings. For top of wall mounted tipping buckets, GWMS uses full SS316 pillow block bearings manufactured by Extreme Bearings. These bearings were originally designed to handle wet, corrosive, and submerged environments with machinery at high speed and/or heavy loads such as those in shell fish processing plants, mining conveyors, etc.

The bearings come from the Extreme Bearing facility ungreased. GWMS greases them at their factory before sending them to the job site. Because the tipping buckets do not experience near the amount of wear and tear for which the bearings are designed, GWMS has learned that periodic greasing is not necessary. As examples, our oldest installations in the mid to late 90's have not greased their bearings, and we have not been called to provide replacements. In fact, only two of our installations have been provided with extended grease lines. In one of which, a pneumatic grease gun was used by the operator and resulted in popping the seals. In the other, operators realized periodic greasing was not necessary and abandoned the grease lines altogether.

It is our hope that this clarifies our design philosophy and alleviates any concerns. Please feel free to contact me if you require anything further with regards to this matter.

Sincerely,

A handwritten signature in blue ink, appearing to read "Francis Grande". The signature is stylized with large, flowing loops.

Francis Grande
Marketing & Sales Manager

3950 Montée Masson
Laval, Québec, Canada
H7B 1C4

Tel.: (450) 315-1115 Toll-free: 1-855-315-1115
Fax: (450) 315-1355

www.grandeinc.com

TIPPING BUCKET

Ref. #	Project name	Install date	Location	Model #	Quantity	Tank Length (ft-in)	Tank Width (ft-in)	Tank Height (ft-in)	Flush Way Width (ft-in)	Flush Way Length (ft-in)	Height to Bucket Centerline (ft-in)	Floor Slope (%)	Wall Supports (back, side, top)	Mat'l
N/A	Port Colborne, Ontario	1996	Port Colborne, ON	GAT-109	2	200'-0"	50'-0"	N/A	24'-0"	200'-0"	N/A	N/A	N/A	N/A
N/A	Puritan Fenkell, MI	Jun-97	Puritan Fenkell, MI	GAT-56	16	100'-0"	280'-0"	N/A	32'-0"	103'-0"	N/A	N/A	N/A	N/A
N/A	Spring Creek, NYC, NY	Jul-97	New York City, NY	GAT-11	4	25'-0"	40'-0"	N/A	20'-0"	27'-0"	N/A	N/A	N/A	N/A
N/A	Wheeler Ave, Louisville, KY	Nov-97	Louisville, KY	GAT-118	4	131'-0"	62'-0"	N/A	15'-0"	123'-0"	N/A	N/A	N/A	N/A
N/A	Wayne CSO, Detroit, MI	Jun-98	Detroit, MI	GAT-48	8	112'-0"	207'-0"	N/A	25'-0"	107'-0"	N/A	N/A	N/A	N/A
N/A	Aurora, IL	Oct-98	Aurora, IL	GAT-85	7	120'-0"	140'-0"	N/A	26'-0"	112'-0"	N/A	N/A	N/A	N/A
N/A	Corvallis, OR	Sep-99	Corvallis, OR	GAT-90	10	127'-0"	233'-0"	N/A	22'-0"	120'-0"	N/A	N/A	N/A	N/A
N/A	Tremont, Chattanooga, TN	Feb-00	Chattanooga, TN	GAT-28	2	55'-0"	26'-0"	N/A	11'-0" 9'-0"	55'-0"	N/A	N/A	N/A	N/A
N/A	Citigo, Chattanooga, TN	Apr-00	Chattanooga, TN	GAT-95	5	150'-0"	120'-0"	N/A	24'-0"	150'-0"	N/A	N/A	N/A	N/A
N/A	GTAA, Toronto, Ontario	Jun-00	Toronto, ON	GAT-105	32	216'-0"	656'-0"	N/A	20'-0"	210'-0"	N/A	N/A	N/A	N/A

TIPPING BUCKET

N/A	Port Colborne, Ontario	1996	Port Colborne, ON	GAT-109	2	200'-0"	50'-0"	N/A	24'-0"	200'-0"	N/A	N/A	N/A	N/A
N/A	Grimbsy, Ontario	Aug-00	Grimbsy, ON	GAT-34	2	67'-0"	38'-0"	N/A	18'-0"	60'-0"	N/A	N/A	N/A	N/A
N/A	Lorain, OH	Sep-00	Lorain, OH	GAT-56	5	100'-0"	120'-0"	N/A	23'-0"	96'-0"	N/A	N/A	N/A	N/A
N/A	Owen Sound, Ontario	Sep-00	Owen Sound, ON	GAT-38	2	69'-0"	39'-0"	N/A	19'-0"	64'-0"	N/A	N/A	N/A	N/A
N/A	Biggar, Grimbsy, Ontario	Sep-00	Biggar, Grimbsy, ON	GAT-18	2	49'-0"	34'-0"	N/A	16'-0"	46'-0"	N/A	N/A	N/A	N/A
N/A	Elmira, Ontario	Oct-00	Elmira, ON	GAT-48	2	104'-0"	51'-0"	N/A	24'-0"	94'-0"	N/A	N/A	N/A	N/A
N/A	Dundas, Ontario	Dec-01	Dundas, ON	GAT-65	8	105'-0"	184'-0"	N/A	22'-0"	100'-0"	N/A	N/A	N/A	N/A
N/A	Massilon, OH	Dec-03	Massilon, OH	GAT-63	16	129'-0"	398'-0"	N/A	24'-0"	123'-0"	N/A	N/A	N/A	N/A
N/A	Walker's Creek, St. Catharines, Ontario	Feb-04	St. Catharines, ON	GAT-39	1	76'-0"	20'-0"	N/A	20'-0"	70'-0"	N/A	N/A	N/A	N/A
N/A	Roselle, Illinois	Aug-04	Roselle, IL	GAT-48	4	74'-0"	104'-0"	N/A	25'-0"	68'-0"	N/A	N/A	N/A	N/A
N/A	Truman School, New Haven CT.	Oct-04	New Haven CT.	GAT-60	12	138'-0"	240'-0"	N/A	20'-0"	130'-0"	N/A	N/A	N/A	N/A
N/A	Bleams Road, Kitchener ON	Jul-05	Kitchener ON	GAT-34	1	34'-0"	10'-0"	N/A	10'-0"	34'-0"	N/A	N/A	N/A	N/A
N/A	Kernahan, St. Catharines, ON	Dec-05	St. Catharines, ON	GAT-32	2	55'-0"	26'-0"	N/A	12'-0"	50'-0"	N/A	N/A	N/A	N/A
N/A	Duluth, MN	Feb-06	Duluth, MN	GAT-60	2	96'-0"	24'-0"	N/A	11'-0"	96'-0"	N/A	N/A	N/A	N/A

TIPPING BUCKET

N/A	Port Colborne, Ontario	1996	Port Colborne, ON	GAT-109	2	200'-0"	50'-0"	N/A	24'-0"	200'-0"	N/A	N/A	N/A	N/A
N/A	Royal Avenue, Hamilton ON	Oct-06	Hamilton ,ON	GAT-64	6	121'-0"	135'-0"	N/A	20'-0"	109'-0"	N/A	N/A	N/A	N/A
N/A	Newton Falls, Ohio	Nov-06	Newton Falls, OH	GAT-50	3	78'-0"	50'-0"	N/A	16'-0"	70'-0"	N/A	N/A	N/A	N/A
N/A	Canmore, Alberta	Sep-07	Canmore, AB	GAT-40	1	51'-0"	18'-0"	N/A	18'-0"	46'-0"	N/A	N/A	N/A	N/A
N/A	Welland Ontario, St. Catharines, ON	Oct-07	St. Catharines, ON	GAT-95	3	194'-0"	53'-0"	N/A	16'-0"	187'-0"	N/A	N/A	N/A	N/A
1177	Duluth 2007 (2 Tanks), Duluth MN	Oct-07	Duluth MN	GAT-90 GAT-120	2 2	195'-0" 250'-0"	33'-0" 36'-0"	22'-8" 22'-8"	15'-0" 17'-0"	178'-0" 233'-0"	18'-6" 18'-6"	N/A	8 side wall supports	SS 304L
1185	Roaches Pond, Halifax NS	Nov-07	Halifax NS	GAT-60	4	131'-2"	78'-8"	18'-4"	18'-0" 18'-8"	117'-1"	14'-7"	2.25	8 back wall supports	SS-304
1202	ORO-Medonte, Barrie Ontario	Apr-09	Barrie, ON	GAT-48	9	85'-3"	143'-0"	27'-10"	14'-3" 14'-1"	82'-0"	23'-11"	2	18 back wall supports	SS 304L
1189	Harbour Landing, Regina Alberta	Jun-09	Regina, AB	GAT-45	4	93'-2"	90'-2"	23'-4"	21'-3"	89'-10"	18'-5"	3.6	8 side wall supports	SS 304 L
1223	Duluth – Basin 2, Duluth MN	May-10	Duluth MN	GAT-110	4	159'-8" 163'-6"	40'-0"	19'-10"	18'-5" 18'-5"	159'-8" 163'-6"	14'-10" 15'-1"	2	8 side wall supports	SS 304L
1180	LS-507	Oct-10	Indiannapolis, MN	GAT-42	4	100'-0"	99'-9"	22'-6"	24'-0"	95'-0"	17'-4"	N/A	8 side wall supports	SS 304

TIPPING BUCKET

N/A	Port Colborne, Ontario	1996	Port Colborne, ON	GAT-109	2	200'-0"	50'-0"	N/A	24'-0"	200'-0"	N/A	N/A	N/A	N/A
1253	Duluth – Pike Lake, Duluth MN	Jan-11	Duluth, MN	GAT-60	2	92'-0"	36'-0"	14'-16"	15'-7"	88'-0"	10'-3"	N/A	4 side wall support	SS 304
1206	Baker Road, Grimsby Ontario	Mar-11	Grimsby, ON	GAT-50	4	101'-0"	92'-0"	N/A	21'-11" 21'-11"	76'-0"	11'-2"	1	6 top of wall supports	SS 304L
1203	Belleville CSO	Jun-11	Belleville, IL	GAT-20	4	45'-0"	58'-0"	N/A	13'-6"	14'-0"	27'-3"	1	8 back wall supports	SS 316
1269	Fairlawn Ave SSO Facility Niles, OH	Jun-11	Niles, OH	GAT-100	5	105'-0"	86'-0"	17'-6"	16'-0"	100'-0"	12'-6"	N/A	10 side wall supports	SS 316L
1245	Duluth– East Interceptor, Duluth MN	Jun-11	Duluth, MN	GAT-110	6	179'-0"	45'-0"	32'-11"	13'-9"	173'-0"	26'-5"	1	12 side wall supports	SS 304
1239	Duluth –Polk Street, Duluth, MN	Jul-11	Duluth, MN	GAT-65	3	118'-0"	46'-0"	22'-2"	14'-0"	113'-0"	17'-2"	1	6 side wall supports	SS 304
1251	Fox Metro, Oswego, Illinois	Nov-11	Oswego, IL	GAT-75 GAT-185 GAT-135	14 1 1	142'-0"	225'-0"	N/A	15'-0" 10'-0" 5'-0"	128'-0" 234'-0" 234'-0"	14'-6" 13'-11" 24'-5"	2 1 3	32 side wall supports	SS 304L
1234	Philip H. Jones Upgrade Penetanguishene, ON	Jul-12	Penetanguishene, ON	GAT-32	4	65'-7"	67'-2"	21'-0"	15'-9"	59'-0"	17'-8"	1	8 side wall supports	SS 304

TIPPING BUCKET

N/A	Port Colborne, Ontario	1996	Port Colborne, ON	GAT-109	2	200'-0"	50'-0"	N/A	24'-0"	200'-0"	N/A	N/A	N/A	N/A
1248	Coatsworth Cut Conveyance Controls, Kingston & Dundas Storage Tanks Toronto, ON	Jul-12	Toronto, ON	GAT-20	1	49'-2"	16'-4"	30'-11"	16'-4"	45'-11"	23'-8"	2	2 side wall supports	SS 304L
1347	Charles Caccia Park CSO Storage Tank	Feb-14	Toronto, ON	GAT-65	5	131'-0"	87'-3"	28'-3"	16'-3" 16'-2"	123'-0"	19'-8"	N/A	10 side wall supports	SS 304L
1329	CSO-005-006 Screening and Disinfection Facility	Mar-14	Nashua, NH	GAT-40	2	527'-0"	83'-0"	21'-9" 21'-3"	20'-0" 20'-0"	83'-0" 73'-8"	14'-6" 16'-2"	0.5 0.5	4 side wall supports	SS 316L
1327	City of Seattle Genesee CSO Reduction Facility	Apr-14	Seattle, WA	GAT-35 GAT-70	2 1	124'-0" 89'-6"	44'-0" 12'-0"	N/A	18'-6" 12'-0"	112'-0" 81'-6"	15'-1" 11'-8"	N/A	4 Top 2 Top	SS 304L SS 304L

TIPPING BUCKET

N/A	Port Colborne, Ontario	1996	Port Colborne, ON	GAT-109	2	200'-0"	50'-0"	N/A	24'-0"	200'-0"	N/A	N/A	N/A	N/A
1326	North Wastewater Treatment Plant Upgrade Phase 1B	Jun-14	City of Wood Dale, IL	GAT-40	4	68'-0"	60'-6"	N/A	14'-0"	64'-0"	12'-2"	2	8 top wall supports	SS 304
1394	Freeport Sewage Pumping Station	Jul-14	Kitchener, ON	GAT-100	2	155'-0"	50'-7"	16'-10"	24'-9"	104'-4"	13'-7"	1.5	4 side wall supports	SS 316L
1335	Grand Avenue Pump Station Louisville and Jefferson County MSD	Oct-14	Louisville, KY	GAT-20	8	57'-8"	83'-10"	39'-8"	20'-0"	51'-7"	27'-6"	2	16 side wall supports	SS 304
1464	South Side Low Lift Sewage Pumping Station Upgrades and CSO Tank Niagara Falls, ON	Oct-14	Niagara Falls, ON	GAT-45	3	108'-3"	55'-9"	34'-9"	17'-3"	101'-8"	31'-9"	N/A	6 side wall supports	SS 304L
1274	Anne Street Off-Line Storage Tank	Feb-15	Whitby, ON	GAT-110	4	328'-0"	26'-2"	21'-8"	11'-11"	157'-0"	15'-1"	0.5	8 side wall supports	SS 316L

TIPPING BUCKET

N/A	Port Colborne, Ontario	1996	Port Colborne, ON	GAT-109	2	200'-0"	50'-0"	N/A	24'-0"	200'-0"	N/A	N/A	N/A	N/A
1409	WWTP & Anammox Facility	Jul-15	City of Guelph, ON	GAT-20	2	N/A	26'-7"	N/A	12'-7"	N/A	13'-1"	N/A	4 back wall supports	SS 304L
1521	Doon South Sanitary Pump Station	Feb-16	City of Kitchener, ON	GAT-32	2	N/A	N/A	15'-0"	23'-1"	N/A	9'-11"	2	4 back wall supports	SS 316L
1250	Piscataway WWPT	Apr-16	Washington DC	GAT-135	9	N/A	169'-0"	25'-9"	17'-8"	N/A	21'-0"	2	18 side wall supports	SS 316L
1426	Bancroft Pump Station and Storage Basin	Apr-16	Louisville, KY	GAT-25	2	61'-0"	46'-4"	34'-3"	22'-2"	54'-6"	30'-2"	2	4 side wall supports	SS 316L
1526	CSO Screening Facility & Storage Tank	Apr-16	City of Clyde, OH	GAT-70	5	120'-0"	100'-0"	13'-9"	19'-0"	114'-0"	14'-13"	1	10 top of wall supports	SS 304L
1334	Murray CSO Control Facility, King County	Sep-16	Seattle, WA	GAT-35	5	N/A	N/A	N/A	15'-0"	N/A	28'-9"	2	10 top of wall supports	SS 304L
1440	CSO Retention Basin & Mech.	Sep-16	City of Gardiner, ME	GAT-40	2	N/A	32'-0"	29'-0"	15'-0"	N/A	25'-6"	1	4 side wall supports	SS 304L
1519	CSO Rack 14 Storage Basin	Sep-16	City of Akron, OH	GAT-40	8	N/A	176'-0"	21'-0"	21'-3"	N/A	18'-3"	2	16 side wall supports	SS 316L

TIPPING BUCKET

[illegible]

APPENDIX F: DESIGN CALCULATIONS



980 Washington Street
Dedham, MA 02026
Tel. (800) 446-5518

CLIENT Sargent/City of Portland
PROJECT Back Cove CSO
DESIGNED B. Rogers, rev Nov 12 2019
CHECKED E. Osborn 11/13/2019
PROJ. NO. 0232069.00

Description of Work

Size vents coming out of CSO tanks to accommodate fill/draw operations.

Design Criteria

Peak Flow Into System, $Q_{max} = 705.5$ cfs, per Vol 2 Table 3-2 in RFP
316628.4 gpm

cfs, per pump calculations (maximum flow of each pump x 4.

Forcemain restrictions would not allow this condition; provided for

Peak Possible Flow Out of the System = 11.6 reference.)

= 5200.0 gpm

Conclusion: Size air pipes for tank fill. Tank emptying will be of much lower air demand.

Peak allowable velocity in vent pipes = $V_{max} = 2500.00$ fpm, per Vol 2 Section 3.1.5 of RFP
= 41.67 fps

Calculate Dimensions Using Only

Scenario 1: Initial Fill. While tank 1 is filling, it will be able to exhaust air via its outgoing vent pipe to the header, and via the tank interconnection pipelines. In this scenario, the pressure in the tanks will be able to equalize via both the vents and the interconnection pipelines, so pressure buildup will be negligible, provided that the outlet vent is adequately sized, which can be confirmed via scenario 2.

Scenario 2: Filling After Interconnection Pipelines are Overtopped. In this scenario, the interconnection pipelines will not be available to allow pressure to equalize. However, per the hydraulic model, the interconnection pipelines have been sized for gravity flow while filling under peak flow, i.e. per these model results, the interconnection pipelines will all get blocked by water approximately simultaneously. At this point, all tanks will fill at approximately the same rate, and once again the volumetric air flow will still be evenly distributed.

Air per Chimney-Bays

Each tank has 2 chimneys, and 2 bays => 4 chimney-bays/tank, 2 per side. 4 tanks x 4 chimney-bays/tank = 16 chimney/bays. See figure to right.

Number of chimney-bays: 16

Total Air Flow: 705.5

cfs, peak inflow per above.

Air Flow per Chimney-Bay: 44.09

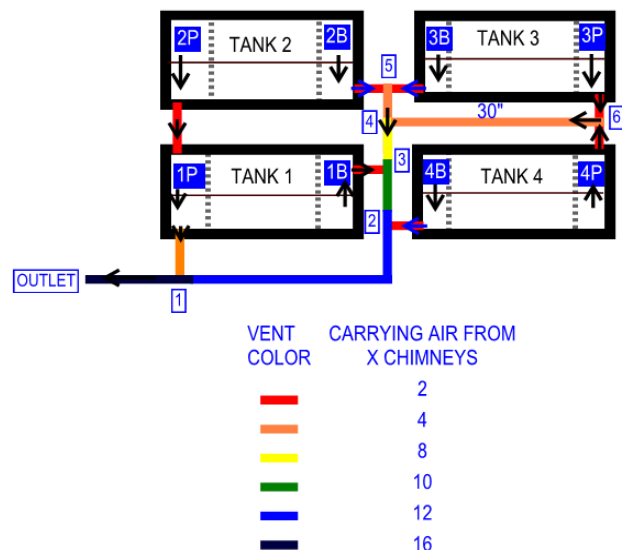
cfs

Refer to diagram to right for vent system.

Vent Section	Carrying Flow from X Chimneys	Flow, cfs	Min Area per Outlet to achieve maximum velocity sf	Min Diameter per Outlet		Preliminary Selected Diameter, in, see note 1
				ft	in	
Outlet from 1B & 4B	2	88.19	2.12	1.64	19.7	24
Outlet from 2P, 2B, 3B, 3P, & 4P	2	88.19	2.12	1.64	19.7	30
Outlet from 1P; pt. 4-5, PT 4-6	4	176.38	4.23	2.32	27.9	
Pt. 3-4	8	352.75	8.47	3.28	39.4	
Pt. 2-3	10	440.94	10.58	3.67	44.0	
Pt. 1-2	12	529.13	12.70	4.02	48.3	
Outlet to Pt. 1	16	705.50	16.93	4.64	55.7	

Notes

1. Diameters are selected based on nominal pipe dimensions readily available, to limit fittings required, and to simplify construction. This results in an oversized venting system, which is a more conservative design.





980 Washington Street
Dedham, MA 02026
Tel. (800) 446-5518

CLIENT: Sargent/ City of Portland
PROJECT: Back Cove CSO
DESIGNED: B. Rogers, rev Nov 12, 2019
CHECKED: E. Osborn, Nov 15, 2019
PROJ. NO.: 232069.00

Tank Dewatering Pump Forcemain Hydraulics

Legend

Inputs are highlighted in blue

Form/Minor Loss Coefficients

$$\text{Minor losses} = H_{\text{mi}} = K \times V^2 / (2 \times g)$$

$$V = Q/A = 4 \times Q / (\pi \times D^2) \Rightarrow V^2 = 16 \times Q^2 / (\pi^2 \times D^4) \Rightarrow H_{\text{mi}} = 8 \times K \times Q^2 / (g \times \pi^2 \times D^4)$$

$$K' = 8 \times K / (\pi^2 \times g \times D^4)$$

$$\Rightarrow H_{\text{mi}} = K' \times Q^2$$

Source for K coefficients: Cameron Hydraulics

					# Pumps Running:	1	2	3	4			
ITEM	QTY	Pipe Diam In, in	Pipe Diam Out, in	Diameter to Use for Calculating Coefficient, in	K	K', H _{lim} /Q[cfs]^2, ft/cfs^2	% of Total Flow through Fitting	K', H _{lim} /Q[cfs]^2, ft/cfs^2	% of Total Flow through Fitting	K', H _{lim} /Q[cfs]^2, ft/cfs^2	% of Total Flow through Fitting	K', H _{lim} /Q[cfs]^2, ft/cfs^2
Suction												
Through Pump	1	6	6	6	0.50	0.2014	50%	0.0503	33%	0.0224	25%	0.0126
Suction Subtotal						0.2014		0.0503		0.0224		0.0126
Discharge												
90D El (Discharge, Riser, to VV)	3	6	6	6	0.45	0.5437	50%	0.1359	33%	0.0604	25%	0.0340
Valve Vault 1												
Check valve (swing type)	1	6	6	6	1.50	0.6042	50%	0.1510	33%	0.0671	25%	0.0378
Plug valve	1	6	6	6	0.27	0.1087	50%	0.0272	33%	0.0121	25%	0.0068
Increaser	1	6	10	6	0.41	0.1650	50%	0.0412	33%	0.0183	25%	0.0103
Flanged Tee - Branch	1	10	10	10	0.84	0.0438	50%	0.0110	67%	0.0195	50%	0.0110
Valve Vault 2												
10"x10"x6"x6" cross, through	1	10	10	10	0.28	0.0146	100%	0.0146	100%	0.0146	100%	0.0146
Flanged Tee - Branch	1	10	10	10	0.84	0.0438	100%	0.0438	100%	0.0438	100%	0.0438
Plug valve	1	10	10	10	0.25	0.0130	100%	0.0130	100%	0.0130	100%	0.0130
Forcemain Air Release/Cleanout Manholes												
Flanged Tee - Through	2	12	12	12	0.26	0.0131	100%	0.0131	100%	0.0131	100%	0.0131
Gate valve	4	12	12	12	0.10	0.0101	100%	0.0101	100%	0.0101	100%	0.0101
Elbows, bends allowance (based on 45°)	10	12	12	12	0.16	0.0413	100%	0.0413	100%	0.0413	100%	0.0413
Free discharge	1	12	12	12	1.00	0.0252	100%	0.0252	100%	0.0252	100%	0.0252
Discharge Subtotal												
						1.6266		0.5275		0.3386		0.2610
Minor Loss Coefficients, K':						1.8280		0.5779		0.3610		0.2736

Friction/Major Loss Coefficients

$$\text{Major Losses: } h_{\text{mj}} = Q[\text{gpm}]^{1.85} \times 10.44 \times L[\text{ft}] \times / (C^{1.85} \times d[\text{in}]^{4.87})$$

$$C' = 10.44 \times L[\text{ft}] \times / (C^{1.85} \times d[\text{in}]^{4.87})$$

$$\Rightarrow h_{\text{mj}} = C' \times Q[\text{gpm}]^{1.85}$$

# Pumps Running:				1	2	3	4			
Pipe Diameter, in	Material	Length, ft	C	C' = $h_{mj}/Q[gpm]^{1.85}$	% of Flow	C' = $h_{mj}/Q[gpm]^{1.85}$	% of Flow	C' = $h_{mj}/Q[gpm]^{1.85}$	% of Flow	C' = $h_{mj}/Q[gpm]^{1.85}$
Suction										
No suction piping										
Suction Subtotal				0.00E+00		0.00E+00		0.00E+00		0.00E+00
Discharge										
6.00	CLDI	34	120	8.21E-06	50%	2.28E-06	33%	1.08E-06	25%	6.31E-07
5.80	HDPE	20	140	4.28E-06	50%	1.19E-06	33%	5.61E-07	25%	3.29E-07
9.41	HDPE	508	140	1.03E-05	50%	2.86E-06	67%	4.86E-06	50%	2.86E-06
10.00	CLDI	11.5	120	2.31E-07	50%	6.40E-08	67%	1.09E-07	50%	6.40E-08
11.16	HDPE	2400	140	2.12E-05	100%	2.12E-05	100%	2.12E-05	100%	2.12E-05
Discharge Subtotal				4.42E-05		2.76E-05		2.78E-05		2.51E-05
Major Loss Coefficients:				4.42E-05		2.76E-05		2.78E-05		2.51E-05

Coefficient Summary Table

	1	2	3	4	5	6	7
	Suction		Discharge		Total		
Pumps Running	Minor	Major	Minor	Major	Minor	Major	
1	0.2014	0.00E+00	1.6266	4.42E-05	1.8280	4.42E-05	
2	0.0503	0.00E+00	0.5275	2.76E-05	0.5779	2.76E-05	
3	0.0224	0.00E+00	0.3386	2.78E-05	0.3610	2.78E-05	
4	0.0126	0.00E+00	0.2610	2.51E-05	0.2736	2.51E-05	
Low Sensitivity - 1 Pump, 10% less friction losses, 20% less minor losses	0.1333	0.00E+00	1.0765	3.58E-05	1.2097	3.58E-05	
High Sensitivity - 4 Pumps, 10% more friction losses, 20% more minor losses	0.0181	0.00E+00	0.3758	2.99E-05	0.3939	2.99E-05	

Note: see 'Graphs' tab for graphs. Loss coefficients calculated on 'Loss Coefficients' Tab

Inputs are highlighted in blue

Discharge Elevation = 5.0

HWL = -1.24 ft (High alarm)
LWL = -22.3 ft (LWL)

Low WSE/High Static Heat	6.3
High WSE/Low Static Heat	27.3

[illegible]

Pump Curves

Inputs are highlighted in blue

Vaughan Chopper Pump Model S4S
Curve C (30 HP / 22 KW, 1655 rpm,
10.5" impeller diameter)

	Flow [US g.p.m.]	Head [ft]	Pump Efficiency [%]
1	200.00	87.80	30.00
2	247.00	85.80	35.00
3	288.00	84.00	40.00
4	344.00	81.70	45.00
5	396.00	80.00	50.00
6	463.00	77.00	55.00
7	542.00	74.00	60.00
8	628.00	70.70	63.00
9	722.00	66.80	65.00
10	1019.00	53.00	65.00
11	1102.00	48.00	63.00
12	1193.00	42.00	60.00
13	1277.00	36.00	55.00
14			

Affinity Law Curves - Head

100% Speed = 60 Hz

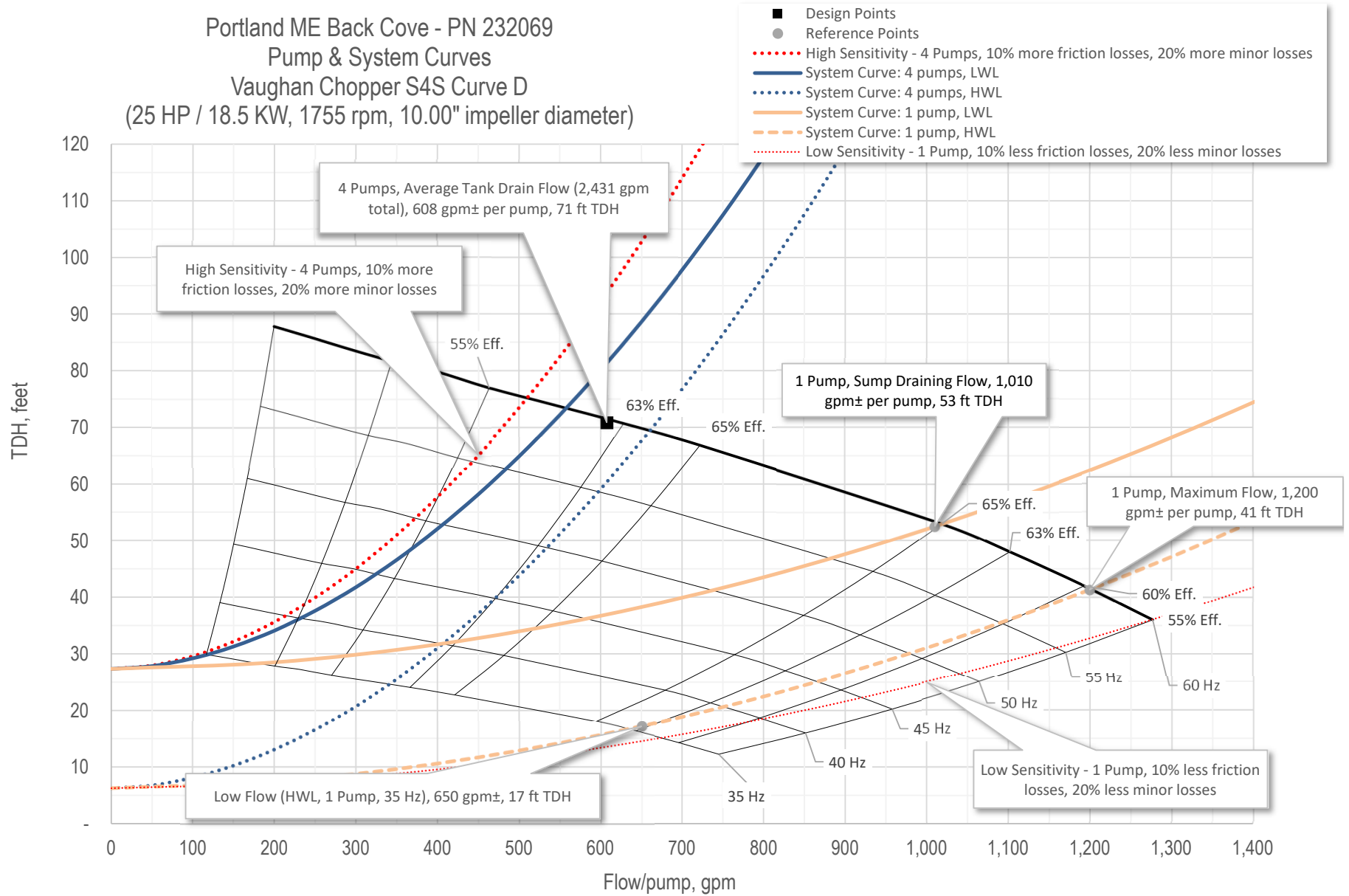
Speed, Hz	55 Hz	50 Hz	45 Hz	40 Hz	35 Hz
N=	92%	83%	75%	67%	58%
N1/N2=	1.1	1.2	1.3	1.5	1.7

Q2	H2	Q2	H2	Q2	H2	Q2	H2	Q2	H2
183	74	167	61	150	49	133	39	117	30
226	72	206	60	185	48	165	38	144	29
264	71	240	58	216	47	192	37	168	29
315	69	287	57	258	46	229	36	201	28
363	67	330	56	297	45	264	36	231	27
424	65	386	53	347	43	309	34	270	26
497	62	452	51	407	42	361	33	316	25
576	59	523	49	471	40	419	31	366	24
662	56	602	46	542	38	481	30	421	23
934	45	849	37	764	30	679	24	594	18
1,010	40	918	33	827	27	735	21	643	16
1,094	35	994	29	895	24	795	19	696	14
1,171	30	1,064	25	958	20	851	16	745	12

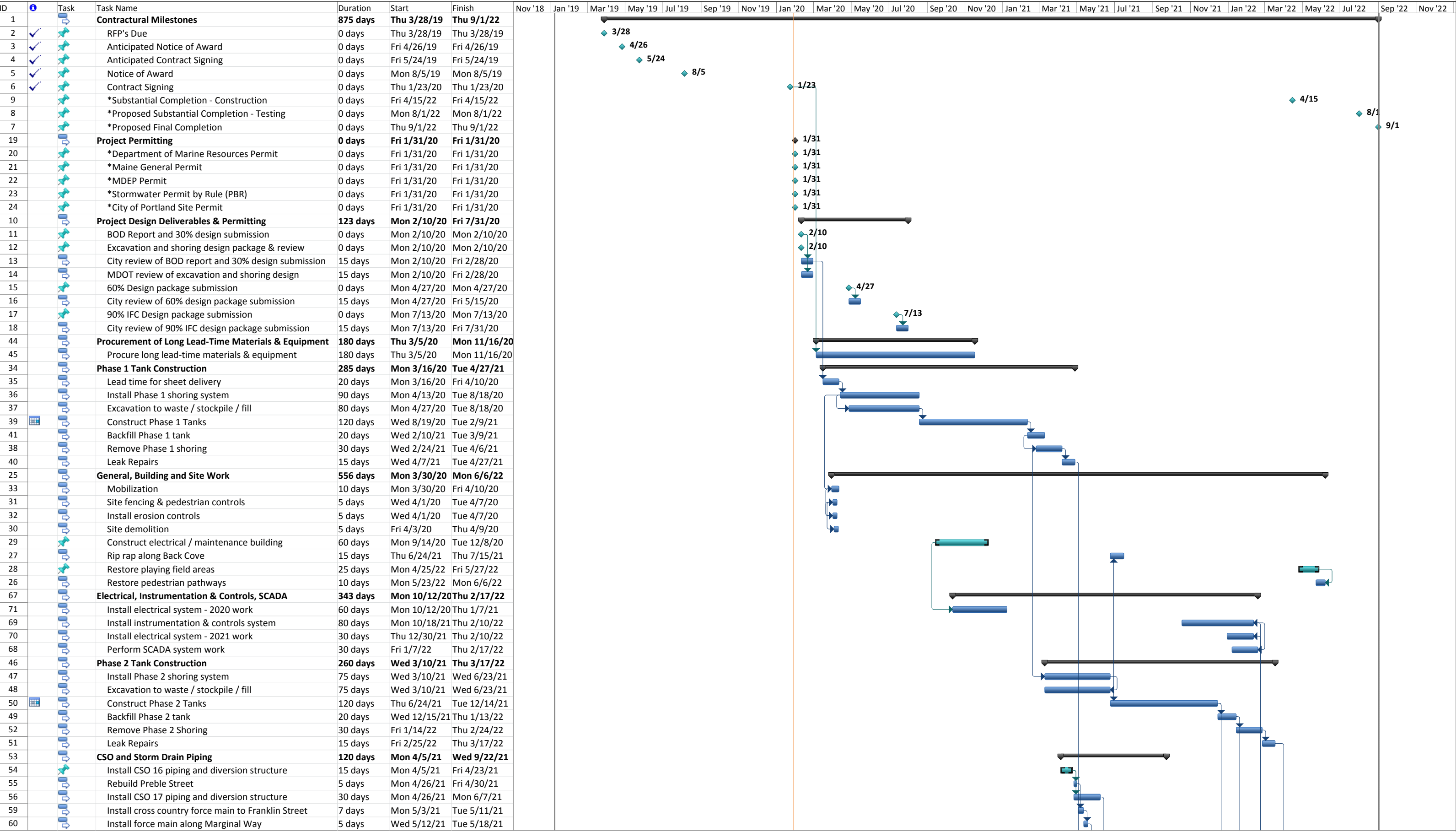
Efficiency Curves

		30% Eff.	45% Eff.	55% Eff.	63% Eff.	65% Eff.	65% Eff.	63% Eff.	60% Eff.	55% Eff.									
Lookup row:		1	4	6	8	9	10	11	12	13									
N2	N1/N2	Q	H	Q	H	Q	H	Q	H	Q	H								
100%	1.0	200.0	#	344.0	81.7	463.0	77.0	628.0	70.7	722.0	66.8	1019.0	53.0	1102.0	48.0	1193.0	42.0	1277.0	36.0
92%	1.1	183.3	#	315.3	68.7	424.4	64.7	575.7	59.4	661.8	56.1	934.1	44.5	1010.2	40.3	1093.6	35.3	1170.6	30.3
83%	1.2	166.7	#	286.7	56.7	385.8	53.5	523.3	49.1	601.7	46.4	849.2	36.8	918.3	33.3	994.2	29.2	1064.2	25.0
75%	1.3	150.0	#	258.0	46.0	347.3	43.3	471.0	39.8	541.5	37.6	764.3	29.8	826.5	27.0	894.8	23.6	957.8	20.3
67%	1.5	133.3	#	229.3	36.3	308.7	34.2	418.7	31.4	481.3	29.7	679.3	23.6	734.7	21.3	795.3	18.7	851.3	16.0
58%	1.7	116.7	#	200.7	27.8	270.1	26.2	366.3	24.1	421.2	22.7	594.4	18.0	642.8	16.3	695.9	14.3	744.9	12.3

Portland ME Back Cove - PN 232069
Pump & System Curves
Vaughan Chopper S4S Curve D
(25 HP / 18.5 KW, 1755 rpm, 10.00" impeller diameter)



APPENDIX G: PROJECT SCHEDULE





ID		Task	Task Name	Duration	Start	Finish	Nov '18	Jan '19	Mar '19	May '19	Jul '19	Sep '19	Nov '19	Jan '20	Mar '20	May '20	Jul '20	Sep '20	Nov '20	Jan '21	Mar '21	May '21	Jul '21	Sep '21	Nov '21	Jan '22	Mar '22	May '22	Jul '22	Sep '22	Nov '22
61			Marginal Way trench repair	4 days	Wed 5/19/21	Mon 5/24/21																									
57			Install CSO 18 piping and diversion structure	40 days	Tue 6/8/21	Tue 8/3/21																									
62			Install Franklin St. storm drain piping to outfall	15 days	Wed 8/4/21	Tue 8/24/21																									
58			Rebuild Franklin Street	20 days	Wed 8/25/21	Wed 9/22/21																									
63			Install Buckets, Pumps, Mechanical & Vent Piping	190 days	Wed 4/28/21	Thu 1/27/22																									
66			Install buckets, pumps, mechanical piping - Phase 1	30 days	Wed 4/28/21	Wed 6/9/21																									
64			Install buckets, pumps, mechanical piping - Phase 2	30 days	Wed 12/15/21	Thu 1/27/22																									
65			Install tank vent piping	10 days	Fri 1/14/22	Thu 1/27/22																									
42			Project Startup and Acceptance Testing	40 days	Fri 4/1/22	Thu 5/26/22																									
43			Project startup and acceptance testing	40 days	Fri 4/1/22	Thu 5/26/22																									

APPENDIX H: TECHNICAL SPECIFICATIONS TABLE OF CONTENTS

SECTION 00 01 10

PRELIMINARY TABLE OF CONTENTS

DIVISION 01 GENERAL REQUIREMENTS

01 11 00	Summary of Work
01 15 00	Specific Project Requirements and Procedures
01 15 30	Payment and Administrative Procedures and Quality Requirements
01 50 00	Temporary Facilities and Controls
01 51 38	Temporary Water Bypass
01 51 40	Temporary Sewage Bypass
01 51 42	Temporary Stormwater Drainage Bypass
01 60 00	Product Requirements
01 70 00	Execution and Closeout Requirements
01 91 15	Startup and Commissioning Requirements

DIVISION 02 - EXISTING CONDITIONS

02 31 00	Geophysical Investigations
02 32 00	Geotechnical Investigations
02 41 13	Drainage Structure Removal
02 41 14	Selective Site Demolition & Restoration
02 58 00	Snow Control
02 61 00	Removal & Disposal of Contaminated Soils
02 72 00	Water Decontamination

DIVISION 03 - CONCRETE

03 01 06	Cementitious Crystalline Leak Repair
03 11 00	Concrete Forming
03 16 00	Concrete Specialties
03 20 00	Concrete Reinforcing
03 30 00	Cast-in-Place Concrete
03 30 20	Concrete Placing, Curing, Finishing
03 41 00	Precast Concrete Planks
03 41 26	Precast Box
03 63 00	Injection Grouting Crack Repair

DIVISION 04 - MASONRY

04 20 00	Unit Masonry
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DIVISION 05 - METALS

05 50 00	Metal Fabrications
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DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 10 00	Rough Carpentry
06 17 53	Shop-Fabricated Wood Trusses
06 20 00	Finish Carpentry

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 21 00	Thermal Insulation
07 26 00	Vapor Barrier
07 31 13	Asphalt Shingles
07 46 46	Mineral Fiber Cement Siding
07 92 00	Joint Sealants

DIVISION 08 - OPENINGS

08 11 00	Metal Doors and Frames
08 71 00	Door Hardware

DIVISION 09 - FINISHES

09 29 00	Gypsum Board
09 90 00	Painting and Coating

DIVISION 10 - SPECIALTIES

10 14 00	Signage
10 44 16	Fire Extinguishers

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

3 05 00	Common Work Results for HVAC
32 90 00	Louvers and Vents

DIVISION 26 - ELECTRICAL

26 05 00	Common Work Results for Electrical
26 05 19	Low-Voltage Electrical Power Conductors and Cables
26 05 26	Grounding and Bonding for Electrical Systems
26 05 33	Raceways and Boxes for Electrical Systems
26 05 43	Underground Ducts and Raceways for Electrical Systems
26 05 73	Short Circuit Analysis and Coordination Study
26 09 16	Electrical Controls and Relays
26 21 00	Low-Voltage Electrical Service Entrance
26 22 00	Low-Voltage Dry-Type Transformers
26 24 16	Panelboards
26 24 19	Motor Control Center (Intelligent)
26 27 26	Wiring Devices
26 28 16	Enclosed Switches and Circuit Breakers
26 29 13	Enclosed Controllers
26 29 23	Variable Frequency Motor Controllers
26 41 00	Facility Lightning Protection
26 43 00	Surge Protective Devices
26 51 00	Interior Lighting

DIVISION 27 - COMMUNICATIONS

27 00 00 Communications

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 10 00 Electronic Access Control and Intrusion Detection

28 31 11 Digital, Addressable Fire-Alarm Systems

DIVISION 31 - EARTHWORK

31 00 00 Earthwork

31 05 19 Geotextiles for Earthwork

31 09 00 Geotechnical Instrumentation and Monitoring of Earthwork

31 14 13 Soil Stockpiling

31 23 13 Subgrade Preparation

31 23 16 Excavation

31 23 19 Dewatering

31 23 23 Fill

31 25 00 Erosion & Sedimentation Controls

31 35 00 Slope Protection

31 37 00 Riprap

31 41 00 Shoring

31 50 00 Excavation Support & Protection

31 60 00 Special Foundations and Load-Bearing Elements

31 26 00 Removal & Setting of Signage

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 30 00 Site Improvements

32 80 00 Irrigation

32 90 00 Planting

32 92 00 Turf & Grasses

DIVISION 33 - UTILITIES

33 01 10 Disinfection Water Utility Piping Systems

33 14 XX Water Utility Piping

33 31 11 Public Sanitary Sewerage Gravity Piping

33 31 23.XX Sanitary Utility Sewerage Force Mains

33 39 13 Sanitary Utility Sewerage Manholes, Frames, & Covers

33 40 00 Storm Drainage Utilities

33 41 00 Storm Utility Drainage Piping

33 41 46 Subdrainage Piping

33 49 00 Stormwater Structures

DIVISION 40 - PROCESS INTEGRATION

40 05 13	Process Pipe and Fittings
40 05 14	Process Pipe
40 05 15	Process Pipe Supports
40 05 17	Process Pipe Sleeves and Seals
40 05 23	Process Valves and Strainers
40 41 13	Process Pipe Heat Tracing
40 61 01	Instrumentation-Controls General Requirements
40 63 43	Programmable Logic Controllers
40 67 00	Control System Equipment Panels-Racks
40 70 00	Instrumentation for Process Systems

DIVISION 43 - PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE EQUIPMENT

43 21 41	Submersible Centrifugal Chopper Pump
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DIVISION 46 - WATER AND WASTEWATER EQUIPMENT

46 46 13	Tipping Sediment Flushing Buckets
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END OF SECTION

APPENDIX I: DRAWING LIST (DRAWINGS BOUND SEPARATELY)

PRELIMINARY DRAWING SHEET LIST

SHEET NUMBER

SHEET TITLE

GENERAL

G-000 COVER SHEET

CIVIL

C-100 GENERAL NOTES & LEGEND
C-200 KEY PLAN
C-201 EROSION CONTROL PLAN (PREBLE PARK)
C-202 EROSION CONTROL PLAN (TRAIL)
C-203 CSO 16 CONVEYANCE PLAN & PROFILE - 1
C-204 CSO 16 CONVEYANCE PLAN & PROFILE - 2
C-205 CSO 16 CONVEYANCE PLAN & PROFILE - 3
C-206 CSO 17 CONVEYANCE PLAN & PROFILE
C-207 CSO 18 CONVEYANCE PLAN & PROFILE - 1
C-208 CSO 18 CONVEYANCE PLAN & PROFILE - 2
C-209 CSO 18 CONVEYANCE PLAN & PROFILE - 3
C-210 FRANKLIN STREET PLAN AND PROFILE - 1
C-211 FRANKLIN STREET PLAN AND PROFILE - 2
C-212 MARGINAL WAY PLAN & PROFILE - 1
C-213 MARGINAL WAY PLAN & PROFILE - 2
C-214 YARD PIPING - OVERALL PLAN
C-215 YARD PIPING - TANK VENT AND FORCEMAIN PLAN & SECTION - 1
C-216 YARD PIPING - TANK VENT AND FORCEMAIN PLAN & SECTION - 2
C-217 YARD PIPING - TIPPING BUCKET WATER PLAN & ISOMETRIC
C-218 FINAL GRADING AND SITE RESTORATION PLAN - 1
C-219 FINAL GRADING AND SITE RESTORATION PLAN - 2
C-220 TANK ISOMETRIC
C-300 EROSION CONTROL NOTES
C-301 EROSION CONTROL DETAILS
C-302 CIVIL DETAILS - 1
C-303 CIVIL DETAILS - 2
C-304 CIVIL DETAILS - 3
C-305 CIVIL DETAILS - 4

ARCHITECTURAL

A-001 ARCHITECTURAL LEGENDS, ABBREVIATIONS AND NOTES, CODE SUMMARY
A-301 ELECTRICAL MAINTENANCE BUILDING FLOOR AND ROOF PLAN
A-302 ELECTRICAL MAINTENANCE BUILDING ELEVATIONS
A-303 ELECTRICAL MAINTENANCE BUILDING ISOMETRICS
A-304 ELECTRICAL MAINTENANCE BUILDING ARCHITECTURAL SECTIONS AND DETAILS
A-305 ELECTRICAL MAINTENANCE BUILDING SCHEDULES AND DETAILS

PRELIMINARY DRAWING SHEET LIST

SHEET NUMBER

SHEET TITLE

STRUCTURAL

S-001	STRUCTURAL NOTES AND DESIGN LOADS
S-002	STRUCTURAL SPECIAL INSPECTIONS 1
S-003	STRUCTURAL SPECIAL INSPECTIONS 2
S-101	STORAGE TANKS OVERALL PLAN
S-102	UPPER LEVEL PLAN - TANK 2 (TYP FOR TANKS 1 - 4)
S-103	LOWER LEVEL PLAN - TANK 2 (TYP FOR TANKS 1 - 4)
S-104	STORAGE TANK 2 SECTIONS (TYP FOR TANKS 1 - 4)
S-200	CSO 016 DIVERSION STRUCTURE
S-201	CSO 017 DIVERSION STRUCTURE
S-202	CSO 018 DIVERSION STRUCTURE
S-301	ELECTRICAL MAINTENANCE BUILDING FOUNDATION PLAN & SECTION
S-302	ELECTRICAL MAINTENANCE BUILDING ROOF FRAMING PLAN
S-303	ELECTRICAL MAINTENANCE BUILDING SECTIONS AND DETAILS
S-1000	EARTHWORK NOTES AND DETAILS
S-1300	CONCRETE TANK DETAILS
S-1301	CONCRETE WALL AND FLOOR PENETRATION DETAILS
S-1302	CONCRETE FLOOR SLAB & WALL FOOTING DETAILS
S-1303	WALL FOOTING SECTIONS & DETAILS
S-1400	MASONRY DETAILS
S-1401	MASONRY SECTIONS AND DETAILS
S-1500	GRATING, MECH GATES & MECH EQUIPMENT SUPPORTS
S-1600	ROUGH CARPENTRY ROOF FRAMING, SECTIONS & DETAILS

PROCESS

P-001	PROCESS LEGEND
P-100	CSO STORAGE FLOW DIAGRAM
P-101	CSO STORAGE FACILITY P&ID
P-102	DIVERSION STRUCTURES P&ID
P-200	PROCESS TANK PLAN
P-201	PROCESS TANK SECTIONS
P-202	PROCESS TIPPING BUCKET PLAN & DETAILS
P-203	PROCESS VALVE VAULT 1 PLAN & SECTIONS
P-204	PROCESS VALVE VAULT 2 PLAN & SECTIONS
P-205	PROCESS VALVE VAULT 3 PLAN & SECTIONS
P-500	PROCESS DETAILS
P-501	PROCESS DETAILS
P-502	PROCESS DETAILS

HVAC

H-001	HVAC LEGENDS AND GENERAL NOTES
H-100	ELECTRICAL MAINTENANCE BUILDING FLOOR PLAN
H-101	HVAC SCHEDULES

PRELIMINARY DRAWING SHEET LIST

SHEET NUMBER

SHEET TITLE

ELECTRICAL

E-001	ELECTRICAL LEGEND
E-005	ELECTRICAL DEMOLITION PLAN
E-002	ELECTRICAL OVERALL SITE PLAN 1
E-002	ELECTRICAL PARTIAL SITE PLAN 1
E-003	ELECTRICAL PARTIAL SITE PLAN 2
E-050	SITE GROUNDING PLANS
E-010	ONE-LINE DIAGRAM
E-100	TANK POWER AND CONTROLS PLAN 1
E-101	TANK POWER AND CONTROLS PLAN 2
E-200	ELECTRICAL MAINTENANCE BUILDING POWER AND CONTROL PLAN
E-201	ELECTRICAL MAINTENANCE BUILDING LIGHTING AND BUILDING SYSTEMS PLAN
E-500	INSTRUMENT AND CONTROLS RISER DIAGRAM
E-600	PANEL AND LIGHT FIXTURE SCHEDULES
E-700	MOTOR WIRING DIAGRAMS
E-800	ELECTRICAL DETAILS 1
E-801	ELECTRICAL DETAILS 2

INSTRUMENTATION

I-001	INSTRUMENTATION & CONTROLS NETWORK ARCHITECTURE
I-010	INSTRUMENTATION & CONTROLS DETAIL SHEET 1
I-011	INSTRUMENTATION & CONTROLS DETAIL SHEET 2
I-012	INSTRUMENTATION & CONTROLS DETAIL SHEET 3
I-101	INSTRUMENTATION & CONTROLS SCADA PANEL NOTES & LEGEND
I-102	INSTRUMENTATION & CONTROLS SCADA PANEL BILL OF MATERIALS
I-103	INSTRUMENTATION & CONTROLS SCADA PANEL EQUIPMENT LAYOUT
I-104	INSTRUMENTATION & CONTROLS SCADA PANEL TERMINAL BLOCK LAYOUT
I-105	INSTRUMENTATION & CONTROLS SCADA PANEL POWER DISTRIBUTION
I-106	INSTRUMENTATION & CONTROLS SCADA PANEL COMMUNICATIONS
I-107	INSTRUMENTATION & CONTROLS SCADA PANEL DISCRETE INPUTS
I-108	INSTRUMENTATION & CONTROLS SCADA PANEL DISCRETE OUTPUTS
I-109	INSTRUMENTATION & CONTROLS SCADA PANEL ANALOG INPUTS (1 OF 3)
I-110	INSTRUMENTATION & CONTROLS SCADA PANEL ANALOG INPUTS (2 OF 3)
I-111	INSTRUMENTATION & CONTROLS SCADA PANEL ANALOG INPUTS (3 OF 3)
I-112	INSTRUMENTATION & CONTROLS INTRINSIC BARRIER PANEL EQUIPMENT LAYOUT
I-113	INSTRUMENTATION & CONTROLS INTRINSIC BARRIER PANEL WIRING DETAIL

APPENDIX J: SARGENT CORPORATION HEALTH & SAFETY PLAN



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HEALTH & SAFETY PLAN

2020

SARGENT CORPORATION

**378 BENNOCH ROAD
P.O. BOX 435
STILLWATER, ME 04489
207-827-4435**

**363 CALEF HIGHWAY
EPPING, NH 03042
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TABLE OF CONTENTS

I.	SARGENT CORPORATION SAFETY POLICY	1
1.0	Policy Statement	1
2.0	Objectives	2
3.0	Organization and Responsibilities.....	3
4.0	Subcontractor Responsibilities.....	5
5.0	Site Specific Health and Safety Plans	5
6.0	Drug and Alcohol Free Workplace Policy	6
	<i>Notice to Employees – Drug and Alcohol-Free Workplace</i>	<i>7</i>
7.0	Project Safety Meetings	7
8.0	Project Safety Inspections.....	8
9.0	OSHA and MSHA Inspections	8
10.0	Employee Safe Acts Policy.....	10
11.0	Progressive Employee Counseling Policy.....	11
	<i>Behavior Modification Report (form).....</i>	<i>12</i>
II.	SAFETY REQUIREMENTS FOR NEW EMPLOYEES.....	13
1.0	Policy Statement for New Employees.....	13
2.0	Hiring Procedure.....	13
3.0	<i>Sargent Corporation’s Summary of Safety Rules</i>	<i>13</i>
4.0	<i>New Employee Orientation Checklist (form)</i>	<i>16</i>
III.	ACCIDENT PREVENTION PLAN: INCIDENT INVESTIGATION & REPORTING	17
1.0	Introduction.....	17
2.0	Reporting Requirements	17
3.0	Incident Investigation.....	17
4.0	Employee Injury Investigation.....	18
	<i>Incident Investigation Report (form).....</i>	<i>19</i>
5.0	Property Damage Claims	27
6.0	Prevention of Lost Time Injuries	27
7.0	First Aid	28
8.0	OSHA Record Keeping Requirements.....	28
IV.	SAFE WORK PRACTICES / STANDARD OPERATING PROCEDURES	30
1.0	Personal Protective Equipment (PPE).....	30
2.0	Fall Protection Plan.....	32

3.0	Hot Work – Welding and Cutting Operations.....	38
4.0	Hoisting and Rigging Equipment.....	40
5.0	Concrete and Concrete Form Work	46
6.0	Electrical Tools	46
7.0	Housekeeping.....	47
8.0	Fire Protection.....	47
9.0	Lifting... ..	48
10.0	Equipment Safety.....	49
11.0	Traffic Work Zone Safety	52
12.0	Working Over or Near Water.....	53
13.0	Blasting Safety	53
14.0	Working Alone.....	54
V.	TRENCHING AND EXCAVATION.....	55
1.0	Definitions.....	55
2.0	Trenching and Excavation Requirements	55
3.0	Excavations Near Buried Utility Lines	58
4.0	Digging in Contaminated Soils	60
VI.	CONFINED SPACE ENTRY PROGRAM.....	61
1.0	Definitions.....	61
2.0	Requirements for Entry into ALL Confined Spaces	62
3.0	Additional Requirements for Entry into Permit Required Confined Spaces.....	63
	<i>Confined Space Entry Permit (Form)</i>	68
	<i>Confined Space Entry Definitions & Permit Requirements (Instructions)</i>	69
VII.	LOCKOUT/TAGOUT/TRYOUT PROGRAM	70
1.0	Purpose.....	70
2.0	Scope and Application	70
3.0	Definitions.....	70
4.0	Program Elements.....	71
5.0	Lockout/Tagout/Tryout Procedures	72
6.0	Procedures for Restart.....	73
7.0	Employee Training.....	73

8.0	Lockout/Tagout/Tryout Requirements at Construction Sites	74
9.0	Lockout/Tagout/Tryout Requirements at Stillwater Maintenance Shop	75
10.0	Lockout/Tagout/Tryout Requirements at Stillwater Welding Shop	79
VIII.	ELECTRICAL PROTECTION PROGRAM.....	82
1.0	Policy Statement	82
2.0	Electrical Safety and Awareness Training	82
IX.	HAZARDOUS MATERIAL EXPOSURE	83
1.0	Hazard Communications (HAZCOM) Policy	83
2.0	Definitions.....	83
3.0	HAZCOM Standard Procedures	85
4.0	Hazardous Materials Handling Projects	87
5.0	Lead in Construction and Lead Abatement Plan.....	91
	<i>Summary of Lead in Construction and Lead Abatement Standards (chart)</i>	97
	<i>Lead in Construction Permit (form)</i>	98
6.0	Oil and Fuel Spills.....	99
X.	RESPIRATORY PROTECTION PLAN	101
1.0	Purpose.....	101
2.0	Scope and Application	101
3.0	Responsibilities	102
4.0	Program Elements.....	102
5.0	Silica Exposure Control Plan	104
	<i>Table 1: Specified Exposure Control Methods When Working With</i>	
	<i>Materials Containing Crystalline Silica</i>	105
6.0	Voluntary Respirator Use.....	111
	Appendix D.....	111
	<i>OSHA 29 CFR 1910.134 Appendix D (Instructions)</i>	111
XI.	HEARING CONSERVATION PROGRAM	116
1.0	Purpose.....	117
2.0	Scope and Application	117

3.0	Program Elements	117
4.0	Responsibilities	119
5.0	Hearing Conservation Controls	120
XII.	BLOODBORNE PATHOGEN EXPOSURE CONTROL PLAN	120
1.0	Exposure Control	121
	<i>Hepatitis B Virus Declination (form)</i>	134
	<i>Bloodborne Pathogen Exposure Report (form)</i>	136
XIII.	TRANSITE PIPE HANDLING PLAN	137
1.0	Scope and Application	137
2.0	Definitions.....	137
XIV.	FLEET SAFETY PLAN	142
1.0	Introduction.....	142
2.0	Motor Vehicle Safety Policy	142
3.0	Vehicle Use	142
4.0	Truck Driver Selection	144
5.0	Fleet Motor Carrier Requirements	146
6.0	Fleet Safety Requirements	148
7.0	Hours of Service and Log Books	150
	<i>Drivers Daily Log (Example)</i>	153
8.0	Alcohol and Controlled Substances	154
	<i>CMV Driver Requirements (Chart)</i>	157

I. SARGENT CORPORATION SAFETY POLICY

1.0 POLICY STATEMENT

It is the policy of **SARGENT CORPORATION** that all employees are entitled to work under safe and healthful conditions in the performance of their duties. We shall endeavor to maintain a safe and healthful workplace, provide safe working equipment, appropriate training, and necessary and appropriate personal protective equipment for all employees. To accomplish this policy, the company shall appoint a person to function as Safety Director.

The Safety Director shall be responsible for the formulation and implementation of the Health and Safety Plan, which includes the Safety Policy and Accident Prevention Plan. It shall be his/her responsibility to maintain current knowledge of state and federal safety regulations and to provide instructions to all managers and supervisors of methods of performing work consistent with those regulations. Although the Safety Director cannot be on each work-site on a continuing basis, he/she shall ensure the work is performed consistent with safety regulations and policies through timely employee training, job-site inspections, consulting with supervisors, documentation of violations of safety standards and follow up corrective actions.

Superintendents and foremen shall be responsible to plan and complete their project work in accordance with appropriate current knowledge of OSHA, MSHA, FMCSA, and company safety standards as provided by the Safety Director.

Superintendents and foremen are responsible not only for the quality and quantity of work produced by the people they supervise, but for their health and safety as well. Jobsite supervisors have the greatest opportunity to effect safe working conditions and safe attitudes. Since foremen have continued contact with crew members and are responsible for their supervision, they are also responsible to ensure that the work is performed in a manner consistent with the company's safety standards and with state and federal regulations. By virtue of training and/or experience, the foreman is usually the designated "competent person" for the work his/her crew performs. The competent person is responsible to identify existing and predictable hazards and has authorization to take prompt corrective measures to eliminate them.

The project superintendents, with the support of the Operations Managers, bear overall responsibility to ensure their crews and subcontractor crews perform the work in accordance with OSHA, MSHA, FMCSA, and **SARGENT CORPORATION** safety standards.

Superintendents shall hold weekly project safety meetings each Tuesday using the agenda developed for these meetings. Topics of employee safety will be appropriate for each project activity. These meetings shall be documented with the record sent to the Human Resource Department. The Safety Director shall monitor the meetings and attend as many as feasible.

Herbert R. Sargent, President/CEO

2.0 OBJECTIVES

- 2.1 Our objective is to eliminate or reduce the possibility of injury or illness of our employees. By accomplishing this, we protect the safety and well-being of the employee. We will also benefit from increased efficiency, fewer unplanned business interruptions from accidents, and lower insurance costs.
- 2.2 **Method of Obtaining Objectives.** The methods used to achieve our objective shall include the following procedures:
 - 2.2.1 Plan all work to avoid personal injury or illness, property damage, and loss of productive time;
 - 2.2.2 Use administrative measures such as Preparatory Inspections (P3), Job Hazard Analyses (JHA), and Safety Task Assessments (STA) to ensure work hazards are identified and properly addressed;
 - 2.2.3 Maintain an Incident Investigation process for prompt detection, documentation, and correction of faulty procedures, unsafe work practices, and unsafe conditions;
 - 2.2.4 Make available and require the use of personal protective equipment;
 - 2.2.5 Establish an effective system of tool and equipment inspection and maintenance;
 - 2.2.6 Establish a training and orientation program to maintain interest and cooperation of all levels of employment including the following:
 - 2.2.6.1 Provide appropriate training for all employees;
 - 2.2.6.2 Provide an employee orientation training program for all newly hired employees;
 - 2.2.6.3 Hold weekly safety meetings for all employees;
 - 2.2.6.4 Communicate and enforce safety requirements for all job operations; and
 - 2.2.6.5 Investigate all accidents to determine the causes and necessary corrective actions.

3.0 ORGANIZATION – RESPONSIBILITIES

3.1 President/CEO:

- 3.1.1 Approves and supports company Health and Safety policies.

3.2 Safety and Training Director:

- 3.2.1 Defines and implements the Health and Safety policies.
- 3.2.2 Oversees education and training programs as appropriate.
- 3.2.3 Collects and disseminates necessary information pertaining to applicable federal, state and company health and safety standards.
- 3.2.4 Provides appropriate information concerning health and safety standards to all supervisors.
- 3.2.5 Visits and inspects job sites and consults with supervisors to assure compliance with health and safety policies.

3.3 Division Operations Managers:

- 3.3.1 Provide oversight and support to assist Superintendents to assure compliance with applicable federal, state and company safety regulations as defined by the Health and Safety Plan (HASP).
- 3.3.2 Implement enforcement action as necessary to ensure the work is performed safely and in compliance with all applicable health and safety requirements.

3.4 Superintendents:

- 3.4.1 Assume overall jobsite safety responsibilities.
- 3.4.2 Assure compliance with applicable federal, state and company safety regulations as defined by the Health and Safety Plan (HASP).
- 3.4.3 Oversee and train foremen in their job responsibilities regarding safety as well as production.
- 3.4.4 Complete P3's and JHA's prior to starting major work items, and communicate with foremen and crewmembers.
- 3.4.5 Assign a competent person for each work item, who is capable of identifying existing and predictable hazards and who has authority to take prompt corrective action to eliminate them.
- 3.4.6 Review the daily STA's and provide constructive feedback to the foremen.

- 3.4.7 Hold and document crew safety meetings on a weekly basis. (Tuesday morning)
- 3.4.8 Assure that all accidents, injuries, and near misses are properly reported and thoroughly investigated, and that corrective action(s) are implemented as needed.
- 3.4.9 Assure that subcontractors comply with all federal, state and company health and safety standards.

3.5 Foremen:

- 3.5.1 Assume specific responsibility for the safety of their crew(s). In most cases, the crew foreman is assigned as the competent person for the work performed.
- 3.5.2 Be familiar with all federal, state and company health and safety standards from information provided by the Safety Director.
- 3.5.3 Mentor and train crew members to ensure they perform the work safely and efficiently.
- 3.5.4 Explain, train and enforce the use of all employee personal protective equipment and guards as required by OSHA, MSHA, FMCSA, and the company HASP.
- 3.5.5 Complete STA's on a daily basis and for each new task, and discuss them with crewmembers.
- 3.5.6 Report and investigate all accidents, injuries, and near misses, and take necessary action as directed by the superintendent.

3.6 Employees:

- 3.6.1 Work in accordance with federal, state and company health and safety standards.
- 3.6.2 Report unsafe conditions and work practices to a supervisor.

3.7 Competent Person:

- 3.7.1 A **competent person** is defined as one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- 3.7.2 A competent person shall oversee each project item performed. Most generally the foreman who is assigned to an item will be the competent person for the work associated with that item.

4.0 SUBCONTRACTOR RESPONSIBILITIES

- 4.1 Accident prevention on the job can only be successful with the cooperation of our subcontractors. All subcontractors shall comply with all details of applicable OSHA, MSHA, FMCSA standards **and with the SARGENT CORPORATION Health and Safety Plan.**
- 4.2 It is the responsibility of the **SARGENT CORPORATION** Project Superintendent to manage the provisions of this Health and Safety Plan with all Subcontractor employees, working through the subcontractor's on-site supervisor.
- 4.3 In all cases, subcontractors must report injuries and property damage and provide a copy of their Incident Investigation Report to the **SARGENT CORPORATION** Project Superintendent. A copy of this report shall be forwarded to the Human Resource Department in Stillwater.

5.0 SITE SPECIFIC HEALTH AND SAFETY PLANS

- 5.1 The **SARGENT CORPORATION** Health and Safety Plan shall be maintained in the field office at each project site and made available to all employees.
- 5.2 For those projects where it is anticipated that employees may be exposed to site specific hazards and/or hazardous materials not covered in this HASP, a project specific HASP will be developed to address these and other site specific issues, such as:
 - 5.2.1 Telephone numbers for emergency contact persons and agencies, owner representatives, and contractor or subcontractor contact persons.
 - 5.2.2 Site control elements including site map, communication procedures, and locations of occupational healthcare and emergency medical care facilities.
 - 5.2.3 Special hazards that may be encountered on the project and precautions associated with those hazards.
 - 5.2.4 Levels of Personal Protection Equipment required.
 - 5.2.5 Fire, explosion and emergency response guidelines.
 - 5.2.6 Site security.
 - 5.2.7 Other safety concerns unique to the project.
 - 5.2.8 At projects with long access roads which are not able to accommodate two-way traffic, a CB channel will be established, mile markers will be posted.

5.2.9 Jobsites with no established address or in a location where medical services are not reasonably available will post GPS coordinates.

5.2.9.1 A landing zone will be established with a minimum size of 100' x 100'.

5.2.9.2 The landing zone will be clear of overhead wires and reasonably flat.

5.2.10 When a general contractor, owner or owner's representative establishes a rule or requirement exceeding OSHA, MSHA or Sargent Corporation policy.

6.0 DRUG AND ALCOHOL FREE WORKPLACE POLICY

6.1 **Policy statement.** It is the policy of **SARGENT CORPORATION** to maintain a drug and alcohol free workplace. No employee shall be allowed to work while under the influence of drugs or alcohol.

6.2 The unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the workplace.

6.3 Any employee who is seen using illegal drugs or alcohol during working hours shall be subject to immediate suspension and possible termination of employment.

6.4 An employee who is suspected of being under the influence of illegal drugs or alcohol shall be removed from the job site and driven to a safe location.

6.5 **Prescription drugs.** An employee who is using prescription drugs shall inform his/her supervisor so that his/her job requirements can be altered to minimize possible injury to the employee and other employees.

6.6 **Pre-Employment drug testing.** **SARGENT CORPORATION** has a pre-employment Drug Testing Plan. Candidates for employment who are offered a position must submit to a test for illegal drugs. All offers of employment are conditioned on a negative test for illegal drugs.

6.7 **Post-Accident drug testing.** **SARGENT CORPORATION** has a Post-Accident Drug Testing Plan for employees who are operating company vehicles and for employees who are driving personal vehicles on company business.

6.7.1 Both alcohol and controlled substance tests will be administered to operators as soon as practical following an accident when:

6.7.1.1 The accident involves a human fatality (regardless of fault); or

6.7.1.2 The accident resulted in bodily injury with immediate medical treatment,
or

6.7.1.3 The accident resulted in disabling damage to a motor vehicle requiring it to be towed or transported away from the accident site.

6.7.2 If a driver refuses to test, it will be viewed by the company as a “positive” result

6.7.3 A “positive” alcohol and/or controlled substance outcome will result in disciplinary action up to and including termination

6.8 **Drug and Alcohol Policy Notice.** The following notice to employees is included in the **SARGENT CORPORATION** Employee Handbook and is posted at all jobsites:

NOTICE TO EMPLOYEES

It is the policy of **SARGENT CORPORATION** to provide a drug and alcohol free work site in accordance with Federal Regulations. Any employee who engages in the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance in the workplace will be subject to immediate suspension and possible termination of employment.

SARGENT CORPORATION has adopted a Pre-Employment Drug Testing Plan approved by the Maine Department of Labor. Candidates for employment who are offered a position must submit to a test for illegal drugs. All offers of employment at **SARGENT CORPORATION** are made conditioned on a negative test for illegal drugs.

7.0 PROJECT SAFETY MEETINGS

7.1 **Full Participation.** All employees shall participate in safety meetings to be held at project sites each week.

7.2 **Content.** The meetings will include discussion of standardized safety topics as well as issues or concerns specific to each project.

7.3 **Documentation.** Safety meeting documentation shall include a listing of the topics discussed and the names of all persons attending. Copies of safety meeting topics and attendance sheets shall be sent to the Safety Department in Stillwater.

7.4 **Subcontractor Safety Meetings.** Each subcontractor is required to hold and document weekly safety meetings for its employees, covering safety topics that are appropriate to the subcontract work and the project work environment.

8.0 PROJECT SAFETY INSPECTIONS

- 8.1 Each project Superintendent shall be responsible for conducting at least daily visual inspections of the project under his/her supervision to determine that the project is maintained in a condition that eliminates or reduces the potential for an accident or injury to company employees and other workers on the site and members of the public who gain access to or travel through or past the project site.
- 8.2 On a weekly basis, a written record shall be made by the Superintendent to document that these inspections are being performed, deficiencies identified, and corrective action(s) taken.
- 8.3 Items that must be inspected shall include but not be limited to:
 - 8.3.1 Open excavations/trenches are properly barricaded and guarded.
 - 8.3.2 Small tools are properly stored and secured.
 - 8.3.3 All storage and office areas are secured and locked.
 - 8.3.4 All highway signs are properly located, clean and visible.
 - 8.3.5 All lights and traffic control devices are in place and functioning properly.
 - 8.3.6 Equipment keys are removed and cabs locked and secured as appropriate.
 - 8.3.7 Floor and ground openings are covered or guarded, staging is secured/blocked, and ladders are removed or secured.
 - 8.3.8 Other items shall be inspected as appropriate for the project.
- 8.4 The Safety Director and/or Site Safety Specialist shall conduct safety audits of each project as often as possible and at least once per month.

9.0 OSHA and MSHA INSPECTIONS

- 9.1 **Full cooperation.** It is the policy of SARGENT CORPORATION to admit and cooperate with OSHA and MSHA Compliance Officers wishing to visit or inspect our project sites with as minimal disturbance to normal procedures as possible. The following procedures should be followed for all inspections.
- 9.2 **Assure Proper Identification.** All OSHA and MSHA Compliance Officers are required to carry and show an identity card (with photo) to properly identify themselves. Be sure to document the inspector's name for future reference.
- 9.3 **Ask The Purpose Of The Visit.** It could be a regularly scheduled general inspection, the result of an employee complaint, to inspect work in an OSHA focus area, an industrial hygiene inspection, or for other reasons.

- 9.4 **Opening Conference.** There should be an opening conference between the OSHA Compliance Officer and the Project Superintendent to discuss the purpose of the inspection. Answer all questions truthfully, but do not volunteer information other than what you feel would be beneficial towards the outcome of the inspection.
- 9.5 **Inspection.** The project superintendent or other site supervisor should accompany the OSHA or MSHA Compliance Officer during the inspection to explain or answer questions.
- 9.5.1 Under the law, the Compliance Officer may speak to any of our employees, either with a company representative present or in private.
- 9.5.2 If the inspector indicates a possible violation and/or takes a photo, please also take photos of the same area.
- 9.5.3 **Correct any violations or concerns noted by the OSHA or MSHA Compliance Officer immediately.**
- 9.5.4 If the safety concern cannot be corrected immediately, the work in violation shall be discontinued until the problem has been eliminated.
- 9.6 **Closing Conference.** There should be a closing conference where the OSHA Compliance Officer explains to the project superintendent what s/he saw and if s/he feels there were any violations.
- 9.6.1 Please feel free to discuss with the officer any situation that s/he brings up. The purpose of the closing conference is to allow you to explain your position and that of the company.
- 9.6.2 If an employee has knowingly violated an OSHA, MSHA, or **SARGENT CORPORATION** safety standard, it is appropriate to describe our Progressive Employee Counseling Policy to the Compliance Officer.
- 9.6.3 You should also take notes about the closing conference. **Remember – discussion is fine. Arguing is not.**
- 9.6.4 At the end of the conference, call and inform the Safety Director about the OSHA inspection. Notify the Aggregates Manager of MSHA inspections.
- 9.7 **Citations.**
- 9.7.1 If any citations are issued, the OSHA or MSHA Regional Office will send them to the Stillwater office.
- 9.7.2 Copies will be forwarded to the project site where they must be posted for a minimum of three (3) working days and until all violations are corrected.

- 9.7.3 Each citation will have an abatement period (specific date by which the violation must be corrected).

10.0 EMPLOYEE SAFE ACTS POLICY

10.1 Purpose.

- 10.1.1 As affirmed in this Health and Safety Plan, each employee will be provided with a workplace that is safe and maintains good health.
- 10.1.2 It is the intent of this Safe Acts Policy that each employee is responsible for and shall be held accountable for procedures that are conducted in violation of applicable federal or state regulations or company policies.

10.2 Policy Statement. It is the policy of **SARGENT CORPORATION** to hold accountable the person in the highest level of authority who has knowledge and control of workplace procedures that are conducted in violation of applicable federal or state regulations or company policies.

10.3 Disciplinary procedure.

- 10.3.1 Employees who have knowledge and/or control over conditions or actions in violation of safety regulations shall be disciplined according to the following guideline:

First Violation: Verbal warning with note to employee's personnel file.

Second Violation: Written warning.

Third Violation: Possible suspension without pay up to five work days.

Fourth Violation: May be subject to termination of employment.

- 10.3.2 Depending on the nature and degree of seriousness of the violation, an employee who knowingly places him/herself or others at risk of serious injury or death may be subject to a written warning, suspension without pay, or termination of employment without first having received a verbal warning.
- 10.3.3 An employee who causes an accident through a negligent act which results in property damage or personal injury (such as collision with equipment or vehicle) will be subject to immediate suspension without pay for a period of up to five working days without having first received a warning.

- 10.4 **Report Form.** Records of employee discipline will be documented on the “**Behavior Modification Report**” form found at the end of this section. Copies go to the employee, project superintendent, Vice President of Operations, and the Human Resources Department.
- 10.5 All records of discipline will remain in the employee’s personnel file for three years.
- 10.6 A person whose employment is terminated under this procedure will not be eligible for rehire with any division of the company without prior consideration and approval by Vice President of Operations.

11.0 PROGRESSIVE EMPLOYEE COUNSELING POLICY

- 11.1 It is the policy of **SARGENT CORPORATION** to afford each employee the opportunity to correct behaviors and attitudes that do not contribute to the efficient completion of goals. To this end, the following procedure shall be used when discussing employee behavior that must be improved.
 - 11.1.1 **First Incident.** The Project Superintendent or Department Head will hold an oral discussion with the employee which clearly indicates the nature of the unacceptable behavior, and the course of action which is required to correct the problem. Written documentation of the behavior and counseling session will be made with a copy placed in the employee’s file.
 - 11.1.2 **Second Incident.** The Project Superintendent or Supervisor will meet with the Human Resource Administrator and/or appropriate Operations Manager to discuss the employee’s behavior. Following this meeting, the appropriate manager in charge will meet with the employee to discuss and provide a written warning to the employee, which clearly indicates the nature of the unacceptable behavior, and corrective measures which are required. It will be emphasized to the employee that further inappropriate behavior will result in termination of his/her employment. The notice will be presented to the employee with a copy placed in the employee’s file.
 - 11.1.3 **Third Incident.** The employee may receive a suspension without pay for a period of up to five days, or his/her employment with the company may be terminated following notification of the Vice President of Operations, appropriate Operation Manager(s), and Human Resource Administrator with proper documentation in the employee’s personnel file.
- 11.2 Records of progressive employee counseling will be documented on the “**Behavior Modification Report**” form. Copies go to the employee, project superintendent, VP of Operations, and the Human Resources Department.
- 11.3 All records of discipline will remain in the employee’s personnel file for three years.
- 11.4 A person whose employment is terminated under this procedure will not be eligible for rehire by the company without prior consideration and approval by the VP of Operations.



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BEHAVIOR MODIFICATION REPORT

Instructions: This form should be used to document unacceptable and/or unsafe employee behavior. Please fax the completed form to the Human Resources Department immediately upon completion.		
Name of Employee:	Date of Behavior(s):	Date of Report:
Name of Superintendent Preparing Report:	Project Location:	Project Number:
Name(s) of Witness(es):		
Please indicate the general nature of the behavior(s): Attendance: Absent excessively Absent without permission Late Other	Action: Damage of company property Discrimination/harassment Unsatisfactory attitude Unsatisfactory job performance Other	Safety: Failure to wear/use PPE Horseplay Improper use of tools or equip. Violation of drug/alcohol policy Violation of other safety rules
Please describe the behavior(s) in detail (use additional pages if necessary):		
Please describe steps employee must take in order to correct behavior(s) (use additional pages if necessary):		
Please state all corrective or disciplinary measures taken: Verbally counseled/training (with this note to file) Written reprimand (this notice serves as reprimand) Employee immediately removed from project site Suspension without pay for _____ days Termination		
NOTES: While SARGENT CORPORATION attempts to use progressive discipline, it retains the right to forego less severe measures when it deems more severe measures, including discharge, are appropriate. The Human Resources Department must be consulted before an employee may be suspended or terminated. The Human Resources Department reserves the right to modify discipline imposed at a jobsite when records reveal that the employee has been previously disciplined or as circumstances warrant.		
Comments, if any, by employee:		
Signature of Supervisor certifying that behavior and corrective measures have been discussed with employee:		
Signature of employee indicating receipt of copy of report (note: report is still effective without signature):		
Signature indicating receipt by Human Resources Department:	Date Received:	

II. SAFETY REQUIREMENTS FOR NEW EMPLOYEES

1.0 POLICY STATEMENT FOR NEW EMPLOYEES

- 1.1 It is the policy of SARGENT CORPORATION that each employee has the right to work in an environment that is safe and healthful.
- 1.2 Each new employee shall receive a safety orientation prior to working on a construction jobsite.
- 1.3 Foremen shall ensure their crew members have been field trained for each task they are asked to complete.
- 1.4 Employees shall inform their foremen if they have not performed an assigned task before or if they feel they need additional training to safely perform the work.

2.0 HIRING PROCEDURE

- 2.1 Each employee shall be orientated to the company by a qualified person using the Health and Safety Plan as a guide.
- 2.2 All information outlined in the “New Employee Orientation Checklist”, as well as other appropriate information will be explained to the employee.
- 2.3 The completed “New Employee Orientation Checklist” shall be signed by the employee and the person providing the orientation, and filed at the Stillwater office along with other personnel information.
- 2.4 At the time that an employee is hired, he/she will be given a copy of “Sargent Corporation’s Summary of Safety Rules” to read and sign acknowledgement of receipt. The acknowledgement portion shall be filed in the employee’s personnel file.

3.0 SARGENT CORPORATION’S SUMMARY OF SAFETY RULES

- 3.1 Proper clothing shall be worn at ALL times. This includes long pants and a shirt or jersey with at least four-inch sleeves. Shorts, sweatpants, and tank tops are NOT permitted.
- 3.2 Safety toe work boots of at least ankle height in good condition shall be worn at ALL times on ALL projects. Sneakers, hiking boots or street shoes, even with safety toes, will NOT meet this requirement. Steel shank work boots are required for work on landfill closure projects as well as for demolition and building projects where there is likelihood of stepping on nails or other sharp objects and are recommended on all projects.
- 3.3 Hard hats shall be worn at ALL times on ALL projects except in offices or inside the cabs of vehicles or equipment.

Section II

- 3.4 Safety glasses shall be worn at ALL times on ALL projects except in offices or when an operator or driver is inside the enclosed cab of a vehicle or equipment.
- 3.5 Face and secondary eye protection (i.e.: face shield) shall be worn for high-risk tasks such as welding, chipping, grinding, pipe saw and chain saw use, and similar activities.
- 3.6 Hand protection shall be worn when handling materials with sharp edges or which are irritating to the skin.
- 3.7 High visibility vests appropriate for the type of work zone or project shall be worn at ALL times on projects except in offices.
- 3.8 The source of power must be disconnected and keys removed from ignition switches whenever it is necessary to do repair or maintenance work on power driven equipment. When working on electrical equipment, the disconnect switch must be locked out and tagged prior to repair.
- 3.9 Walkways and work areas must be kept clean and clear of tools, supplies, power cords and other tripping hazards. Good housekeeping is a must.
- 3.10 Ladders used in any situation must be secured from slipping and be in good condition. Stepladders shall be used on level and stable surfaces, and must be opened and locked.
- 3.11 Ladders shall be inspected prior to each use and removed from service if defective.
- 3.12 Fall protection (standard railings or personal fall arrest system) is required for all workers who are 6 feet or more above an adjacent surface on construction projects. This includes the assembly or disassembly or scaffolding, workers on ladders, and workers in buckets or on lifts of any kind. This standard applies to workers on manholes, retaining walls, roofs, and other structures, but it does not apply to all excavations and trenches. OSHA's General Industry standards require that fall protection is provided when exposed to a fall greater than 4 feet. MSHA requires protection when a fall hazard is present.
- 3.13 All electrical equipment shall be properly grounded. Three wire tool cords and extension cords in good condition are required. Ground fault circuit interrupters (GFCI) shall be installed on all temporary circuits of 120 volts.
- 3.14 All tools shall be inspected for defects or unsafe conditions prior to use. Unsafe tools shall be removed from service immediately and tagged as defective.
- 3.15 Do not use a tool or piece of equipment with which you are unfamiliar until you have received instructions on its use and have read all safety precautions contained in the owner's/operator's manual. Before approaching a piece of equipment establish eye contact with the operator.
- 3.16 Cables, ropes, booms, lifting equipment etc. shall be inspected before each use and shall be removed from service if defective.
- 3.17 Gasoline shall be handled and stored in approved safety cans. Engines shall be turned off during refueling. No smoking is permitted while refueling or handling fuel containers. Flammable materials shall be stowed away from ignition sources such as flames or batteries.

Section II

- 3.18 Open excavations that are accessible to others shall be guarded at all times by barriers. Manholes and floor openings shall be securely covered or guarded by railings.
- 3.19 Excavations and trenches more than 5 feet deep shall be shored with a trench box or sloped according to OSHA standards. No employee shall enter a trench more than 5 feet deep without this protection.
- 3.20 Excavations and trenches more than 4 feet deep shall be provided with a ladder, ramp, or other safe means of access/egress. In a trench, safe access must be provided within 25 feet of each employee in the trench.
- 3.21 Get help when lifting objects that are too heavy or awkward to be lifted alone. Under most circumstances, the maximum weight any employee should lift unassisted is 50 pounds.
- 3.22 Immediately report all accidents or injuries, however slight, to your foreman or superintendent.
- 3.23 **SARGENT CORPORATION** provides a drug free workplace. Employees who engage in unlawful manufacture, distribution, possession or use of a controlled substance will be subject to immediate suspension and possible termination of employment.
- 3.24 Any employee under the influence of alcohol or drugs on the job will be subject to immediate termination of employment.
- 3.25 Any employee fighting, provoking a fight or participating in horseplay on a project site will be subject to immediate suspension or termination of employment.
- 3.26 Any employee violating **SARGENT CORPORATION** safety policies will be subject to disciplinary action, up to and including immediate suspension or termination.
- 3.27 Employees observing an unsafe condition or work practice in the workplace shall bring it to the immediate attention their foreman or superintendent. If this fails to correct the situation, please call the Safety Director or the Training Administrator in Stillwater.

SAFETY IS EVERYONE'S BUSINESS.

CERTIFICATION

I certify that I have read and understand **SARGENT CORPORATION'S SUMMARY OF SAFETY RULES** and I agree to follow those rules while I am employed by **SARGENT CORPORATION**.

I further certify that I have been provided with a copy of **SARGENT CORPORATION'S** employee handbook. I acknowledge that I am an "Employee at Will," and either **SARGENT CORPORATION** or I may terminate my employment at any time, for any reason or no reason, with or without prior notice.

Date: _____

Employee Name (print) _____

Employee Signature _____

SARGENT CORPORATION
NEW EMPLOYEE ORIENTATION CHECKLIST

EMPLOYEE NAME: _____ DATE: _____

NAME OF PERSON COMPLETING ORIENTATION: _____

The person(s) providing the new employee orientation should review the following items and indicate either they have been reviewed or that they are not applicable. This form must accompany payroll information and be included in the employee file.

- Starting and quitting times..... ☐ YES ☐ N/A
- Time and length of coffee break..... ☐ YES ☐ N/A
- Time and length of meal break..... ☐ YES ☐ N/A
- Location of toilets ☐ YES ☐ N/A
- Employee’s classification and rate of pay ☐ YES ☐ N/A
- Date of first paycheck and regular pay day ☐ YES ☐ N/A
- Mandatory direct deposit of paycheck (need paperwork within 2 weeks)..... ☐ YES ☐ N/A
- Who and where to call when unable to report to work (provide phone number) ☐ YES ☐ N/A
- Name of project superintendent..... ☐ YES ☐ N/A
- Reporting procedures for employee injuries and accidents..... ☐ YES ☐ N/A
- Read and sign ‘Summary of Safety Rules’ ☐ YES ☐ N/A
- Complete and sign W-4..... ☐ YES ☐ N/A
- Complete and sign I-9 and provide supporting documentation..... ☐ YES ☐ N/A
- Complete and sign employee setup form..... ☐ YES ☐ N/A
- Work dress requirements (shirt with sleeves, long pants, safety work boots)..... ☐ YES ☐ N/A
- Hard hat policy discussed and hard hat issued..... ☐ YES ☐ N/A
- High visibility vest policy discussed and vest issued..... ☐ YES ☐ N/A
- Safety glasses policy discussed and safety glasses issued ☐ YES ☐ N/A
- Fall protection policy discussed ☐ YES ☐ N/A
- EEO and sexual harassment policies explained..... ☐ YES ☐ N/A
- Employee has no physical limitation(s) to prevent him/her from doing work ☐ YES ☐ N/A
- Confined space entry explained..... ☐ YES ☐ N/A
- Use of drugs or alcohol during workday (including during coffee and lunch breaks) or reporting to work under the influence of
drugs or alcohol will result in immediate termination..... ☐ YES ☐ N/A
- Employee will report all unsafe working conditions and/or procedures to foreman or superintendent..... ☐ YES ☐ N/A
- Days and times of safety meetings explained ☐ YES ☐ N/A
- Employee will participate in all safety meetings ☐ YES ☐ N/A
- Hazardous materials exposure policy, SDS availability, and location and project chemical list discussed..... ☐ YES ☐ N/A
- Equipment greasing and maintenance requirements discussed in detail..... ☐ YES ☐ N/A
- Employee Evaluation Parameters ☐ YES ☐ N/A
- Employee Evaluation Questions..... ☐ YES ☐ N/A
- Other (specify): _____..... ☐ YES ☐ N/A

THESE ITEMS HAVE BEEN DISCUSSED WITH AND ARE UNDERSTOOD BY THE EMPLOYEE.

Supervisor Signature

Employee Signature

III. ACCIDENT PREVENTION PLAN: INCIDENT INVESTIGATION & REPORTING PROCEDURES

1.0 INTRODUCTION

- 1.1 **Investigation and Analysis.** A complete and accurate investigation and analysis of an accident or near miss provides an opportunity to address hazards that may not be obvious, or that result from a combination of circumstances. Because these categories of accidents account for the greater percentage of losses, in terms of injuries and property damage, **SARGENT CORPORATION** considers reporting and accident investigation an important and integral part of each Superintendent's and Foreman's responsibilities.

2.0 REPORTING REQUIREMENTS

- 2.1 Every incident involving a reported injury, property damage claim, or near miss shall be reported to the appropriate regional office and to Stillwater before the end of the workday.
- 2.2 The superintendent shall, in each case, submit an **Incident Investigation Report**.
- 2.3 Any case involving a hospital visit, lost time, vehicle damage or damage to property shall also be telephoned to the Stillwater office on the day it occurs. Please report injuries to Adam Kasprzak, Heather Hutchinson or Arthur Herbest, and report property damage claims to Kim Ryan.

3.0 INCIDENT INVESTIGATION

- 3.1 Incident investigations shall be the responsibility of the project Superintendent.
- 3.2 S/he shall conduct a thorough investigation of every accident involving property damage or employee injury.
- 3.3 The goal of an incident investigation is to locate and identify unsafe conditions or unsafe practices and to correct them. Consequently, one of the most important parts of the investigation is to determine the cause of the incident, the steps taken to correct the conditions, and the follow up actions needed to ensure there will be no reoccurrences. Photographs are very helpful for documenting the details of an incident.
- 3.4 The results of the incident investigation shall be reported on the "**SARGENT CORPORATION INCIDENT INVESTIGATION REPORT**" form.

4.0 EMPLOYEE INJURY INVESTIGATION

- 4.1 As soon as possible following the employee's notification of an injury, the Superintendent must complete an Incident Investigation Report. It is important that the report be as accurate and complete as possible. However, do not hold up a report because you lack some information. We can supplement missing information later.
- 4.2 All injuries shall be reported on a "**SARGENT CORPORATION INCIDENT INVESTIGATION REPORT**" form. This report is to be completed as soon as possible and sent to **Adam Kasprzak via email at akasprzak@sargent-corp.com**. Please be very specific as to the nature of the injury such as "laceration on third finger of right hand" or "muscle strain of lower left back". It is extremely important that we know what body parts are affected and the exact nature (as best you know) of the injury.
- 4.3 In the event that an injury requires a doctor visit, please contact Adam Kasprzak, Heather Hutchinson, or Arthur Herbest as soon as possible. For all medical emergencies call 911. For all other injuries requiring medical assistance, a supervisor must accompany the injured employee to the local occupational health facility that has been pre-approved by the Human Resource Department.
- 4.4 If the injury results in lost time from work, please indicate that appropriately on the form. Please note that if an employee misses time from work to seek medical attention on the day of the injury but returns to work the following day, this is NOT a lost time injury. Disability does not begin until the day following the injury. Please also pay the injured person for a full day on the date of injury if s/he leaves to seek medical attention.
- 4.5 For a minor injury that may or may not require first aid, please also complete an Incident Investigation Report and send it to **Adam Kasprzak at akasprzak@sargent-corp.com**. It will be kept on file in the event that medical treatment is necessary at a later date.



Incident Reporting Instructions

Injury

In the event of an injury, take care of the injured employee and then notify Adam Kasprzak as soon as possible at 207-745-4817. Complete the tab marked "injury" and forward it to kryan@sargent-corp.com and akasprzak@sargent-corp.com within 48 hours of the incident.

In the event of an OSHA-recordable injury, complete sheets "Investigation 1 and Investigation 2".

Near Miss

In the event of a "Near Miss", complete the tab marked "Near Miss" and send it kryan@sargent-corp.com and akasprzak@sargent-corp.com within 72 hours. You do not have to fill out all the pages of the form.

Property Damage

In the event of property damage, if the damage is to private property, client-owned property or equipment, or public property, complete the tab marked "Property Damage" only and send it to kryan@sargent-corp.com and tgardner@sargent-corp.com immediately and copy akasprzak@sargent-corp.com as well. You do not have to fill out all the pages of the form.

Equipment Damage

In the event of equipment damage, complete the tab marked "Property Damage" and send it to trichards@sargent-corp.com, kryan@sargent-corp.com and tgardner@sargent-corp.com immediately and copy akasprzak@sargent-corp.com as well. You do not have to fill out all the pages of the form.

Incident Investigation Summary

* Did the accident result in the death of one or more persons? ☐ Yes ☐ No ** Did the accident result in the inpatient hospitalization of one or more persons? ☐ Yes ☐ No ** Did the accident result in an amputation? ☐ Yes ☐ No		** Did the accident result in the loss of an eye? ☐ Yes ☐ No Was medical treatment provided? ☐ Yes ☐ No Was this a recordable injury or illness? ☐ Yes ☐ No
--	--	---

* Fatalities must be reported to OSHA within 8 hours.

** Inpatient hospitalizations, amputations, and eye loss incidents must be reported to OSHA within 24 hours.

You can report online at <https://www.osha.gov/html/Ramap.html>

Summary

Remember to send to Stillwater:

- ✓ Medical information
- ✓ Photographs
- ✓ Witness statement
- ✓ Copy of client reports
- ✓ Copy of STA
- ✓ Incident Report

Incident Report

I am reporting a work-related: ☐ Injury ☐ Illness ☐ Exposure

Name of injured employee _____ Job title _____

Reported to: _____ Supervisor _____

Foreman _____ Foreman's Phone # _____

Date of injury _____ Time of injury _____ Reported date _____

Home phone or cell # ☐ Home ☐ Cell _____ DOB _____ Gender ☐ M ☐ F

Address _____ SSN _____

Where did the accident occur? _____

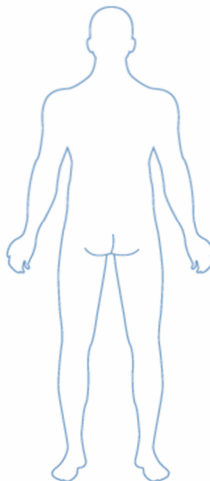
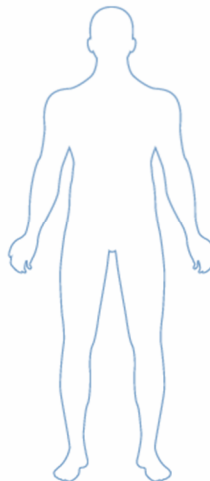
Is injury an aggravation of a previous injury? _____ If yes, explain _____

Witness _____ Phone # _____ Witness _____ Phone # _____

What Happened

What body part(s) were affected? _____

Place an "x" on all affected body parts.



- ☐ Abrasion
- ☐ Amputation
- ☐ Burn (chemical)
- ☐ Burn (thermal)
- ☐ Cold
- ☐ Concussion
- ☐ Contusion
- ☐ Crushing injury
- ☐ Damage to a body system
- ☐ Electric shock
- ☐ Fracture
- ☐ Heart attack

- ☐ Heat
- ☐ Hernia
- ☐ Inhalation
- ☐ Laceration
- ☐ Puncture
- ☐ Rash
- ☐ Sprain
- ☐ Sting/bite
- ☐ Strain
- ☐ Other

Section III

Medical treatment? ☐ Yes ☐ No E/R? ☐ Yes ☐ No Ambulance ☐ Yes ☐ No
 What medical facility? _____

Type of Incident / Cause

☐ Caught in / caught between	☐ Repetitive motion	☐ Struck by
☐ Contact with	☐ Slip / trip / fall	☐ Struck against
☐ Exposure to	☐ Strain / sprain	☐ Other

Specific activity at the time of injury:

All equipment, tools, and materials directly related to and/or being used at time of injury:

Was the injury the result of an unsafe act? ☐ Yes ☐ No

Was the injury the result of an unsafe condition? ☐ Yes ☐ No

Was the injured employee trained to safely accomplish the task (s) he was working on? ☐ Yes ☐ No

Have eyewitnesses been interviewed? ☐ Yes ☐ No

Are there notes, sketches, observations, or photographs that might be helpful? ☐ Yes ☐ No

What is the root cause?

Are there changes that need to be made in policy or conditions? ☐ Yes ☐ No

Does the client need to be notified that an accident occurred? ☐ Yes ☐ No

Does the client need a copy of this report? ☐ Yes ☐ No

Claims - for office use only

☐	Minor	Restricted duty starts	
☐	Recordable	Restricted duty ends	
☐	Lost Time	Lost time starts	
☐	Recordable without lost time or restriction	Lost time ends	
			Other
			Full duty release

Name of person who completed this form:

Name:

Position:

Safety Director's Signature

Date:

Accident Investigation									
What went wrong?									
If a hazardous condition existed, why did it exist?									
If an unsafe act occurred, why did it occur?									
Was the employee tired? How many hours had s/he worked when the incident happened?									
Was the employee being rushed to complete this task?									
	Yes		No	If yes, explain.					
Were unsafe acts or hazardous conditions reported prior to the incident?									
	Yes		No	If yes, by whom? Explain.					
Have there been similar incidents or near misses prior to this one?									
	Yes		No	If yes, explain.					
Was the injury or exposure caused by the employee's willful misconduct, intoxication, or deliberate intent to injure him/herself or another?									
	Yes		No	If yes, explain.					
Was the injury a result of violation of established safety policies?									
	Yes		No	If yes, explain.					
Has the employee received training to perform this task safely?									
	Yes		No	If no, explain.					
Was adequate PPE provided and used for the task?									
	Yes		No	If no, explain.					
Explain any additional policies, personal factors, and environmental factors that led to hazardous condition or unsafe acts.									

Accident Investigation**Why did the accident or exposure occur?**

Unsafe workplace conditions (Check all that apply)

- ☐ Inadequate guard
☐ Unguarded hazard
☐ Safety device missing or defective
☐ Tool or equipment defective
☐ Work environment is hazardous
☐ Inadequate lighting
☐ Inadequate ventilation
☐ PPE not available
☐ Inadequate PPE
☐ Inadequate training
☐ Other

Unsafe acts (Check all that apply)

- ☐ Operating without license or permission
☐ Operating at unsafe speed
☐ Working on equipment that is not locked out
☐ Bypassing a safety device
☐ Using defective equipment
☐ Using equipment in an unapproved way
☐ Unsafe lifting
☐ Poor ergonomics
☐ Horseplay
☐ Distraction
☐ Failure to wear proper PPE
☐ Other

How can future incidents be prevented?**What changes do you suggest to prevent this from happening again?**

- | | |
|--|---|
| ☐ Stop this activity | ☐ Guard the hazard |
| ☐ Train/retrain the employee | ☐ Train/retrain the supervisor |
| ☐ Redesign the task steps | ☐ Engineer out hazard(s) of work environment |
| ☐ Write a new policy or work rule | ☐ Enforce existing policy or work rule |
| ☐ Inspect | ☐ PPE |
| ☐ Other | |

What should be (or has been) done to carry out the suggestion(s) checked above?

Investigation team members

Name:

Position:

Name of person who completed this form:

Name:

Position:

--	--

Job Number		Date Reported		Reported By:				
Jobsite		Time of Incident						

Description of Incident:	

[illegible][illegible]

Report Completed By:					Date:				



Property Damage Reporting Form

				Date of Incident:							
Employees involved with the incident											
		Employee 1						Superintendent			
		Employee 2						Foreman			
		Employee 3									
Required action for damaged equipment:											
		☐ Document only				☐ Continue to operate				☐ Repair on jobsite	
		☐ Send to dealer for repair				☐ Send to shop for repair				☐ Replace equipment	
		☐ Other: _____									
Equipment incident type:											
		☐ Equipment hitting other equipment						☐ Equipment hitting other objects			
		☐ Equipment damage to overhead utilities						☐ Equipment damage to underground utilities			
		☐ Operator not in control of load/material						☐ Traffic accident			
		☐ Equipment driven off road						☐ Equipment rollover			
		☐ Other: _____									
Incident overview and statements:											
To be completed for all employee(s) involved in the incident. Please describe the incident as completely as possible - attach additional pages, photos, sketches, etc. as needed.											
Employee 1											
Employee 2											
Incident cause(s) and corrective actions:											
Please include relevant background information such as employee's location/position in relation to surroundings and what employee was doing when the incident occurred. Please attach photos, sketches, diagrams, etc. as needed.											

Section III

Sargent Corporation equipment involved in incident:									
Unit number		Make/Model		Operator					
Unit number		Make/Model		Operator					
Description of other damaged property:									
Owner's name									
Address									
Phone		(cell)		(home)		(work)			
Cause(s) contributing factors: (People, equipment, environment)									
What condition(s) or factors(s) contributed to the incident? (Check all that apply)									
☐	Inadequate training			☐	Improper equipment used				
☐	Rule violation or deviation from procedure			☐	Extreme temperatures				
☐	Lack of procedure enforcement			☐	Poor housekeeping				
☐	Unsafe work practices and procedures			☐	Equipment failure or defective				
☐	Inadequate warning system			☐	Air contamination or no ventilation				
☐	Inadequate guarding of equipment			☐	PPE not used or improper PPE				
☐	Equipment inspection insufficient or not performed			☐	Task too physically demanding				
☐	Hazard was not identified (No JHA or STA)			☐	Preexisting condition				
☐	Hazard identified but not addressed			☐	Other _____				
Explain: _____									
Program failure: (check all that apply)									
☐	Inadequate or no Job Hazard Analysis (JHA)			☐	Inadequate or no training				
☐	Inadequate or no Safety Task Analysis (STA)			☐	Poor housekeeping				
☐	Inadequate site safety inspection program			☐	Inadequate or no rule enforcement				
☐	Inadquate warning signs/barricades			☐	Equipment not inspected				
☐	Inadequate employee orientation or OJT			☐	Other _____				
Explain: _____									
Correction action taken to prevent recurrence (check all that apply)									
☐	Review/revise/recommunicate JHA			☐	Improve housekeeping				
☐	Review/revise/recommunicate STA			☐	Discuss incident with crew				
☐	Train/retrain employee(s)			☐	Performs equipment/tool inspection				
☐	Mark/remark hazards			☐	Upgrade equipment design				
☐	Enforce rules and procedures			☐	Use proper equipment				
☐	Increase frequency of site inspections			☐	Other _____				
☐	Install guards/safety devices								
Explain: _____									
Report completed by _____ Date _____									
Safety Director _____ Date _____									

5.0 PROPERTY DAMAGE CLAIMS

- 5.1 All claims of property damage or loss that involve **SARGENT CORPORATION** employees or agents shall be reported to Vice-President of Finance in Stillwater as soon as possible.
- 5.2 To facilitate the gathering of information, a **SARGENT CORPORATION INCIDENT INVESTIGATION REPORT** form must be completed and **emailed to Kim Ryan at kryan@sargent-corp.com** .
- 5.3 Whenever possible, please include photographs with reports of property damage or loss.

6.0 PREVENTION OF LOST TIME INJURIES

- 6.1 **SARGENT CORPORATION** is committed to reducing lost time injuries of our employees to zero.
- 6.2 **SARGENT CORPORATION** will provide meaningful alternate or light duty work for each injured employee who is unable to return to his/her regular duty. The alternate or light duty work assigned will be within the restrictions placed on the injured employee by the treating physician.
- 6.3 The injured employee, the employee's foreman, and the project superintendent shall review and strictly adhere to any restrictions recommended by the treating physician.
- 6.4 In the event an employee must lose time from work as a result of a workplace injury, the project superintendent and the safety director shall conduct a thorough investigation of the incident, including:
 - 6.4.1 A review of the incident investigation report completed by the superintendent and foreman.
 - 6.4.2 Interviews with the injured employee and/or witnesses to the incident.
 - 6.4.3 A determination of all factors including actions, procedures, and/or conditions that contributed to cause the injury.
 - 6.4.4 A determination of steps to be instituted to prevent recurrence.
 - 6.4.5 Communication to all operations managers and project superintendents of the causes of the lost time injury and resulting procedural changes, if any.

7.0 FIRST AID

- 7.1 In the absence of an infirmary, clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite, a person who has a valid certificate in first aid shall be available at the worksite.
- 7.2 First aid training must be obtained from the American Red Cross, National Safety Council, or equivalent organization. Training shall be documented and a certificate of training provided.
- 7.3 First aid supplies shall be easily accessible when required. First aid kits shall consist of appropriate items which will be adequate for the environment in which they are used. For construction operations, items shall be stored in a weather proof container with individually sealed packages of each type of item.
- 7.4 In addition to the availability of adequate first aid supplies, first aid kits will be periodically inspected and restocked as supplies are used. Materials that have met their expiration date will be removed. For construction operations, first aid kits shall be checked before being sent out to each job and at least weekly.
- 7.5 Proper equipment for prompt transportation of the injured person to a physician or hospital or a communication system for contacting necessary ambulance service shall be provided and posted at all projects.
- 7.6 Where the eyes or body of any person may be exposed to corrosive materials that could cause injury, suitable facilities shall be provided within the work area.

8.0 OSHA RECORD KEEPING REQUIREMENTS

- 8.1 **OSHA Form 300.** The Safety Director is responsible to keep the OSHA record keeping up to date.
 - 8.1.1 All employee injuries are recorded on a company database kept in Stillwater.
 - 8.1.2 The OSHA Form 300 must be kept on a calendar year basis. Work related injuries and illnesses must be recorded on the OSHA Form 300 if they result in any of the following:
 - 8.1.2.1 Death of the employee.
 - 8.1.2.2 One or more lost work days.
 - 8.1.2.3 Restrictions of work or motion outside the usual activities or responsibilities of the employee's work classification.

8.1.2.4 Loss of consciousness.

8.1.2.5 Transfer to another job as result of injury.

8.1.2.6 Medical treatment beyond first aid, including those involving broken bones, stitches, prescription medications taken, and/or repeat visits to a doctor, chiropractor or physical therapist for treatments or follow-up care.

8.2 **OSHA Form 300A.** This annual summary of injuries and illnesses shall be completed by the Safety Director and posted at each location where company employees report for work for the period February 1 to April 30 annually.

IV. SAFE WORK PRACTICES / STANDARD OPERATING PROCEDURES (Last revised 03/21/2017; Updated on 12/19/17.)

1.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- 1.1 **Construction Work Clothing.** All employees and subcontractor employees in construction work areas shall wear ankle length work pants and shirts with at least 4-inch sleeves. Short work pants and sleeveless shirts are not allowed on **SARGENT CORPORATION** project sites. All clothing shall be clean and in good condition at the start of each work shift.
- 1.2 **Head Protection.** All employees shall wear hard hats at construction project sites, borrow pits, and quarries at all times except in offices or inside the cab of a vehicle or equipment.
- 1.3 **Eye Protection.** Safety glasses shall be provided and worn on all projects and shop work areas at all times. The company reimbursement program for employees who purchase and wear prescription safety glasses with permanently attached side shields is detailed in the **SARGENT CORPORATION** Employee Handbook. Alternatively, the company will provide safety over-glasses.
- 1.4 **Face Protection.** Employees shall wear face shields in addition to safety glasses for all high-risk tasks such as welding, chipping and grinding metals, chipping concrete, using pipe saws and chain saws, and similar activities that cause flying debris.
- 1.5 **Foot Protection.** Safety toe work boots, maintained in good condition, shall be the minimum acceptable foot protection on all projects. Footwear shall be constructed of leather and/or other durable and puncture resistant materials. Safety toe sneakers, hiking boots, or street shoes shall not be allowed on any project.
- 1.6 **Hand Protection.** Gloves should be worn whenever practical or required to protect hands from cold, cuts, scratches, heat or abrasions when handling materials. The company will provide task specific hand protection for unusual working conditions, such as handling wet concrete, chemical exposure, welding or jack hammering.
- 1.7 **Hearing Protection.** Hearing protection shall be provided and worn whenever noise levels or duration of exposure cannot be reduced to below OSHA permissible exposure levels. For example, hearing protection is required when working with or near loud equipment such as a plate tamp, chain saw, pipe saw, impact tool, metal grinder, or sheet pile driver. (See also Section XI, Hearing Conservation Program.)
- 1.8 **Safety Vest.** Employees shall be provided with and required to wear high visibility appropriate for the work area. Employees may elect to buy and wear high visibility coats or tee shirts with reflective stripes at their own expense. Class 2 is the minimum requirement at all Sargent Corporation projects. An employee may remove the safety

vest while welding and conducting other hot work activities, so long as the work area is not in the right-of-way of a public roadway and is well protected from moving equipment, trucks, and other vehicles.

- 1.9 **Job Specific PPE.** Chain saw operators shall wear protective chaps in addition to head, eye, face, hearing, and foot protection. A plexiglass or other type protective debris shield shall be installed in front of the operator's front window when operating a hoe ram or performing demolition work.
- 1.10 **Other PPE** such as protective clothing, respiratory protection, and protective shields and barriers may also be required. The competent person shall provide and require the use of all PPE necessary to protect employees from hazards in their work area. For additional detail on appropriate selection and use of respiratory protection, refer to Section X of this Health & Safety Plan.
- 1.11 **Training.** Training should be provided to employees concerning when to wear PPE, what PPE should be worn, how to put on, take off and adjust PPE. Such training should include the limitations of the PPE as well as proper care, inspection and maintenance. When there is a reason to believe an employee who has been trained does not have the appropriate level of understanding and skill or there are changes in the workplace, the employee must be retrained. All PPE training should be documented.
- 1.12 **Other Consideration for PPE Use.** Protective equipment for eyes, face, head, and extremities, any protective clothing, respiratory devices, and protective shields and barriers, must be provided, used, and maintained in sanitary and reliable condition.
 - 1.12.1 PPE that fits poorly will not afford the necessary protection. Continued wearing of the device is more likely if it fits the wearer comfortably. Protective devices are generally available in a variety of sizes. Care should be taken to ensure that the right size is selected.
 - 1.12.2 If during inspection or during use it is determined any PPE is defective or damaged, it shall be discarded or tagged and removed from service until repaired.
- 1.13 **Employee Supplied/Owned PPE.** Where employees provide their own protective equipment, the employer must assure its adequacy, including proper maintenance, and sanitation of such equipment.
- 1.14 **Hazard Assessment for PPE.** Along with the standard activities listed below, an onsite hazard assessment must be completed as part of the Job Hazard Analysis (JHA) process. The JHA must be done prior to the job starting to determine what PPE might be needed on the job. All JHAs must be signed by the person completing the hazard assessment.

ACTIVITY	ADDITIONAL PPE REQUIRED
Chain saw and cutoff saw work	Face shield and hearing protection (ear plugs or muffs). Chain saw operators shall also wear protective chaps.
Hoe ramming with excavator hammer	A plexiglass sheet or other type protective debris shield shall be installed in front of the operator's front window.
Precasting	Rubber or cotton gloves to protect hands.
Operating small compactor (tamp).	Hearing protection (ear plugs or muffs).
Welding	Welding hood for eye and face protection and leather gloves to protect hands.
Cutting and burning	Welding goggles with minimum no. 5 shade lens.
Grinding and chipping	Face shield is required in addition to safety glasses.
Painting	Supplied air hood for respiratory protection.
Sand blasting	Sand blast hood for eye and face protection. HEPA respiratory protection (N95 half face disposable respirator at minimum). Do not sand blast lead paint.
Rock crushing and aggregate screening	Ear plugs or muffs for hearing protection and gloves to protect hands.

2.0 FALL PROTECTION PLAN

- 2.1 **Introduction.** This Fall Protection Plan is developed to provide specific guidelines and requirements for **SARGENT CORPORATION** personnel and subcontractor personnel for work performed on all projects. It complies with and includes by reference all OSHA Standards relative to fall protection as published in 29 CFR 1926. Where there are differing requirements between this Fall Protection Plan and OSHA Standards, the stricter of the standards shall govern.
- 2.2 **Fall Protection Policy.** Each employee shall be protected from falling when walking or working where there is a danger of falling 6 feet or more to a lower level. A fall prevention system shall be used wherever possible. These include guardrail systems, positioning devices, and barricade systems that effectively keep employees at least 15 feet away from the fall hazard. Where it is impossible or impractical to install a fall prevention system, a personal fall arrest system or safety net shall be used. Site specific fall protection plans will be developed and overseen by a qualified person.
- 2.3 **Employee Training.** Each employee who might be exposed to fall hazards shall be trained in the recognition and how to minimize fall hazards. When new hazards are identified or unsafe behavior is observed, retraining shall be performed with employees. All fall protection training should be documented.
- 2.4 A **Guardrail System** shall be capable of withstanding an outward or downward force of 200 pounds with a minimum of deflection.

- 2.4.1 Vertical supports shall be 2x4 lumber (minimum) or equivalent and shall be a maximum of 8 feet apart.
- 2.4.2 Top rails of 2x4 lumber (minimum) or equivalent shall be approximately 42 inches high (+/- 3 inches).
- 2.4.3 Mid-rails of 1x6 or 2x4 lumber (minimum) or equivalent shall be positioned half way between the top rail and the toe board.
- 2.4.4 Toe boards shall be a minimum of 1 x 4 lumber.
- 2.5 A **Positioning Device** may be used to effectively prevent an employee from being exposed to a fall hazard. The employee wears a harness and is tied to an anchor system such that the employee cannot reach the fall hazard. Ropes, anchors, and other components of the positioning device shall be capable of withstanding at least twice the combined weights of the persons tied to them.
- 2.6 A **Barricade System** may also be used to prevent employees from entering a potential fall hazard area. A barricade system is a physical obstruction such as Danger tape or other highly visible warning line that warns and limits access to the fall hazard. A barricade system shall be approximately waist high and shall be continuous such that it completely surrounds the affected employees or the fall hazard, and effectively keeps employees at least 15 feet away from the fall hazard.
- 2.7 **Personal Fall Protection.**
 - 2.7.1 When using a personal fall arrest system to provide required fall protection, 100% tie-off is required.
 - 2.7.2 Prior to using a personal fall arrest system to provide required fall protection, a plan shall be in place for effective and prompt rescue of any employee who falls while attached to the fall arrest system.
 - 2.7.3 Prior to using a personal fall arrest system and at least daily thereafter, each affected employee shall visually inspect his/her safety harness, shock absorbing or retractable lanyard, tie-off point, and all other components of the fall protection system. Any part found to have a defect shall be immediately removed from service and replaced.
 - 2.7.4 All personal fall protection equipment shall be 5000 pounds test. All lifelines and anchor points shall be 5000 pounds test per person attached to them. They shall be rigged such that the employee can neither free fall more than 6 feet, nor contact a lower level.
 - 2.7.5 Where repeated attachment and detachment of the lanyard is required to accomplish the task, two lanyards will be used to ensure 100% tie-off protection.

- 2.8 **Scaffolding.** Use of scaffolding shall comply with OSHA Subpart L. Listed below are some of the requirements. The complete section can be found in OSHA Construction Industry Regulations (29 CFR 1926).
- 2.8.1 Scaffolds shall be designed by a qualified person and shall be constructed and loaded in accordance with that design under the direction of the competent person. The competent person must ensure scaffolds are safe prior to use and shall affix a tag at each open point of access to scaffolds to indicate the current status of the scaffold (“OK to Use”, “Use with Personal Fall Arrest Only”, or “Do Not Use”).
 - 2.8.2 All scaffolding components including cross members, footing plates, etc. must be included in the scaffolding system. Unsafe equipment, components or conditions must be tagged by a competent person until corrected.
 - 2.8.3 Footing or anchorage for scaffolds shall be sound, rigid and capable of carrying the maximum intended load without settling. Unstable objects such as bricks and concrete blocks shall not be used to support scaffolds or planks. Scaffold systems must be erected plumb and level.
 - 2.8.4 Guardrail systems, including top-rails, mid-rails, and toe-boards shall be installed on all open sides and ends of platforms over 6 feet in height.
 - 2.8.4.1 Personal fall arrest systems may be used in lieu of standard railings. (Toe-boards are always required). Lanyard anchor points shall not be attached to the scaffolding.
 - 2.8.4.2 Barricade areas beneath the scaffold to prevent workers from working or walking beneath working areas of the scaffold.
 - 2.8.4.3 When workers are required to work or walk below a working level of the scaffold, a wire mesh screen shall be installed between the toe-boards and the top rails of the guardrail system.
 - 2.8.5 Each platform on all working levels of scaffolds shall be fully planked or decked between the front uprights and guardrail supports.
 - 2.8.5.1 Scaffolds and their components shall be capable of supporting at least four times the maximum intended load.
 - 2.8.5.2 Platform planks will be 2 x 10 minimum (full dimension and scaffold grade).
 - 2.8.5.3 Scaffold platforms and walkways shall be at least 18” wide.

- 2.8.5.4 The front edge of all platforms shall not be more than 14" from the face of the work unless guardrails or personal fall arrest systems are used.
- 2.8.5.5 All overlapping of platform planks shall be over scaffold support members. Planks shall be overlapped 12 inches (minimum) or secured to prevent movement.
- 2.8.5.6 Scaffold planks shall not extend over end supports less than 6 inches or more than 12 inches.
- 2.8.6 **Access.** A ladder, stair tower, or other means of safe access shall be provided.
 - 2.8.6.1 It is permissible to climb integral prefabricated scaffold access end frames so long as the rungs are evenly spaced and no more than 16³/₄ inches apart. Safe handholds shall be provided at least 3 feet above the platform being accessed.
 - 2.8.6.2 Climbing scaffold cross-bracing is prohibited.
- 2.8.7 Scaffolds with a height to width ratio of more than 4:1 shall be secured to building/structures at intervals not to exceed 30 feet horizontally and 26 feet vertically (20 feet vertically for scaffolds 3 feet wide or less).
- 2.8.8 Manually Propelled Mobile Scaffolds:
 - 2.8.8.1 The height of a freestanding mobile tower shall not exceed four times its minimum base dimension.
 - 2.8.8.2 All casters shall be provided with a positive locking device and shall be locked when employees are on the mobile scaffold.
 - 2.8.8.3 Employees shall not be allowed to ride on mobile scaffolds that are being moved.
- 2.8.9 Training shall be provided to all employees regarding hazards by qualified persons in the subject matter. Retraining is required where changes at the worksite present a hazard about which an employee has not been previously trained, where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard. Retraining is also necessary where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.
 - 2.8.9.1 Hazards including fall protection, electrical safety, falling object protection, scaffold use and load capacity should all be addressed in the training provided to employees.

- 2.9 **Ladders.** Design and use of ladders (manufactured or job-made) shall conform to OSHA Subpart X and ANSI (A14.1-1968) Standards. Listed below are some of the requirements.

2.9.1 General.

- 2.9.1.1 Ladder users shall read and follow all manufacturer instructions printed on the ladder. These instructions shall be clearly legible. Replacement ladder labels are available from the safety department.
- 2.9.1.2 Ladders shall be inspected prior to each use. Defective ladders shall be tagged out of service and shall not be used.
- 2.9.1.3 All ladders shall be secured against slipping. Ladders shall not be used on unstable, uneven, or slippery surfaces unless secured to prevent accidental displacement.
- 2.9.1.4 When ascending or descending a ladder, the user shall face the ladder and shall have both hands free in order to maintain three points of contact with the ladder.
- 2.9.1.5 Workers shall not carry tools and materials while ascending or descending a ladder, except in a tool belt designed for this purpose.

2.9.2 Portable Ladder – Manufactured:

- 2.9.2.1 All ladders used on construction projects shall have at minimum Type 1A Duty Rating (300 pound safe load capacity).
- 2.9.2.2 Portable ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts. Portable ladders with metal side rails shall not be used.
- 2.9.2.3 The use of ladders with broken or missing rungs or steps, broken or split side rails or other faulty or defective components is prohibited.
- 2.9.2.4 Ladder feet shall be placed on a level and substantial base, and areas around the top and bottom shall be kept clear.
- 2.9.2.5 Ladders shall be pitched so that horizontal distance from top support to the foot of the ladder is no more than $\frac{1}{4}$ of the working length of ladder. (Note: A person standing upright at the foot of the ladder should be able to reach out and grasp the ladder rung at shoulder height.)
- 2.9.2.6 Portable ladders shall be secured to prevent movement during use. Ladders should be tied off whenever possible; otherwise another person must hold the top or bottom to prevent the ladder from slipping.

2.9.2.7 Side rails shall extend at least 36 inches above the landing. Grab rails should be installed when this is not practical.

2.9.2.8 Any employee using a ladder as a work platform shall be protected from falling by the use of a personal fall protection system when their feet are 6 feet or more above an adjacent lower level.

2.9.3 Stepladders:

2.9.3.1 Workers shall read and follow all manufacturer instructions printed on the ladder. These instructions shall be clearly legible. Replacement ladder labels are available from the safety department.

2.9.3.2 Stepladders may only be used in an open and latched position and shall never be used as a straight ladder.

2.9.3.3 The base of the stepladder must be on flat, level, and solid footing.

2.9.3.4 Workers shall keep both feet on the steps of the ladder and shall not stand or step on the top or top steps of the ladder. Workers shall not straddle or sit on the top of a stepladder.

2.9.3.5 Workers shall not overreach; the worker's belt buckle may not extend outside the side rails.

2.9.3.6 Fall protection is required when working on a stepladder positioned near a potential fall to a lower level such as a stairway or floor edge.

2.10 **Safe Access at Changes in Elevation.**

2.10.1 When employees need repeated access to a higher or lower level where the break in elevation is 19 inches or more, a stairway, ladder, ramp or other safe means of access shall be provided.

2.10.2 Safe access shall be provided into trenches and excavations. A ladder, ramp, or other safe means of access is required within 25 feet of any employee in a trench that is 4 feet or more in depth.

2.10.3 Ladders, stairways, or other safe climbing equipment shall be provided for access to elevated work areas. Employees shall not free climb on equipment, buildings, or other structures more than 6 feet high except when using 100% fall protection.

2.10.4 Jumping off equipment, trucks, or any elevated platform more than 4 feet high is likely to result in an injury and should be strictly avoided.

2.11 Aerial Lifts.

2.11.1 Prior to using an aerial lift (including a scissor lift) all users shall be trained in the safe and proper use of the lift by a qualified person. A complete inspection of the lift and test of the lift controls shall be performed and documented daily.

2.11.2 All persons using aerial lifts (including scissor lifts) shall be protected from falling by use of a personal fall arrest system. Anchor points shall be at or below the mid-rails, and worker's feet shall remain on the floor of the lift. Climbing on the rails or the edge of the basket is prohibited. Modifications to the equipment shall not be made without written approval from the manufacturer.

2.11.3 Load limits specified by the manufacturer shall not be exceeded. Lifts will not operate within 10 feet of overhead electrical lines.

2.12 Hole Covers. A secure cover or standard railing including mid-rails and toe boards shall protect all floor openings, holes, manholes, catch basins and other open top structures.

2.13 Protection from Falling Objects.

2.13.1 Whenever possible, elevated work shall be scheduled such that areas beneath the elevated workers are not used as walk or work areas for other workers. Use barricades and/or red "Danger" tape to prevent access to these areas.

2.13.2 When workers are required to walk or work beneath other workers, screens and/or canopies shall be erected as necessary to protect them from falling objects, and warning tape and/or warning signs shall be erected to warn workers of the overhead hazard.

2.13.3 Toe boards are required on all elevated work platforms 6 feet or more high wherever it is possible a person may access the area beneath the work platform.

2.13.4 Tools, materials, etc. shall not be tossed or thrown from one level to another.

2.13.5 Materials, supplies, equipment, concrete buckets and other objects shall not be craned over people.

3.0 HOT WORK – WELDING/CUTTING OPERATIONS

3.1 A Fire Extinguisher shall be immediately available for all hot work operations.

3.2 Fire Watch. For hot work where there is a fire hazard (flammable liquids, gases, or solids), a fire watch shall be posted and water hose will be used where practical.

- 3.2.1 The assigned fire watch must be trained in the use of fire extinguishing equipment and familiar with the facilities for sounding an alarm in the event of a fire.
- 3.2.2 When a fire watch is required, they shall be maintained at least a half hour after the welding or cutting operation is completed.
- 3.3 **Eye and Face Protection.** A welder or cutter and helper shall use both eye and face protection.
- 3.4 **Gas cylinders.** All gas cylinders shall be handled in accordance with OSHA Standards.
 - 3.4.1 Gas cylinders shall be transported and stored in vertical position.
 - 3.4.2 Gas cylinders shall be secured or chained upright to prevent tipping.
 - 3.4.3 Caps shall be installed on gas cylinders when not in use.
 - 3.4.4 Oxygen shall not be stored with any fuel gases. Oxygen shall be stored a minimum distance of 20 feet from fuel gas cylinders and other combustible materials in storage or separated by a noncombustible barrier with a fire resistance rating of at least 30 minutes.
- 3.5 **Arc Welding.**
 - 3.5.1 Frames of all Arc welding/cutting machines shall be grounded unless mounted on a rubber tire vehicle.
 - 3.5.2 All ground connections shall be inspected daily to ensure they are mechanically strong and adequate for the required current.
 - 3.5.3 All cables shall be completely insulated and flexible – capable of handling maximum current requirements.
 - 3.5.4 Repairs or splices in cable shall be insulated with a capacity equal to that of the original cable, and shall not be allowed within 10' of the electrode holder.
 - 3.5.5 Welding shields shall be used whenever employees may be exposed to welding flash.
- 3.6 **Other Requirements.**
 - 3.6.1 Training. Cutters or welders and their supervisors shall be trained in the safe operation of their equipment and safe use in the surrounding work area.
 - 3.6.2 If the object to be welded or cut cannot readily be moved, all moveable fire hazards should be removed from the work area.

- 3.6.3 If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shields, fire blankets, etc. shall be used to confine the heat, sparks and slag and to protect the immovable fire hazards.
- 3.6.4 If fire hazards cannot be taken to a safe place or guards cannot be used to confine heat, sparks, slag and protect the immovable fire hazards, the welding/cutting shall not be performed.
- 3.6.5 Before welding/cutting is permitted the area shall be inspected, and when required, a written permit shall be used to authorize welding and cutting operations.
- 3.6.6 Any welding, cutting or burning of lead base metals, zinc, cadmium, mercury, beryllium or exotic metals or paints not listed here shall have proper ventilation or respiratory protection.
- 3.6.7 Operators of equipment should report any equipment defect or safety hazards and discontinue use of equipment until its safety has been assured. Repairs shall be made only by qualified personnel.

4.0 HOISTING AND RIGGING EQUIPMENT

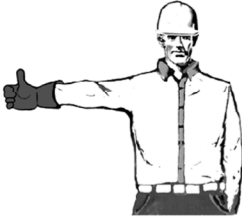
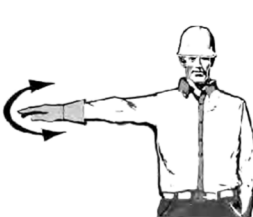
4.1 Cranes.

- 4.1.1 Use of cranes shall comply with OSHA 1926 Subpart CC – Cranes and Derricks in Construction, and manufacturer’s specifications and limitations.
- 4.1.2 Proof of a current yearly inspection performed by a qualified person shall be affixed to each crane or shall be kept on file at project sites.
- 4.1.3 Crane operators shall be trained and qualified for the type(s) of crane they are operating. Proof of crane operator’s qualifications shall be kept on file at project sites.
- 4.1.4 Rated load capacities and recommended operating speeds, warnings or instructions shall be conspicuously posted on all equipment. Operators of cranes shall comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments. Any modifications or additions must be approved by the manufacturer and provided in writing. A registered professional engineer must be qualified with respect to the equipment involved, and must ensure the original safety factor of the equipment is not reduced.

- 4.1.5 Competent person(s) shall inspect and document all cranes prior to use each day. In addition, rigging equipment and/or lifting devices shall be inspected prior to and during use. Safety devices on all equipment must be in proper working order before operations begin. If any of the devices are not in proper working order the equipment must be taken out of service and operations must not resume until the device is working properly again.
- 4.1.6 Accessible areas within the swing radius of the rotating superstructure of the crane shall be barricaded to prevent an employee from being struck or crushed by the crane.
- 4.1.7 Materials shall not be craned over workers. Only employees essential to the crane operation are permitted to be within the fall zone, and they shall not be directly under the load.
- 4.1.8 The minimum clearance from live electrical lines to any part of the crane or its load shall be: a) 10 feet for power lines up to 50kV; b) 15 feet for 50kV – 200kV; c) 20 feet for 200kV – 350 kV; d) 25 feet for 350 kV – 500 kV; e) 35 feet for 500 kV – 750 kV; or f) 45 feet for 750kV – 1000kV.
- 4.1.9 To prevent encroachment/electrocution, when a crane is capable of reaching within 20 feet of a live electrical line, a warning line shall be erected and maintained at the minimum approach distance. If the operator is unable to see the warning line, there shall be a dedicated spotter who is in continuous contact with the operator.
- 4.1.10 Persons giving signal directions to crane operators must have documented proof of signal training. When using hand signals, the Standard Method shall be used. A hand signal chart shall be posted on the equipment or conspicuously posted in the vicinity of the hoisting operation. A copy of the standard hand signals for controlling mobile crane operations is shown on the following pages.
- 4.1.11 Equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met.
- 4.1.12 All manufacturer procedures and prohibitions must be complied with when assembling and disassembling equipment. In addition, assembly/disassembly of equipment must be directed by a competent and qualified person.
- 4.1.13 Whenever there is a safety concern, the operator must have the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.



Standard Hand Signals FOR CONTROLLING MOBILE CRANE OPERATIONS

 HOIST With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles.	 LOWER With arm and index finger pointing down, hand and finger make small circles.	 USE MAIN HOIST A hand taps on top of the head. Then regular signal is given to indicate desired action.	 USE WHIPLINE (Auxiliary Hoist) With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action.
 BOOM UP With arm extended horizontally to the side, thumb points up with other fingers closed.	 BOOM DOWN With arm extended horizontally to the side, thumb points down with other fingers closed.	 MOVE SLOWLY A hand is placed in front of the hand that is giving the action signal. (Hoist slowly shown in example.)	 SWING With arm extended horizontally, index finger points in direction that boom is to swing.
 BOOM DOWN AND RAISE THE LOAD With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired.	 BOOM UP AND LOWER THE LOAD With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired.	 STOP With arm extended horizontally to the side, palm down, arm is swung back and forth.	 EMERGENCY STOP With both arms extended horizontally to the side, palms down, arms are swung back and forth.

 TRAVEL With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel.	 DOG EVERYTHING Hands held together at waist level.	 TRAVEL (BOTH TRACKS) Rotate fists around each other in front of body; direction of rotation away from body indicates travel forward; rotation towards body indicates travel backward. (For crawler cranes only)	 TRAVEL (ONE TRACK) Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel. (For crawler cranes only)
 TELESCOPE OUT (TELESCOPING BOOMS) With hands to the front at waist level, thumbs point outward with other fingers closed.	 TELESCOPE IN (TELESCOPING BOOMS) With hands to the front at waist level, thumbs point at each other with other fingers closed.	 TELESCOPE OUT (TELESCOPING BOOMS) One hand signal. One fist in front of chest with thumb tapping chest.	 TELESCOPE IN (TELESCOPING BOOMS) One hand signal. One fist in front of chest, thumb pointing outward and heel of fist tapping chest.

4.2 Other Hoisting Equipment – Excavators, Loaders, and Forklifts.

- 4.2.1 Excavators and loaders shall be operated by employees the company has designated as authorized operators based on their training and experience. The ‘Authorized Operator List’ is maintained and made available by the Safety Department.
- 4.2.2 Forklift operators shall have a certification card for each class or type of forklift they are operating in their possession to document their training and ability to safely operate the equipment. Copies of forklift certification cards are kept in the employee’s personnel files in Stillwater. (Note: A loader with forks is not a forklift.)
- 4.2.3 Steel sheets and trench boxes may be transported by a forklift or a loader with forks, but shall not be transported on a loader bucket. Large and ungainly objects shall be secured to the forks if necessary to ensure they are under the operator’s control at all times and will not slide off the forks.
- 4.2.4 The minimum clearance from live electrical lines to any part of an excavator/ loader/ forklift or its load is 10 feet for power lines up to 50kV. For power lines carrying more than 50 kV, the minimum clearance is 10 feet plus an additional 0.4 inch for every 1 kV over 50 kV.

4.3 Rigging Equipment and Safe Rigging Practices

- 4.3.1 Materials shall be rigged by a qualified rigger, who by his/her knowledge, training, and/or experience has demonstrated the ability to analyze the weight, shape, and other rigging requirements for the materials and properly rig the load.
- 4.3.2 Slings and other rigging equipment used to lift materials shall be properly certified, inspected, and stored, and shall be used only for that purpose. Rigging equipment shall be inspected by a qualified person prior to each use. Additionally, chain slings shall be inspected annually by a qualified third party rigging inspector, and the results of the inspection shall be documented and available for review.
- 4.3.3 Rigging equipment not in use shall be removed from the immediate work area so as not to present a hazard to employees. Defective rigging equipment shall be immediately tagged out of service and shall not be used.
- 4.3.4 Light duty web slings are often included with the delivery of rolls of HDPE liner, geosynthetic materials, and other fabrics. These are intended as single use slings, to facilitate loading and unloading the rolls, and they shall not be used for other general duty lifting purposes on jobsites. They may be used to drag HDPE pipe if desired, but they must be clearly marked “NOT FOR LIFTING”.

- 4.3.5 Rated sling capacities as determined by the sling manufacturer shall not be exceeded. Wire rope sling capacities can be found on a rigger's reference card, the OSHA book, or by contacting the sling manufacturer. Sling capacities for chain and web slings shall be clearly labeled on the sling.
- 4.3.6 Rated capacities shall also be clearly labeled on all lifting devices and rigging hardware.
- 4.3.7 Tag line(s) shall be used when necessary to help control the load. No person shall be in direct contact with a suspended load while it is being transported.

4.4 **Positive Connection Requirements.**

- 4.4.1 Slings and other rigging equipment shall in all cases be connected to the hoisting equipment by means of a safety hook with latch, clevis, or other lifting device that has been specifically designed to create a positive attachment. Slings shall not be wrapped around buckets, bucket teeth, or loader/forklift forks. Hydraulic quick-connect pins shall not be used as rigging attachment points.
- 4.4.2 In general, a positive connection is not required between the rigging equipment and the material being lifted. However, the competent person shall determine if a positive connection is necessary in order to safely lift and move the load.
- 4.4.3 Exception: When using a chain or wire rope sling to lift a steel sheet, the sling shall be securely attached to the sheet by means of a shackle, safety hook, or other positive attachment device. In a circumstance where the competent person determines that neither of the sling connection points could be accessed safely after the sheet has been secured in place, s/he document the reasons for not using a positive attachment. The daily STA shall be used for this purpose and to communicate with the crew all precautions that will be taken to protect workers and the public if the steel sheet is dropped.

5.0 CONCRETE AND CONCRETE FORM WORK

- 5.1 **Rebar Caps.** All exposed vertical reinforcing steel (rebar) less than 6' in height (or of any height where employees are working above the rebar) shall be properly capped to protect workers against impalement. Where commercially available caps are used, use "flattops" for impalement protection; "mushroom" caps may only be used for scratch protection on horizontal rebar.
- 5.2 **Powered Concrete Trowels.** Powered, rotating concrete trowel machines shall be equipped with a dead man switch.
- 5.3 **Concrete Buckets.**
 - 5.3.1 Riding in/on concrete buckets for any reason is prohibited.
 - 5.3.2 No employee shall walk or work under suspended buckets and loads.
 - 5.3.3 Suspended buckets and loads shall not be swung over crewmembers under any circumstance.
- 5.4 **Self-propelled Concrete Buggies** shall be driven in accordance with an established traffic pattern to minimize collision.

6.0 ELECTRICAL TOOLS

- 6.1 **Inspection.** All electrical tools shall be in good repair. Electrical tools, power cords, GFCI's, and other portable electrical equipment shall be inspected prior to each use.
- 6.2 **Power Cords.** Cords shall be of the three-wire type except for double insulated tools.
- 6.3 **GFCI Required.** All temporary power circuits, used to power hand tools at 120 volts, shall be equipped with a Ground Fault Circuit Interrupter. Use of an extension cord is considered temporary power and shall be used with a GFCI.
- 6.4 **Bulb Guards.** All lighting fixtures shall be equipped with a bulb guard.
- 6.5 **Dedicated Circuit for Lighting.** All temporary light strings shall be attached directly to a dedicated circuit for that purpose. Extension cords shall not be used with temporary lighting.

7.0 HOUSEKEEPING

- 7.1 Good housekeeping is one of the best indications that a job is being well controlled and efficiently run. Further, poor housekeeping contributes to a host of hazards ranging from trip hazards to fire hazards.
- 7.2 **Responsibility for Good Housekeeping.**
 - 7.2.1 It is the responsibility of the every person on a job to correct poor housekeeping as the job progresses, not after the work is done.
 - 7.2.2 While it is everyone's responsibility to ensure good housekeeping, it shall be the foreman and superintendent's job to assure that it is an ongoing practice.
 - 7.2.3 Subcontractors shall be responsible for their own housekeeping duties, and **SARGENT CORPORATION** superintendents shall enforce this common sense rule.
- 7.3 **Trip Hazards.** A continuous effort to eliminate trip hazards, remove flammable debris, stack lumber, remove or bend nails from scrap and generally keep work areas free of hidden traps and hazards contributes greatly to efficiency on our jobsites and the safety of our employees.
- 7.4 **Slippery Surfaces.** Snow shall be removed from stairways, travelways, work areas, and platforms. Icy walking/working surfaces shall be sanded to prevent slips and falls wherever possible. Ice cleats shall be worn on large jobsites where it is not possible or practical to sand all slippery walking/working surfaces.

8.0 FIRE PROTECTION

- 8.1 **Flammable Liquids.** Gasoline and other flammable liquids shall be handled and stored in metal containers that meet OSHA standards (safety gasoline cans) and labeled to indicate content.
- 8.2 **Fire Extinguishers shall be Available at all Project Sites.**
 - 8.2.1 All fire extinguishers shall be rated for Class A, B, and C fires. They shall be located, mounted, and identified so they are readily available and easily accessible to employees.
 - 8.2.2 A fire extinguisher shall be mounted in each office and storage trailer.
 - 8.2.3 A fire extinguisher is required within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used or stored. This requirement does not apply to integral fuel tanks of vehicles or equipment.

- 8.2.4 Fire extinguishers are required in all commercial motor vehicles and in all cranes.
 - 8.2.5 20 pound (minimum) fire extinguishers are required on fuel trucks, skid tanks, and other vehicles or tanks used to transport, store, or dispense more than 60 gallons of flammable or combustible liquids.
 - 8.2.6 Fire extinguishers are required at locations of cutting and/or welding activities.
 - 8.2.7 Fire extinguishers shall be mounted in building construction work areas, one (1) for each 3000 square feet, at least one for each floor level, and one within 100 feet of all workers in protected areas.
 - 8.2.8 Training shall be provided to familiarize employees with the general principles of fire extinguisher use and the hazards involved in incipient/initial stage firefighting measures. Refresher training shall be provided annually.
- 8.3 **Fire Extinguisher Inspection Requirements.**
- 8.3.1 Fire extinguishers shall be inspected at least annually by a qualified person who has been trained and certified to do so. S/he keeps a written documentation of the inspection and attaches a new annual inspection tag on the extinguisher.
 - 8.3.2 Each fire extinguisher must be inspected monthly by the user or other designated person. Monthly inspections are documented on the inspection tag by date and inspector's initials.
- 8.4 **Fire Extinguisher Limitations.**
- 8.4.1 Fire extinguishers may only be used to put out newly started small fires fueled by non-hazardous flammable or combustible materials.
 - 8.4.2 Never fight a fire that is rapidly spreading or one that is burning hazardous or unknown materials.
 - 8.4.3 When in doubt, back off and call 911 or the local fire department.

9.0 LIFTING

9.1 Lifting Limitations.

- 9.1.1 Company personnel shall seek assistance when lifting heavy objects. Help is also needed when the shape or size of the object makes it awkward to lift.

9.1.2 Under normal conditions, the weight limit for unassisted lifts is fifty (50) pounds. The competent person may increase or decrease this weight limit in certain situations, depending on the lifting conditions.

9.1.3 Objects weighing more than one hundred (100) pounds and ungainly objects that are difficult to keep hold of shall not be lifted by hand, even with help. Use mechanized equipment for all such lifts.

9.2 Use Proper Lifting Techniques.

9.2.1 Plan ahead. Clear a path, avoid twisting or bending, and if lifting with another person, make sure both of you agree with the plan.

9.2.2 Lift close to your body. This makes you a stronger and more stable lifter.

9.2.3 Keep your feet shoulder width apart to maintain a solid, stable base while lifting.

9.2.4 Bend your knees and keep your back straight. Practice the lifting motion before you lift the object, and focus on keeping your spine straight.

9.2.5 Tighten your stomach muscles and lift with your legs. Leg muscles are many times stronger than back muscles – let that strength work in your favor.

9.2.6 If you are straining, get help. It's just not worth the damage that can be caused by attempting to lift a heavy or awkward object.

10.0 EQUIPMENT SAFETY

10.1 Authorized Equipment Operators.

10.1.1 Only qualified operators and drivers are authorized to operate **SARGENT CORPORATION** equipment and vehicles.

10.1.2 Operators and drivers in training shall do so under the oversight and supervision of a qualified person.

10.1.3 A listing of authorized operators shall be made available to superintendents periodically and upon request.

10.2 License Requirements. All employees who drive vehicles or operate equipment on a public way shall be required to hold a valid operator's license issued by the state of residency and appropriate for the class vehicle being operated or driven.

- 10.3 **Operator Responsibility.** The equipment operator or truck driver is responsible and shall be held accountable for the safe operation of the equipment or truck s/he operates.
- 10.3.1 The operator or driver shall not move his/her equipment in either direction until the path is determined to be clear of obstructions and other workers. A spotter must be used if the operator is unable to clearly determine that their path is clear of obstructions or workers.
- 10.3.2 No operator shall lift any person in the bucket of the equipment.
- 10.3.3 No person shall be allowed to ride on the side of any piece of equipment or in the back of a truck or pickup.
- 10.4 **Daily Equipment Inspection.** Each operator shall perform a safety check at the beginning of each shift. The operator shall submit a completed “Equipment Inspection Checklist” to the supervisor on a daily basis.
- 10.5 **Daily Truck Inspection.** Each truck driver shall inspect the truck and shall submit a completed “Driver’s Vehicle Inspection Report” to the supervisor on a daily basis.
- 10.6 **Equipment Lockout/Tagout for Maintenance.** Prior to greasing or performing maintenance on equipment or trucks, the machine shall be shut off and the key removed from the ignition switch, all elevated buckets, blades, and other potential sources of energy shall be lowered to the ground, blocked up, or otherwise controlled, and an “out-of-service” tag shall be placed in a conspicuous location on the machine.
- 10.7 **Lockout/Tagout for Connecting Equipment.** When directing a truck driver or equipment operator into position to hook to a haul-behind attachment, tow a stuck or disabled vehicle, or pull any other object, employees shall at no time be located between the moving equipment and the object it is being connected to. The moving equipment shall be stopped with the motor shut off and the brake set before an employee is allowed to go between two pieces of equipment to make a connection.
- 10.8 **Backup/Travel Alarm and Warning Horn.** Each piece of equipment capable of two-directional travel shall be equipped with a working reverse/travel alarm and warning horn, and shall be placed out of service immediately if the alarm or horn becomes inoperative.
- 10.9 **Visibility Requirements.**
- 10.9.1 All field employees shall wear high visibility apparel.
- 10.9.2 Field employees shall make eye contact with the equipment operator before approaching the equipment!

10.9.3 All cab glass shall be kept clean and clear of obstructions so visibility by the operator or driver is not impaired.

10.10 **Distance from Dumping Trucks.** Keep personnel and equipment well clear of dumping trucks – they may roll over.

10.11 **Minimum Clearance Distance from Overhead Power Lines.**

10.11.1 Vertically moving parts of equipment such as excavator booms, loader buckets, or dumping truck bodies shall be kept at least 10 feet away from energized overhead power lines at all times. Warning signs and tape, barricades, spotters, and/or other preventive measures shall be taken as necessary to ensure this standard is met.

10.11.2 If the overhead power utility company installs an insulated wrap around the line to prevent arcing or flashing, the clearance requirement may be reduced as determined by the manufacturer of the insulated wrap and the utility owner.

10.11.3 The 10 foot clearance requirement does not apply to an overhead power line that has been de-energized and grounded by the utility owner.

10.12 **Seatbelt Requirements.**

10.12.1 Seatbelts shall be installed and maintained in good condition in all motor vehicles and in all mobile equipment.

10.12.2 Seatbelts need not be provided in equipment which is designed expressly for stand-up operation, or which does not have a rollover protective structure (ROPS) or adequate canopy protection.

10.12.3 All persons riding in equipment, trucks, and other vehicles shall be in seats designed for that purpose, and shall fasten the seatbelts where provided.

10.13 **Safe Access to Equipment.**

10.13.1 When the equipment is equipped with steps, stairways, or ladders for personnel access, this equipment shall be maintained in good condition.

10.13.2 For equipment with built-in ladders, employees shall face the ladder and use three points of contact while entering or exiting the equipment.

10.13.3 Jumping from the equipment to the ground is prohibited.

10.14 **Full Time Operator Awareness.** The use of hand held cellular/mobile phones and other similar devices is not permitted while operating equipment or driving a commercial

motor vehicle. These and other distracting activities such as eating, drinking, or adjusting the radio increase the risk of having an accident.

11.0 TRAFFIC WORK ZONE SAFETY

- 11.1 **Compliance Requirements.** Employee work zones that are exposed to public vehicle traffic shall be set up in compliance with the most current edition of the Manual on Uniform Traffic Control Devices (MUTCD).
- 11.2 **Employee Visibility.** Employees shall at minimum wear ANSI Class 2 high visibility safety vests with reflective striping. Class 3 safety apparel is required for work on interstate highways and for night work on all public roadways.
- 11.3 **Traffic Control Devices.**
 - 11.3.1 A competent person under the direction of the project superintendent shall be responsible for the selection, placement, and maintenance of traffic control devices in compliance with the MUTCD.
 - 11.3.2 Barricades, signs, and other traffic control devices shall be used as necessary to safeguard open manholes, trenches, excavations, and other safety hazards, or to control traffic during construction operations.
 - 11.3.3 Barricades and warning devices will be lighted at night as necessary.
- 11.4 **Flagger Requirements.**
 - 11.4.1 Flaggers shall be trained and certified in accordance with applicable state and local regulations.
 - 11.4.2 Stop/slow sign paddles and two-way radios or other means of communication between flaggers are required.
 - 11.4.3 The flagger shall face oncoming traffic and have a planned escape route at all times.
 - 11.4.4 The flagger's personal vehicle shall be parked well off the travel way of the road and where it will not interfere with the flagger's planned escape route.

12.0 WORKING OVER OR NEAR WATER

12.1 Compliance Requirements.

- 12.1.1 Employees working over or near water, where danger of drowning exists, shall be provided with U.S. Coast Guard approved life jackets or buoyant work vests.
- 12.1.2 Prior to and after each use, the life jackets or buoyant work vests shall be inspected for defects which would alter their strength or buoyancy.
- 12.1.3 Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.
- 12.1.4 At least one lifesaving skiff shall be immediately available at locations where employees are working over water or adjacent to water.

12.2 Additional Items. Take the time to identify short duration work near water as well as access to water sources as significant potential hazards. An example would include setting up a pump and generator for filling water trucks or tanks.

- 12.2.1 No one shall be allowed to work alone when near or above a water hazard.
- 12.2.2 The skiff must be in the water or capable of being quickly launched.
- 12.2.3 The skiff must be equipped with both motor (which will provide sufficient power for the current) and oars.
- 12.2.4 The skiff shall be inspected and the motor started each day prior to working near or over water.

13.0 BLASTING SAFETY

13.1 Compliance Requirements.

- 13.1.1 Equipment shall not be operated within 50 feet of loaded holes.
- 13.1.2 When a misfire is found, all employees shall move to an area safely outside any danger zone.
- 13.1.3 If a misfire is found, the blasting contractor shall be notified immediately and work will not resume in the area until determined to be safe by the blaster.

14.0 WORKING ALONE

- 14.1 When performing any type of hazardous work, employees shall not work alone.
- 14.2 If it is necessary for someone to arrive at, periodically monitor, or stay at a project alone; a call in person shall be identified and checked in with on a predetermined schedule.

V. TRENCHING AND EXCAVATION

(Last revised 12/13/2019)

1.0 DEFINITIONS

- 1.1 **Competent Person:** One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, and dangerous to employees or which do not meet applicable OSHA Standards, and who has been given the authorization and responsibility to take prompt corrective measures to eliminate them.
- 1.2 **Trench:** A narrow excavation (in relation to depth and length) made below the surface of the ground. In general, its depth is greater than its width, but the width of a trench (measured at the bottom) is not greater than 15 feet.
- 1.3 **Shield (Shoring):** A structure that is able to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Shields used in trenches are usually referred to as trench boxes and manhole boxes.
- 1.4 **Tabulated Data:** Tables and charts approved by a registered professional engineer and used to design and construct a protective system.
- 1.5 **Sloping System:** A method of protecting workers from cave-ins by excavating to incline the walls of a trench or excavation so that the top is larger than the bottom. The angle of incline required to prevent a cave-in varies with differences in several factors. Nearly all sloping systems shall be inclined at 1½ feet horizontal to 1 foot vertical.
- 1.6 **Stable Rock:** Natural solid ledge that is free of excessive cracks and fissures, such that it can be excavated with vertical sides and will remain intact while exposed.
- 1.7 **Hazardous Atmosphere:** An atmosphere which by means of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic or otherwise harmful, may cause death, illness or injury.

2.0 TRENCHING & EXCAVATION REQUIREMENTS

The following are minimum requirements for excavating or trenching. (see OSHA 29 CFR 1926 Subpart P for detailed regulations).

- 2.1 **Daily Inspections.** A competent person shall conduct daily inspections of excavations and the surrounding areas before the start of work for evidence of possible cave-ins, failure of the protection system, a hazardous atmosphere or any other dangerous condition. These inspections and the steps taken to correct potential dangerous conditions shall be documented in their field book, daily report or other appropriate file.

- 2.2 **Protection from Cave-in.** Walls or faces of all excavations in which employees are exposed to danger from falling or moving earth or which are greater than 5 feet shall be guarded by shoring, sloping or equivalent means.
- 2.3 **Soils Classifications:**
- 2.3.1 **Stable Rock:** natural solid ledge that can be excavated with vertical sides and remain intact while exposed.
- 2.3.2 **Type A:** cohesive soils without cracks or fissures: clay, sandy clay, hardpan.
- 2.3.3 **Type B:** angular gravel, crushed rock, silt, loam, dry rock that is not stable.
- 2.3.4 **Type C:** gravel, sand, submerged soil, wet soil.
- 2.4 **Requirements for Excavation Slope Stability:**
- 2.4.1 **Stable Rock:** vertical
- 2.4.2 **Type A:** 5-20 feet deep – slope at $\frac{3}{4}$ foot horizontal to 1 foot vertical ($\frac{3}{4}$:1).
(Note: Simple slope excavations that are less than 8 feet deep and will be open less than 24 hours may be sloped at $\frac{1}{2}$:1.)
Decrease slopes if there are signs of distress.
- 2.4.3 **Type B:** 5-20 feet deep – slope at 1:1.
Decrease slopes if there are signs of distress.
- 2.4.4 **Type C:** 5-20 feet deep – slope at $1\frac{1}{2}$:1
Decrease slopes if there are signs of distress.
- Benching is not allowed in type C soils.**
- 2.5 **Soil Classification Requirements.** All soils types except solid rock and Type C must be defined in accordance with OSHA 1926 Subpart P, Appendix A, by a soils engineer, geologist, or other qualified person with training and experience in soil classification. Written certification of soil type(s) other than Type C, together with specific locations and depths for those soil type(s), shall be kept on record at the project site. **All soil shall be treated as Type C unless it is recertified as described above.** All ledge cuts shall be treated as Type C unless the sidewalls are solid rock without cracks or fissures.
- 2.6 **PE Design for Holes over 20 Feet Deep.** A registered professional engineer (PE) shall design protective systems for excavations and trenches greater than 20 feet (as measured from the original existing ground surface). Design specifications shall be kept on site.
- 2.7 **Trench Box Tabulated Data.** If trench boxes or manhole boxes are used, copies of the tabulated data for the make and model of each box shall be on site.

- 2.8 **Steel Sheets Used in Shoring Systems.** Soil walls at the spreader ends of a trench box or manhole box must be protected from collapse either by proper sloping or by inserting a 1 inch thick steel sheet or other adequate protective barrier between the soil wall and the end of the trench box or manhole box. PE designs for uses and limitations of steel sheets in shoring systems are included in the Trench Box Tabulated Data notebooks.
- 2.9 **18-Inch Requirement for Box/Slope Combination.** When trench protection is accomplished by means of a combination of trench boxes and sloping, then the trench box must extend 18" above the bottom of the sloped side, in order to prevent materials from falling into the trench shield.
- 2.10 **Trench Box within 2 feet of Trench Floor.** Earth excavation is permitted to a level not to exceed two (2) feet below the bottom of a trench box, but only if there are no indications of soil loss from beneath or behind the trench box. Shoring protection must extend to the bottom of the trench if necessary to prevent soils from entering the trench.
- 2.11 **Spoils Piles at least 2 feet from Edge of Hole.** Excavated material must be placed at least two (2) feet from the edge of the excavation. Tools, equipment and other materials shall not be placed where they could fall or roll into an excavation.
- 2.12 **Fall Protection near Trenches and Excavations.**
- 2.12.1 Only those employees who are directly involved in the trenching operation shall be allowed within 6 feet of the trench. Barricades or other effective means shall be used as directed by the competent person to prevent employees from falling into trenches.
- 2.12.2 Walkways shall be provided where employees are required or permitted to cross over trenches. Walkways that are 6 feet or more above a lower level shall include guardrails.
- 2.12.3 Trench shields shall be backfilled, or other adequate provisions shall be made to ensure employees cannot fall between the excavation sidewalls and the trench shield.
- 2.13 **Falling Object Protection.** All surface encumbrances located so as to create a hazard to employees shall be removed or supported as necessary to protect employees.
- 2.14 **Support Adjacent Structures.** Sidewalks, pavements and other structures adjacent to a trench or excavation shall not be undermined unless a support system or other method of employee protection is provided.
- 2.15 **Water Accumulation.** Excavations and trenches shall be dewatered before being entered by personnel, and during operations as necessary. Employees shall not work in excavations where water is accumulating unless steps have been taken to protect the employees from the hazards posed by water accumulation.

- 2.16 **Safe Access.** All trenches and excavations greater than four (4) feet in depth shall be provided with a ladder, ramp, or other means of safe egress. For trenches, safe egress shall be provided at intervals such that each employee in the trench is within twenty-five (25) feet of an egress point. If ladders are used to provide safe egress, they shall be properly set up according to the manufacturers' instructions and secured from movement while in use.
- 2.17 **No Exposure to Overhead Loads.** No employee shall be permitted under equipment buckets or suspended loads handled by loading or digging equipment. Loads shall not be hoisted or suspended over any employee or other person.
- 2.18 **High Visibility.** Employees shall be provided with and wear high visibility vests with reflective stripes.
- 2.19 **Excavations / Trenches as Confined Spaces.** Excavations and trenches greater than four (4) feet in depth are by definition confined spaces. They shall be treated as permit- required confined spaces whenever there is a likelihood of a hazardous or oxygen deficient atmosphere, engulfment, or other hazardous condition.
- 2.20 **Control of Hazardous Atmospheres:**
 - 2.20.1 Trenches and excavations: Where oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist (i.e. sewer line trenches or excavations in landfills) the atmosphere shall be tested and ventilated as necessary before employees enter excavations greater than 4 feet in depth.
 - 2.20.2 Manholes, catch basins, and similar structures: Any enclosed structure more than four feet in depth must have its atmosphere tested prior to entry for oxygen content and to determine the presence of explosive or toxic gases. Follow all permit-required confined space entry procedures.
- 2.21 **Protection for Unattended Excavations.** All trenches and excavations shall be filled, covered, or otherwise barricaded and protected prior to being left unattended. All test pits or excavations shall be backfilled as soon as their purpose is completed.

3.0 EXCAVATIONS NEAR BURIED UTILITY LINES

- 3.1 **Locate Underground Utilities.** The locations of all underground utility lines shall be determined prior to opening an excavation. Utility companies and other utility owners shall be contacted, advised of the proposed work and asked to establish the location of the underground utility prior to the start of actual excavation.
- 3.2 **One Call System.** For all excavation, grading, and other ground breaking projects, we are required by law to call the appropriate "One Call" Utility Notification Service in the state we are working in. In most cases, a minimum of 3 normal business days (72 hours) notification is required before a permit is issued. The "one call" permits are valid for at least 30 days in all states. Some states have longer duration permits. Ask when you call.

- 3.3 **DIG SAFE.** For projects in Maine, New Hampshire Vermont, and Massachusetts, call DIG SAFE at 800-225-4977. **Sargent Corporation's** Dig Safe Numbers are: 16836 for New England Division projects, and 37722 for Bangor Division projects.
- 3.4 **MISS UTILITY.** For projects in Maryland, Virginia, and North Carolina, call MISS UTILITY at 800-552-7001.
- A “One Call” ticket should be renewed at least 3 days before its expiration date.**
- 3.5 **Nonmember Utilities.** The “One Call” service notifies their member utilities only (typically electric power, communications, and natural gas companies.) We are responsible to notify all other utility owners who may have buried utility lines in our work area (typically water and sewer companies and private companies or landowners.) In Maine, look for non-member utilities in your project area at www.oktodig.com. The State of New Hampshire has a book of nonmember utilities available.
- 3.6 For **gas line notification**, please also call “One-Call” in the following states:
- | | |
|---------------------------|--------------|
| Delaware, MD, Northern VA | 800-257-7777 |
| New York | 800-962-7962 |
| North Carolina | 800-632-4949 |
| Pennsylvania | 800-242-1776 |
| Virginia | 800-552-7001 |
| West Virginia | 800-245-4848 |
- 3.7 **De-energize Electric Lines.** Buried electrical cables expected or encountered during excavation shall be de-energized prior to digging whenever possible. Soils around electrical conduits may be removed using hand tools and extreme caution under the supervision of a competent person.
- 3.8 **18-Inch Safety Zone.** The law requires us to dig by hand within 18 inches of a marked underground utility line until the line is exposed. (The safety zone is 24 inches in Virginia and Delaware, and 36 inches in Montgomery County, Maryland.)
- 3.9 **If You Hit A Utility Line:**
- 3.9.1 Immediately notify the affected utility company.
- 3.9.2 If the damage creates a safety concern, call the fire department and take immediate steps to safeguard health and property.
- 3.9.3 All incidents in which buried utility lines are damaged, disturbed, threatened, or are improperly marked **must be reported to the Public Utilities Commission (PUC).** Conduct a thorough incident investigation using the Incident Investigation Report Form. If possible, include photos showing the damaged utility and any remaining utility markings on the ground surface. Contact the Safety Director in Stillwater who will prepare and submit the required PUC report.

3.9.4 Non-compliance with the above PUC rules may result in fines of \$5000 or more.

3.10 Overhead Utility Lines.

3.10.1 Equipment with parts capable of vertical movement, such as excavators and dump trucks, shall maintain a separation of at least 10 feet from overhead electric lines.

3.10.2 Use operator training, warning signs, flagging, or other effective means as necessary to ensure equipment operators and truck drivers are aware at all times of the existence and location of overhead power and other utility lines.

4.0 DIGGING IN CONTAMINATED SOILS

4.1 **HAZWOPER Projects.** In accordance with 29 CFR 1926.65, **Hazardous Waste Operations and Emergency Response**, the following operations require that employees involved receive 40-hour training and 8-hour annual refresher training, when appropriate:

4.1.1 Cleanup operations required by a governmental body (Federal, State or Local) involving an identified hazardous waste site.

4.1.2 Corrective actions involving cleanup operations at sites covered by Resource Conservation and Recovery Act (RCRA) of 1976.

4.1.3 Voluntary cleanup operations at sites recognized by Federal, State or Local governmental bodies as uncontrolled waste sites.

4.1.4 Operations involving hazardous wastes that are conducted at treatment, storage and disposal sites.

4.1.5 Emergency Response operations for releases of hazardous substances, or for substantial threats of releases of hazardous substances.

4.1.6 When designated by the Safety Director for **SARGENT CORPORATION**.

4.2 **Recognition and Response.** All employees performing their duties in situations where there is a potential of encountering contaminated soils shall be trained to identify the contaminated soils and react properly. In all cases, the first response shall be to evacuate the area and ensure that employees shall not be exposed to potentially hazardous materials. Appropriate company officials and State and/or Federal Agencies shall be contacted for guidance and direction.

4.3 **Medical Surveillance.** Employees who are or may be exposed to hazardous substances on projects as described above shall be enrolled in a medical surveillance program in accordance with 29 CFR 1926.65(f).

VI. CONFINED SPACE ENTRY PROGRAM

(Last revised 02/01/2016; updated 12/04/2017)

1.0 DEFINITIONS

- 1.1 **Competent Person** means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who is authorized by the company to take prompt corrective measures to eliminate them.

Any entry into a confined space shall be overseen by a competent person.

- 1.2 **Confined Space** means space or work area that: a) is large enough for an employee to enter and perform work; and b) is not designed or intended for continuous human occupancy; and c) has a limited or restricted means of entry or exit.

Examples of confined spaces include but are not limited to trenches, sewers, manholes, catch basins, culverts, tunnels, tanks, vessels, chests, attics, and crawl spaces. It also includes open top spaces greater than 4 feet deep such as pits, bins, tubs, silos, vaults, etc.

- 1.3 **Non-Permit Confined Space** means a confined space that does not contain or have the potential of containing any hazard capable of causing death or serious harm.

Examples of non-permit confined spaces may include trenches in a safe location and new manhole structures that have not been piped or backfilled.

- 1.4 **Permit-Required Confined Space (PRCS)** means a confined space where there is an existing or potential hazard, or where the work in the space could create a hazard.

1.4.1 Such hazards include: a) hazardous atmosphere; b) liquid or solid materials that could engulf an entrant; c) inwardly sloping walls or floor, or other configuration of the space that could cause an entrant to become trapped; d) electrical, mechanical, chemical, or biological hazards; or e) any other recognized serious safety or health hazard, such as potential falls, falling objects, fires, and poisonous insects or animals.

1.4.2 Each confined space shall be considered a **permit-required confined space** unless and until the competent person specifically confirms that the space does not have an existing or potential hazard of any kind.

1.4.3 Because of poor ventilation and the potential for a hazardous atmosphere, **all manholes, catch basins, and other top entry structures found on earthwork construction projects shall be considered permit-required confined spaces as soon as the pipes are installed or the structure is backfilled.**

2.0 **REQUIREMENTS FOR ENTRY INTO ALL CONFINED SPACES**

- 2.1 **Safe Working Procedures and Conditions.** Work in a confined space shall be conducted in accordance with all OSHA and SARGENT CORPORATION safety standards.
- 2.2 **A Competent Person shall oversee all confined space entry work.** Prior to entry into a confined space, the competent person shall conduct a thorough survey of the space to determine if there are any existing or potential hazardous materials or conditions.
- 2.3 **Training.** Each employee who enters into a confined or enclosed space shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of any protective or emergency equipment required. Training will be documented on the confined space entry permit for the space. This instruction shall include a review of the Safety Data Sheets (SDS) for all hazardous materials that are present in the confined space or will be used inside the space.
- 2.4 **Confirm Safe Atmosphere.** Prior to entry into a confined space, the competent person shall use a properly calibrated air monitoring instrument to determine that the atmosphere in the space provides a safe work environment. The instrument(s) used shall at a minimum measure the oxygen content of the air and identify the presence of any combustible gases, carbon monoxide, or hydrogen sulfide. The following acceptable levels shall be maintained prior to entry:
- 2.4.1 Oxygen (O₂): Between 19.5% and 23.5% (fresh air contains 20.9% O₂)
- 2.4.2 Combustible Gases: 10% of Lower Explosive Limit (LEL) maximum
- 2.4.3 Toxics:
- | | <u>CEILING</u> | <u>8-hr. TWA</u> | <u>15 min. STEL</u> |
|--|----------------|------------------|---------------------|
| a) Carbon monoxide (CO) – | 35 ppm | 35 ppm | 100 ppm |
| b) Hydrogen sulfide (H ₂ S) – | 10 ppm | 10 ppm | 15 ppm |
| c) Other – Any known toxic gas or hazardous substance that could reasonably be expected to exist in the space shall be monitored and maintained below the OSHA Permissible Exposure Limit (PEL). | | | |
- 2.4.4 Total Dust – Below 50 micrograms of respirable crystalline silica per cubic meter of air (µg/m³), averaged over an 8 hour day.
- 2.5 **Access and Lighting.** Safe access and sufficient lighting shall be provided for work in all confined spaces.

3.0 ADDITIONAL REQUIREMENTS FOR ENTRY INTO PERMIT REQUIRED CONFINED SPACES

- 3.1 **Permit Space Entry Communications and Coordination.** Prior to performing permit entry operations, affected employers shall obtain all available information regarding known and potential hazards in the permit required confined space(s). They shall provide this information to all persons who will enter the permit space, and to all other entities whose activities could potentially result in a hazard in the space.
- 3.2 **Entry Team Members.** The confined space entry team shall at minimum include a) one or more entrants, b) an attendant, and c) an entry supervisor who shall also be the competent person. The entry supervisor may fill a dual role and also function as an entrant or an attendant.
- 3.3 **Entry Team Training Requirements.** All team members shall be trained in their assigned duties:
 - 3.3.1 The **Entry Supervisor** (person authorizing entry) shall be a confined space **Competent Person** who is trained in confined space entry procedures and shall be responsible to:
 - 3.3.1.1 Determine that the entry permit contains all the required information before authorizing or allowing entry.
 - 3.3.1.2 Determine that the necessary procedures, practices, and equipment for safe entry, and a rescue plan are in place before allowing entry.
 - 3.3.1.3 Verify at appropriate intervals, that entry operations remain consistent with the terms of the entry permit, and that acceptable entry conditions are maintained.
 - 3.3.1.4 Cancel the entry authorization and require all entrants to evacuate the space whenever acceptable entry conditions are not present.
 - 3.3.1.5 Take the necessary measures for concluding an entry operation, such as closing off a permit space and canceling the permit when the work authorized by the permit has been completed.
 - 3.3.1.6 The entry supervisor may at the same time be an entrant or attendant so long as s/he has the proper training.

3.3.2 The **Attendant** shall be trained in confined space entry procedures and shall be responsible to:

- 3.3.2.1 Stay in continual contact with entrants in the space. An attendant shall only monitor a single entry point and may not leave his/her post for any reason. The attendant shall evacuate all entrants from the confined space or wait for a trained replacement attendant before leaving the immediate area of the confined space.
- 3.3.2.2 Maintain a count of the number of workers in the confined space at all times.
- 3.3.2.3 Monitor activities both inside and outside the space and recognize conditions that could pose a potential hazard to those in the space.
- 3.3.2.4 Order the immediate evacuation of the entrant(s) if s/he observes any of the following:
 - a) A condition not allowed by the permit (i.e. hot work, abrasive blasting, solvent usage or unauthorized work practices/procedures);
 - b) Behavioral changes in the entrant(s), such as euphoria (feeling good or giddiness) or unexpected laughing that may result from an oxygen deficiency or excessive exposure to certain gases or vapors;
 - c) Situations outside the space that could endanger those inside (i.e. a pool of spilled solvent or a vehicle idling near the ventilation intake);
 - d) An uncontrolled circuit or a leaking fluid line in the space.
- 3.3.2.5 Use emergency equipment and practices to begin **non-entry** rescue procedures (i.e. calling for emergency assistance by phone or radio and/or using the tripod and winch to extract an entrant who is unable to self-rescue). The attendant shall not allow an unauthorized person to attempt rescue.
- 3.3.2.6 An attendant shall never attempt an in-space rescue unless s/he:
 - a) Has been relieved by another trained attendant; and
 - b) Has been trained and equipped as necessary to safely perform the rescue procedure.

3.3.3 The **Entrant(s)** shall be trained in confined space entry procedures and shall be responsible to:

- 3.3.3.1 Recognize any hazardous condition or substance they might be exposed to during entry. They must be aware of the signs and symptoms of exposure to the hazard, understand the possible consequences, and know the proper procedures for safely eliminating the hazard or avoiding exposure to it.
- 3.3.3.2 Maintain contact and communication with the attendant and follow his/her direction immediately at all times and without question.

3.3.3.3 Wear a harness attached to a mechanical winch for vertical entry.

3.3.3.4 Exit the space under any of the following conditions:

- a) When ordered by the attendant;
- b) When a gas meter or other evacuation alarm sounds;
- c) If they become aware of an uncontrolled hazard in the space; or
- d) If they believe they are in any danger.

3.4 **Confined Space Entry Permit.**

3.4.1 The entry supervisor shall begin filling out a Confined Space Entry Permit form before allowing entry into the space and s/he shall maintain it as long as people are in the space. The entry permit documents all appropriate steps that are taken to protect employees in the space and comply with the requirements of this Section.

3.4.2 The entry permit expires and must be terminated when: a) the planned work is completed; or b) the work shift is completed for the day; or c) there is an emergency evacuation.

3.4.3 New entry permits shall be completed each day before re-entry into the same space.

3.4.4 A separate entry permit shall be completed for each new permit space entered.

3.4.5 The entry permit shall be maintained in the immediate vicinity of the PRCS. The supervisor shall make the entry permit available upon request from any official or authority.

3.4.6 Copies of all entry permits shall be delivered to the Safety Department at Stillwater on a weekly basis.

3.5 **Full Time Attendant.** The attendant shall be continuously stationed at the entrance of the permit space for the duration of entry operations. Reliable means shall be provided for communication between the attendant and entrant(s), and for contacting emergency services and/or rescue.

3.6 **Eliminate / Control Hazards.** All necessary steps shall be taken to control all existing or potential hazards in the space, such as:

3.6.1 Using lockout and tagout procedures.

3.6.2 Purging and/or blocking pipelines.

3.6.3 De-watering and/or pre-cleaning contaminants from the space.

3.6.4 Posting warning signs and sufficient barricades to prevent unauthorized entry and to protect entrants from external hazards.

3.6.5 Using proper PPE.

- 3.6.6 Initiating other engineering and/or administrative controls as appropriate.
- 3.7 **Ensure Safe Atmosphere.** Air monitoring shall be conducted prior to entry and on a full time basis while people are inside the PRCS. Mechanical ventilation shall be provided as necessary to maintain safe breathing conditions.
- 3.7.1 If a safe atmosphere cannot be maintained on a continual basis, an entry plan reviewed and approved by the Safety Director shall be in place prior to entry, and entrant(s) shall comply with all requirements of the approved entry plan.
- 3.7.2 If a safe atmosphere cannot be maintained on a continual basis, only properly trained personnel who are wearing appropriate respiratory protective equipment shall be allowed to enter the space.
- 3.7.3 When conditions are immediately dangerous to life or health (IDLH) and the confined space is occupied, rescue services must be on-site.
- 3.8 **Lockout / Tagout (LOTO).** After the confined space environment has been made safe for work, the entry supervisor shall take all necessary precautions, including LOTO procedures to prevent the accidental release of hazardous energy in the space and/or to keep unwanted liquids, gases or solids from entering into the confined space during occupancy. See Section VII of this HASP for LOTO requirements.
- 3.9 **Confined Space Rescue Requirements.** While the preferred means of rescuing an entrant from a confined space is always self-rescue, there shall be a plan in place for the emergency rescue of an ill or injured person from the space.
- 3.9.1 **Non-entry rescue plan.**
- 3.9.1.1 For vertical entry into a structure, a mechanical retrieval device (tripod and winch) shall be attached to each entrant. If the retrieval device is also being used to provide entry into the space, a secondary means of fall protection shall be provided. **Never use a rescue retrieval device to raise or lower materials or equipment.**
- 3.9.1.2 For horizontal entry, a lifeline from the entrance shall be attached to each entrant, and standby personnel shall be available to pull the entrant(s) from the space.
- 3.9.2 **Alternate Permit Entry Plan.** Non-entry rescue procedures listed in 3.9.1 may not be required if all of the following conditions are met:
- 3.9.2.1 The competent person has determined that the **only** actual or potential hazard in the permit-required confined space is an atmospheric one; and
- 3.9.2.2 The competent person confirms and documents on the Confined Space Entry Permit that continuous forced ventilation alone is sufficient to maintain safe atmospheric conditions; and
- 3.9.2.3 Mechanical ventilation is used to force a continuous supply of fresh air into the space for the duration of entry operations; and

- 3.9.2.4 The entrant tests the atmosphere within the space on a continuous basis to ensure that the forced air ventilation is preventing an accumulation of a hazardous atmosphere; and
 - 3.9.2.5 All entrants into the space wear harnesses and there is a retrieval system available at the site; and
 - 3.9.2.6 The entrant(s) shall exit the space immediately if **any** hazard (including but not limited to an atmospheric hazard) arises within the space; and
 - 3.9.2.7 The attendant shall not enter the confined space to assist with a rescue or for any reason until he/she is replaced by another qualified attendant.
- 3.9.3 **Other Approved Rescue Plans.** In the event the established rescue procedures described in this section are impossible or impractical for a particular confined space, a **written** effective rescue plan shall be reviewed and approved by the Safety Director. The approved rescue plan shall be in place and all members of the CSE team shall be trained to execute the plan prior to entry.
- 3.10 **Multi-Employer Worksites.** When employees from more than one employer are working simultaneously in a permit space, procedures to coordinate entry operations, in consultation with the controlling contractor, shall be developed and implemented. These procedures apply to the permit space or elsewhere on the worksite where their activities could, either alone or in conjunction with the activities within a permit space, foreseeably result in a hazard within the confined space. The coordinated operations is intended to prevent employees of one employer from endangering the employees of any other employer.
- 3.11 This plan shall be reviewed annually for accuracy and to ensure employees working in confined spaces are effectively protected from hazards.

CONFINED SPACE ENTRY PERMIT

EMERGENCY NUMBER: 911 Project Loc: _____ Project No: _____
 Site Specific Emergency No: _____ Project Superintendent: _____
 Stillwater Office: 207-827-4435 Date: _____ Time: _____ AM / PM
 Competent Person / Entry Supervisor (please print): _____

1. Location and description of the Confined Space: _____
2. Purpose of Entry: _____
3. Existing or Potential Hazard(s) of the permit space: _____
4. Other Concerns/Precautions Taken: _____

- Please see following page for confined space entry definitions and permit requirements -

Confined Space Entry Preparation

	Yes	N/A
All CSE team members are trained.		
Air quality is monitored and safe.		
Each entrant wears a rescue harness.		
Effective communications are in place? Method: Visual / Verbal / Radio / Phone		
Rescue plan is discussed and in place:		
Rescue Plan Tripod/winch attached to entrants?		
(or) Alternate Entry procedure used? (see 9.b. on following page)		
(or) Other written and approved rescue plan is in place? Describe:		
Dewatering required?		
Ladders inspected and in place?		
Sufficient lighting in space?		
Lines blanked / plugged and blocked?		
Energy sources locked and tagged out?		
Blower required for air quality?		
Respiratory Equipment Required? Type used?		
Other Required Permits for Space? List:		
Other		

Time Permit Issued: _____ AM/PM

Time Permit Expires: _____ AM/PM

Tools, Equipment & Materials in Confined Space:

CSE Team Members

Authorized Entrants (print)	Time In	Time Out

Attendant: (print): _____

Entry Supervisor (signature): _____

Actual Time Permit Terminated: _____ AM/PM

Date Permit Terminated: _____

Comments: _____

**PLEASE RETURN PERMIT TO STILLWATER
OFFICE AFTER ENTRY IS TERMINATED**

Atmosphere Testing Results

Gas Meter ID:		Time			
	PEL				
Oxygen	>19.5% <23.5%				
Flammable Gas	<10% LEL				
Hydrogen Sulfide	<10 PPM				
Carbon Monoxide	<35 PPM				

CONFINED SPACE ENTRY DEFINITIONS & PERMIT REQUIREMENTS

1. **Competent person** means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who is authorized by Sargent Corporation to take prompt corrective measures to eliminate them. In most cases, the foreman in charge of the PRCS is the *competent person* for the entry. **A Competent Person shall oversee all confined space entry work.**
2. **Confined space** means a space that:
 - a. Is large enough for an employee to enter and perform work; and
 - b. Is not designed or intended for continuous human occupancy; and
 - c. Has a limited or restricted means of entry or exit.
3. **Permit Required Confined Space (PRCS)** means a confined space where there is an existing or potential hazard, or where the work in the space might create a hazard. A manhole, catch basin, or other top entry structure is a PRCS as soon as the pipes are installed or the structure is backfilled.
4. **Training requirements.** A PRCS Entry Team shall include at minimum a **supervisor, attendant,** and one or more **entrants** (Note: an entry supervisor may also serve as an attendant or entrant, as long as he/she is properly trained and equipped for the job. The **attendant** shall not perform any work that takes his/her attention away from entrants in the space at any time.). All PRCS entry team members shall be trained in their specific job duties.
5. A **Confined Space Entry Permit** shall be completed before entering a PRCS. A separate entry permit is required for each PRCS entered.
6. **A confined space entry permit must be terminated when:**
 - a. The planned work is completed, or
 - b. The work shift ends, or
 - c. There is an emergency evacuation.
 After an entry permit has been terminated, a new entry permit must be completed before anyone is allowed to re-enter the space.
7. A **4-gas meter** shall be used to monitor air quality before and during entry into a PRCS.
8. If **respiratory equipment** of any type is required, its use shall be in full compliance with the Sargent Corporation Respiratory Protection Plan, including training, medical evaluation, and annual fit test.
9. A **rescue plan** shall be in place and discussed with all PRCS team members, using one or more of the following rescue procedures:
 - a. **Non-entry Rescue:** Each person who enters into a PRCS shall wear a harness which is connected to a retrieval line to allow rescue by personnel who do not enter the PRCS. A mechanical winch shall be used for rescue from vertical entry structures such as manholes and catch basins. A rope may be used for horizontal rescue so long as there are no obstacles that could impede the rescue.
 - b. **Alternate Entry Procedure:** If the only potential hazard is atmospheric, entrants may be disconnected from the mechanical winch provided that all of the following are in place:
 - One or more mechanical blowers are used to provide continuous fresh air ventilation; and
 - Entrants continuously monitor the air quality using a 4-gas meter; and
 - The blowers alone are capable of maintaining safe breathing air conditions in the PRCS; and
 - The entrant is wearing a harness; and
 - A mechanical winch is on site and readily available for use if needed.
 - c. **Other Approved Rescue Plans:** Must be in writing and approved by the Safety Director.

VII. LOCKOUT/TAGOUT/TRYOUT PROGRAM

(Updated on 03/24/2017; Updated 11/30/17; Updated 11/16/18.)

1.0 PURPOSE

- 1.1 The purpose of this energy control program is to protect **SARGENT CORPORATION** employees and subcontractor employees from unexpected energizing or start-up of machines or equipment or the release of stored energy, hazardous materials or gases that could cause injury.
- 1.2 This program establishes the requirements for isolation and control of potentially hazardous energy, including but not limited to electrical, chemical, thermal, hydraulic, pneumatic, mechanical and gravitational energy.

2.0 SCOPE AND APPLICATION

- 2.1 This program applies to all employees and subcontractor employees performing installation, service (including greasing), maintenance, or any other work on systems, machines, or equipment in which the unexpected start up or the release of stored energy, or hazardous materials or gases could cause injury to employees.
- 2.2 This lockout/tagout/tryout program complies with 29 CFR 1910.147 OSHA General Industry Regulations.

3.0 DEFINITIONS

- 3.1 **Affected Employee.** An employee whose job requires him/her to operate or use a machine or equipment on which maintenance, service, or repair is being performed under this lockout/tagout/tryout policy, or whose job requires him/her to work in an area in which such maintenance or repair is being performed.
- 3.2 **Authorized Employee.** An employee who locks and/or tags machines or equipment out of service in order to perform maintenance, service, or repair on that machine or equipment. An affected employee becomes an authorized employee when his/her job duties include maintenance, service, or repair of a system, machine, or equipment under this lockout/tagout/tryout program.
- 3.3 **Compliance with Lockout/Tagout/Tryout Program.** All employees are required to comply with the restrictions, limitations, and requirements of this program. Authorized employees are required to perform the lockout/tagout/tryout procedures as defined below. All employees, upon observing a machine or piece of equipment which is locked and/or tagged out of service shall not attempt to start, energize, or use that machine or equipment. An employee who violates the provisions of this program shall be subject to

disciplinary action including possible immediate termination of employment as provided in this Health and Safety Plan.

- 3.4 **Energy Source** means any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, gravitational, or other energy.
- 3.5 **Maintenance, Service, and/or Repair.** Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, lubricating, cleaning, unjamming, adjusting, changing tools or worn parts, and/or any other work on systems, machines, or equipment where an employee may be exposed to the unexpected energization or startup of the equipment or the release of hazardous energy.

4.0 PROGRAM ELEMENTS

- 4.1 The main power disconnect device or other energy isolating device which controls a source of potentially hazardous energy or material flow shall be locked out and tagged out of service whenever employees are performing maintenance, service and/or repairs on machinery or equipment.
- 4.2 Each authorized employee shall be protected from any unexpected energy release or material flow by locking out the system, machinery, or equipment and attaching a tag in a conspicuous location on the system, machinery, or equipment to indicate it cannot be started.
- 4.3 The foreman, mechanic, operator or other qualified employee who supervises the work on locked out energy systems, machinery, or equipment is responsible for implementing the lockout/tagout procedures. Each authorized person is responsible to include their individual locks and tags on the system, machine, or equipment on which they are performing service or repairs.
- 4.4 When machinery or equipment energy systems are incapable of being locked out, the Safety Department shall be contacted for approved tagout procedures.
- 4.5 For work on large process systems, each affected employee may be required to individually lock/tag the energy source or equipment. In this case, it is permissible for the supervisor to install a company lock and tag on the energy source. The key to the company lock must then be secured in a “group lock box” or comparable mechanism by the locks of each affected employee. The supervisor’s lock must remain on the system until all employees are accounted for in a safe location and each has removed his/her lock from the “group lock box.”
- 4.6 The project supervisor is authorized to remove an affected employee’s lock/tag if necessary. The supervisor may remove the employee’s lock/tag only after determining that the employee is no longer in the vicinity of the equipment and has failed to remove the lock through error. The supervisor must notify the employee that the lock/tag has

been removed before the employee returns to the work site in order to ensure his/her safety.

- 4.7 Where more than one authorized employee is engaged in working on machinery or equipment, each of them shall lock and tag the energy isolating device out of service. Lockout hasps, boxes, and/or other lockout devices for multiple employees shall be provided for this purpose.
- 4.8 Pressure shall be eliminated from any pneumatic or hydraulic lines that activate a mechanism or machine, and the valve holding back the activating substance shall be locked out before an employee works on that mechanism or machine.
- 4.9 Mechanisms under spring tension or compression shall be blocked, clamped, secured in position, or the compression or tension totally relieved before being worked on by an employee.
- 4.10 Heavy machinery, equipment or parts thereof, which are suspended or held aloft by the use of slings, hoists or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are allowed to work under or between them.
- 4.11 Bulldozer and scraper blades, excavator and loader buckets, dump bodies and similar hydraulically controlled equipment, shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the motors stopped and brakes set, unless work being performed requires otherwise.
- 4.12 All company owned trucks with dump bodies shall be equipped with a positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.
- 4.13 Whenever wheeled equipment is parked, the parking brake shall be set. Equipment parked on inclines shall have the wheels chocked and the parking brakes set.
- 4.14 When directing equipment into position to hook to a haul-behind attachment, tow a stuck or disabled vehicle, or pull any other object, employees shall at no time be located between the moving equipment and the object it is being connected to. The moving equipment shall be stopped with the motor shut off and the brake set before the connection is made.
- 4.15 A periodic inspection of the energy control procedure shall be conducted at least annually to ensure the procedures are accurate and requirements of this section are being followed.

5.0 LOCKOUT/TAGOUT/TRYOUT PROCEDURES

- 5.1 Authorized employees shall use the following lockout/tagout/tryout procedures prior to conducting service, maintenance or repair work on machinery or equipment. If more

than one energy source is involved, each source must be locked and tagged out of service before work may begin.

- 5.2 Notify all affected employees of the lockout/tagout.
- 5.3 Shut off the equipment or machine.
- 5.4 Locate the energy isolating devices, such as ignition switches, electric control panels, or control valves, and isolate the system, equipment, or machinery from there.
- 5.5 Lock and tag the energy isolating devices out of service.
- 5.6 Reduce or eliminate stored residual energy by chocking, blocking, blanking, bleeding, grounding, or other effective means.
- 5.7 **Verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.**

6.0 PROCEDURES FOR RESTART

- 6.1 When the equipment or machine is ready to be returned to normal operating condition the following procedures shall be followed.
- 6.2 Check the equipment and area to ensure all nonessential items have been removed, guards have been reinstalled and the equipment is operationally intact.
- 6.3 Verify the controls are in the neutral or off position and all employees have been safely positioned or removed from the area.
- 6.4 Notify affected employees that the work has been completed and the equipment is ready to be returned to normal operation.
- 6.5 Remove the lockout and tagout devices and reenergize equipment. Each person must remove their own lock. Under no circumstance may a lock or isolating device be removed by another person.

7.0 EMPLOYEE TRAINING

- 7.1 **SARGENT CORPORATION** shall provide training to ensure employees understand the purpose and function of the lockout/tagout/tryout program. The training must provide employees with the knowledge and skills necessary for the safe application, usage and removal of the energy control measures and devices. All training shall be documented.

- 7.2 Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy and the methods and means necessary for isolation and control.
- 7.3 Each affected employee shall be instructed in the purpose and use of the program.
- 7.4 All other employees whose work operations are or may be in an area where machines or equipment are locked out shall be instructed about the procedures and dangers relating to attempts to restart or reenergize them.
- 7.5 Employee retraining shall be provided for all authorized and affected employees whenever there is a change in machines, equipment or processes that present a new hazard. Retraining shall also occur when there is a change in the energy control procedures.

8.0 LOCKOUT/TAGOUT/TRYOUT AT CONSTRUCTION SITES

- 8.1 **Mobile equipment, trucks, crushers, screening plants, and other construction equipment with an electric starter such as a generator, compressor, or mulcher.**
 - 8.1.1 The operator, mechanic, or other authorized person providing repairs, maintenance, or service shall remove the ignition key and keep it in his/her possession at all times.
 - 8.1.2 If there are multiple keys to the equipment, such as with Caterpillar equipment, the master switch must also be shut off.
 - 8.1.3 If the equipment does not have a removable switch key, the equipment shall be disabled by other means, such as by removing the battery cables.
 - 8.1.4 An “Out of Service / Do Not Start” tag (or other tag with a similar message) shall be attached in a conspicuous location such as on the steering wheel, next to the ignition switch, or on the driver’s side door handle.
 - 8.1.5 If the equipment motor must be started in order for the authorized mechanic to diagnose the problem and/or perform repairs, the operator or other qualified person shall be stationed to guard the controls at all times and shall maintain communication with the mechanic.
 - 8.1.6 Reduce or eliminate residual stored energy by chocking, blocking, bleeding, and/or grounding.
 - 8.1.7 **Verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.**

8.2 Maintenance, service, and/or repairs on all other project related systems, equipment, and machines that have one or more sources of hazardous energy.

- 8.2.1 The project supervisor shall be responsible to ensure all affected and authorized employees are protected from an unexpected startup or release of stored energy by performing the work in strict compliance with the requirements of this lockout/tagout program.
- 8.2.2 Each authorized employee shall lock and tag the energy source(s) out of service. A lock box, lockout hasps, and/or other effective means shall be provided for this purpose.
- 8.2.3 The supervisor shall maintain his/her lock(s) on the system, equipment, or machine until he/she has confirmed **all** of the following:
 - a. It is now safe to start up, or all potential energy sources have been removed or disabled; and
 - b. All affected employees have been advised that the lockout has ended; and
 - c. All authorized employees have removed their locks and are in a safe location.

8.3 Before starting work on a locked out system, equipment or machine, always be sure to verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.

8.4 Procedures for restart are detailed in §6.0 above.

**9.0 LOCKOUT/TAGOUT/TRYOUT AT THE STILLWATER
MAINTENANCE SHOP**

9.1 Mobile Equipment, trucks, crushers, screening plants, and other construction equipment equipped with an electric starter such as a generator, compressor, or mulcher.

- 9.1.1 Each authorized employee working on the equipment or truck shall lock and tag it out of service. Each lock and tag shall include the name of the authorized employee.
- 9.1.2 If only one employee is performing the service or maintenance, he/she may lock it out by removing the ignition key and keeping the key in his/her possession and control at all times. S/he shall also tag the equipment out of service.
- 9.1.3 If there are multiple keys to the equipment, such as with Caterpillar equipment, or if the equipment does not have a removable switch key, the equipment shall be disabled by another effective means, such as by removing the battery cables from the battery and locking them together to prevent their reattachment.

- 9.1.4 If more than one employee is performing the service or maintenance, each of them shall lock and tagout the equipment. Lock boxes and/or lockout hasps shall be provided for this purpose.
 - 9.1.5 “Out of Service / Do Not Start” tag(s) (or other tag(s) with a similar message) shall be attached in a conspicuous location such as on the steering wheel, next to the ignition switch, or on the driver’s side door handle.
 - 9.1.6 If the equipment motor must be left running in order for the mechanic to diagnose the problem and/or perform the repairs, a qualified person shall be stationed to guard the controls at all times and shall maintain communication with the mechanic.
 - 9.1.7 Reduce or eliminate residual stored energy by chocking, blocking, bleeding, and/or grounding.
 - 9.1.8 **Verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.**
- 9.2 **Drills, saws, grinders, lathes, and other power tools and milling machines.**
- 9.2.1 A power tool or machine shall be locked and tagged out of service when an authorized employee performs maintenance, repair, and/or service operations on the tool or machine.
 - 9.2.2 Lockout/tagout procedures shall also be in effect when changing bits, blades, wheels, and machine attachments, and while making adjustments to a machine when the unexpected startup of the machine could cause an accident or injury.
 - 9.2.3 **Machine Shop.** (Lock and tag all disconnects and switches prior to starting work on any of the equipment listed in a-g below)
 - a. American Lathe #1: Disconnect switch is located on the wall behind the lathe.
 - b. Monarch Lathe: Locking control switch is located on the back of the lathe.
 - c. Surface Grinder: Disconnect switch is located on the wall behind the Monarch lathe.
 - d. Welder #2: Disconnect switch is located on support beam next to the welder.
 - e. American Lathe Turnmaster #2: Turn off, unplug quick disconnect located behind the lathe at Panel B-13-15-17.
 - f. Toshiba Boring Mill VZ8 (Grey#1): Shut of power on the machine, lockout Panel D 9,11,13 in the off position.
 - g. Toshiba Boring Mill VZ8 (Green #2): Shut of power on the machine, lockout power in the off position at Breaker ‘From Transformer 3’.

9.2.4 **Plug and Cord Connected Power Tools.**

- a. Unplug power tools before changing bits, blades, wheels, and similar attachments.
- b. Unplug power tools before making adjustments to the tool whenever the unexpected startup of the tool could cause an accident or injury.
- c. A power tool that is found to be defective or one that requires service shall be tagged out of service until the defect is repaired or service completed.

9.3 **150 Ton Hydraulic Press.** Disconnect and tag the power cord and plug. Release any stored energy.

9.4 **Compressed Air System (Old System) Note: As of March 2017 used as air storage and back-up system.**

9.4.1 There are two air compressors in the maintenance shop: one is next to the overhead door at the west end of the shop and the other is upstairs in the paint bay. These air compressors are tied together as one system – they must both be locked and tagged out of service before performing work on either of them or on individual parts of the system that cannot be isolated from the system by valves.

9.4.2 To work on the system as a whole or on one or both compressors:

- a. Shut off, lock and tag the shop compressor disconnect switch box K which is located next to the overhead door on the north wall of the small tools maintenance area.
- b. Shut off, lock and tag the paint room compressor disconnect switch located on the back wall of the compressor room.
- c. Drain the tanks by means of petcocks on the shop tank and ball valve on the paint bay tank.
- d. Drain the air hoses and tools.

9.4.3 To work on the automatic lube system, paint bay airline system, or another individual airline:

- a. Close, lock and tag the ball valves that isolate the airline requiring service.
- b. Drain the air hose and air tools in the work area.

9.5 To work on the **Ingersoll Rand Compressor**, with the air system in the shops active.

9.5.1 Shut off power using the on/off button, secure switch in the off position at Panel PP-B#20, close primary valve #1, and use bleed valve to drain pressure.

9.6 To work on the air system in the Maintenance Shop.

- 9.6.1 Shut off power to the Ingersoll Rand Compressor using the on/off button, lock and tag the switch in the off position at Panel PP-B#20, close and lock primary valve #1. Next, follow the steps detailed in sections 9.4.1, 9.4.2 and 9.4.3 above.
- 9.6.2 To work on an individual airline:
 - a. Close, lock and tag the ball valve(s) that isolate the airline requiring service.
 - b. Drain the air hose and tool in the work area.
- 9.7 **Overhead Cranes.** Shut off, lock and tag the disconnect switch box or circuit breaker for the crane requiring service. For cord and plug connected cranes, unplug and tag the power cord out of service.
 - 9.7.1 5-ton crane #1: Switch box is located on the support post next to the small tools maintenance area.
 - 9.7.2 5-ton crane #2: Switch box is located next to walk-in door along the south wall.
 - 9.7.3 2-ton crane #3 and #4 in the small tools maintenance area: Circuit breaker #1 in Panel D4, which is located on the north wall next to the overhead door.
 - 9.7.4 Overhead cranes in machine shop: Disconnect and tag the power cord and plug.
- 9.8 **Steam Cleaner in Wash Bay.**
 - 9.8.1 Shut off, lock, and tag circuit breakers 20-22-24 in Panel B located on the North wall in the machine shop.
 - 9.8.2 Release the water pressure with the cleaning wand.
 - 9.8.3 Wait until all parts of the cleaner are cool to the touch.
- 9.9 **Boiler Heating System.**
 - 9.9.1 Boiler: Shut off, lock, and tag the electric switch on the control box on the boiler; also lock and tag out breaker number 7 in Panel E located on the North wall to eliminate power to the control box. Wait one-half hour for the boiler to cool down.
 - 9.9.2 Hot water lines: Shut off, lock, and tag gate valves in the furnace room.
 - 9.9.3 Circulators: Shut off, lock, and tag disconnect switches in the furnace room.
 - 9.9.4 Heating units in shop: Shut off, lock, and tag electric switches on ceiling units.

- 9.9.5 Heating units in paint bay: Shut off, lock, and tag the switch on the right side of circuit breaker #5 in Panel E in the furnace room.
- 9.9.6 Intake and exhaust fans for roof units in paint bay: Shut off, lock, and tag disconnect switches in the furnace room.
- 9.10 **Oil / Water Separator in Sludge Room.** Shut off, lock, and tag the electric switch box on the south wall of the sludge room.
- 9.11 **Before starting work on a locked out system, equipment or machine, always be sure to verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.**
- 9.12 **Procedures for restart are detailed in §6.0 above.**

10.0 LOCKOUT/TAGOUT/TRYOUT AT THE STILLWATER WELDING SHOP

- 10.1 **Construction Equipment and Trucks.** Lockout/tagout/tryout procedures are detailed in §9.1 above.
- 10.2 **Drills, saws, grinders, lathes, and other power tools and milling machines.**
 - 10.2.1 A power tool or machine shall be locked and tagged out of service when an employee performs maintenance, repair, and/or service operations on the tool or machine.
 - 10.2.2 Lockout/tagout/tryout procedures shall also be in effect when changing bits, blades, wheels, and other machine attachments, and while making adjustments to a machine when the unexpected startup of the machine could cause an accident or injury.
 - 10.2.3 Hydraulic (450-Ton) press break in new shop: Shut off, lock, and tag the lockout switch which is located on the hydraulic press control panel.
 - 10.2.4 Burn Table: Shut off, lock, and tag circuit breaker #19 in panel LP-2.
 - 10.2.5 **Plug and Cord Connected Power Tools.**
 - a. Unplug power tools before changing bits, blades, wheels, and similar attachments.
 - b. Unplug power tools before making adjustments to the tool whenever the unexpected startup of the tool could cause an accident or injury.
 - c. A power tool that is found to be defective or one that requires service shall be tagged out of service until the defect is repaired or service completed.

10.3 **Welding Machines.**

10.3.1 The welders and their corresponding disconnect switches are numbered alike. Shut off, lock, and tag the appropriate disconnect switch.

10.3.2 For cord and plug connected welders, unplug the welder and attach an “Out of Service / Do Not Start” tag (or a tag with similar message) on the power cord.

10.4 **Compressed Air System.**

10.4.1 To work on the air compressor or the system as a whole:

- a. Shut off, lock, and tag circuit breaker #9 in panel PP-C.
- b. Close valve #7, lock and tag, inside the maintenance shop.
- c. Drain the two connected air tanks.
- d. Close valve #11 inside the welding shop.
- e. Drain the air hoses and tools.
- f. Unplug the air dryer.

10.4.2 To work on an individual airline:

- a. Close, lock and tag the ball valve(s) that isolate the airline requiring service.
- b. Drain the air hose and tool in the work area.

10.5 **Overhead Cranes.** Shut off, lock, and tag the disconnect switch or the circuit breaker for the crane requiring service.

10.5.1 5-ton crane in old shop: Disconnect switch is located on the crane bridge. Circuit breaker #1 in panel PP-C disconnects power to the switch.

10.5.2 5-ton crane in new shop: Disconnect switch is located on the south wall of the new shop. Circuit breaker #13 in panel PP-B disconnects power to the switch.

10.5.3 Jib cranes in new shop: The four jib cranes and their corresponding disconnect switches are numbered alike. Shut off, lock, and tag the appropriately labeled disconnect switch which is mounted on the wall near each jib crane.

10.6 **Air Handlers.** The eight air handlers and their corresponding disconnect switches are numbered alike. Shut off, lock, and tag the appropriately labeled disconnect switch which is mounted on the wall near the air handler.

10.7 **Furnaces.**

10.7.1 Furnace in old shop: Shut off, lock, and tag circuit breaker #19 in panel LP-1.

10.7.2 Furnace in new shop: Shut off, lock, and tag circuit breaker #18 in panel LP-2.

- 10.8 **Before starting work on a locked-out system, equipment or machine, be sure to verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.**
- 10.9 Procedures for restart are detailed in §6.0 above.

VIII. ELECTRICAL PROTECTION PROGRAM

(Updated on 12/29/17).

1.0 POLICY STATEMENT

- 1.1 **SARGENT CORPORATION shall comply with applicable OSHA standards concerning employee protection from electrical hazards as published in 29 CFR 1926 Subpart K, through the use of Ground Fault Circuit Interrupters (GFCI).**

2.0 ELECTRICAL SAFETY AND AWARENESS TRAINING

- 2.1 Employees shall be trained in and familiar with the safety-related work practices that pertain to their respective job assignments.
- 2.2 Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts. The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards when work is performed near or on equipment or circuits which are or may be energized.
- 2.3 Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them.
- 2.4 When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table S5 (below). **Sargent Corporation does not have employees qualified to work on or in the vicinity of overhead lines.**

TABLE S5 - Voltage range (phase to phase) and Minimum approach distance

300 V and less	Avoid Contact
Over 300 V, not over 750 V	1 ft. 0 in. (30.5 cm)
Over 750 V, not over 2k V	1 ft. 6 in. (46 cm)
Over 2 kV, not over 15 kV	2 ft. 0 in. (61 cm)
Over 15 kV, not over 37 kV	3 ft. 0 in. (91 cm)
Over 37 kV, not over 87.5 kV	3 ft. 6 in. (107 cm)
Over 87.5 kV, not over 121 kV	4 ft. 0 in. (122 cm)
Over 121 kV, not over 140 kV	4 ft. 6 in. (137 cm)

IX. HAZARDOUS MATERIAL EXPOSURE

(Last revised 02/04/2016)

1.0 HAZARD COMMUNICATIONS (HAZCOM) POLICY

- 1.1 It is the policy of **SARGENT CORPORATION** to comply with all applicable regulatory standards for hazard communications as enacted by OSHA (29 CFR 1926.59 and 1910.1200), MSHA (30 CFR Part 47), and the Federal Motor Carrier Safety Administration.
- 1.2 Under this HAZCOM policy, we shall provide employees with all information necessary for the safe use, handling, and storage of hazardous chemicals.
- 1.3 This policy includes guidelines on identification of chemical hazards, employee training, and the preparation and proper use of container labels, placards and other types of warning devices. It is intended to be consistent with the provisions of the **United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS), Revision 3.**

2.0 DEFINITIONS

- 2.1 **Carcinogen:** a chemical is considered to be a carcinogen if it is determined to be a potential cancer-causing agent.
- 2.2 **Chemical:** any element, compound or mixture of elements and/or compounds.
- 2.3 **Combustible Liquid:** any liquid having a flashpoint at or above 100° F (37.8° C), but below 200° F (93.3° C), except any mixture having components with flashpoints of 200° F (93.3° C), or higher, the total volume of which make up 99% or more of the total volume of the mixture.
- 2.4 **Container:** means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank or the like that contains a hazardous chemical. For the purpose of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.
- 2.5 **Corrosive:** a chemical that causes visible destruction of or alterations in living tissue by chemical action at the site of contact.
- 2.6 **Employee:** a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies.
- 2.7 **Employer:** a person engaged in a business where chemicals are either used, distributed or are produced for use or distribution, including a contractor or subcontractor.

- 2.8 **Explosive:** a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure or high temperature.
- 2.9 **Flammable Liquid:** any liquid having a flashpoint below 100° F (37.8° C), except any mixture having components with flash points of 100° F (37.8° C) or higher, the total of which make up 99% or more of the total volume of the mixture.
- 2.10 **Flashpoint:** the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when exposed to a flame.
- 2.11 **Hazardous Chemical:** any chemical that is a physical hazard or a health hazard.
- 2.12 **Hazard Warning:** any words, pictures, symbols or combination thereof appearing on a label or other appropriate form of warning which convey the hazard(s) of the chemical(s) in the container(s).
- 2.13 **Irritant:** a chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact.
- 2.14 **Label:** any written, printed or graphic material displayed on or affixed to containers of hazardous chemicals.
- 2.15 **Pictogram:** a sign or picture that is intended to convey specific information about the hazards of a chemical.
- 2.16 **Safety Data Sheet (SDS):** written or printed material concerning a hazardous chemical.
- 2.17 **Signal Word:** “Danger” (more severe) and “Warning” (less severe) are signal words used to alert workers of the relative hazards of a chemical.
- 2.18 **Oxidizer:** a chemical other than a blasting agent or explosive that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.
- 2.19 **Physical Hazard:** a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.
- 2.20 **Water-Reactive:** a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

3.0 HAZCOM STANDARD PROCEDURES

3.1 Chemical Inventory.

- 3.1.1 **SARGENT CORPORATION** maintains an inventory of all known chemicals in use. The Superintendent at each project site shall maintain a listing of all chemicals used at the site. The chemical inventory list shall be posted where it is available for all employees at the project site.
- 3.1.2 Site specific hazardous materials brought onto the work site shall be added to the posted chemical inventory list.

3.2 Container Labeling.

- 3.2.1 All chemicals on site shall be stored in their original or approved containers with a proper label attached, except small quantities for immediate use. Any container not properly labeled should be given to a foreman or superintendent for labeling or proper disposal.
- 3.2.2 Workers may dispense chemicals from the original container to a smaller secondary container so long as it is intended for immediate use. The secondary container must be labeled as to its contents. Any chemical left in a secondary container after work is completed must be returned to the original container.
- 3.2.3 No unmarked containers of any size are to be left unattended in the work area.
- 3.2.4 **SARGENT CORPORATION** will rely on the manufacturer applied labels whenever possible, and will ensure that these labels are maintained. Containers that are not labeled or on which the manufacturer's label has been removed will be relabeled.
- 3.2.5 **SARGENT CORPORATION** project Superintendents shall ensure that each container is labeled with the identity of the hazardous chemical contained and any appropriate hazard warnings.

3.3 Safety Data Sheets (SDS).

- 3.3.1 SDS's shall be available in the office trailer at each project site for all chemicals contained on the project chemical inventory list.
- 3.3.2 Supervisors shall review the SDS for a hazardous chemical with all affected employees before assigning employees to work with the chemical.
- 3.3.3 Employees working with a hazardous chemical may request a copy of the SDS. Requests for SDS's may be made to project superintendents, or the Safety Director.

3.4 **Employee Training.**

- 3.4.1 The project superintendent shall ensure employees are trained to work safely with hazardous chemicals prior to using or coming in contact with them.
- 3.4.2 Employees at each project site shall be trained to know about and recognize any hazardous chemicals being used at the site. New employees shall be trained as they are orientated at the project site.
- 3.4.3 Employee training will include appropriate topics such as:
 - 3.4.3.1 Methods that may be used to detect a release of a hazardous chemical in the workplace.
 - 3.4.3.2 Physical and health hazards associated with chemicals on site.
 - 3.4.3.3 Protective measures to be taken.
 - 3.4.3.4 Safe work practices.
 - 3.4.3.5 Information of the Hazard Communication Standard including:
 - a) Labeling, pictograms, and warning systems, and
 - b) An explanation of Safety Data Sheets.

3.5 **Personal Protective Equipment.**

- 3.5.1 The project superintendent shall provide each employee with the required PPE that is appropriate for the chemical(s) to which he/she is being exposed.
- 3.5.2 Any employee found in violation of PPE requirements shall be subject to disciplinary actions as provided in this HASP.

3.6 **Emergency Response.**

- 3.6.1 Any incident of over-exposure or spill of a hazardous chemical must be reported to a supervisor at once.
- 3.6.2 The foreman or superintendent shall be responsible for ensuring that proper emergency response actions are taken in over-exposure or spill situations.

3.7 **Chemical Hazards of Non-Routine Tasks.**

- 3.7.1 Superintendents shall inform employees of any special tasks that may arise which would involve possible exposure to hazardous chemicals.
- 3.7.2 Review of safe work procedures and use of required PPE shall be conducted prior to the start of such tasks.
- 3.7.3 Where necessary, signs and barricades shall be used to indicate the nature of the hazard involved.

3.8 **Informing Other Site Workers about Known Chemical Hazards.**

- 3.8.1 Sargent Corporation subcontractor employees are required to adhere to the provisions of this Hazard Communication Policy.
- 3.8.2 Information on hazardous chemicals known to be present shall be exchanged with other contractors and/or subcontractors on the project site. Employers shall be responsible for providing necessary information to their employees.
- 3.8.3 Other on-site employers will be provided with a copy of **SARGENT CORPORATION's** Hazard Communication Policy upon request.

3.9 **Posting Requirements.** **SARGENT CORPORATION** will post information about OSHA's Hazard Communications Standard (Right to Know Law) in the office trailer at each project site so that it is available to all employees.

4.0 **HAZARDOUS MATERIALS HANDLING PROJECTS**

4.1 **Applicability.** The following are examples of projects where the requirements of this paragraph shall be implemented. They are generally recognized as sites requiring hazardous materials handling or having other special hazards to which employees are likely to be exposed, but similar conditions may be encountered on other construction sites as well.

4.1.1 Superfund Sites with or without National Priority List (NPL) designation. For these projects, all personnel working within the boundaries of the contaminated zone(s) must have had a 40-hour training course in Hazardous Waste Operations and Emergency Response (HAZWOPER) and current year 8-hour refresher training as defined in OSHA 29 CFR 1926.65. They must also be enrolled in a medical surveillance program with a baseline physical examination and a follow up examination at least every 12 months.

4.1.2 Projects that are designated by the owner or engineering firm as requiring 40-hour trained personnel by contract specifications. Examples are sites such as landfill closings that may involve relocation of refuse and installation of leachate collection systems.

4.1.3 Projects that are designated by the Safety Director or Operations Manager to require 40-hour trained employees and/or personal protection greater than Level D because of special hazards to which employees may be exposed.

4.2 **Hazardous Materials Handling Policy.** It is the policy of **SARGENT CORPORATION** to provide employees working at Hazardous Materials sites with proper levels of training, personal protective equipment, engineering controls, and defined work procedures to control health and safety hazards.

4.3 Levels of Personal Protection.

4.3.1 **LEVEL D:** This level of protection is the minimum standard for construction workers and includes:

- 4.3.1.1 Hardhat.
- 4.3.1.2 Safety glasses.
- 4.3.1.3 Sturdy work boots with safety toe, in good condition.
- 4.3.1.4 Long work pants in good condition.
- 4.3.1.5 Shirt with 4-inch minimum sleeves.
- 4.3.1.6 Outer clothing appropriate for weather conditions.

4.3.2 **LEVEL D – MODIFIED:** This level of protection is usually the minimum for hazardous materials handling projects, and includes all items listed for Level D, plus:

- 4.3.2.1 Chemical resistant or chemical proof suit (Tyvek).
- 4.3.2.2 Inner and outer gloves.
- 4.3.2.3 Chemical resistant boots (over the work boots).
- 4.3.2.4 All sleeves and leg openings taped to gloves/boots using duct tape.
- 4.3.2.5 Training in the proper methods of donning and doffing and disposal of the protective clothing.

4.3.3 **LEVEL C:** This level of protection includes all items listed for Level D – Modified, plus:

- 4.3.3.1 Chemical resistant or chemical proof suit with hood.
- 4.3.3.2 Half or full-face respirator.
- 4.3.3.3 Respirator cartridges appropriate for the atmospheric contaminants to be encountered.
- 4.3.3.4 Compliance with and training in the Respiratory Protection Plan.
- 4.3.3.5 Medical evaluation prior to respirator use.

4.3.4 **LEVEL B:** This level of protection includes all items of Level D – Modified, plus a self-contained breathing apparatus (SCBA) or supplied air respirator.

4.3.5 **LEVEL A:** This level of protection includes all items of Level D plus full body encapsulation and SCBA.

4.4 Planning For Hazardous Materials Handling Projects.

4.4.1 Each such project shall be managed by a team comprised of:

- 4.4.1.1 Operations Manager.
- 4.4.1.2 Safety Director.
- 4.4.1.3 Project Manager.

- 4.4.1.4 Project Superintendent.
- 4.4.1.5 Estimator (first meeting only).
- 4.4.2 The Project Team will meet as soon as practical following award of the project to assign/clarify roles and discuss the following items:
 - 4.4.2.1 Project location and description.
 - 4.4.2.2 Owner and engineering firm requirements.
 - 4.4.2.3 Projected start/end dates.
 - 4.4.2.4 Description of all major project activities.
 - 4.4.2.5 Description of unique activities.
 - 4.4.2.6 Description of anticipated hazards.
 - 4.4.2.7 Determination of employee training requirements.
 - 4.4.2.8 Determination of levels of employee protection required at each phase of the project.
 - 4.4.2.9 Discussion of sequence of work.
 - 4.4.2.10 Timetable and person responsible for accomplishing the following major activities:
 - a. Development of the Site Specific Health and Safety Plan.
 - b. Date and location of pre-construction meeting.
 - c. Early submittal requirements.
 - d. Naming of initial crewmembers.
 - e. Personnel decontamination requirements.
 - f. Equipment decontamination requirements.
 - g. Anticipated/required environmental protection activities.
 - h. All required written plan submittals.
- 4.4.3 The Regional Operations Manager, Project Superintendent and Safety Director will meet on site with the project crew prior to the beginning of work involving the hazardous materials. The purpose of this meeting will include the following:
 - 4.4.3.1 Description and discussion of the project activities.
 - 4.4.3.2 Confirmation of required training and medical surveillance enrollment.
 - 4.4.3.3 Discussion of all phases of the Site Specific HASP.
 - 4.4.3.4 Discussion of the levels of personal protection required for each project phase.
- 4.4.4 The Safety Director shall meet with the Project Superintendent and the crew on site within one week after starting hazardous material handling operations for the purpose of reviewing general procedures and addressing concerns or questions of crewmembers.
- 4.4.5 The Project Team will meet within two weeks after starting hazardous material handling operations to assess the appropriateness of the levels of personal protection, general procedures, and required equipment and activities being used.

4.5 Standard Procedures for Hazardous Materials Handling Projects.

- 4.5.1 Crew and equipment decontamination facilities shall be fully functional prior to hazardous material handling.
- 4.5.2 In general, all activities involving exposed hazardous substances such as excavation/relocation of Municipal Solid Waste (MSW), excavation of soils contaminated by landfill leachate and live sewage shall be performed with LEVEL D - MODIFIED personal protection, at a minimum.
- 4.5.3 Air quality monitoring shall be performed on a continuous basis. If the following action levels are exceeded, levels of employee protection shall be upgraded as appropriate and as determined by the Safety Director.

Test For:	Action Level
Oxygen	- Less than 19.5% or more than 23.5%
Combustible Gases	- 10% of the LEL (lower explosive limit)
Hydrogen Sulfide	- 10 ppm (8-hour TWA)
Carbon Monoxide	- 35 ppm (8-hour TWA)
Volatile Organic Vapors	- 1 ppm for vinyl chloride or benzene; - 50 ppm if neither of these is present
Respirable Dust	- 50 micrograms of respirable crystalline silica per cubic meter of air ($\mu\text{g}/\text{m}^3$), averaged over an 8 hour day.

- 4.5.4 Dust control methods shall be implemented as necessary to maintain dust levels below the action level.
- 4.5.5 Levels of protection may be downgraded after the site is remediated.
- 4.5.6 No employee shall handle, transport or dispose of asbestos or asbestos containing materials. When asbestos materials are encountered, activity shall cease for remediation/removal by others. (Exception: See Transite Pipe Handling Plan in Section XIII of this HASP.)
- 4.5.7 Whenever drums or other containers of unknown content are encountered on projects, the operation shall stop, employees and equipment shall leave the immediate area and the contents of the drums or containers shall be determined. When analysis is complete, a plan to deal with the containers shall be developed and followed.
- 4.5.8 All subcontractor employees shall conduct their work in accordance with the policies of **SARGENT CORPORATION** and applicable OSHA Standards. It shall be the subcontractor's responsibility to provide its employees with appropriate training and protective equipment.

5.0 LEAD IN CONSTRUCTION AND LEAD ABATEMENT PLAN

(Updated 12/11/17).

5.1 Introduction.

- 5.1.1 All employees who are required to work with lead containing materials shall be informed of the hazards, educated of the methods required to properly protect themselves from exposure and shall be trained to identify and properly handle and dispose of them.
- 5.1.2 This procedure is intended to safeguard employees against the hazards of lead exposure in accordance with 29 CFR 1926.62.
- 5.1.3 Lead is a common material found both in the home and workplace and commonly found in paints, batteries, solder, lubricants, etc. Lead exposure primarily occurs through inhalation or ingestion and may occur by absorption throughout. Organs within the body will absorb some of the lead and some will be excreted. Human contamination by lead can be measured by blood analysis.
- 5.1.4 Performing safe work practices and personal hygiene requirements as directed in this plan greatly reduces the potential for lead contamination to employees and possible lead exposure to family members.

5.2 Definitions.

- 5.2.1 **Permissible Exposure Limit (PEL):** The PEL is the maximum concentration, averaged over an 8-hour period, which is considered safe by OSHA Standard. The PEL for airborne lead is 50 micrograms of lead per cubic meter ($50 \mu\text{g}/\text{m}^3$) of breathing air averaged over an 8-hour period. The formula to determine the PEL for other exposure time periods is: $\text{PEL (in } \mu\text{g}/\text{m}^3) = 400 / \text{number of hours worked}$.
- 5.2.2 **Action Level:** The Action Level is the lowest concentration of hazardous materials which requires that employees must begin to use Personal Protective Equipment (PPE). The Action Level for airborne lead is 30 micrograms per cubic meter of breathing air ($30 \mu\text{g}/\text{m}^3$).
- 5.2.3 **Personal Protective Equipment:** Protective gear, including (but not limited to) gloves, coveralls or similar full body work clothing, adequate respiratory protection with HEPA filter cartridges, boots, hardhat, safety glasses, etc.

5.3 Training of Employees.

- 5.3.1 All employees who may be exposed to lead above the action level of $30 \mu\text{g}/\text{m}^3$ must receive information and training regarding hazards of lead exposure, protective measures that must be taken and other requirements of applicable

OSHA Standards. Training shall be provided at the time of hire, during orientation, or before initial assignment, and annually thereafter; unless the employee is no longer working where exposure above the action level is possible in accordance with the Hazard Communication Program. All lead training shall be documented.

5.4 Blood Lead Testing.

5.4.1 Any employee who will be exposed to lead above the action level shall have the opportunity for blood level analysis for lead. Although the employee is not required to have blood testing performed, the test is the only method available to determine the past and continuing exposure to lead.

5.4.2 Any employee exposed at or above the action level for more than 30 days in any 12 consecutive months shall have his/her blood analyzed for lead.

5.4.2.1 A level of lead in the blood above 25 µg/dl shall cause a work practice assessment by the supervisor and the Safety Department.

5.4.2.2 An employee whose blood level exceeds 40 µg/dl shall be removed from the lead contaminated environment until 2 consecutive blood analyses at 2-month intervals indicate that the blood lead level is below 40 µg/dl.

5.4.3 The Company's occupational health care provider will provide blood level testing as needed.

5.5 Determining if a Material Contains Lead.

5.5.1 When material which may contain lead must be repaired, demolished, burned, welded, blasted, ground, sanded or otherwise disturbed, the first step taken must be to determine if the coating contains lead using a "Lead Test Kit", or by using an x-ray florescence analyzer or through record keeping. Record keeping consists of determining through documentation whether or not the material contains lead.

5.5.2 If a material is known to be lead-free, through certification provided by a vendor or supplier, no further testing for lead need be performed.

5.5.3 In the event of an emergency repair or if it is impossible or impractical to determine if a material contains lead, either by record keeping or testing, then the material must be presumed to contain lead.

5.5.4 If it is determined a material contains lead, employees must abide by any signs/labels/assessment reports indicating the presence of lead containing materials. Appropriate work practices must be followed to ensure the lead containing materials are not disturbed.

5.6 Required Documentation.

- 5.6.1 Whenever **SARGENT CORPORATION** employees will perform a task that disturbs lead containing materials, the Competent Person shall complete the Lead in Construction Permit (copy attached) for each task performed.
- 5.6.2 All records involving lead abatement work shall be maintained at the home office in Stillwater, Maine for a period of at least 30 years. The records include but are not limited to:
 - 5.6.2.1 Lead surveys; and
 - 5.6.2.2 Lead abatement permits; and
 - 5.6.2.3 Personal air monitoring and blood lead level test results.

5.7 Air Quality Monitoring.

- 5.7.1 When work with lead containing materials is being performed, air monitoring shall be conducted to ensure no employee is exposed to airborne lead in excess of the Action Level (30 $\mu\text{g}/\text{m}^3$).
- 5.7.2 Monitoring procedure. The air quality within the breathing zone of a key employee(s) shall be monitored by use of a “Sensidyne” BDX 530 Air Sampling Pump (or equivalent) equipped with “AA” type filter cartridge. The cartridges shall be submitted to The Scott Lawson Group, LTD., 20 Chenell Drive, P.O. Box 3304, Concord, NH 03301 (or other competent laboratory) for analysis.
- 5.7.3 An **Initial Exposure Assessment** shall be conducted to determine if any employee may be exposed above the action level.
 - 5.7.3.1 Personal samples representative of a full shift shall be collected and analyzed for each job classification in each work area.
 - 5.7.3.2 If the initial exposure assessment reveals employee exposure is below the action level, additional monitoring is not required unless there is a change in conditions which may result in increased employee exposure to lead, such as but not limited to: changes in the work environment, equipment, process, control, personnel, or a new task has been initiated.
- 5.7.4 **Monitoring Frequency.** If the initial exposure assessment or a follow-up assessment reveals employee exposure above the action level, air quality monitoring shall be repeated every 3 months until at least two consecutive measurements, taken at least 7 days apart, are below the action level at which time monitoring may be discontinued except as provided in §5.7.3.2 above.

5.8 Personal Protective Equipment (PPE).

5.8.1 **Respiratory Protection.** All workers performing work on lead containing materials shall be provided with adequate respiratory protection for the task as described in OSHA 1926.62(d)(2) and 1926.62(f).

5.8.1.1 Until the employee exposure assessment is completed, it shall be assumed that airborne lead exposure is above the PEL and respiratory protection shall be provided and used for lead related tasks as follows:

- a. Half-face respirator with HEPA filters: manual demolition of structures, manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems.
- b. Full-face respirator with HEPA filters: using lead containing mortar, rivet busting, power tool cleaning without dust collection systems, cleanup activities where dry expendable abrasives are used, and abrasive blasting enclosure movement and removal.
- c. Supplied air system: abrasive blasting, cutting, and torch burning.

5.8.1.2 Once the actual employee exposure is known, respiratory protection shall be provided and used as follows:

- a. 0 - 30 $\mu\text{g}/\text{m}^3$: respiratory use is optional, at employee discretion.
- b. 31 – 500 $\mu\text{g}/\text{m}^3$: half-face respirator with HEPA filters.
- c. 501 – 2500 $\mu\text{g}/\text{m}^3$: full-face respirator with HEPA filters.
- d. Over 2500 $\mu\text{g}/\text{m}^3$: supplied air system.

5.8.1.3 All requirements of the **SARGENT CORPORATION** Respiratory Protection Plan (HASP Section X), including medical evaluation, training, respirator fit test, and maintenance shall be in effect.

5.8.2 Other PPE including but not limited to disposable gloves, coveralls, and boot covers shall be supplied and its use required as appropriate to ensure lead containing dusts are not carried from the site on employee clothing, boots, and equipment.

5.9 Personal Hygiene.

5.9.1 Employees who are exposed to lead contamination can greatly reduce the risk of exposure to themselves and to others through consistent and strict personal hygiene. Airborne lead dust will cling to clothing, hair, skin, tools and equipment and can be easily carried away from the workplace. Workers using Level C personal protection (described above) where airborne exposure to lead is above the PEL shall proceed as follows:

5.9.1.1 Prior to beginning work, employees shall don clean PPE.

- 5.9.1.2 When work is complete or when employees are leaving the work area, a HEPA vacuum shall be used to gather loose lead dust from the suit, face and respirator.
 - 5.9.1.3 While still wearing the respirator, remove all outer protective clothing. Place disposable contaminated items in a container designated for that purpose (typically a 6-mil poly bag or a sealable drum labeled "Lead").
 - 5.9.1.4 Wet-wipe the outside of the respirator and any exposed skin to remove lead containing dust; remove respirator cartridges. Dispose of lead contaminated materials and cleaning supplies in the properly labeled container.
 - 5.9.1.5 Remove the respirator and immediately proceed to the wash area; wash face, hands and any exposed skin; proceed to the shower area (where provided) for a full body shower including hair.
 - 5.9.1.6 Dispose of any 6-mil poly bags containing lead contaminated materials in "Lead" labeled drums for proper disposal along with other lead containing wastes from the project.
- 5.9.2 Health effects of lead exposure. Common symptoms of acute lead poisoning are loss of appetite, nausea, vomiting, stomach cramps, constipation, difficulty in sleeping, fatigue, moodiness, headache, joint or muscle aches, and anemia. Long term (chronic) overexposure to lead may result in severe damage to the blood-forming, nervous, urinary, and reproductive systems.

5.10 Site Preparation.

- 5.10.1 Prior to the beginning of work, the supervisor shall ensure that signs are posted to warn that lead containing materials work is ongoing, and that red barrier tape is placed around the perimeter of the work area. Plastic sheeting or other practical means shall be used as necessary to prevent lead containing dust from contaminating lower levels and adjacent areas. Whenever possible, dust-collecting attachments connected to a HEPA filtered vacuum shall be used on grinding and cutting tools.
- 5.10.2 Upon completion of the work, all remaining lead containing materials shall be cleaned and properly stored. All tools and other equipment exposed to lead contamination shall be decontaminated using water, wipes, HEPA vacuum, and/or other appropriate means. Shoveling, dry or wet sweeping, and brushing may be used only where other equally effective methods have been tried and found not to be effective. Compressed air shall not be used to remove lead from any surface.
- 5.10.3 Multi-Contractor Worksites. If employees working immediately adjacent to a lead abatement activity are exposed to lead due to the inadequate containment of

such job, they shall either be removed from the area until the enclosure breach is repaired or initial exposure assessment is performed.

5.10.4 A carrier licensed to transport lead containing wastes shall remove the temporary lead waste storage containers to a secure landfill licensed for lead disposal.

5.11 **Lead Paint.** Equipment and materials manufactured and painted prior to 1980 shall be tested for lead paint prior to sandblasting, grinding, cutting, or otherwise generating dusts or fumes from the painted surfaces.

5.12 Summary of Lead in Construction and Lead Abatement Standards

OSHA Requirements	< 30 µg/m ³	30 to 50 µg/m ³	> 50 µg/m ³
Sampling Frequency	Initial & with production change	Initial, with production change and at least every 6 months	Initial, with production change, and quarterly
Sampling Notification	Within 5 days in writing to employee	Within 5 days in writing to employee	Within 5 days in writing to employee plus description of corrective action
Written Compliance Program	None required	None required	Prior to commencing job and revised/updated every 6 months
Respiratory Protection	Provide if requested	Provide if requested	Provide, require use
Respirator Program	Yes, if respirators are used	Yes, if respirators are used	YES
Personal Protective Clothing	Level D	Level D	Level C, including Tyvek suit, gloves, boots, and respirator with HEPA filters
Housekeeping	Surfaces maintained as free as practicable from accumulations of lead containing dust. ❖ HEPA filtered vacuuming used wherever possible ❖ No compressed air to be used for cleaning clothing or surfaces ❖ Shoveling, brushing and dry or wet sweeping only as last resort		
Food, Beverages, Tobacco and Cosmetics	No restrictions	No restrictions	Prohibited in work area
Change Areas	Not required	Not required	Separate change area with clothes storage
Showers	Not required	Not required	Provided where feasible
Eating Facilities	No special requirements	No special requirements	Must be provided and be clean. Workers must wash hands & face prior to eating
Washing Facilities	Required	Required	Required
Medical Surveillance	Not required	Made available	Required
Employee Training	Required at initial start up	Required at initial start up	Required at initial startup and annually
Sign and Barriers	Not required	Not required	Required
Record Keeping: Exposure Records	Required	Required	Required
Medical Records	Required if conducted	Required if conducted	Required
Respirators	Required if used	Required if used	Required

5.13 LEAD IN CONSTRUCTION PERMIT

Project Location: _____ Date: _____

Supervisor: _____

Project Description: _____

1. Has work surface been tested for lead? _____ Yes _____ No

If yes, state test method: _____

If no, state why not: _____

2. Give a brief description of lead hazards/procedures:

3. PPE required: _____ Tyvek _____ Gloves _____ Respirator _____ Boots

_____ Area barricaded/sign erected; access restricted to employees involved.

_____ Change room set up with disposal bags.

_____ Air quality monitoring in place.

_____ Hygiene Facilities in place.

_____ Housekeeping addressed.

FINAL CLEARANCE CHECK LIST

_____ Work area decontaminated with HEPA Vacuum or damp cleanup.

_____ Contaminant material removed & properly disposed of.

_____ PPE decontaminated & properly disposed of.

_____ Barricades and signs removed.

Signature of person issuing permit_____
Signature of supervisor

6.0 OIL & FUEL SPILLS

6.1 Reporting Requirements.

- 6.1.1 The **U. S. Environmental Protection Agency** (EPA) requires a telephone report to the National Response Center at 800-424-8802 for any oil spill that causes a film or “sheen” on a navigable surface water body or its adjoining shoreline.
- 6.1.2 The state of **Maine** requires that each oil, gasoline, and diesel fuel spill shall be reported to the Department of Environmental Protection (DEP) within two hours after the spill.
- 6.1.2.1 There is no minimum quantity for this requirement.
- 6.1.2.2 Under Maine law, a person responsible for an oil spill is exempt from civil enforcement penalties so long as the discharge is reported within two hours of its discovery and is promptly cleaned up to the DEP’s satisfaction.
- 6.1.2.3 The contacts and call numbers for oil spill reporting in Maine are:
- | | |
|------------------------------|--------------|
| a. Emergency Spill Statewide | 800-482-0777 |
| b. Augusta Area | 207-287-3901 |
| c. Bangor Area | 207-941-4570 |
| d. Portland Area | 207-822-6300 |
| e. Presque Isle Area | 207-764-0477 |
- 6.1.3 In **New Hampshire**, an oil spill of 25 gallons or more must be immediately reported to the Department of Environmental Services (DES) Waste Management Division at 603-271-3899 (Monday through Friday, 8 a.m. to 4 p.m.), or to the New Hampshire Department of Safety at 800-346-4009 (24 hours/day).
- 6.1.4 In **North Carolina**,
- 6.1.5 In **Vermont**, the Department of Environmental Conservation (DEC) Waste Management Division’s Spill Response Team assesses the environmental impact of hazardous materials spills, oversees the cleanup of spills, and enforces environmental regulations triggered by spills. To report an oil or other petroleum spill, call 802-241-3888 during business hours, or 800-641-5005 for 24 hour reporting. For more information about reporting requirements, call Marc Roy at 802-241-3874.
- 6.1.6 In **Virginia**, an oil spill of 25 gallons or more must be immediately reported to the nearest Department of Environmental Quality (DEQ) regional office.
- 6.1.6.1 The call numbers for the Virginia regional offices are:
- | | |
|-----------------------------------|--------------|
| a. Northern Virginia – Woodbridge | 703-583-3800 |
| b. Valley Region – Harrisonburg | 540-574-7800 |

- c. West Central Region – Roanoke 540-562-6700
- d. Piedmont Region – Glen Allen 804-527-5020
- e. Southwest Region – Abingdon 276-676-4800
- f. South Central Region – Lynchburg 434-582-5120
- g. Tidewater Region – Virginia Beach 757-518-2000

6.1.7 In **Maryland**, an oil spill of any quantity must be reported to the Maryland Department of the Environment (MDE) Emergency Response Division, usually within two hours of the spill incident. Call 866-633-4686 for 24 hour spill reporting. The Emergency Response office number is 410-537-3932.

6.1.8 Reporting requirements vary from state to state. In the event of an oil spill in a state not listed above, please contact your Safety Director or Project Manager to research the local reporting requirements.

6.2 Cleanup Requirements.

6.2.1 All petroleum spills must be immediately cleaned up and removed from project sites.

6.2.2 In general, a small and localized spill should be cleaned up and taken to an approved landfill for disposal. In Maine, oil contaminated soils, absorbent pads, and other cleanup waste materials are classified as “non-hazardous special wastes”.

6.2.3 Larger quantities of contaminated soils may be recycled at a paving plant or other approved facility.

6.2.4 Your state environmental agency reporting contact will provide guidance in the most cost effective and environmentally safe means to dispose of oil contaminated soils.

X. RESPIRATORY PROTECTION PLAN

(Updated 11/29/17)

1.0 PURPOSE

- 1.1 **Provide Protection from Respiratory Hazards.** SARGENT CORPORATION has determined that employees may be exposed to respiratory hazards during routine work operations. These hazards may include dusts, mists and other particulates, as well as gases and vapors. The purpose of this program is to ensure that all employees are protected from these respiratory hazards.
- 1.2 **Primary Line of Defense.** Engineering controls such as general or local ventilation and use of wet methods when cutting or sanding concrete, rock, asphalt, and similar products shall be used whenever possible to prevent atmospheric contamination and silica exposure in the workplace. Respirators are to be used as the primary control of respiratory hazards only where engineering and administrative controls alone cannot control the hazards, or while engineering controls are being installed.

2.0 SCOPE AND APPLICATION

- 2.1 **Required Use of Respirators.** This program applies to all employees who are required to wear respirators during normal work activities, and during some non-routine or emergency activities. This section does not allow for work in situations where atmospheric conditions are immediately dangerous to life or health (IDLH).
- 2.2 **Voluntary Use of Respirators.** Voluntary use is when an employee chooses to wear a respirator, even though the use of a respirator is not required by either the employer or by any OSHA standard.
 - 2.2.1 An employee who voluntarily uses a respirator (except those who voluntarily use a dust mask) shall also be subject to the elements of this program that pertain to medical evaluation and procedures for cleaning, inspecting, storing, discarding, and otherwise maintaining respirators.
 - 2.2.2 Any employee who voluntarily wears a respirator shall be provided with the information and requirements for non-mandatory respirator usage (Appendix D) as detailed in §6.0 of this Respiratory Protection Plan.
 - 2.2.3 Except for the requirements of Appendix D, employees who voluntarily wear filtering face pieces (dust masks) are not subject to the other elements of this Respiratory Protection Plan.

3.0 RESPONSIBILITIES

- 3.1 **The Safety Director** is responsible for this program and has full authority to make decisions to ensure the safety of employees.
- 3.2 **Supervisors** must ensure that employees follow all elements of this program.
- 3.3 **All Employees** must wear a respirator when required and follow proper respiratory protection procedures.

4.0 PROGRAM ELEMENTS

- 4.1 **When Respirators are Required.** Each employee performing intrusive work in a hazardous atmosphere shall be provided with and be required to use proper respiratory protection whenever engineering controls alone cannot eliminate the hazard. Employees whose work causes them to be exposed to silica dust, such as rock crushing operations or cutting/sanding pavement or concrete, shall use wet methods to eliminate as much dust as possible. If any dust remains visible in the air, they shall also at minimum wear an N-95 disposable HEPA respirator to reduce dust exposure to acceptable levels.
- 4.2 **Program Training.** Each affected employee shall be instructed in the elements and procedures of this respiratory program.
- 4.3 **Medical Evaluation.** Employees shall not be assigned tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. Each employee required to wear a respirator shall fill out the Respirator Medical Evaluation Questionnaire found on the following pages. The questionnaire shall be sent directly to the company's Medical Review Officer who will then evaluate the need for a physical or pulmonary function test (PFT). A copy of the PFT will be made available to the employee and will be kept on file at the project office and at the **SARGENT CORPORATION** corporate office at 378 Bennoch Road, Stillwater, ME 04489 for a period of not less than 30 years.
- 4.4 **Respirator Selection.** Respirators shall be selected on the basis of hazards to which the worker is exposed. Only NIOSH certified respirators shall be selected and used.
- 4.5 **Respirator Use Training.** Each user shall be instructed and trained in the proper use of respirators and their limitations, including general requirements of 29 CFR 1910.134. Training will provide an opportunity for the employee to become familiar with the respirator, have it properly fitted, and wear it in normal air for at least 5 minutes. Every respirator wearer shall receive instruction on donning and doffing the respirator and adjusting it for proper fit. They shall be instructed in proper maintenance requirements, and symptoms of exposure.

- 4.6 **Proper Fit Required.** Prior to using a respirator, employees shall be given a qualitative fit test to ensure the size and shape of the respirator allows for a proper seal to the user's face. Respirators shall not be worn when conditions prevent a good face seal. Such conditions may include a growth of beard, sideburns, a skull cap that projects under the face piece, or glasses. Employees who are required to wear respirators must be clean shaven where the face piece to face seal occurs. To assure proper protection, the wearer shall follow the manufacturer's face piece fitting instructions to check the face piece fit each time the wearer puts on the respirator.
- 4.7 **Individual Use.** Respirators will be assigned to individual workers for their exclusive use.
- 4.8 **Cleaning Requirements.** Respirators shall be regularly cleaned, disinfected, inspected, and properly stored at the end of each day's use or more often if necessary.
- 4.8.1 Respirators shall be cleaned and disinfected following manufacturer recommendations. At a minimum, the employee who has worn the respirator (or a designated person) shall remove and dispose of the cartridges, wash the mask with soap and water, rinse in a bleach/water bath, dry the mask, examine all valves and parts for wear and place the mask in a sealed plastic bag.
- 4.8.2 Respirators shall be cleaned and stored in a clean, dry, and sanitary location.
- 4.8.3 During cleaning, respirators shall be inspected. Worn or deteriorated parts shall be replaced. Respirators for emergency use such as self-contained devices shall be thoroughly inspected at least once a month and after each use. Inspection for SCBA breathing gas pressure shall be performed weekly.
- 4.9 **Filter Replacement Schedule.**
- 4.9.1 Employees wearing Air Purifying Respirators (APR) for protection against particulates such as dust, mists, or fumes shall leave the work area and discard their filtering face piece (dust mask) or change filters when breathing becomes difficult.
- 4.9.2 Employees wearing APRs for protection against gases or vapors must discard their cartridges or canisters at the end of each work day or more often if directed by the safety department.
- 4.10 **Daily Inspections.** Continual surveillance of work area conditions and degree of employee exposure or stress shall be maintained by the Competent Person.
- 4.11 **Program Effectiveness.** Regular inspection and evaluation shall be conducted to determine the continued effectiveness of the program. The Safety Director will make frequent inspections of all areas where respirators are used to ensure compliance with the Respiratory Protection Plan.

- 4.12 **Annual Refresher Training and Fit Testing.** Retraining and respirator fit tests shall occur annually or sooner if changes in the workplace require it, if the employee's physical condition changes, or if the employee has not retained the requisite understanding.

5.0 SILICA EXPOSURE CONTROL PLAN

- 5.1 **Purpose.** The purpose of this document is to establish and implement a written exposure control plan that identifies tasks involving silica exposure and methods used to protect employees.
- 5.2 **Applicable Standards.** The following standards are applicable for respirable crystalline silica at Sargent Corporation projects and shops:
- 1926.1153 – Respirable Crystalline Silica
- 5.3 **Scope.** The Silica Exposure Control Plan applies to all Sargent Corporation employees who are expected to be exposed to respirable crystalline silica as detailed in Table 1 below.
- 5.4 **Responsibilities.** Employees will be trained on the hazards, control methods and precautions associated with silica exposure.
- 5.4.1 Supervisors shall implement and ensure procedures are followed in accordance with this Plan. They will discuss the details of implementation, provide the equipment and methods of control (engineering controls, work practice controls and PPE) at their project where activities involve respirable crystalline silica. If any activities at the project are not covered under Table 1, the supervisor should contact the safety department for assistance to evaluate exposure levels.
- 5.4.2 Employees shall follow the training they receive regarding silica exposure, work methods and hazard control. They shall follow the plan, the procedures provided on Table 1, and utilize and maintain the dust suppression systems provided for each tool.
- 5.4.3 **Housekeeping.** Dry sweeping or dry brushing shall not be allowed where such activity could result in employee exposure to respirable crystalline silica. Wet sweeping or HEPA filtered vacuuming shall be used. In addition, compressed air shall not be used to clean clothing or surfaces where such activity could contribute to employee exposure to crystalline silica.

Table 1: Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
1	Stationary masonry saws	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
2a	Handheld power saws (any blade diameter) when used outdoors	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
2b	Handheld power saws (any blade diameter) when used indoors or in an enclosed area	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
3	Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less) for tasks performed outdoors only	- Use saw equipped with commercially available dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	None	None
4a	Walk-behind saws when used outdoors	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
4b	Walk-behind saws when used indoors or in an enclosed area	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
5	Drivable saws for tasks performed outdoors only	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
6	Rig-mounted core saws or drills	Use tool equipped with integrated water delivery system that supplies water to cutting surface.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		
7	Handheld and stand-mounted drills (including impact and rotary hammer drills)	- Use drill equipped with commercially available shroud or cowling with dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. - Use a HEPA-filtered vacuum when cleaning holes.	None	None
8	Dowel drilling rigs for concrete for tasks performed outdoors only	- Use shroud around drill bit with a dust collection system. - Dust collector must have a filter with 99% or greater efficiency and a filter cleaning mechanism. - Use a HEPA-filtered vacuum when cleaning holes.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
9a	Vehicle-mounted drilling rigs for rock and concrete	Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector.	None	None
9b	Vehicle-mounted drilling rigs for rock and concrete	Operate from within an enclosed cab and use water for dust suppression on drill bit.	None	None
10a	Jackhammers and handheld powered chipping tools when used outdoors	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10b	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10c	Jackhammers and handheld powered chipping tools when used outdoors	- Use tool equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the tool manufacturer, or	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.		
10d	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	- Use tool equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
11	Handheld grinders for mortar removal (i.e., tuckpointing)	- Use grinder equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	Powered Air-Purifying Respirator (PAPR) with P100 Filters
12a	Handheld grinders for uses other than mortar removal for tasks performed outdoors only	- Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
12b	Handheld grinders for uses other than mortar removal when used outdoors	- Use grinder equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	None	None
12c	Handheld grinders for uses other than mortar removal when used indoors or in an enclosed area	- Use grinder equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
13a	Walk-behind milling machines and floor grinders	• Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
13b	Walk-behind milling machines and floor grinders	• Use machine equipped with dust collection system recommended by the manufacturer. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. • When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.	None	None
14	Small drivable milling machines (less than half-lane)	• Use a machine equipped with supplemental water sprays designed to suppress dust. • Water must be combined with a surfactant. • Operate and maintain machine to minimize dust emissions.	None	None
15a	Large drivable milling machines (half-lane and larger) for cuts of any depth on asphalt only	• Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. • Operate and maintain machine to minimize dust emissions.	None	None
15b	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	• Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. • Operate and maintain machine to minimize dust emissions.	None	None
15c	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	• Use a machine equipped with supplemental water spray designed to suppress dust. • Water must be combined with a surfactant. • Operate and maintain machine to minimize dust emissions.	None	None
16	Crushing machines	• Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points). • Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station.		
17a	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	Operate equipment from within an enclosed cab.	None	None
17b	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None
18a	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	Apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None
18b	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.	None	None

5.5 The following shall be implementing when utilizing the control measures specified in Table 1:

- 5.5.1 For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust;
- 5.5.2 For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust;
- 5.5.3 For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:
 - 5.5.3.1 Is maintained as free as practicable from settled dust;
 - 5.5.3.2 Has door seals and closing mechanisms that work properly;
 - 5.5.3.3 Has gaskets and seals that are in good condition and working properly;
 - 5.5.3.4 Is under positive pressure maintained through continuous delivery of fresh air;
 - 5.5.3.5 Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 μm range (e.g., MERV-16 or better); and
 - 5.5.3.6 Has heating and cooling capabilities.
- 5.5.4 Where an employee performs more than one task included on OSHA's Construction Standard Table 1 during the course of a shift, and the total duration of all tasks combined is more than four hours, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift. If the total duration of all tasks on Table 1 combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.
- 5.6 Alternative Exposure Control Methods apply for tasks not listed in OSHA's Construction Standard Table 1, or where engineering controls, work practices, and respiratory protection described in Table 1 cannot not fully and properly implemented. The exposure of each employee who is or may reasonably be expected to be exposed to Respirable Crystalline Silica at or above the Action Level will be assessed in accordance with the Performance Option.
 - 5.6.1 **Performance Option.** Assess the 8-hour TWA exposure for each employee on the basis of any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures to Respirable Crystalline Silica.

6.0 **VOLUNTARY RESPIRATOR USE**

- 6.1 **Medical Evaluation.** Employees are required to undergo a medical evaluation prior to voluntary use of a half-face or full-face respirator. A medical evaluation is not required for voluntary use of a filtering facepiece (dust mask).
- 6.3 **Appendix D.** Employees voluntarily using respirators when not required shall be provided with a copy of 29 CFR 1910.134 Appendix D: "Information for Employees Using Respirators When Not Required under the Standard," which follows:

APPENDIX D

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substances does not exceed the exposure limits set by OSHA. If **SARGENT CORPORATION** provides respirators for your voluntary use, or you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

1. Read and follow all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.
2. Choose respirators certified for use to protect against the contaminants of concern. NIOSH, the National Institute for Occupational Safety and Health, certifies respirators. A label or statement of certification should appear on the respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke. Cartridge type respirators do not provide protection in an oxygen deficient environment.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

Mandatory OSHA Respirator Medical Evaluation Questionnaire

SARGENT CORPORATION
P.O. Box 435, 378 Bennoch Road
Stillwater, ME 04489
Phone: 207-827-4435 Fax: 207-827-2945

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee: Can you read (circle one): Yes/No

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Please fax to: _____

(Note: To review this questionnaire with a healthcare professional, you may contact the HR Department at Stillwater who will schedule an appointment for you.

Part A. Section 1. (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date: _____

2. Your name: _____

3. Your date of birth: _____

4. Sex (circle one): Male/Female

5. Your height: _____ ft. _____ in.

6. Your weight: _____ lbs.

7. Your job title: _____

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____

9. The best time to phone you at this number: _____

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No

11. Check the type of respirator you will use (you can check more than one category):

- a. _____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
- b. _____ Other type (for example, half- or full-face type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you ever worn a respirator (circle one): Yes/No

If "yes," what type(s): _____

Part A. Section 2. (Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you **currently** smoke tobacco, or have you smoked tobacco in the last month: Yes/No

2. Have you **ever had** any of the following conditions?

- a. Seizures (fits): Yes/No
- b. Diabetes (sugar disease): Yes/No
- c. Allergic reactions that interfere with your breathing: Yes/No
- d. Claustrophobia (fear of closed-in places): Yes/No
- e. Trouble smelling odors: Yes/No

3. Have you **ever had** any of the following pulmonary or lung problems?

- a. Asbestosis: Yes/No
- b. Asthma: Yes/No
- c. Chronic bronchitis: Yes/No
- d. Emphysema: Yes/No
- e. Pneumonia: Yes/No
- f. Tuberculosis: Yes/No
- g. Silicosis: Yes/No
- h. Pneumothorax (collapsed lung): Yes/No
- i. Lung cancer: Yes/No
- j. Broken ribs: Yes/No
- k. Any chest injuries or surgeries: Yes/No
- l. Any other lung problem that you've been told about: Yes/No

4. Do you **currently** have any of the following symptoms of pulmonary or lung illness?

- a. Shortness of breath: Yes/No
- b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes/No

- c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No
 - d. Have to stop for breath when walking at your own pace on level ground: Yes/No
 - e. Shortness of breath when washing or dressing yourself: Yes/No
 - f. Shortness of breath that interferes with your job: Yes/No
 - g. Coughing that produces phlegm (thick sputum): Yes/No
 - h. Coughing that wakes you early in the morning: Yes/No
 - i. Coughing that occurs mostly when you are lying down: Yes/No
 - j. Coughing up blood in the last month: Yes/No
 - k. Wheezing: Yes/No
 - l. Wheezing that interferes with your job: Yes/No
 - m. Chest pain when you breathe deeply: Yes/No
 - n. Any other symptoms that you think may be related to lung problems: Yes/No
5. Have you **ever had** any of the following cardiovascular or heart problems?
- a. Heart attack: Yes/No
 - b. Stroke: Yes/No
 - c. Angina: Yes/No
 - d. Heart failure: Yes/No
 - e. Swelling in your legs or feet (not caused by walking): Yes/No
 - f. Heart arrhythmia (heart beating irregularly): Yes/No
 - g. High blood pressure: Yes/No
 - h. Any other heart problem that you've been told about: Yes/No
6. Have you **ever had** any of the following cardiovascular or heart symptoms?
- a. Frequent pain or tightness in your chest: Yes/No
 - b. Pain or tightness in your chest during physical activity: Yes/No
 - c. Pain or tightness in your chest that interferes with your job: Yes/No
 - d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
 - e. Heartburn or indigestion that is not related to eating: Yes/ No
 - f. Any other symptoms that you think may be related to heart or circulation problems: Yes/No
7. Do you **currently** take medication for any of the following problems?
- a. Breathing or lung problems: Yes/No
 - b. Heart trouble: Yes/No
 - c. Blood pressure: Yes/No
 - d. Seizures (fits): Yes/No
8. If you've used a respirator, have you **ever had** any of the following problems? (If you've never used a respirator, check the following space and go to question 9) _____
- a. Eye irritation: Yes/No

- b. Skin allergies or rashes: Yes/No
- c. Anxiety: Yes/No
- d. General weakness or fatigue: Yes/No
- e. Any other problem that interferes with your use of a respirator: Yes/No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-face piece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is not required.

10. Have you **ever lost** vision in either eye (temporarily or permanently): Yes/No

11. Do you **currently** have any of the following vision problems?

- a. Wear contact lenses: Yes/No
- b. Wear glasses: Yes/No
- c. Color blind: Yes/No
- d. Any other eye or vision problem: Yes/No

12. Have you **ever had** an injury to your ears, including a broken ear drum: Yes/No

13. Do you **currently** have any of the following hearing problems?

- a. Difficulty hearing: Yes/No
- b. Wear a hearing aid: Yes/No
- c. Any other hearing or ear problem: Yes/No

14. Have you **ever had** a back injury: Yes/No

15. Do you **currently** have any of the following musculoskeletal problems?

- a. Weakness in any of your arms, hands, legs, or feet: Yes/No
- b. Back pain: Yes/No
- c. Difficulty fully moving your arms and legs: Yes/No
- d. Pain or stiffness when you lean forward or backward at the waist: Yes/No
- e. Difficulty fully moving your head up or down: Yes/No
- f. Difficulty fully moving your head side to side: Yes/No
- g. Difficulty bending at your knees: Yes/No
- h. Difficulty squatting to the ground: Yes/No
- i. Difficulty climbing a flight of stairs or a ladder carrying more than 25 lbs.: Yes/No
- j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

SARGENT CORPORATION

Request for Respiratory Medical Evaluation and Clearance
(to be completed by employer)

Fax to: _____

Employer _____

Date Provided _____

Employer Representative _____ Title _____ Phone _____

Employee Name(s) _____ Job Title(s): _____

Type(s) of Respirator to be used: _____

Air-Purifying Respirator: _____

_____ Atmosphere-supplying Respirator: _____

_____ Disposable Filter Mask, Non-Cartridge Type

_____ SCBA

_____ Half Mask or Full-Face Cartridge Type

_____ Supplied Air

_____ PAPR

Exposures Anticipated: (Please be specific)

_____ Particulate: _____

_____ Other Particulates: _____

_____ Vapor/Gases: _____

_____ Other: _____

Level of Work Effort:

_____ Light

_____ Moderate

_____ Heavy

_____ Strenuous

Sitting

Driving truck

Heavy lifting

Heavy Construction

Light Typing

Walking on level at 2

(<50 lbs.)

Assembly work

mph

Shoveling

Push wheelbarrow

Laying Brick

with 100 lbs.

Frequent stairs

Extent of Usage:

_____ Over 4 hrs./day

_____ 2-4 hrs./day

_____ Less than 2 hrs./day

_____ Less than 5 hrs./wk.

_____ Emergency Rescue Only

_____ Escape Use Only (no rescue)

Other Special Considerations:

_____ Confined Space

_____ Temp Extremes

_____ Hazardous Materials

_____ Other Pro. Equip.

_____ >80-90 Degrees

_____ <30 Degrees

Do No Write Below This Line**Medical Evaluation & Frequency Recommendations:**

_____ Annual

_____ Bi-Annual

_____ Tri-Annual

_____ Other _____

_____ Review Questionnaire

_____ Vital Signs

_____ Clinician Exam

_____ PFT

Reviewing Clinician Signature

Date

Set-up Complete

Date

XI. HEARING CONSERVATION PROGRAM

(Adopted 2/20/08; Revised 2/11/09; Updated 11/30/17)

1.0 PURPOSE

- 1.1 Identify work areas and activities that expose employees to noise levels that exceed Permissible Noise Exposure Limits as defined in the table below:

Duration per day, hours	Sound level dBA slow response
12	87
10½	88
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

- 1.2 Implement engineering controls wherever practical in noisy work areas to reduce employee exposure levels to within Permissible Noise Exposure Limits.
- 1.3 Provide hearing personal protective equipment (PPE) in all work areas, and require employees to use hearing protection where engineering controls do not reduce noise exposure to acceptable levels.
- 1.4 Sargent Corporation intends to protect all employees from significant noise exposure that could cause hearing impairment.

2.0 SCOPE AND APPLICATION

- 2.1 Whenever employee noise exposure is equal to or exceeds an 8-hour time-weighted average sound level (TWA) of 85 dBA, the affected employee shall be enrolled in a **Hearing Conservation Program**.

3.0 PROGRAM ELEMENTS

- 3.1 **Noise Monitoring.**
- 3.1.1 Employee noise exposure levels shall be monitored for a variety of work activities. This sampling of noise exposure levels will help identify which employees must be included in the Hearing Conservation Program.

- 3.1.2 Noise level monitoring will be utilized to determine where appropriate engineering controls need to be implemented and/or hearing protection required.
- 3.1.3 Representative personal noise sampling will be performed rather than area monitoring in most cases since most employees are mobile and are not assigned to individual work stations.
- 3.2 **Employee Notification.** Each employee exposed at or above an 8-hour TWA of 85 dBA shall be notified of such exposure.
- 3.3 **Audiometric Testing Program.** Audiometric testing shall be conducted for all employees whose exposures equal or exceed an 8-hour TWA of 85 dBA. Such testing shall be provided at no cost to the employee.
 - 3.3.1 **Baseline Audiogram** – Must be performed within 6 months of the employee’s first exposure at or above an 8-hour TWA of 85 dBA. Prior to completing the baseline audiogram, the employee shall not be exposed to workplace noise for at least 14 hours. This shall provide a comparison point for all future audiograms.
 - 3.3.2 **Annual Audiogram** – After obtaining the baseline audiogram, a new audiogram shall be performed at least annually for each employee exposed at or above an 8-hour TWA of 85 dBA.
 - 3.3.3 A **Standard Threshold Shift** is a change in hearing threshold relative to the baseline audiogram of an average of 10 dBA or more at 2000, 3000, and 4000 HZ in either ear.
 - 3.3.3.1 If an annual audiogram indicates a standard threshold shift, Sargent Corporation may obtain a retest within 30 days and consider the results of the retest as the annual audiogram.
 - 3.3.3.2 An employee whose annual audiogram indicates a standard threshold shift shall be informed of this fact in writing, within 21 days of determination.
 - 3.3.3.3 Unless a physician indicates that the standard threshold shift is not work related or aggravated by noise exposure in the workplace, Sargent Corporation shall take all necessary corrective and preventative steps as listed in OSHA 1910.95 (g)(8)(ii).
 - 3.3.4 **Evaluation of Audiogram** – Shall be performed by an audiologist.
- 3.4 **Training Requirements.** Hearing Conservation Training shall be included in safety orientations for newly hired employees. In addition, training shall be provided annually to any employees enrolled in the hearing conservation program. The training shall include the following topics:

- 3.4.1 The rules and procedures of this Hearing Conservation Program.
- 3.4.2 Requirements for employee use of hearing protection when noise levels exceed the limits listed in section 1.1 above.
- 3.4.3 Proper methods for selection, use, and care for hearing protection.
- 3.4.4 Effects of noise on hearing and hearing loss.

4.0 RESPONSIBILITIES

4.1 Management Responsibilities.

- 4.1.1 Conduct noise surveys whenever new equipment, new activities, or work conditions create noise levels that could potentially exceed 85 dBA. Accurate records of employee exposure monitoring shall be maintained.
- 4.1.2 Carefully check and calibrate instruments used to monitor noise levels.
- 4.1.3 Provide hearing conservation training for all employees that are or could be exposed to noise levels that exceed 90 dBA.
- 4.1.4 Implement engineering and administrative controls to limit or reduce employee noise exposure.
- 4.1.5 Develop and provide a list of work activities and the typical noise exposure levels associated with each activity. Post warning signs at locations that regularly have high noise levels.
- 4.1.6 Provide adequate hearing protection for employees at all jobsites. At least two types of earplugs shall be made available and shall be individually fitted for each affected employee. Hearing protectors shall be provided free of charge to employees.
- 4.1.7 Conduct annual hearing tests for all employees who are exposed at or above the 8-hour TWA of 85 dBA.

4.2 Employee Responsibilities.

- 4.2.1 Use company provided and approved hearing protection whenever informed that noise exposure in their work area exceeds OSHA permissible exposure limits as shown in Table D-2.
- 4.2.2 Request and use hearing protection whenever working with or near loud equipment such as a plate tamp, chain saw, pipe saw, impact tool, metal grinder,

or sheet pile driver. If you need to shout to be heard above background noise, you should use hearing protection.

- 4.2.3 Once a person suffers some level of hearing loss, it can never be restored.

5.0 HEARING CONSERVATION CONTROLS

- 5.1 **Engineering Controls.** If noise exposure levels are determined to be above 85 dBA, engineering controls shall be considered prior to implementing administrative controls. Examples of engineering controls include:

- 5.1.1 Replacing and/or upgrading exhaust mufflers.
- 5.1.2 Insulating noise producing components or operations.
- 5.1.3 Installing cabs or shields.

- 5.2 **Administrative Controls.** If engineering controls alone are not sufficient to reduce noise exposure to permissible levels, administrative controls shall be implemented to limit noise exposure. Examples of administrative controls include:

- 5.2.1 Restricting the time of exposure by rotating job duties.
- 5.2.2 Posting signs to warn employees of the noise hazard.
- 5.2.3 Providing hearing personal protective equipment such as ear muffs or ear plugs.

- 5.3 **PPE** for hearing protection shall be provided on all jobsites.

- 5.3.1 Hearing protection shall be provided for optional use by employees when exposure levels are below 90 dBA.
- 5.3.2 Use of hearing protection shall be mandatory for employees exposed to noise levels at or above 90 dBA.

XII. BLOODBORNE PATHOGEN EXPOSURE CONTROL PLAN

(Adopted 6/1/1993, Revised 2/19/11, Updated 11/29/17)

1.0 EXPOSURE CONTROL

1.1 Statement of Purpose.

In order to comply with Title 29 CFR 1910.1030, Bloodborne Pathogens, hereafter referred to as the rule, **SARGENT CORPORATION** has implemented a Bloodborne Pathogen Exposure Control Plan. All employees who may be reasonably anticipated to come into contact with human blood and other potentially infectious materials in order to perform their jobs shall be identified as having occupational exposure to blood. Employees in these positions shall be made aware of the potential for exposure and afforded the protection outlined by the referenced rule.

1.2 The Bloodborne Pathogen Exposure Control Plan includes:

1.2.1 Written standard operating procedures

1.2.2 Employee training requirements

1.2.3 Engineering controls and work practice controls designed to prevent exposure

1.2.4 Personal protective equipment

1.2.5 Decontamination procedures for clothing and equipment

1.2.6 A vaccination program at no cost to the employees

1.2.7 The maintenance of confidential medical records of vaccinations; the tracking, reporting and investigation of exposures; and provision for post exposure medical follow up and counseling

1.2.8 A system to monitor compliance with established procedures

1.3 Exposure to bloodborne pathogens shall be considered an occupational health hazard. Any communicable disease contracted as a result of a documented work place bloodborne pathogen exposure shall be an occupationally related incident.

1.4 It is intent of this Plan to provide procedures which, when followed, will prevent employee exposure to bloodborne infectious diseases. To that purpose, strict adherence to this policy is mandatory.

2.0 PLAN MAINTENANCE

- 2.1 **SARGENT CORPORATION** has appointed the Safety Director as administrator for the Plan and is responsible for the Plan's maintenance.
- 2.2 The Plan Administrator shall review the Plan at least annually, or more frequently if necessary to reflect new or modified tasks and procedures that affect occupational exposure and to reflect new or revised employee positions with occupational exposure. All updates shall be made at that time.

3.0 DEFINITIONS

- 3.1 **Blood:** human blood, human blood components and products made from human blood.
- 3.2 **Bloodborne Pathogens:** pathogenic microorganisms that are present in human blood and can cause disease to humans. Included but not limited to hepatitis B virus (HBV) and human immunodeficiency virus (HIV).
- 3.3 **Contaminated:** the presence or reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.
- 3.4 **Contaminated Laundry:** laundry that has been soiled with blood or other potentially infectious materials or may contain contaminated sharps.
- 3.5 **Decontamination:** the use of physical or chemical means to remove, inactivate or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is remedied safe for handling, use or disposal.
- 3.6 **Employee:** includes both paid full time and part time company personnel and those working per diem.
- 3.7 **Engineering Controls:** controls (e.g. sharps disposal containers, self-sheathing needles, etc.) that isolate or remove the bloodborne pathogen hazard from the workplace.
- 3.8 **Exposure Incident:** a specific eye, mouth, or other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials which result from the performance of employee's duties.
- 3.9 **Hand Washing Facilities:** a facility providing an adequate supply of running potable water, soap, and single use towels or hot air drying machines.
- 3.10 **HBV:** Hepatitis B Virus.

- 3.11 **Healthcare Professional:** a person whose legally permitted scope of practice allows him or her to independently perform activities required for Hepatitis B vaccination and post exposure evaluation and follow-up.
- 3.12 **HIV:** Human Immunodeficiency Virus.
- 3.13 **Occupational Exposure:** reasonably anticipated skin, eye, mucous membrane or parenteral contact with blood or other potentially infectious material that may result from the performance of an employee's duties.
- 3.14 **Other Potentially Infectious Material:** the following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, and other body fluids in situations where it is difficult or impossible to differentiate between body fluids, any unfixed tissue or organ (other than intact skin) from a human (living or dead).
- 3.15 **Parenteral:** piercing mucous membranes or the skin barrier through such events as needle sticks, cuts and abrasions.
- 3.16 **Pathogens:** microorganisms capable of producing disease.
- 3.17 **Personal Protective Equipment:** specialized clothing or equipment worn by an employee for protection against a hazard (general work clothes are not intended to function as protection against a hazard). Here on referred to as PPE.
- 3.18 **Plan Administrator:** individual appointed by **SARGENT CORPORATION** to administer the company's "Bloodborne Pathogen Exposure Control Plan."
- 3.19 **Regulated Waste:** liquid or semi-liquid blood or other potentially infectious materials: contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.
- 3.20 **Source Individual:** any individual living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee.
- 3.21 **Sterilize:** the use of a physical or chemical procedure to destroy all microbial life including highly resistance bacterial endospore.
- 3.22 **Universal Precautions:** an approach to infection control, according to the concept that all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV and other bloodborne pathogens.

- 3.23 **Workplace Practice Controls:** controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g. prohibiting recapping of needles by a two handed technique).

4.0 OCCUPATIONAL EXPOSURE

- 4.1 At present, no personnel at **SARGENT CORPORATION** have been identified as having occupational exposure as defined in 29 CFR 1910.1030.
- 4.2 Personnel in job classifications such as medical doctors, nurses, medical emergency first responders, and medical facility workers who clean up and dispose of medical wastes are identified as having occupational exposure. Should **SARGENT CORPORATION** employ personnel in these or other classifications having occupational exposure, the personnel shall be covered by the requirements of this Plan. They shall receive appropriate training as outlined in this Plan at least annually and prior to starting in one of these classifications.
- 4.3 Should an employee, not identified as having occupational exposure, have an exposure incident, it is anticipated to be an isolated and unique incident. The employee will receive appropriate training related to the occupational exposure, and will receive the same treatment following an exposure incident. The employee shall be offered the Hepatitis B vaccinations at no cost as a post-exposure precaution.
- 4.4 Each employee identified as having occupational exposure shall be offered the Hepatitis B vaccinations at no cost. Employees may waive the vaccination but must do so in written format. The declination form is attached to this plan. Employees who decline may change their mind at any time and request to be vaccinated. New employees in positions identified as having occupational exposure shall be offered the vaccination within ten days of employment.

5.0 LIST OF TASKS

- 5.1 This paragraph is reserved for future Plan updates as appropriate.

6.0 UNIVERSAL PRECAUTIONS

- 6.1 It is the policy of **SARGENT CORPORATION** that all human blood and other potentially infectious materials as defined in 29 CFR 1910.1030 shall be treated as if known to be infectious for HIV, HBV and other bloodborne pathogens.
- 6.2 All proper exposure controls shall be observed whenever dealing with any of these materials.

- 6.3 An exposure incident that results from the willful disregard of the proper use of personal protective equipment as stated in this Plan will be considered a willfully reckless and negligent act.
- 6.4 Any known exposure incident resulting from lack of use of proper protective equipment will be fully investigated and documented by the Plan Administrator to determine if changes can be made to prevent such occurrences in the future.

7.0 ENGINEERING CONTROLS

- 7.1 Engineering controls shall be practiced as a defense against occupational exposure. Equipment that may be contaminated with blood or other potentially infectious materials shall be examined prior to servicing and shall be decontaminated. The Plan Administrator will ensure that the information is available to all affected personnel. All appropriated precautions shall be taken to reduce exposure.

8.0 WORK PRACTICE CONTROLS

- 8.1 All personnel shall wash all potentially exposed skin with soap and warm water or flush mucous membranes with warm water immediately or as soon as feasible following contact of such body areas with blood or other potentially infectious materials. If hand-washing facilities are not immediately available, personnel are to wipe exposed skin with antiseptic hand cleaner and wipes/towelettes. Hand washing with soap and warm water shall occur at the earliest opportunity.
- 8.2 Eating, drinking, smoking, applying cosmetics, and handling contact lenses shall not be allowed in any area of contamination or possible contamination.
- 8.3 All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.
- 8.4 All contact with blood or other infectious materials that is not necessary for appropriate health care or sanitization shall be avoided.

9.0 PERSONAL PROTECTIVE EQUIPMENT

- 9.1 Where potential occupational exposure to bloodborne pathogens exists, Personal Protective Equipment (PPE) shall be used and provided at no cost to the employee.
- 9.2 PPE shall be considered “appropriate” only if it does not permit blood or other potentially infectious materials to pass through it to reach the employee’s work clothes, skin, eyes,

mouth or other mucous membranes under normal conditions of use and for the duration of time which the PPE shall be used.

- 9.3 Personnel shall use the appropriate PPE.
- 9.4 Contaminated PPE will be disposed of according to this Plan.
- 9.5 Defective PPE shall be discarded and replaced.
- 9.6 If blood or other potentially infectious materials penetrate a garment, the garment shall be removed and stored for cleaning or disposal in accordance with CFR 1910.1030(d) immediately or as soon as feasible.
- 9.7 Used PPE shall be placed in appropriately designated containers (red bags) for disposal or decontamination.
- 9.8 Disposable latex gloves shall be worn when:
 - 9.8.1 It can be reasonably anticipated that the personnel may have hand contact with blood or other potentially infectious materials, mucous membranes, non-intact skin.
 - 9.8.2 Handling or touching potentially contaminated items or surfaces.
- 9.9 Disposable latex gloves shall:
 - 9.9.1 Be replaced as soon as practical when contaminated, torn, punctured, or when their ability to function as a barrier is compromised.
 - 9.9.2 Not be washed or decontaminated for reuse.
- 9.10 Masks in combination with eye protection devices shall be worn whenever splashes, spray, spatter or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can reasonably be anticipated.
- 9.11 Tyvek suits and other protective body clothing shall be worn in occupational exposure situations to the degree determined by the task and the degree of exposure anticipated.

10.0 HOUSEKEEPING

- 10.1 Each project Supervisor shall ensure that all storage areas for PPE's are clean and sanitary.
- 10.2 Superintendents are responsible to ensure workplace conditions are clean and sanitary.
- 10.3 Good Housekeeping Work Practices:

- 10.3.1 Contaminated work surfaces shall be immediately decontaminated with an appropriate disinfectant.
- 10.3.2 The specific type of decontamination solution may vary based on the various products on the market. The solution must meet the requirements for decontamination as defined in 29 CFR 1910.1030.
- 10.3.3 Bins, pail, wastebaskets and similar receptacles intended for reuse which have a reasonable likelihood for becoming contaminated with blood or other potentially infectious materials shall be inspected and decontaminated on a regularly scheduled basis as determined by the cleaning schedule previously described, or as soon as feasible upon visible contamination.
- 10.3.4 Broken glassware which may be contaminated shall not be picked up directly with the hands. It will be cleaned up using mechanical means, such as a brush and dustpan.
- 10.3.5 Contaminated laundry shall be handled as little as possible with minimal agitation.
- 10.3.6 Spills of blood or other potentially infectious materials are to be considered, for the purpose of clean up, a hazardous materials incident. Handling and decontamination will be done in accordance with this Plan.

11.0 VACCINATIONS

- 11.1 **SARGENT CORPORATION** shall make available the hepatitis B vaccination series to all personnel in job classifications identified as having occupational exposure. Any employee who is subjected to an isolated and unique exposure incident shall be offered the HBV vaccination series as a post-exposure precautionary measure. The vaccination series shall be provided at no cost to the employee and at a reasonable time and place.
- 11.2 The vaccination series, evaluation and immunity profile shall be administered according to accepted medical protocol. An accredited laboratory shall conduct all laboratory tests at no cost to the employee.
- 11.3 The hepatitis B vaccine shall be made available to all identified personnel after the person has received the training outlined in this Plan and within 10 working days of initial assignment to a job classification identified as having an occupational exposure unless the person has previously received the complete hepatitis B vaccination series or an antibody test reveals that the person is immune, or the vaccine is inadvisable for medical reasons, or the person signs a waiver declining the vaccine.
 - 11.3.1 The vaccination shall be made available as outlined above if the person initially declines hepatitis B vaccinations, but at a later date, while still covered by this Plan decides to accept the vaccination.

- 11.3.2 If the U. S. Public Health Service recommends a routine booster dose(s) of hepatitis B vaccination at a future date, such booster dose(s) shall be made available to employees.
- 11.3.3 Personnel who decline the vaccination, refuse to sign the declination statement, and do not provide documentation of immunity will be removed from the job classification identified as occupationally exposed until such time as he/she complies with the requirements of this Plan.
- 11.3.4 All records relative to the series of vaccinations, follow up, and immunity profile are to be stored in the employee's medical personnel file.

12.0 EXPOSURE INCIDENT

- 12.1 An **Exposure Incident** is defined as a specific eye, mouth or other mucous membrane, non-intact skin or parenteral contact with blood or other potentially infectious materials that result from the performance of person's duties.
- 12.2 It is imperative that all personnel report any exposure incident to the Safety Director. The report shall be made without regard to the actual or perceived risk or the source individual for bloodborne pathogens. Following a report of an exposure incident:
 - 12.2.1 The designated physician shall evaluate the exposed employee(s) at the earliest opportunity. This confidential medical evaluation and follow up shall be documented in the employee's medical record.
 - 12.2.2 The incident shall be investigated by the Plan Administrator and/or other designated person to determine any appropriate corrective action.
 - 12.2.2.1 In accordance with 29 CFR 1910.1030 the following elements shall be covered in the post exposure investigation:
 - a. Documentation of the route(s) of exposure, and the circumstances under which the exposure incident occurred.
 - b. Identification and documentation of the source individual, unless that identification is not feasible or prohibited by State or Local Law.
 - c. The degree to which engineering, work practice, and PPE controls were utilized.
 - 12.2.2.2 The source individual's blood shall be tested as soon as feasible and after consent is obtained to determine HBV and HIV infection. In the event consent is not obtained, the Plan Administrator will establish and

document that legal consent could not be obtained. Even when the source individual's consent is not received, the source individual's blood, if available, shall be tested and the result documented.

- a. When the source individual is already known to be infected with HBV or HIV, testing need not be repeated.
- b. Results of the source individual's testing shall be made available to the exposed employee and the employee shall be informed of applicable State Law.

12.2.2.3 The exposed employee's blood shall be collected and tested as soon as feasible after consent is obtained.

- a. If the employee consents to baseline blood collection, but does not give consent at the time for HIV serologic testing, the samples shall be preserved for at least 90 days. If within 90 days of the exposure incident, the person elects to have the baseline sample test, such testing shall be done.
- b. Post exposure counseling and evaluation of reported illness shall be made available as medically indicated.
- c. Post exposure disease prevention, when medically indicated and as recommended by the U. S. Public Health Service, shall be provided at no cost to the exposed employee.

13.0 PROVIDE INFORMATION FOR HEALTHCARE

13.1 The Plan Administrator shall ensure that the post exposure evaluating healthcare professional is provided with:

13.1.1 A copy of 29 CFR 1910.1030.

13.1.2 A description of the exposed employee's duties as they relate to the exposure incident.

13.1.3 Documentation of the route(s) of exposure and circumstances under which the exposure occurred.

13.1.4 Results of the source individual's blood testing if available.

13.1.5 All medical records relevant to the appropriate treatment of the employee including vaccination status.

14.0 HEALTHCARE PROFESSIONAL'S WRITTEN OPINION

- 14.1 The evaluating physician shall obtain and provide the exposed employee and the Plan Administrator, with a copy of the evaluating healthcare professional's written opinion within 15 days of the completion of the evaluation.
- 14.2 The healthcare professional's written opinion for the hepatitis B vaccination shall be limited to whether hepatitis B vaccination is appropriate for the employee and if the person has received such vaccination.
- 14.3 The healthcare professional's written opinion for post exposure evaluation and follow up shall be limited to the following information:
 - 14.3.1 That the employee has been informed of the result of the evaluation.
 - 14.3.2 That the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials which require further evaluation or treatment.
- 14.4 All other findings or diagnoses shall remain confidential and shall not be included in this written report.

15.0 TRAINING

- 15.1 All personnel identified with occupational exposure shall receive training as follows:
 - 15.1.1 At the time of initial assignment to an identified job classification.
 - 15.1.2 At least annually thereafter.
 - 15.1.3 When changes such as modification of tasks or procedures, or institution of new tasks or procedures affect the person's occupational exposure. The additional training may be limited to addressing the new exposures created.
 - 15.1.4 An accessible copy of this Bloodborne Pathogen Exposure Control Plan and 29 CFR 1910.1030.
 - 15.1.5 General epidemiology and systems of bloodborne pathogens.
 - 15.1.6 The modes of transmission for bloodborne pathogens.
 - 15.1.7 An explanation of **SARGENT CORPORATION** Bloodborne Pathogen Exposure Control Plan and the means by which and employee can obtain a copy of the written plan.

- 15.1.8 The appropriate methods of recognizing tasks and other activities that may involve exposure to blood or other potentially infectious materials.
- 15.1.9 The use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices and personal protective equipment.
- 15.1.10 The types, proper use, location, removal, handling, decontamination and disposal for personal protective equipment.
- 15.1.11 The basis for selection of personal protective equipment.
- 15.1.12 The hepatitis B vaccinations, including information on its ability to prevent disease, safety, method of administration, the benefit of being vaccinated and that the vaccine and vaccination will be offer free of charge.
- 15.1.13 The appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials.
- 15.1.14 The procedures to follow if an exposure incident occurs including the method of reporting the incident and the medical follow up that will be made.
- 15.1.15 The post exposure evaluation and follow up that the evaluating physician will provide to the employee following an exposure incident.
- 15.1.16 The labeling requirements for medical waste.
- 15.1.17 An opportunity for interactive questions and answers with the person conducting the session.
- 15.2 The person conducting the training shall be knowledgeable in the subject matter covered by the elements contained in the training program as it relates to the workplace.

16.0 RECORD KEEPING

- 16.1 **Medical Records.** The Plan Administrator shall maintain an accurate record for each employee with occupational exposure, in accordance with 29 CFR 1910.1020. This record shall include:
 - 16.1.1 The name and employee number of the employee.
 - 16.1.2 A copy of the employee's hepatitis B vaccination status including the dates of all the hepatitis B vaccinations and any medical records relative to the person's ability to receive this vaccination.

- 16.1.3 A copy of all results of examinations, medical testing, and follow up procedures as required following an exposure incident.
- 16.1.4 A copy of the employee's healthcare professional's written opinion as required by description in this Plan.
- 16.1.5 A copy of the information provided to the healthcare professional as described in this Plan.
- 16.1.6 The Plan Administrator shall ensure that employee medical records required in the Plan are kept confidential and are not discussed or reported without the employee's express written consent to any person within or outside of the workplace except as required by law.
- 16.1.7 **SARGENT CORPORATION**, in conjunction with the company designated physician, will maintain these records for at least the duration of employment, plus 30 years in accordance with 29 CFR 1910.1020.
- 16.2 **Training Records.** Training records required by this Plan shall include:
 - 16.2.1 The dates of the training sessions.
 - 16.2.2 The contents or a summary of the training sessions.
 - 16.2.3 The names and qualifications of persons conducting the training sessions.
 - 16.2.4 The names and job titles of all persons attending the training sessions.
 - 16.2.5 The Plan Administrator shall maintain training records for 3 years from the date on which the training occurred.

17.0 AVAILABILITY AND TRANSFER OF RECORDS

- 17.1 All records required to be maintained by this Plan shall be made available, upon request, to the Assistant Secretary and the Director of the National Institute for Occupational Health and Safety or the U. S. Department of Health and Human Services, or their designated representative.
- 17.2 All employee medical records required to be maintained by this Plan shall be provided upon request for examination and copying to:
 - 17.2.1 The Plan Administrator;
 - 17.2.2 The Employee;
 - 17.2.3 Anyone having written consent of the employee.

- 17.3 **SARGENT CORPORATION** shall comply with requirements involving the transfer of records as set forth in 29 CFR 1910.1020
- 17.4 If the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, the employer shall notify the Director of the National Institute for Occupational Health and Safety at least three months prior to their disposal and transmit them to the Director if required by the Director to do so, within that three-month period.

18.0 ADMINISTRATION OF PLAN

- 18.1 The Plan Administrator shall work with Superintendents to ensure that the Plan is adhered to.
- 18.2 The Plan Administrator shall be available to assist Superintendents with this Plan.
- 18.3 Each jobsite having employees in the designated categories shall develop a separate addendum to cover department specifics.

SARGENT CORPORATION**BLOODBORNE PATHOGEN EXPOSURE CONTROL PLAN****Hepatitis B Virus Declination**

I understand that due to my occupational exposure to blood or other potentially infectious materials, as defined in 29 CFR 1910.1030, I may be at risk if acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Current Job Classification

Name (Last, First, M.I.)

Signature

Date

Signature of Parent of Guardian and
Relationship (if under 18 years of age)

Date

Plan Administrator or Superintendent

Signature

Date

19.0 IF AN EXPOSURE OCCURS

19.1 **Purpose.** Despite dedicated use of engineering and work practice controls, and proper use of personal protective equipment, exposure CAN occur. The purpose of this attachment is to outline the procedure to follow if an employee has been or may have been exposed to a bloodborne pathogen.

19.2 **Policy.** The following procedures will occur immediately following an exposure:

19.2.1 Wound Care:

19.2.1.1 Clean wound with soap and warm water (when not immediately possible use appropriate wipes that are provided).

19.2.1.2 Flush mucous membranes for at least 15 minutes with water/saline.

19.2.1.3 Other wound care dictated by severity of wound, (i.e. stop bleeding).

19.2.2 Contact:

19.2.2.1 Superintendent or Operations Manager

19.2.2.2 Plan Administrator

19.2.2.3 Hospital (Infection Control or Emergency Room)

19.3 In order to provide the most effective medical care, all exposure or suspected exposure incidents must be reported immediately. Some forms of post exposure disease preventatives are best instituted within one hour of exposure. This time frame should be kept in mind when reporting an exposure or suspected exposure. All exposure incidents shall be evaluated to determine the exposure management course. Not all exposures carry the same risk or require the same post exposure management options. The Healthcare Professional will determine these options.

SARGENT CORPORATION

BLOODBORNE PATHOGEN EXPOSURE REPORT

Incident was evaluated by: _____ Date: _____
(print name)

Following recommendation(s) was/were made to avoid future exposure:

Action Taken:

Employee Comments:

Evaluator Signature: _____

Date: _____

XIII. TRANSITE PIPE HANDLING PLAN

(Last Revised 02/04/2016)

1.0 SCOPE AND APPLICATION

- 1.1 This Plan covers projects located in the State of Maine only. Requirements in other states may vary.
- 1.2 This Plan covers the requirements and procedures for the safe handling and disposal of non-friable asbestos / cement piping (transite pipe) used in water distribution systems and wastewater collection systems. It is the policy of **SARGENT CORPORATION** that its employees shall not handle any other asbestos materials.
- 1.3 Transite pipe shall be handled in accordance with the regulations and procedures required by OSHA 29 CFR 1926.1101 *Asbestos in Construction*, and DEP CMR 405.4 *Storage, Transport and Disposal of Asbestos Containing Materials*.

2.0 DEFINITIONS

- 2.1 **Amended Water:** water to which surfactant (wetting agent) has been added to increase its ability to penetrate the ACM pipe.
- 2.2 **Asbestos Containing Material (ACM):** any material containing more than one percent asbestos.
- 2.3 **Authorized Person:** means any person authorized by the employer to be present in regulated areas.
- 2.4 **Class II Asbestos Work and Training Requirements:** activities involving the handling and disposal of substantially intact asbestos transite cement pipe. Employees performing these activities must first successfully complete an 8-hour OSHA Class II awareness course.
- 2.5 **Asbestos Competent Person:** one who has successfully passed an asbestos supervisor / competent person 40-hour training course and has been given corporate authority to define and alter ACM handling procedures. All transite pipe handling and removal operations shall be conducted under the supervision of an Asbestos Competent Person.
- 2.6 **HEPA Filter:** a high efficiency particulate air filter capable of filtering at least 99.97 percent of all particles 0.3 micrometers in diameter.
- 2.7 **Negative Initial Exposure Assessment:** a demonstration by the employer that employee exposures are below OSHA limits.

2.8 **OSHA Limits:**

2.8.1 **Permissible Exposure Limit (PEL):** 0.1 fibers per cubic centimeter of air (f/cc), averaged over an 8-hour period.

2.8.2 **Excursion Limit:** 1.0 fiber per cc of air, averaged over a 30-minute period.

2.8.3 A respirator with HEPA filters is required for exposures above these limits.

2.9 **Prohibited Activities:** cutting, grinding, crushing or purposely breaking transite pipe.

2.10 **Regulated Area:** an area marked by barrier tape and signs within which transite pipe handling occurs.

3.0 **NOTIFICATION OF OTHERS**

3.1 The nature of the work and its potential hazards shall be communicated to owner representatives, subcontractors and others at the site by means of a jobsite memo.

3.2 Sample Jobsite Memo:

SARGENT CORPORATION is performing OSHA Class II asbestos transite pipe handling operations at this project site. These activities are being conducted in regulated areas marked by red "Danger Asbestos" barrier tape and OSHA "Danger Asbestos" signs. Only Authorized Personnel who are properly trained and equipped are allowed in the regulated areas. We thank you for your cooperation and attention to this matter. If you have any questions, please see the jobsite superintendent.

4.0 **REGULATED AREAS**

4.1 All transite pipe removal and disposal activities shall be conducted within regulated areas.

4.2 Regulated areas shall be marked by means of signs and barrier tape.

4.3 Access to regulated areas shall be limited to authorized persons.

4.4 **Respirators.** All persons entering regulated areas are required to wear half face or full-face respirators equipped with HEPA filters unless/until the competent person determines by means of personal air monitoring that employee exposures to airborne asbestos are below OSHA limits.

- 4.5 **Additional PPE.** Each person performing work in a regulated area is required to wear safety glasses, hardhat, rubber or disposable gloves, steel toe boots and a disposable Tyvek suit.
- 4.6 **Prohibited Activities.** Employees shall not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated area.
- 4.7 Employees who work in regulated areas shall remove Tyvek suits and wash their hands and face prior to leaving the work area and before performing hand-to-mouth activities similar to those listed in paragraph 4.6 above.

5.0 EXPOSURE ASSESSMENTS AND MONITORING

- 5.1 Personal exposure assessments shall be performed under the direction of the competent person.
- 5.2 While work is being performed in a regulated area, personal air monitoring shall be conducted in the breathing zone of the employee who is in closest contact with the transite pipe.
- 5.3 Initially, personal air monitoring shall be conducted on a daily basis during transite pipe handling operations. Based on consistent results below the OSHA limits, the competent person may elect to sample less frequently.
- 5.4 Results of laboratory tests conducted on personal air samples shall be posted in the superintendent's office for employee viewing.

6.0 WORK PRACTICES FOR TRANSITE PIPE

- 6.1 Transite pipe handling projects shall be performed as directed by a trained Asbestos Supervisor. The Asbestos Supervisor shall inspect these projects on a regular basis.
- 6.2 Employees shall complete an asbestos awareness training program within 12 months prior to performing work that requires contact with transite pipe.
- 6.3 Transite pipe shall be thoroughly wetted prior to and during its removal.
- 6.4 Care shall be taken to remove the pipe in an intact state. Cutting, abrading, crushing or purposely breaking the pipe is not allowed under this plan.
- 6.5 Dry sweeping of ACM is not allowed. Vacuums used to clean up ACM must be equipped with HEPA filters.

7.0 RESPIRATORY PROTECTION

- 7.1 **SARGENT CORPORATION** shall provide half face respirators equipped with HEPA (N, R, or P-100) filters to employees who are required to enter asbestos regulated areas.
- 7.2 Medical evaluations shall be performed for employees required to wear negative pressure respirators.
- 7.3 Employees shall be fit tested prior to respirator use and every 6 months during transite pipe handling operations.
- 7.4 As determined by the competent person, employees may be allowed to perform work in regulated areas without respiratory protection if personal exposure monitoring consistently shows that levels of airborne asbestos are below OSHA limits. In all cases employees shall be allowed to wear a respirator if they choose.

8.0 DISPOSAL OF TRANSITE PIPE

- 8.1 Transite pipe shall not be intentionally broken or crushed prior to or during disposal.
- 8.2 Transite pipe may be accepted by any landfill licensed by the State of Maine; or
- 8.3 Transite pipe may remain buried in its original trench; or
- 8.4 The piping may be reburied in whole sections on site, at its original trench depth or deeper immediately upon abandonment (Note: The site burial location shall be recorded on an as-built site plan or similar document for the property owner's records); or
- 8.5 The piping may be removed to a site other than a licensed demolition debris landfill for immediate burial with 18 inches of soil and 6 inches of seeded topsoil. Record burial location as follows:
 - 8.5.1 A map indicating the location of the transite pipe burial site shall be forwarded to the Maine Department of Environmental Protection, Attn: Asbestos Control Division, State House Station 17, Augusta, ME 04333-0017.
 - 8.5.2 A permanent on site surveying benchmark shall be established and maintained on all asbestos waste disposal areas. This benchmark shall be shown on all record drawings for the disposal area.

8.5.3 All asbestos waste disposal areas shall be described on a survey plan and recorded in the Registry of Deeds as follows:

8.5.3.1 The type of facility located on the lot and the dates of its operation and closure;

8.5.3.2 The coordination of the disposal areas; and

8.5.3.3 The location and the composition, extent and depth of the asbestos waste material deposited.

8.6 Transportation.

8.6.1 **SARGENT CORPORATION** shall not transport asbestos containing materials.

8.6.2 Off-site transport of transite pipe will be subcontracted to a licensed hauler.

9.0 RECORD KEEPING

9.1 Personal exposure air monitoring results shall be kept for a period of 30 years.

9.2 Employee medical records shall be kept for 30 years beyond the employee's term of employment.

9.3 Employee training records shall be kept at least 1 year beyond the employee's term of employment.

XIV. FLEET SAFETY PLAN

(Adopted 4/02/07. Revised 2/10/09, 1/5/10)

1.0 INTRODUCTION

- 1.1 The information contained in this Plan is for quick reference for **SARGENT CORPORATION** employees who operate company owned motor vehicles on public highways.
- 1.2 For a better understanding of safety rules and regulations regarding the operation of a commercial motor vehicle, please refer to the **Federal Motor Carrier Safety Regulations Handbook (FMCSR)** and/or **Emergency Response Guidebook**. Company drivers may obtain the above publications by contacting the Equipment Dispatcher or Safety Director.
- 1.3 Only a few of the very important issues pertaining to company drivers are summarized within. In addition to the procedures summarized in this Section, company truck drivers are also subject to the applicable requirements of Federal and State Departments of Transportation (DOT) and Environmental Protection Agencies (EPA, DEP, etc.), the Occupational Safety and Health Administration (OSHA), Mine Safety and Health Administration (MSHA), and all sections of this company Health and Safety Plan.

2.0 MOTOR VEHICLE SAFETY POLICY

- 2.1 It is the policy of **SARGENT CORPORATION** to provide and maintain company owned or leased motor vehicles in good shape and safe operating condition.
- 2.2 Employees are expected to operate vehicles safely to prevent accidents which could result in injuries and property loss.
- 2.3 We will work as a team to uphold high standards of vehicle maintenance and safe vehicle operation. We will be considerate of the traveling public at all times.

3.0 VEHICLE USE

- 3.1 **Passenger Vehicles.** An employee who has a valid driver's license and has been authorized by his/her supervisor will be permitted to operate a company owned passenger car or pickup.
- 3.2 **Commercial Motor Vehicles.** An employee who has been authorized by his/her supervisor, has the appropriate driver's license (and any necessary endorsements) as required by state and federal DOT, and meets all other state and federal qualifications will be permitted to operate a commercial vehicle.

- 3.2.1 **Definition. A Commercial Motor Vehicle (CMV)** means any self-propelled or towed motor vehicle used in commerce on a highway when the vehicle (including attached trailers if any):
 - 3.2.1.1 Has a gross vehicle weight rating (or combination gross weight rating) of more than 10,000 pounds (or weighs more than 10,000 pounds); or
 - 3.2.1.2 Is designed to transport more than 8 passengers (including the driver) for compensation; or
 - 3.2.1.3 Is designed to transport more than 15 passengers (including the driver), but is not used to transport passengers for compensation; or
 - 3.2.1.4 Is any weight and is used to transport hazardous materials in a quantity requiring placarding.
- 3.2.2 A Commercial Driver's License (CDL) is required for drivers of some but not all Commercial Vehicles. License classes and endorsement requirements for drivers of commercial vehicles are covered in Paragraph 4.
- 3.3 **Personal Vehicle on Company Business.** Employees who are authorized by their supervisor to use their personal vehicles for company business are subject to the requirements of this Fleet Safety Plan, including:
 - 3.3.1 Maintaining the appropriate driver's license (and any necessary endorsements).
 - 3.3.2 Maintaining current auto liability insurance.
 - 3.3.3 Maintaining current state vehicle registrations and inspections.
 - 3.3.4 Maintaining the personal vehicle in safe operating condition.
- 3.4 **Unauthorized Use of Vehicles.** Authorized drivers will not allow an unauthorized person to operate a company vehicle. No exceptions!
- 3.5 **No Passengers Policy.** No passengers shall be allowed to ride in company owned commercial motor vehicles except as authorized by a supervisor.

4.0 TRUCK DRIVER SELECTION

4.1 **Driver Evaluation.** The selection of commercial truck drivers is based on their driving ability. In evaluating employees and job applicants as commercial drivers, management will:

- 4.1.1 Review past driving performance and work experience by evaluating an employment application, conducting a formal interview, and completing previous employer reference checks.
- 4.1.2 Review the employee's Motor Vehicle Record (MVR) annually and more frequently if reasons warrant.
- 4.1.3 Ensure the employee has a valid Commercial Driver's License (CDL) with appropriate endorsements as necessary and is qualified to operate the type of vehicle he/she will drive.
- 4.1.4 Review the results of pre-employment and subsequent physical examinations. Full time employees classified as Truck Drivers and other CDL holders who may be asked to drive a truck on public roadways must at minimum undergo and pass a biannual DOT physical, and carry a current DOT card.
- 4.1.5 Confirm negative results of pre-employment drug tests. A prospective employee who fails to pass the pre-employment drug test shall not be hired.

4.2 **License Classes.**

- 4.2.1 **Class A:** Any combination of vehicles (truck and one or more trailers) when the gross weight ratings or registered weights of the truck and trailer(s) combined is 26,001 or more pounds, and when the gross weight or gross weight rating of the trailer(s) is in excess of 10,000 pounds. A Class A license is a Commercial Driver's License (CDL). Holders of a Class A license may, with any appropriate endorsements, operate all vehicles in Class B and Class C.
- 4.2.2 **Class B:** Any single vehicle with a gross vehicle weight rating or registered weight of 26,001 or more pounds or any such vehicle towing a vehicle not in excess of 10,000 pounds gross vehicle weight rating or gross weight. A Class B license is a CDL. Holders of a Class B license may, with any appropriate endorsements, operate all vehicles in Class C.
- 4.2.3 **Class C:** Any single vehicle or combination of vehicles that does not meet the definitions of Class A or Class B. Holders of a Class C license may operate a vehicle with a gross vehicle weight less than 26,001 pounds (13 tons).
 - 4.2.3.1 Holders of a Class C license may operate passenger vehicles, pickup trucks, mechanic and welder service trucks, and small rack trucks.

- 4.2.3.2 Holders of a Class C license may tow a vehicle so long as the total gross vehicle weight rating or gross weight of the combination of vehicles is not in excess of 26,000 pounds.
- 4.2.3.3 A Class C license is a CDL only if it carries one of the endorsements listed in Section 4.3 below.

Note: A person who drives or tows a vehicle that is either designed to transport 16 or more passengers, including the driver, or is placarded for hazardous materials must hold a CDL with the proper endorsement(s).

- 4.3 **License Endorsements:** To operate specialized vehicles with specific loads, one or more endorsements may be required. The following 6 endorsements can only be added to a Commercial Driver's License:

- 4.3.1 - **N** - **Tank Vehicle.** This endorsement is for drivers of vehicles which carry non-hazardous gases or liquids in bulk only. A bulk tank is a tank that has a capacity greater than 119 gallons. **Water truck drivers need an "N" (or "X") endorsement to haul on a public road.**
- 4.3.2 - **H** - **Hazardous Materials.** This endorsement is for drivers of vehicles carrying solid hazardous material in bulk when required to be placarded by Federal DOT regulation only. A bulk container is one that has a maximum capacity greater than 119 gallons as a receptacle for a solid.
- 4.3.3 - **X** - **Tank Vehicle with Hazardous Materials.** This endorsement is for drivers of vehicles with bulk tanks designed or used to carry hazardous materials. This combines the endorsements "N" and "H" into one.

A vehicle with a bulk tank for carrying hazardous materials must be placarded. A bulk tank is one with a capacity larger than 119 gallons.

The requirements of this paragraph apply regardless of the gross weight of the vehicle or the actual quantity of hazardous material in the bulk tank. **Fuel truck drivers need an "X" endorsement (or both "N" and "H" endorsements) to haul on a public road.**

- 4.3.4 - **T** - For the operation of double/triple trailers where allowed by law. (Triple trailers are not allowed in Maine.)
- 4.3.5 - **P** - For the operation of passenger vehicles designed to transport over 15 passengers including the driver.
- 4.3.6 - **Y** - For the operation of school buses designed to transport over 15 passengers including the driver.

5.0 **FLEET MOTOR CARRIER REQUIREMENTS**

- 5.1 **Commercial Motor Vehicle (CMV) Registration.** (Note: This paragraph lists some registration requirements in Maine. The requirements may vary from state to state.)
- 5.1.1 A truck used on public roadways, including an eligible pickup truck, must be registered as a **CMV** for the actual gross weight of the truck and load, including the weight of any trailer and its load.
 - 5.1.2 **Booster.** Once a CMV is registered in Maine, the gross weight may be increased for a period of one to eight months by paying an additional fee.
 - 5.1.3 A pickup truck that is registered as a **passenger vehicle** may not exceed 6000 pounds gross vehicle weight of the pickup and its load, even though the vehicle specifications may list a larger gross vehicle weight.
 - 5.1.4 A pickup truck registered as a passenger vehicle may tow:
 - 5.1.4.1 A camper trailer of any weight; or
 - 5.1.4.2 A utility trailer that does not exceed 2000 pounds gross vehicle weight, so long as the combined gross vehicle weight of the truck and the utility trailer does not exceed 8000 pounds.
 - 5.1.4.3 Otherwise, a pickup truck towing a trailer where the combined gross vehicle weight exceeds 6000 pounds must be registered as a CMV.
- 5.2 **Annual Review of Driving Record.**
- 5.2.1 In accordance with Section 391.25 of the Federal Motor Carrier Safety Regulations, the Human Resource Department shall conduct an annual review of the driving record of each employee who drives a commercial vehicle in excess of 10,000 pounds gross vehicle weight.
 - 5.2.2 Each driver will receive a form summarizing the results of the annual review of his/her driving record. Employees will be asked to review this information, make any necessary corrections and/or additions to the record, attest to its accuracy, and return it to the Human Resource Department. The list of violations shall be included in the qualifications section of the driver's personnel file.
 - 5.2.3 The person reviewing a driving record shall use the criteria in Sec. 391.25 to determine whether the driver meets minimum requirements for safe driving or is disqualified to drive a motor vehicle pursuant to Sec. 391.15.
 - 5.2.4 Recommendations to disqualify a driver pursuant to an unsatisfactory driving record shall be made to the company President and/or Vice President of Operations.

- 5.2.5 A note, setting forth the date upon which the review was performed and the name of the person who reviewed the driving record shall be included in the qualifications section of the driver's personnel file.

5.3 Notification of Violations.

- 5.3.1 Each CDL driver who operates a commercial vehicle with gross vehicle weight of 26,001 pounds or more (or one that is placarded for hazardous materials), and who is convicted of violating, in any type of motor vehicle, a State or local law relating to motor vehicle traffic control (other than a parking violation), shall notify the Human Resource Department in writing within 30 days of such conviction.
- 5.3.2 Such notification shall contain the following information:
 - 5.3.2.1 Driver's full name and driver's license number;
 - 5.3.2.2 Location where motor vehicle violation occurred;
 - 5.3.2.3 The specific motor vehicle violation for which the person was convicted and any suspension, revocation, or cancellation of driving privileges which resulted from the conviction (**notification of any suspension of driving privileges is required within 24 hours of the suspension**);
 - 5.3.2.4 Date of conviction; and
 - 5.3.2.5 Driver's signature.
- 5.3.3 Additionally, if such violation and conviction occur in a State or jurisdiction other than the one which issued the driver's license, the driver shall also send a written copy of the above information to an official designated by the State which issued the license. This notification to the state official must also be made within 30 days of the conviction.

- 5.4 **Medical Examiner Certification.** Each employee who drives a commercial vehicle in excess of 10,000 pounds gross vehicle weight (or any placarded vehicle) on public roads must undergo and pass a biannual DOT physical and carry a current DOT card. Employee DOT physicals will be scheduled by the Human Resource Department. The company will pay for the cost of routine DOT physicals, and employees will be paid for their time during company scheduled physicals.

- 5.5 **Driving Rules.** Each employee who at any time drives a commercial vehicle in excess of 10,000 pounds gross vehicle weight is subject to all applicable driving rules listed in **Part 392 – Driving of Commercial Motor Vehicles** of the Federal Motor Carrier Safety Regulations. All CMV drivers shall receive training in and a copy of Part 392.

- 5.6 **Accessory Parts and Equipment.** The installation and maintenance of accessory parts and equipment on company owned, leased, or rented commercial vehicles shall be done only as approved by the manufacturer and shall be performed by qualified personnel.
- 5.7 **Exemptions.** The requirements of §5.2 through §5.4 do not apply to an employee who:
 - 5.7.1 Does not drive a CMV as a normal and routine part of his/her employment; and
 - 5.7.2 Does not drive a CMV that requires placards for hazardous materials; and
 - 5.7.3 Does not drive a CMV more than 100 air-miles from his/her normal work reporting location; and
 - 5.7.4 Does not drive a CMV outside the state of Maine.

6.0 FLEET SAFETY REQUIREMENTS

- 6.1 **Safe Operation.** The driver of a commercial vehicle is responsible and shall be held accountable for the safe operation of the vehicle.
 - 6.1.1 Drivers shall not drive a defective or substandard vehicle which he/she believes could reasonably result in personal injury or property damage.
 - 6.1.2 Drivers shall not drive a vehicle during severe weather conditions or in potentially dangerous situations when he/she believes to do so could reasonably result in personal injury or property damage.
 - 6.1.3 Drivers shall not exceed the posted speed limit.
 - 6.1.4 All drivers shall have had at least one 30-minute rest break within the previous 8 hours on duty.
 - 6.1.5 Supervisors of company drivers shall respect each driver's responsibility to understand his/her own and the vehicle's limitations. No one shall permit or require a driver to operate a vehicle in a manner or situation the driver believes to be unsafe.
 - 6.1.6 The use of handheld cellular/mobile phones while driving commercial vehicle is prohibited. Other distracting activities such as eating or drinking are not permitted while driving a company owned vehicle. Pull off to a safe location before reading a map or calling for directions. Any activity that creates a distraction while driving leads to an increased risk of having an accident.
- 6.2 **Daily Vehicle Inspections.** Each employee who drives a commercial vehicle in excess of 10,000 pounds gross vehicle weight shall complete a **documented** inspection of their truck(s) on a daily basis.

- 6.2.1 Each daily vehicle inspection shall be recorded on an “Official Driver’s Vehicle Inspection Report” as prescribed by the Federal Motor Carrier Safety Administration.
- 6.2.2 Inspection booklets shall be located in all commercial vehicles. Replacement inspection booklets are available from the Equipment Dispatcher.
- 6.2.3 If a defect is found that could cause an unsafe situation or if the vehicle does not have working back-up alarm, the vehicle shall be immediately tagged out of service until the problem is corrected.
- 6.2.4 For less serious deficiencies that are unlikely to cause an unsafe situation, repairs shall be made and defective items replaced as soon as possible.
- 6.2.5 The daily inspection record is made in duplicate. One copy remains in the booklet which shall be kept in the truck. The other copy shall be delivered to the project superintendent or the driver’s supervisor together with the driver’s timecard and a copy of his/her daily log. After any necessary repairs have been made, the superintendent’s copy shall be forwarded to Eric Gifford at Stillwater for final review and filing.
- 6.3 **Seatbelts.** Seatbelts are provided in all company vehicles. Drivers and passengers shall use seatbelts at all times while riding in company vehicles. At no time shall the number of people in a vehicle exceed the number of functioning seat belts.
- 6.4 **Backup Alarm.** Each commercial motor vehicle shall be equipped with a functioning backup alarm which is audible above surrounding background noises. A truck that does not meet this standard shall not be allowed on a **SARGENT CORPORATION** jobsite until the problem has been corrected.
- 6.5 **Secure Loads.** Drivers of commercial vehicles hauling cargo are responsible to ensure that all cargo is secure from any unplanned movement.
 - 6.5.1 Any pieces of gravel, rocks, debris, or other loose objects that could fall from the truck during transit must be removed before leaving the loading area.
 - 6.5.2 Gravel truck covers shall be used when provided.
 - 6.5.3 The vehicle’s cargo must be distributed and properly secured. Requirements for securing specific types of cargo (such as heavy equipment, concrete pipe, etc.) are covered in FMCSR §393.100 through §393.142.
 - 6.5.4 The vehicle’s tailgate, doors, tarpaulins, spare tire, cargo fastening devices, and other equipment must be secured.
 - 6.5.5 The cargo or any other object may not be placed where it will obscure the driver’s view or interfere with his/her free movements or exit from the vehicle.

- 6.5.6 Drivers shall inspect the cargo and all devices used to secure the cargo and make any necessary adjustments after the first 50 miles and every 150 miles thereafter.
- 6.6 **Emergency Equipment.** Each commercial motor vehicle shall be equipped as follows:
 - 6.6.1 **Fire Extinguisher.** The fire extinguisher shall be securely mounted in a readily available location. It must be inspected monthly to ensure it is filled and ready for use.
 - 6.6.2 **Spare Fuses.** There must be at least one spare fuse for each type/size of fuse needed to operate any of the vehicle's required parts and accessories.
 - 6.6.3 **Warning Devices for Stopped Vehicles.** Three bidirectional emergency reflective triangles that conform to the requirements of the Federal Motor Vehicle Safety Standard must be stored in the vehicle.

7.0 HOURS OF SERVICE & LOG BOOKS

- 7.1 **Hours of Service Requirements.** No person shall drive a commercial vehicle with a gross vehicle weight of more than 10,000 pounds (or a placarded vehicle of any weight):
 - 7.1.1 More than 11 total driving hours following 10 consecutive hours off duty; or
 - 7.1.2 After the 14th hour since starting work following 10 consecutive hours off duty; or
 - 7.1.3 After having been on duty 60 hours in any 7 day period. (Note: The 7 day period may re-start after 34 successive hours off duty. For drivers who operate within a 50 air miles of a jobsite, the 7 day period may re-start after 24 hours off duty.)
- 7.2 **Exemption from Hours of Service Requirements.** A driver who works exclusively within a 100 air mile radius of his/her work reporting location in the state of Maine is exempt from the hours of service requirements listed in §7.1 above. If at any time the driver crosses a state line or makes a trip more than 100 air miles in a CMV, all hours of service requirements are in effect. The 100 mile exemption does not apply to the driver of any vehicle that requires a placard for hazardous materials.
- 7.3 **Log Books (Driver's Record of Duty Status).** Every driver who operates a commercial motor vehicle with a gross vehicle weight of more than 10,000 pounds (or a placarded vehicle of any weight) shall record his/her duty status for each 24 hour period.
 - 7.3.1 Duty status shall be recorded in duplicate on a specified grid in a log book provided by the Equipment Dispatcher.
 - 7.3.2 The duty status shall be recorded the grid as: "off duty" (OFF), "driving" (D), or "on-duty not driving" (ON).

- 7.3.3 The driver shall note his/her location (including city and state) in the “Remarks” section of the grid for each non-driving period throughout the day.
- 7.3.4 The driver is the only person allowed to make daily log entries relating to the driver’s duty status. Drivers shall keep their entries current to the last change in duty status.
- 7.3.5 The following information must be included on the daily log in addition to the grid:
- 7.3.5.1 **Date:** Enter today’s date at top of log.
 - 7.3.5.2 **Name and Address of Carrier:** **SARGENT CORPORATION**
378 Bennoch Road
Stillwater, ME 04489
 - 7.3.5.3 **Home Terminal Address:** Enter the address of the project or terminal where truck is assigned.
 - 7.3.5.4 **Total Miles Driving Today:** Enter total miles driven today from midnight to 11:59 PM.
 - 7.3.5.5 **Truck (and trailer) Numbers:** Enter the unit number(s).
 - 7.3.5.6 **Driver’s Signature.** Driver certifies that all entries are true and correct.
 - 7.3.5.7 **Time Base Used.** All company drivers shall use the 60 hour / 7 day time base (see Sec. 5.8.3). Each 24 hour period begins at 12:00 midnight.
 - 7.3.5.8 **Recording days off duty.** Two or more consecutive 24-hour periods may be recorded on one duty status record.
 - 7.3.5.9 **Total hours.** The total hours for each duty status shall be entered at the right of the grid. The total of these entries shall equal 24 hours.
- 7.3.6 **Completed Logs.** Daily log entries are made in duplicate. Originals shall be turned in each day with the driver’s timecard. They will be delivered to the Equipment Dispatcher who will keep them on file in Stillwater. The duplicate copy remains in the driver’s log book which stays with the driver. The driver’s log book must include a record of the previous 7 day time period.
- 7.3.7 **Exemption from Log Book Requirement.** An employee who is not classified as a truck driver, but who occasionally drives a commercial motor vehicle on public highways does not need to keep daily logs on a full time basis. However if the employee at any time drives a CMV more than 100 air miles from his/her work reporting location, the employee must first complete daily logs for the previous seven days, including the day of the trip.

Each employee who is classified as a truck driver and/or who regularly drives a CMV for the company is expected to maintain a current daily log at all times when he/she is on duty. The log book stays with the driver if he/she changes trucks.

7.3.8 Example of a Daily Log.

On May 1, 2007, Charlie Gravel hauled gravel all day from Turner to Lewiston.

He started work at 6:00 AM at the Lewiston project site. Then he spent ½ hour doing morning exercises, discussing the day's STA (Safety Task Assessment) with the crew, completed a walk around inspection, and checked his truck's fluid levels. He logged this time as "On Duty – Not Driving."

He hauled all day, stopping for coffee break at the gravel pit at 8:30 and again for lunch in Auburn at 11:30. Charlie stopped driving at 6:00 PM back at the Lewiston project site, where he spent ½ hour doing a post-trip inspection of his truck.

During each time period when Charlie was not driving, he brought his daily log up to date and showed his location. He logged driving time as "Driving," coffee break and post-trip inspection as "On Duty – Not Driving," and lunch break as "Off Duty." Then at quitting time he completed his log and entered the total number of hours and total mileage.

Charlie's log entries are shown on the following page:

DRIVER'S DAILY LOG
(24 HOURS)

Original - File at home terminal
Duplicate - Driver retains if his/her possession for eight days

5, 01, 07
(Month) (Day) (Year)

226
(24 HOURS)

226
Total Miles Driving Today

29160
Total Mileage Today

RECAP
Complete at end of workday.
12

On-duty hours today. (Total lines 3 & 4)

70 Hour/8 Day Drivers

Name of Carrier or Carriers
SARGENT CORPORATION

Main Office Address
378 Bennoch Rd, STILLWATER, ME

Home Terminal Address
FANCY SITE, Cool Road, Lewiston, ME

I certify these entries are true and correct:
Charles Gravel

Driver's Full Signature

Co-Driver's Name

Truck/Tractor and Trailer Numbers or License Plate(s) / State (show each unit)

29160

1. OFF DUTY

2. SLEEPER BERTH

3. DRIVING

4. ON DUTY (NOT DRIVING)

REMARKS

SHIPPING DOCUMENTS:

B/L or Manifest No.
or SC-Gravel
Shipper & Commodity

FROM: Hauling gravel from Turner, ME to Lewiston Fancy Site
USE TIME STANDARD AT HOME TERMINAL

Enter name of place you reported and where released from work and when and where each change of duty occurred.

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A. Total hours on duty last 7 days, including today.
 B. Total hours available tomorrow, 70 hr. minus A.*
 C. Total hours on duty last 8 days, including today.
 60 Hour/7 Day Drivers
 A. 24
 B. 36
 C. 24
 *If you have not exceeded the 60/70 hour limit and take 34 consecutive hours off duty, you have 60/70 hours available again.

8.0 ALCOHOL & CONTROLLED SUBSTANCES

8.1 General.

- 8.1.1 A qualified member of the Human Resource Department shall present and discuss the information in this section with each employee who is expected to operate a CMV with a gross vehicle weight of 26,001 pounds or more, or one that is placarded for hazardous materials. Any questions regarding this section may be addressed to Heather Hutchinson in the HR Department at 1-800-533-1812.
- 8.1.2 Each CDL driver will be provided with information on testing requirements and consequences for the misuse of alcohol and/or use of controlled substances
- 8.1.3 Drivers will be provided with information concerning the effects of alcohol and controlled substances use on an individual's health, work and personal life.
- 8.1.4 Certificate of receipt. Each driver shall be provided with a copy of this Section of the HASP, and shall be required to sign a statement certifying that he/she has received these materials. The original signed statement will be kept in the driver's personnel file in Stillwater.

8.2 Prohibitions.

- 8.2.1 No driver shall use alcohol while on duty, or while off duty and driving a company vehicle, or within four hours of reporting for duty or driving a company vehicle. No driver shall report for duty or remain on duty while under the influence of alcohol.
- 8.2.2 No driver shall use a controlled substance at any time, except when the use is pursuant to the instructions of a licensed medical practitioner who has advised the driver that the substance will not adversely affect his/her ability to operate a commercial motor vehicle.
- 8.2.3 No company driver shall transport alcoholic beverages in any form or in any location in a CMV.

8.3 Substance Abuse Testing. This paragraph summarizes the FMCSR requirements for substance abuse testing. These rules apply to each employee who holds a Commercial Driver's License and who at any time drives on public roadways, a commercial motor vehicle that either:

- has a gross vehicle weight of 26,001 pounds or more; or
- is designed to transport 15 or more passengers including the driver; or
- is of any size and is placarded to transport hazardous materials.

- 8.3.1 **Pre-employment Testing.** In accordance with the Sargent Corporation Pre-employment Substance Abuse Testing Program, each applicant for employment

shall undergo mandatory drug testing for controlled substances. A verified negative test result is required as a condition of employment.

8.3.2 Random Testing. Each driver shall be enrolled in the company's random drug and alcohol testing program.

8.3.2.1 Our random testing program is administered by LexisNexis who randomly selects candidates for testing on a quarterly basis.

8.3.2.2 Selected drivers are informed when and where they are to appear at a qualified collection facility for testing. Urine specimens are collected under DOT guidelines and sent to a certified toxicology laboratory for test results. A chain of custody form including both the driver's social security number and the specimen number accompanies each specimen to ensure the results are attributed to the correct driver.

8.3.2.3 Test results are kept strictly confidential. Corporate officials are made aware of test results solely on a "need to know" basis for operational purposes.

8.3.2.4 Refusal to submit to a scheduled random substance abuse test shall be counted as a positive test. Failure to appear for a scheduled test without an acceptable excuse and/or failure to cooperate with testing personnel during the test procedure shall be considered a refusal to submit to the test.

8.3.3 Post Accident Testing. Both alcohol and controlled substance tests will be administered to CDL drivers as soon as practical following an accident when:

8.3.3.1 The accident involves a human fatality (regardless of fault); or

8.3.3.2 A citation has been issued to the CDL driver for a moving traffic violation arising from the accident, and the accident resulted in bodily injury with immediate medical treatment away from the accident site; or

8.3.3.3 A citation has been issued to the CDL driver for a moving traffic violation arising from the accident, and the accident resulted in disabling damage to a motor vehicle requiring it to be towed or transported away from the accident site.

8.3.3.4 **Post-accident testing has been amended to include non-CDL personnel driving company vehicles and personnel operating privately-owned vehicles conducting company business (See 6.0 Drug and Alcohol-Free Workplace Policy).**

8.3.3.5 If a required alcohol test cannot be administered within 2-hours following an accident, the Human Resource Department shall prepare

and maintain a record stating the reasons the test was not promptly administered.

- 8.3.3.6 If a required alcohol test cannot be administered within 8-hours and/or the controlled substance test cannot be administered within 32-hours following an accident, efforts to administer such test(s) will cease and the Human Resource Department shall prepare and maintain a record stating the reasons the test(s) could not be administered.

8.3.4 **Reasonable Suspicion Testing.**

- 8.3.4.1 A supervisor who has participated in a **Supervisory Drug & Alcohol Training** program shall require a driver to submit to alcohol and controlled substance testing when the supervisor has reasonable suspicion that the driver is under the influence of or is impaired by one or more of these substances.

- 8.3.4.2 The trained supervisor's determination that reasonable suspicion exists to require the driver to undergo an alcohol or controlled substance test must be based on specific direct observations made by the supervisor concerning the appearance, behavior, speech, or body odors of the driver.

8.4 **Consequences of Prohibited Substance Use.**

- 8.4.1 Any employee who is seen using alcohol or illegal drugs during working hours shall be terminated from employment.
- 8.4.2 A driver who has been tested with a blood alcohol concentration between 0.02 and 0.04 shall not be allowed to operate a CMV for a period not less than 24 hours following the test.
- 8.4.3 A driver who has tested positive for illegal drugs or has an alcohol concentration greater than 0.04 shall not be allowed to drive a commercial vehicle until the driver has:
 - 8.4.3.1 Been evaluated by a Substance Abuse Professional (SAP);
 - 8.4.3.2 Complied with any recommended treatment; and
 - 8.4.3.3 Received a negative result on a return-to-duty test for the prohibited substance of concern.
- 8.4.4 Unannounced follow-up tests for the prohibited substance are also required. The number of required follow-up tests and their scheduling shall be determined by the SAP.



CMV DRIVER REQUIREMENTS

BASED ON GROSS VEHICLE WEIGHT AND DISTANCE TRAVELED

		Driving Within 100 Air-miles of the Normal Work Reporting Location, and Not Outside Maine		Drivers Traveling More Than 100 Air Miles from a Maine Jobsite, or Driving in any other State	
	All Placarded Vehicles (any distance, any weight)	GVW Between 10,000 - 26,000 lbs.	GVW >26,000 lbs.	GVW Between 10,000 - 26,000 lbs.	GVW >26,000 lbs.
CDL Required; Endorsements as Needed	X		X		X
Current DOT Physical Required	X	X**	X**	X	X
Random Substance Abuse Testing Pool	X		X		X
Drivers are Subject to Driving Rules (Part 392)	X	X	X	X	X
Requirement to Keep a Logbook	X	X**	X**	X	X
Hours of Service Requirements Apply	X			X	X
Post Trip Inspection Report Required	X	X	X	X	X

** Employees who do not regularly drive a CMV, but who occasionally drive a CMV **only in the state of Maine and always within 100 miles of their jobsite** do not need to have a physical examination or medical card, and do not need to keep a logbook.



Excellence for Generations.

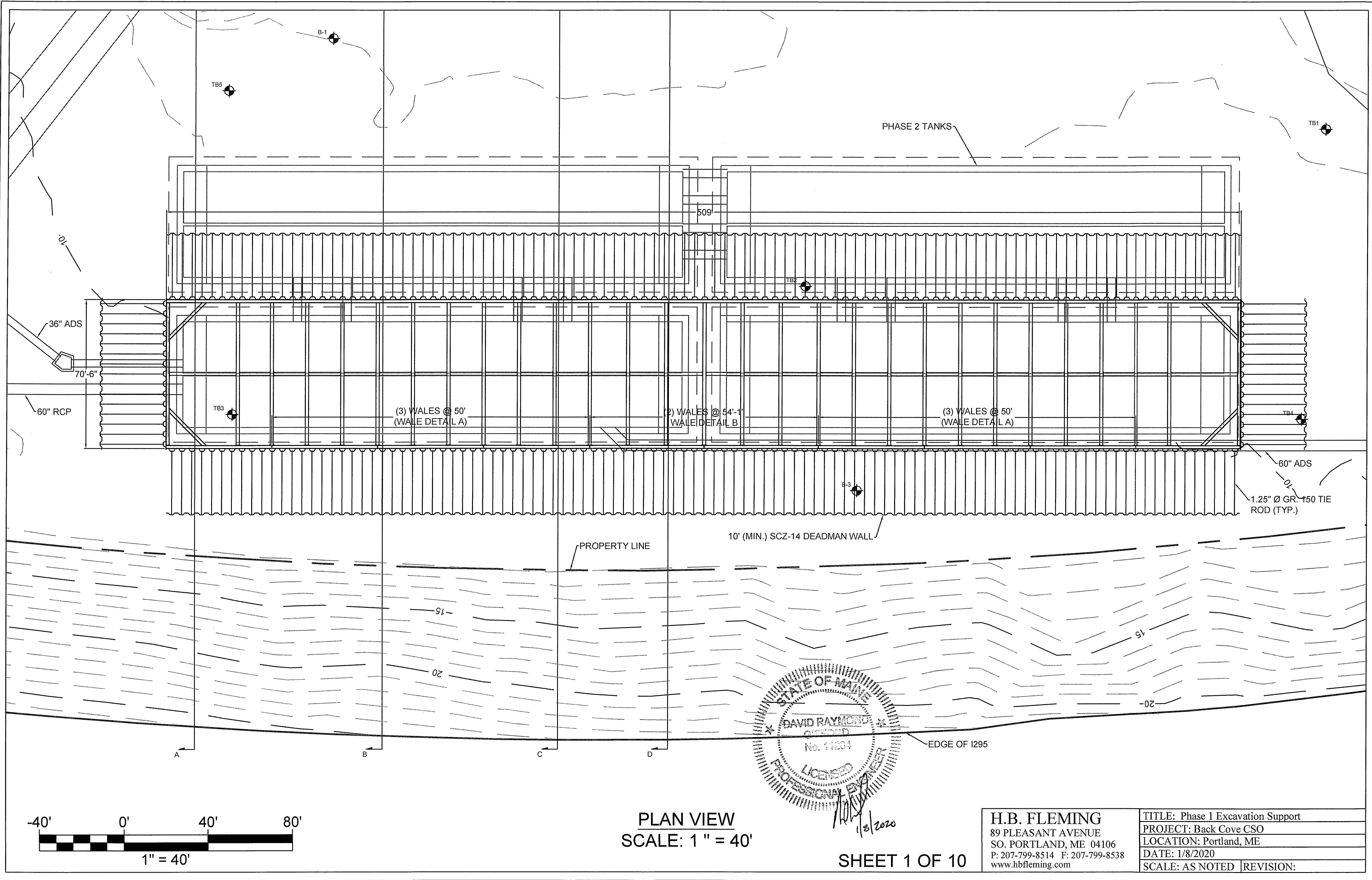
CONCRETE SAFETY POLICY

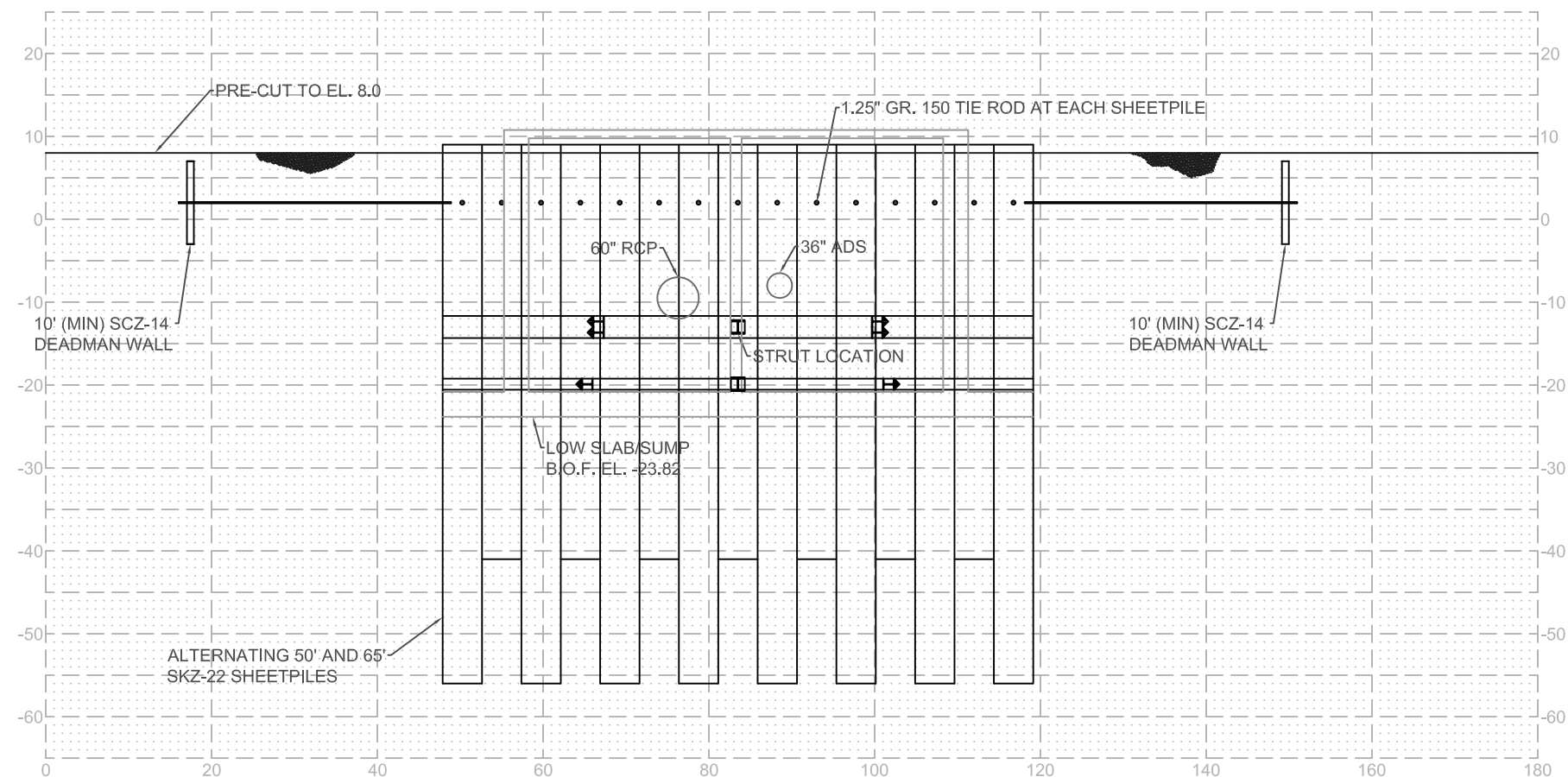
It is the policy of **Sargent Corporation** that all employees are entitled to work under safe and healthful conditions in the performance of their duties. We shall endeavor to maintain a safe and healthful workplace, provide safer working equipment, appropriate training, and necessary and appropriate personal protective equipment for all employees. The following policy is designed to just address our effort to work safely with Concrete.

The following are the minimum requirements for working with concrete. (see OSHA 29 CFR 1926 Subpart Q for detailed regulations)

- 1.1 **Warning**-Wet concrete can cause serious alkali burns and if in direct contact with skin and eyes. Always refer to the proper SDS for more information about concrete if needed.
- 1.2 **Required Personal Protective Equipment (PPE).** 1: Safety glasses and face shield if near the placement of concrete. Safety glasses if just finishing concrete. 2: Chemical or impervious gloves will be worn 3: Long sleeve shirts, long pants. 4: Hard Hat 5: Rubber boots or rubber pullover boots will be worn.
- 1.3 **First aid measures; Skin contact:** Wash the affected skin area with soap/cleanser and rinse with plenty of water. Wash hand thoroughly before eating or drinking. **Eye Contact:** Immediately and thoroughly irrigate with clean water for at least 15 minutes. Do not rub eyes as concrete is abrasive and may scratch the surface of the eye. **Ingestion:** If material enters the mouth, do not induce vomiting. Give plenty of water to drink. Seek medical attention immediately.
- 1.4 **Accidental release measures;** Fresh wet concrete should not be allowed to accidentally enter waterways or storm drains. An established wash out area for concrete trucks will be designated to prevent any concrete from leaving the project site. A stockpile of items to help prevent this occurrence should be available. This means hay bales, fibric, or other material to help keep the concrete contained.

APPENDIX K: CSO STORAGE TANKS EXCAVATION SUPPORT DESIGN





EAST/WEST WALL PROFILE
SCALE: 1 " = 20'

NOTES:

1. All sheetpiles and framing will be ASTM A572 Gr. 50 material
2. All tie rods will be DYWIDAG Gr. 150 Threadbar or equivalent
3. Stone columns will be constructed using $\frac{3}{4}$ " or 1" stone
4. Design assumes groundwater at Elevation 0.0. This groundwater elevation must be maintained by dewatering/similar once the excavation for the frame at Elevation -13.0 begins
5. Bolts and fasteners will be ASTM A325 or SAE Grade 5 (min.) unless noted otherwise
6. Welds will be made using E70XX electrodes by AWS D1.1 certified welders

CONSTRUCTION PROCEDURE:

1. Pre-excavate to El. 8.0
2. Drive sheetpiles as indicated on plan
3. Install stone columns on 15' c-c grid as shown in stone column detail
4. Excavate to Elevation -1.0
5. Install tie rods for deadmen at Elevation 2.0
6. Excavate to Elevation -11.0
7. Excavate local trenches to install frame at Elevation -13.0
8. Install frame at Elevation -13.0
9. Excavate to bottom of footing grade for Mid Slab and Hi Slab. Do not excavate for Low Slab
10. Excavate and place stone under Mid Slab and Hi Slab in 20'x20' sections
11. Cast Mid Slab and Hi Slab against sheetpiles
12. Install Sump Frame at Elevation -19.9
13. Excavate and place stone under Low Slab/Sump in 20'x20' sections
14. Cast Low Slab against sheetpiles
15. Remove Sump Frame at Elevation -19.9
16. Remove frame at Elevation -13.0
17. Cast concrete for tanks
18. Backfill tanks
19. Remove sheetpiles as required for Phase 2 cofferdam

H.B. FLEMING

89 PLEASANT AVENUE
SO. PORTLAND, ME 04106
P: 207-799-8514 F: 207-799-8538
www.hbfleming.com

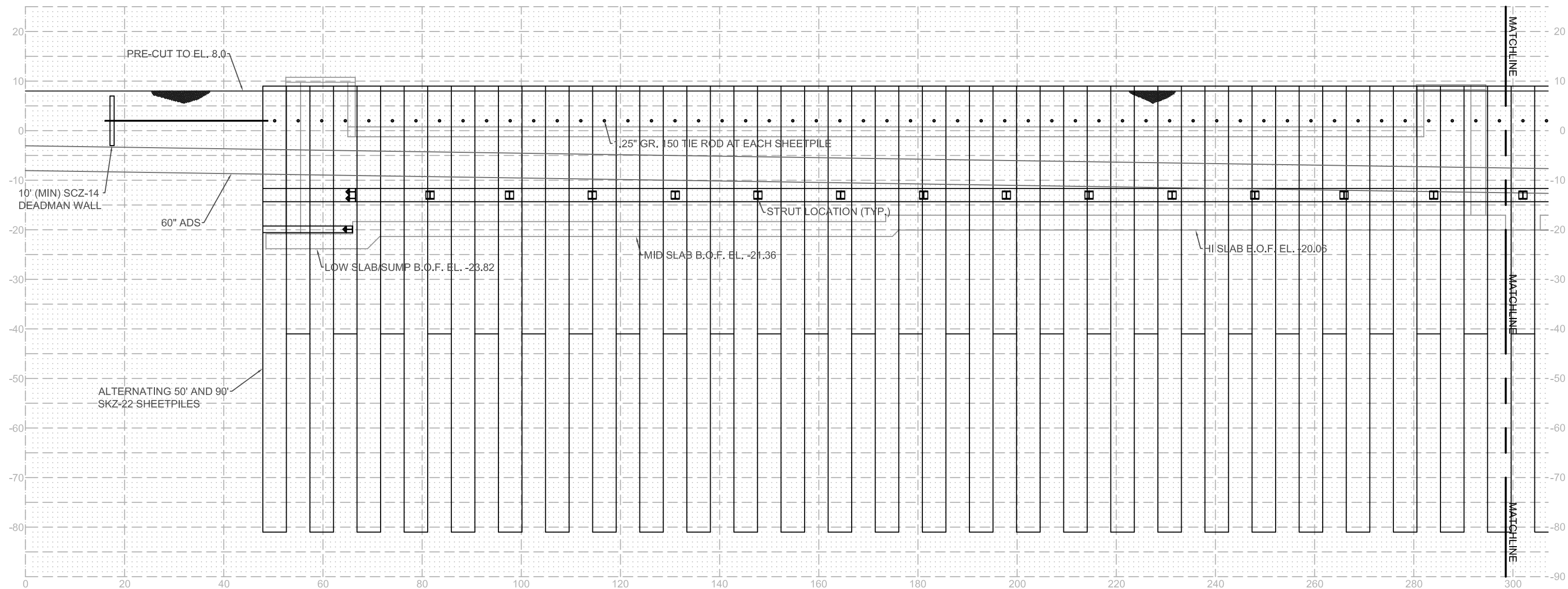
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PROJECT: Back Cove CSO

LOCATION: Portland, ME

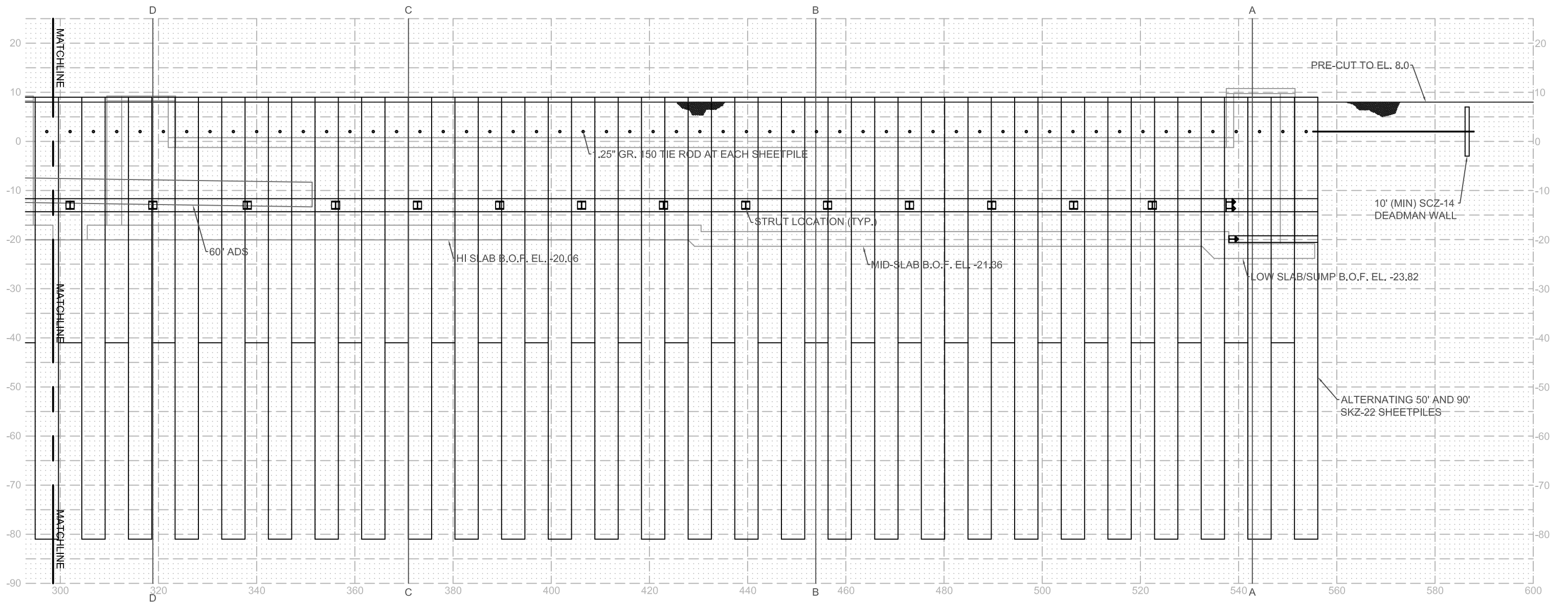
DATE: 1/8/2020

SCALE: AS NOTED REVISION:



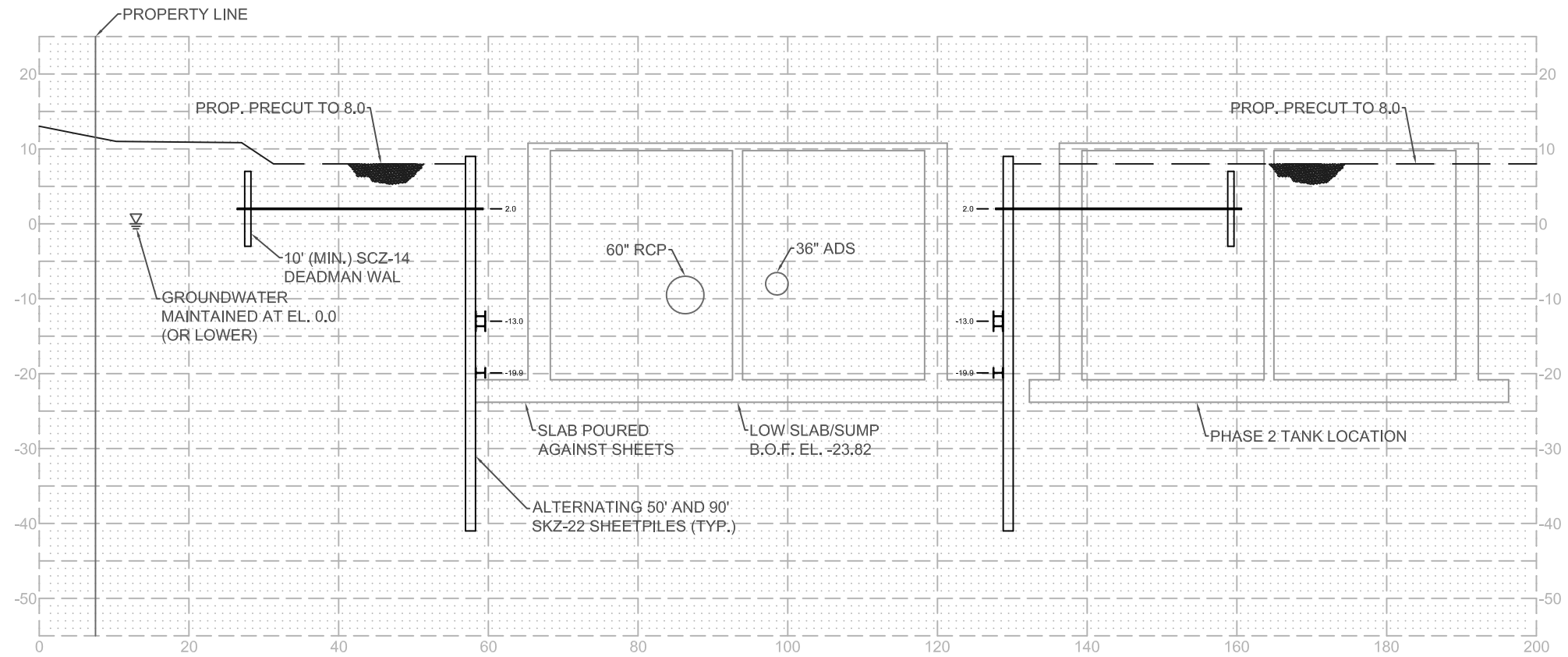
SOUTH/NORTH WALL PROFILE
SCALE: 1 " = 20'

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	LOCATION: Portland, ME	
	DATE: 1/8/2020	
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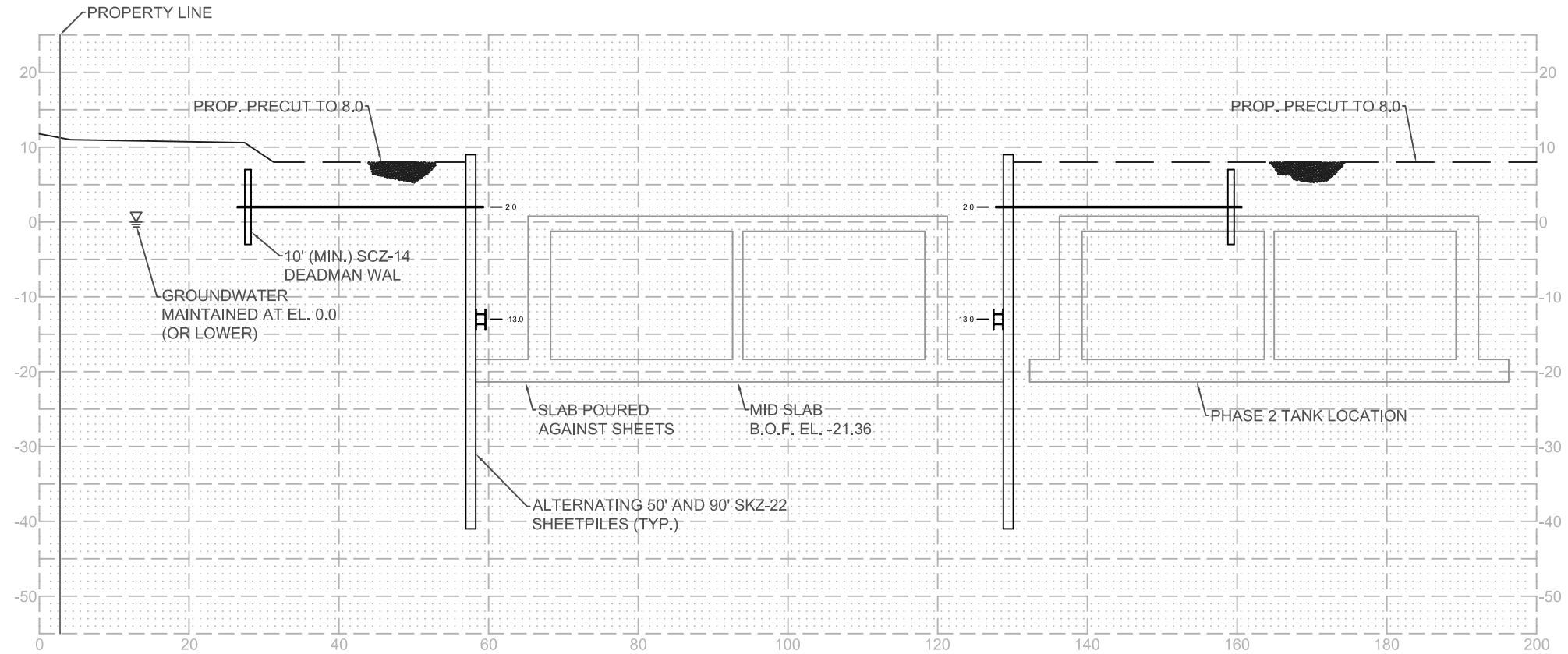


SOUTH/NORTH WALL PROFILE
SCALE: 1 " = 20'

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	LOCATION: Portland, ME	
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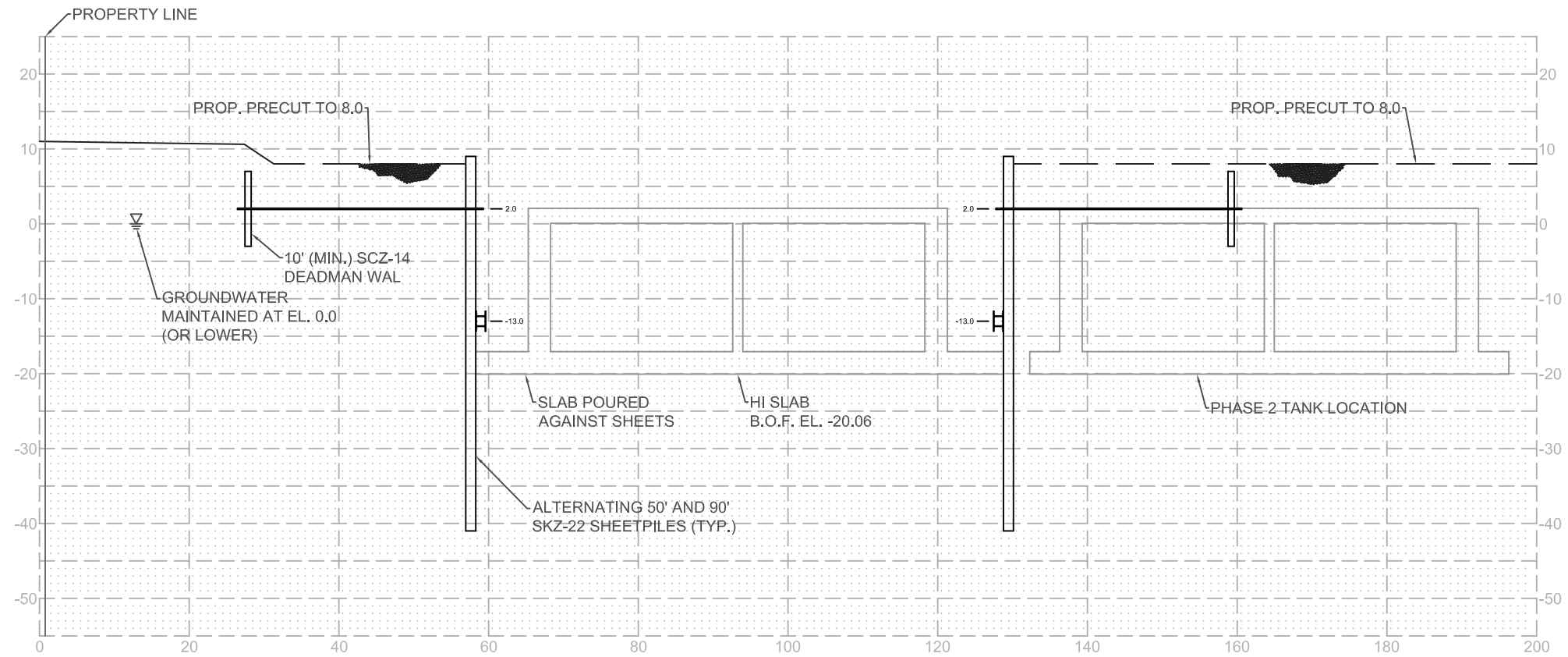


SECTION A-A
SCALE: 1" = 20'

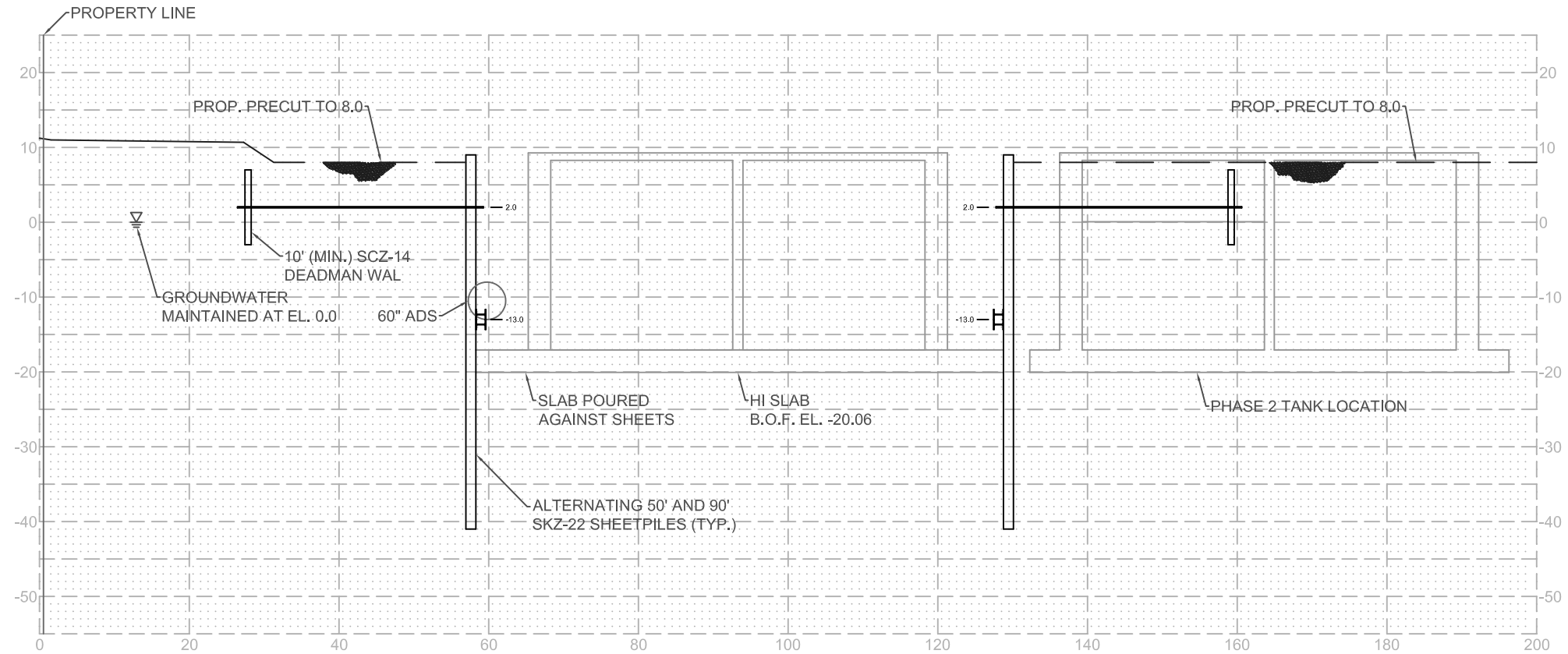


SECTION B-B
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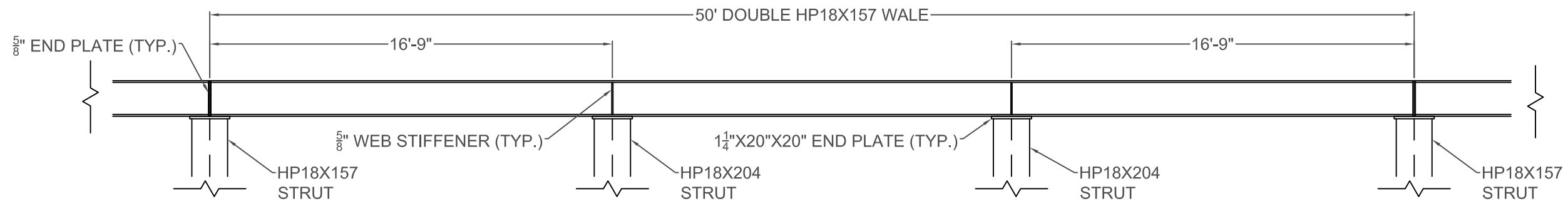
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	PROJECT: Back Cove CSO	
	LOCATION: Portland, ME	
	DATE: 1/8/2020	
	SCALE: AS NOTED	REVISION:



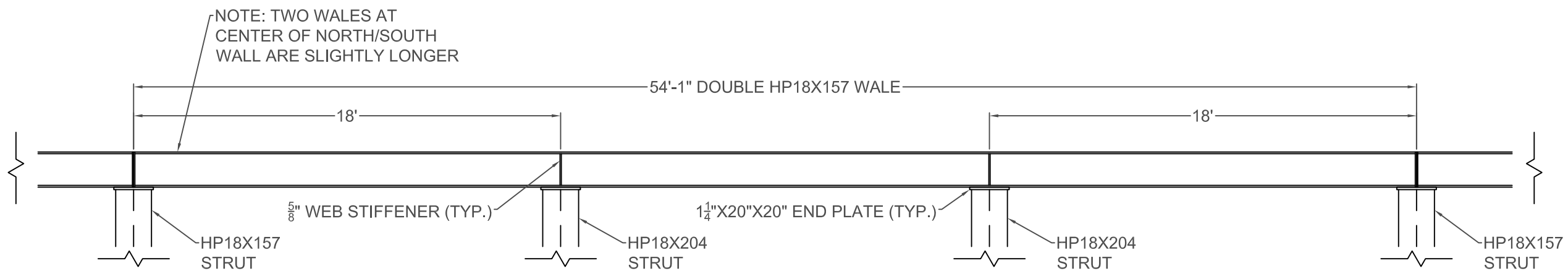
SECTION C-C
SCALE: 1 " = 20'



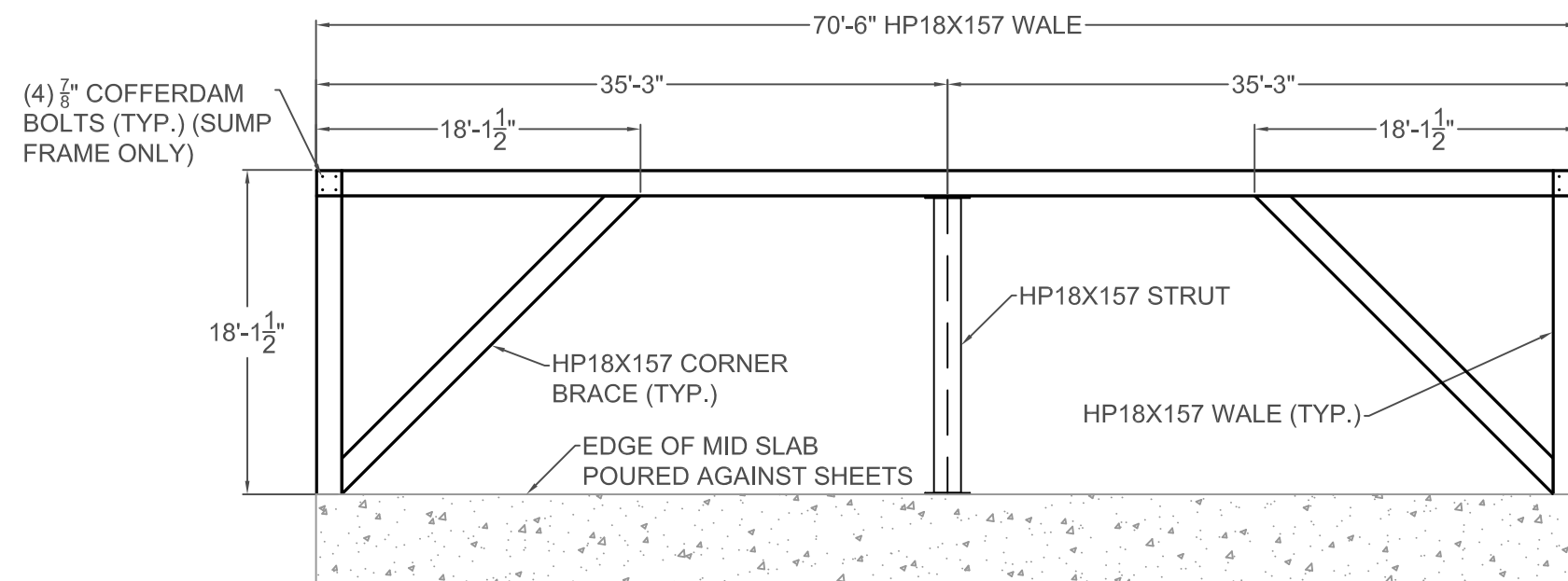
SECTION D-D
SCALE: 1 " = 20'



WALE DETAIL A (EL. -13.0)
SCALE: 1"=5'

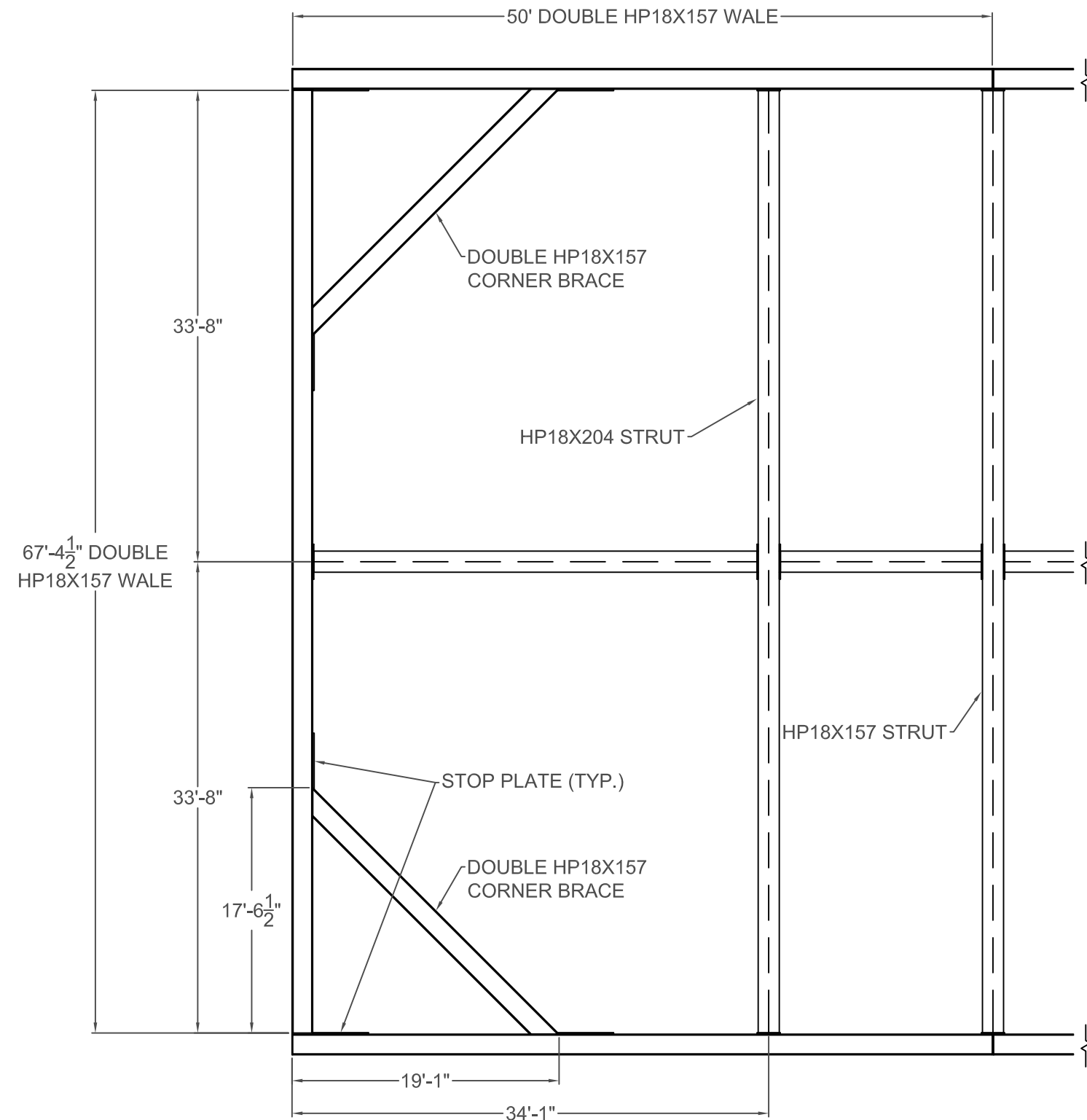


WALE DETAIL B (EL. -13.0)
SCALE: 1"=5'



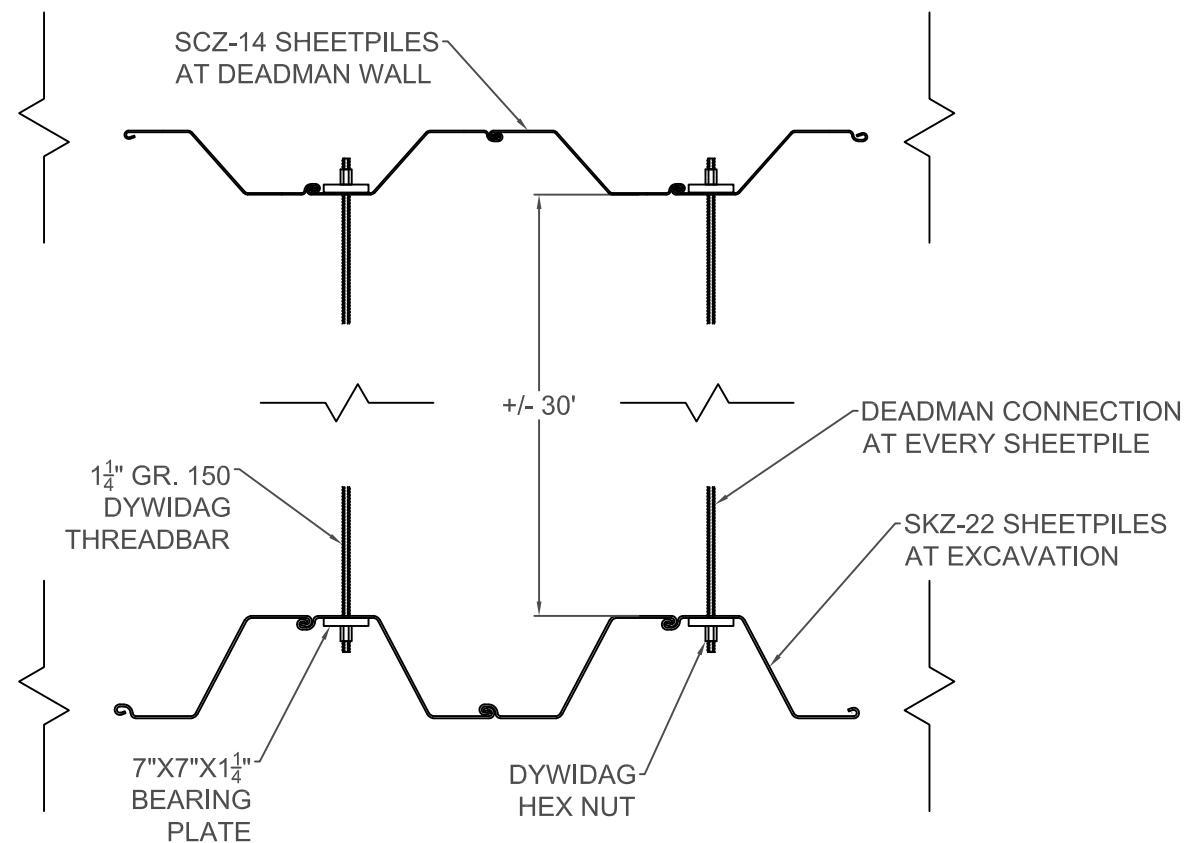
SUMP FRAME DETAIL (EL. -19.9)
SCALE: 1"=10'

H.B. FLEMING 89 PLEASANT AVENUE SO. PORTLAND, ME 04106 P: 207-799-8514 F: 207-799-8538 www.hbfleming.com	TITLE: Phase 1 Excavation Support
	PROJECT: Back Cove CSO
	LOCATION: Portland, ME
	DATE: 1/8/2020
	SCALE: AS NOTED REVISION:

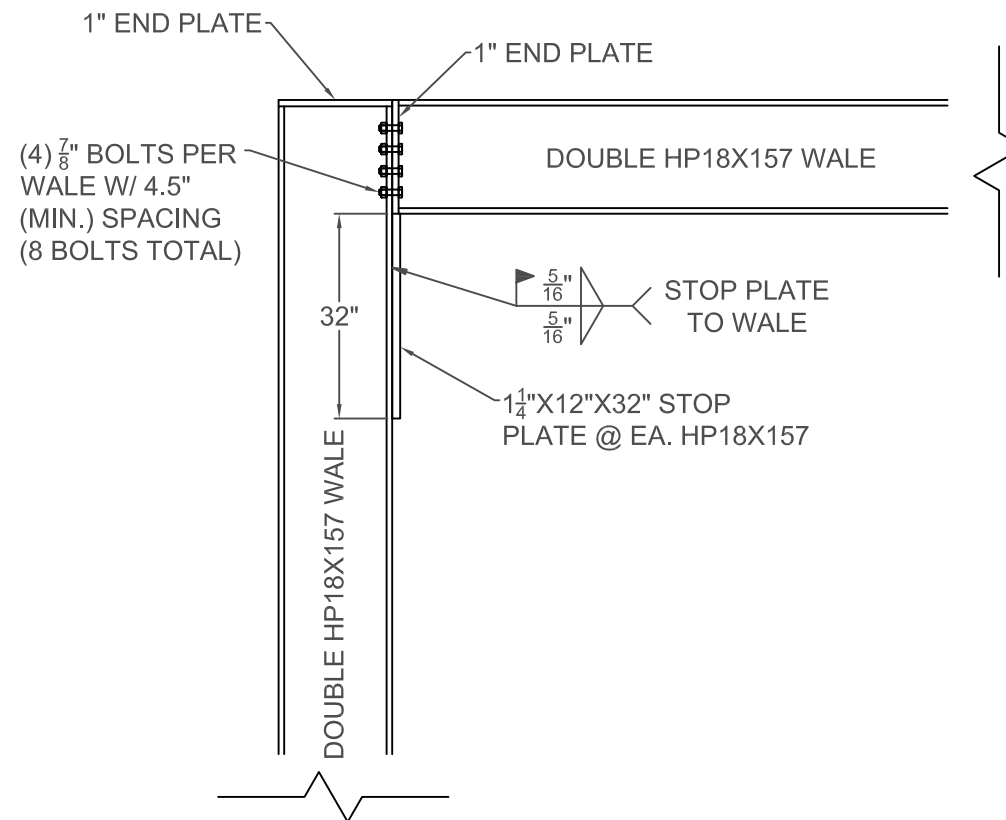


CORNER BRACE FRAME DETAIL (EL -13.0)
SCALE: 1"=10'

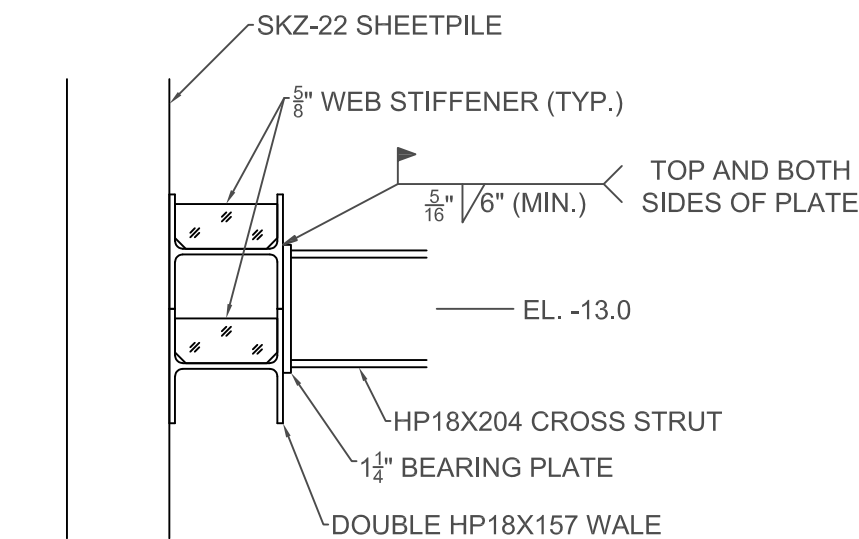
H.B. FLEMING 89 PLEASANT AVENUE SO. PORTLAND, ME 04106 P: 207-799-8514 F: 207-799-8538 www.hbfleming.com	TITLE: Phase 1 Excavation Support
	PROJECT: Back Cove CSO
	LOCATION: Portland, ME
	DATE: 1/8/2020
	SCALE: AS NOTED REVISION:



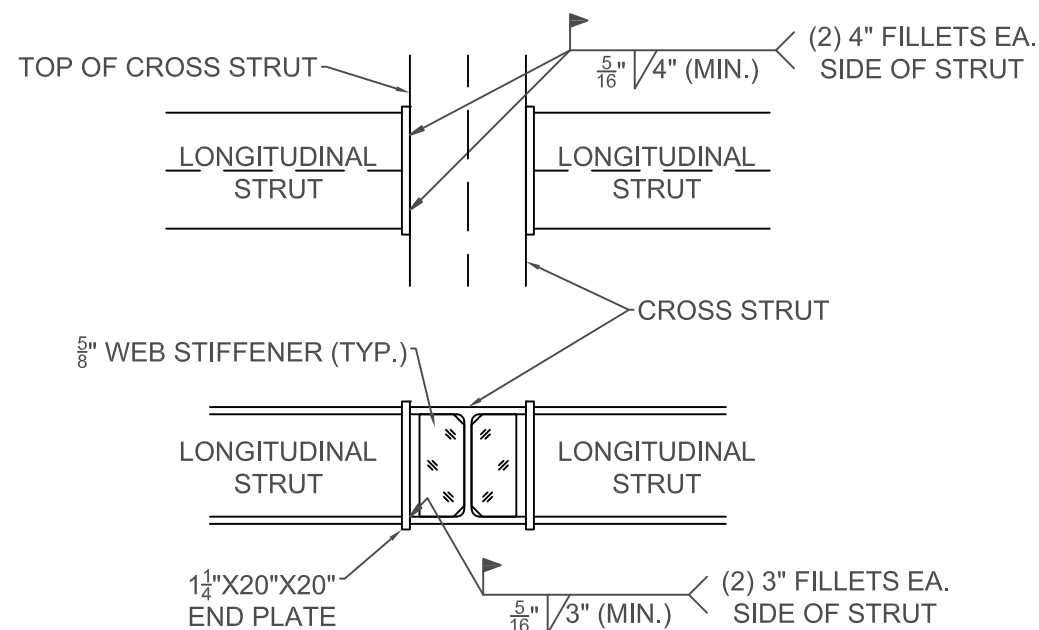
DEADMAN CONNECTION DETAIL
SCALE: NTS



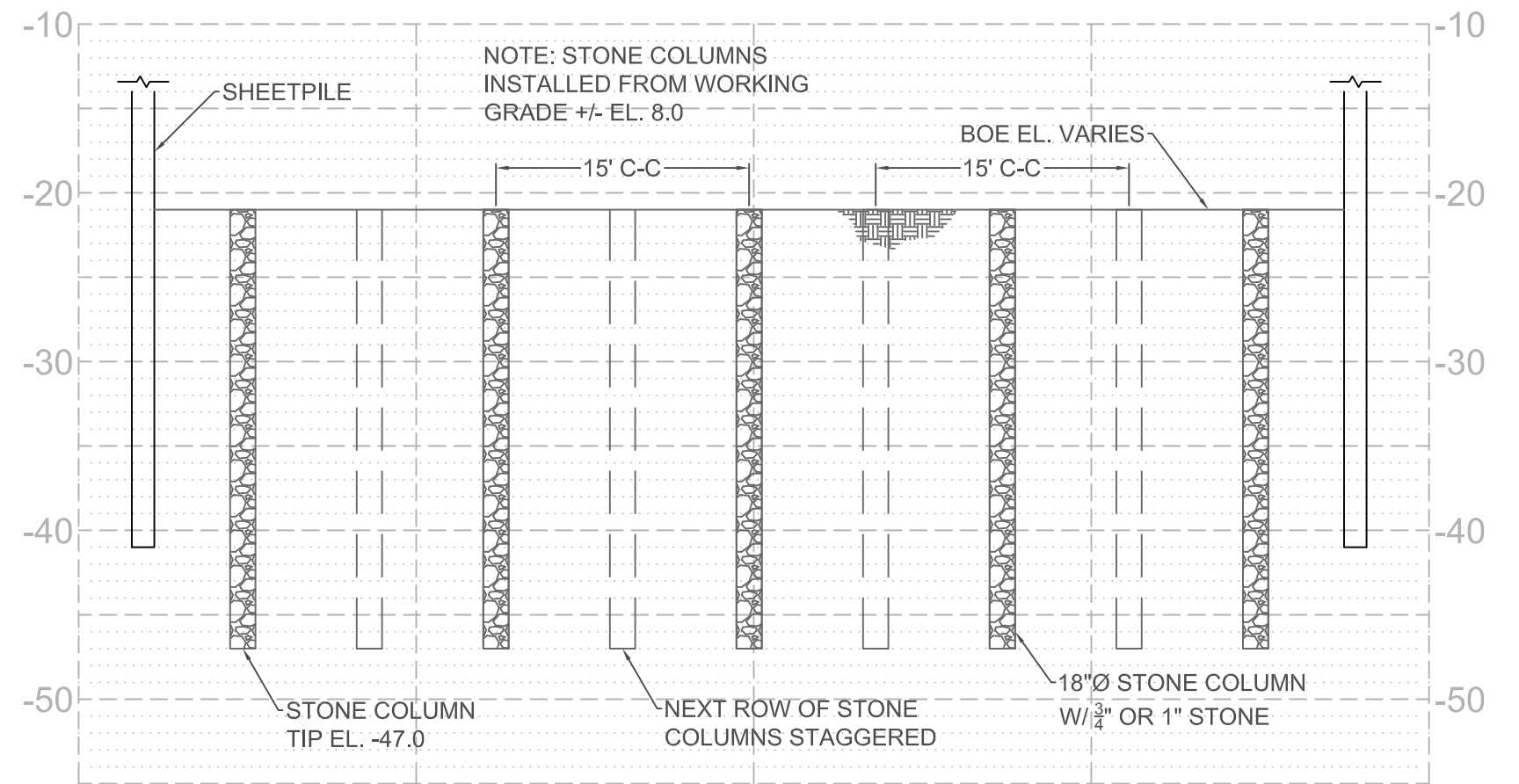
CORNER CONNECTION DETAIL
SCALE: NTS



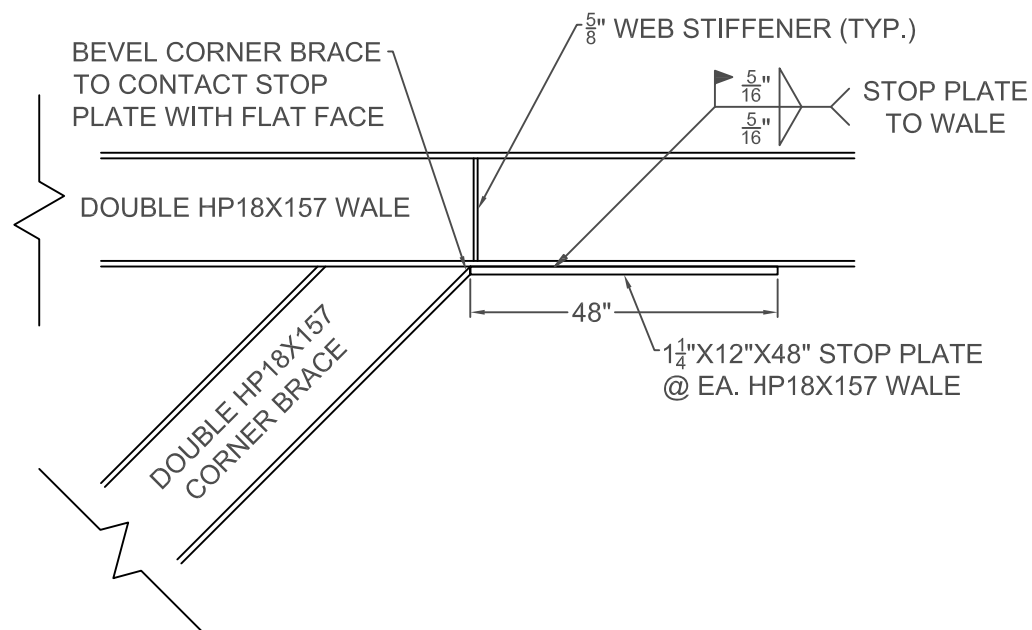
STRUT/WALE CONNECTION DETAIL
SCALE: NTS



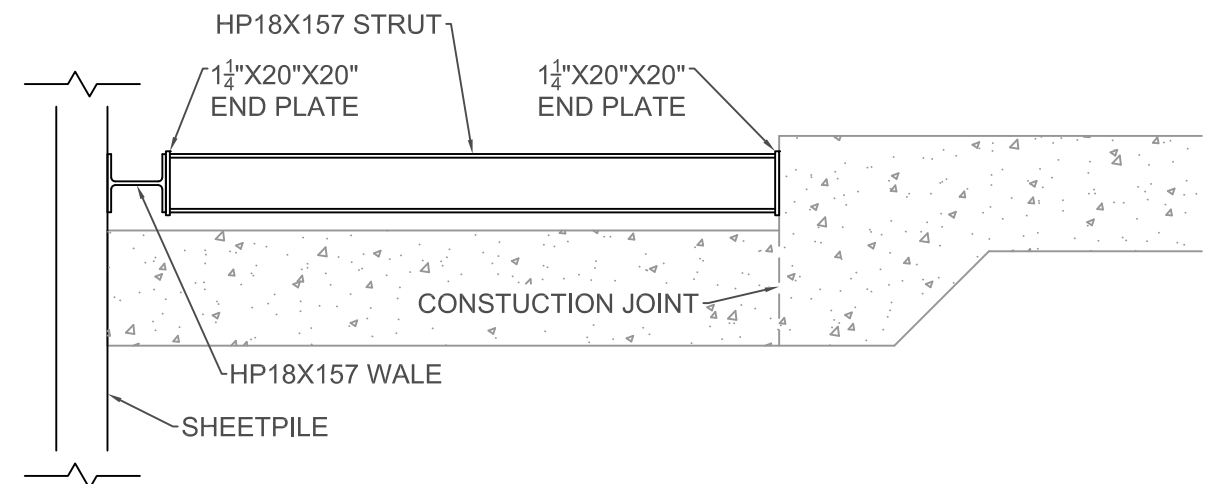
CROSS/LONGITUDINAL STRUT CONNECTION DETAIL
SCALE: NTS



STONE COLUMN DETAIL
SCALE: NTS



CORNER BRACE CONNECTION DETAIL
SCALE: NTS



SUMP FRAME STRUT DETAIL
SCALE: NTS



AGCMAINE

PILE DRIVING

H.B. FLEMING, INC.

CONTRACTING · ENGINEERING

89 Pleasant Ave. South Portland, ME 04106

Phone: (207) 799-8514 Fax: (207) 799-8538

www.hbfleming.com



BRIDGES

SUBMARINE PIPELINES

Phase 1 Excavation Support

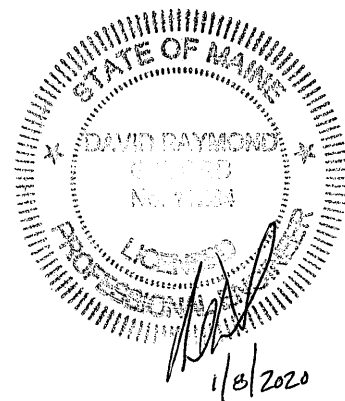
for

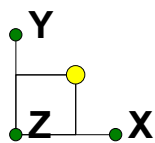
Sargent Corporation

Back Cove CSO

Portland, ME

1/8/2020



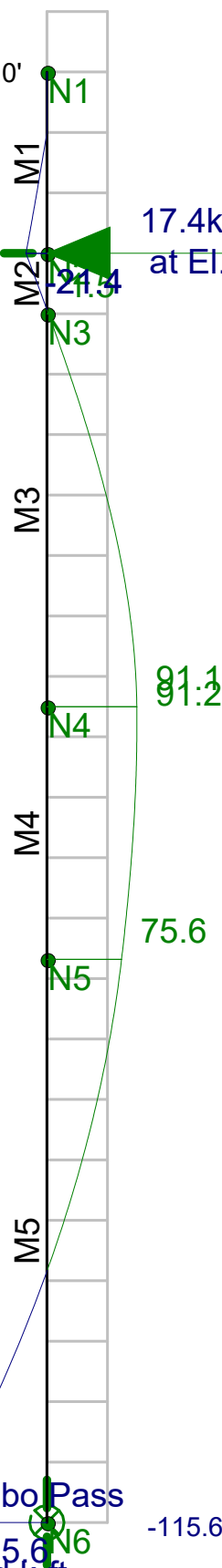


Top/Grnd El. 8.0'

Tie Stress, 1.25"/grade 150
 $A = 1.23 \text{ in}^2$
 $f_t = 17.4 \text{ k/ft} \times 4.75' / 1.23 \text{ in}^2$
 $= 67.2 \text{ ksi} (0.45 \times F_u \text{ ok})$

17.4k/ft Tie-Deadman Load
 at El. 2.0'

SOIL PROPERTIES & GROUND WATER
 Pre-excav. to El. 8.0', Grnd Water El. 0.0'
 Phase 1 Soil above El. -21.0' Granular/
 Frictional >30 degr, 115 to 120 pcf
 Below El. -21.0' Soft Clay 120 to 125 pcf
 $350 \text{ psf} < C < 400 \text{ psf}$.



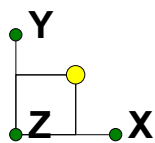
91.1 Max Moment at El. -13.0'
 SKZ-22 Sheet-piling
 $S_x = 33.4 \text{ in}^3$
 $f_b = M \times 12" / f_t / S_x = 32.8 \text{ ksi}$

75.6

Results for LC 4, El -11 Excav Combo Pass
 Member Bending Moments (k-ft)
 X-direction Reaction Units are k and k-ft

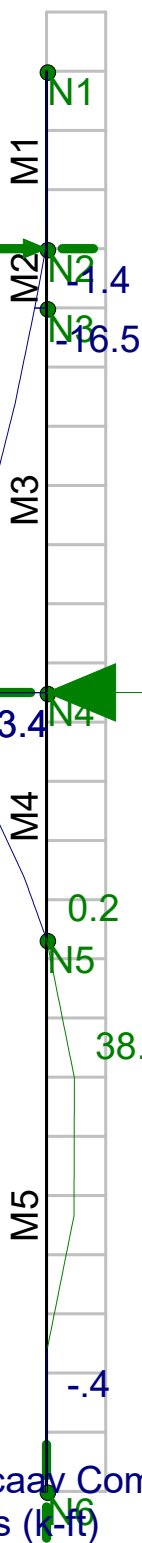
-115.6 ft-kip Maximum Moment (El.-40')

GEI	Fleming Portland CSO Cofferdam (Intermed)	SK - 2
RG		Dec 11, 2019 at 9:21 AM
901FP		Fleming Portland CSO El-11 Exca...



Load: El. 2.0' Tie-backs

6.6



Maximum Sheet Moment

-173.4

-46.4

Load: Frame at El. -13.0'

Soil Properties & Ground Water Level

Pre-excavation to El. 8.0' Ground Water at El. 0.0'

Phase 1 Soil above El. -21.0' Granular/Frictional

>30 degr Saturated Density 115 to 120 pcf

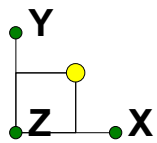
Below El. -21' Soft Clay 120 to 125 pcf

350 < C < 400 psf

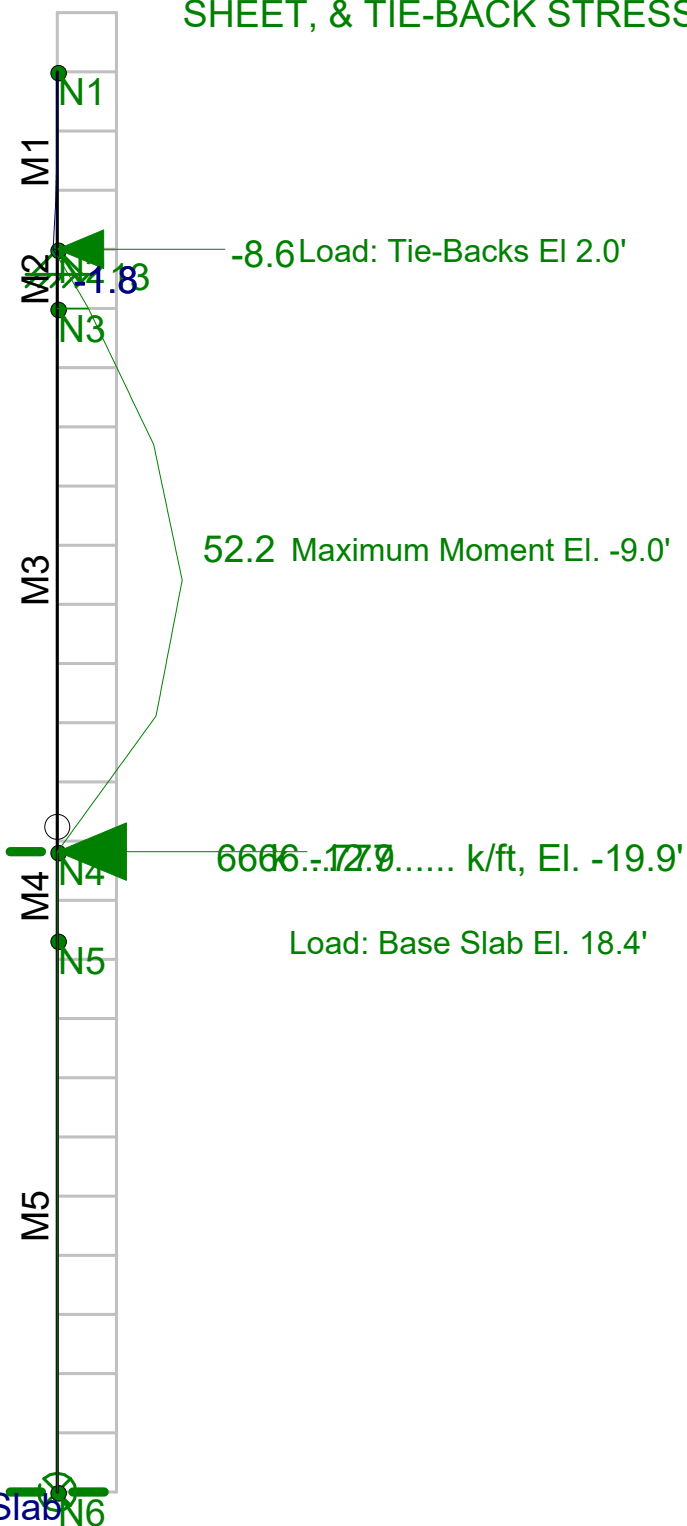
**NOTE: SEE EXCEL SPREADSHEET
DATED 12/10/19 FOR SHEET,
WALE, AND STRUT STRESSES**

Results for LC 5, Final Excaav Combo Pass
Member Bending Moments (k-ft)
X-direction Reaction Units are k and k-ft

GEI	Fleming Portland CSO Cofferdam	SK - 1
RG		Dec 11, 2019 at 9:00 AM
901FP		Fleming Portland CSO Final Excav...

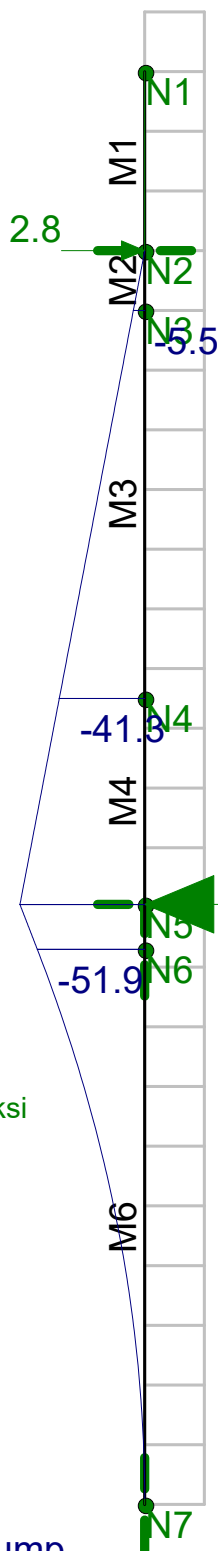
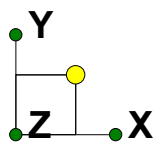


NOTE: SEE EXCEL SPREADSHEET
DATED 12/10/19 FOR FRAME,
SHEET, & TIE-BACK STRESSES



Results for LC 1, Post-Base Slab
Member Bending Moments (k-ft)
X-direction Reaction Units are k and k-ft

GEI	Fleming Portland CSO Cofferdam	SK - 1
RG		Dec 11, 2019 at 9:35 AM
901FP		Fleming Portland CSO Post Base ...



-60.3 ft-kip/ft
Max Moment
in Sheets

SKZ-22 Sheet-Piling
 $M < 60.3 \text{ kip-ft}$
 $f_b < M \cdot 12'' / 33.4 \text{ in}^3 = 21.7 \text{ ksi}$
 $(= 0.43 F_y \text{ OK})$

-8.3 kip/ft
El. -19.9'

HP18x157 Wales, 18' spans
 $f_b < 8.3 \text{ k} \cdot 18' \cdot 18' / 8 \cdot 12'' / 290 \text{ in}^3$
 $= 13.9 \text{ ksi} < 33.0 \text{ ksi } 0.67 \cdot 50 \text{ OK}$

HP18x157 Struts at 18'o/c, <17' Length
 $P_c < 8.3 \text{ k/ft} \cdot 18' \cdot 0.6 \cdot 2 = 107.6 \text{ kips}$
 $kl/ry > 0.9 \cdot 17' \cdot 12'' / 4.25'' = 43.2$
 $f_c < P_c / 46.2 \text{ in}^2 = 2.33 \text{ ksi (low, OK)}$

Results for LC 6, Delta Sump
 Member Bending Moments (k-ft)
 X-direction Reaction Units are k and k-ft

GEI	Fleming Portland CSO Cofferdam (Delta) Sump Excavation Frame @ El.-19.9'	SK - 2
RG		01/07/2020
901FP		Fleming Portland CSO Final Excav...

Fleming Portland CSO Cofferdam Phase 1; RISA Reations & Moments, Member Stresses By RG/GEI 12/10/19

Load Case	Reaction at El.	Magnitude kip	Moment @ El.	Magnitude ft-kip
1. Pre-Lower F	2.00	17.4	-13.00	91.20
2. Final Excava	2.00	-6.6		
	-13.00	46.4	-13.00	-173.40
3. Post-Base Sl	2.00	8.6	-9.00	52.30
	-18.36	12.9	-18.36	0.00
Sum Superpimposed				
El 2.0 Ties		19.4		
El. -13 Moment				-82.20

Wales																	
Dbl HP18x157	3 Spans at 16.67	Fctored Load 61.71	Mu 19651.38	Mp 32700.00	Ax 92.35	fcu 16.71	kl/ry 40.01	Fe 178.82	Fcrc 43.85	Lb 170.03	Lp 180.14	Mn 32700.00	Sum Ratios 0.98				
i/s Struts		Pu	fcu	rx	k*I/rx	Fe	Fcrc	Mu	fbu	Mp	Mn	Lb	Lp	Lr	(Lb-Lp)/(Lr-Lp)	Fcrb	Sum Ratios
HP18x204		1131.61	18.86	7.60	89.92	35.40	27.68	188.64	5.97	1804.17	1227.03	341.70	182.69	446.73	0.60	25.89	0.84
o/s Struts		Pu	fcu	rx	k*I/rx	Fe	Fcr	Mu	fbu	Mp	Mn	Lb	Lp	Lr	(Lb-Lp)/(Lr-Lp)	Fcr	Sum Ratios
HP18x157		822.99	17.82	7.46	91.61	34.11	27.07	152.04	6.29	1362.50	1055.63	341.70	180.14	452.15	0.59	25.10	0.80

Sheet Piling					
SKZ-22/50	Moment	Sx	Stress	% Fy	Therefore
Case 1	91.20	33.40	32.77	0.66	OK
**	-82.20	33.40	29.53	0.59	OK

** Note: Max Moment From Superposition of Cases 1 + 2

Fleming Portland CSO Cofferdam Phase 1; RISA Reations & Moments, Member Stresses By RG/GEI 12/10/19

Tie-Rods						
1.25" dia/50	Tension**	Ax	Spacing	Stress	% Fu	Therefore
	19.40	1.26	4.75	73.13	0.49	OK

** Note: Max Tension From Superposition of Cases 1+ 2+3

Deadman Wall					
10', cntr 2.0	Passive Resist	Max Load	FS	FS req	Therefore
	38.01	19.40	1.96	1.25	OK

NOTES:
Reactions & Moments are from RISA models
Load Factor is 1.33
Mu = Factored Moment
Mp = Plastic Moment
Mn = Moment Strength/Resistance
Lower case Stresses are actual/factored Stresses
Upper case Stresses are Strength/Resistant Stresses
Strength Equations: AISC 13th Ed. Specs E2 & F3. for 50ksi steel

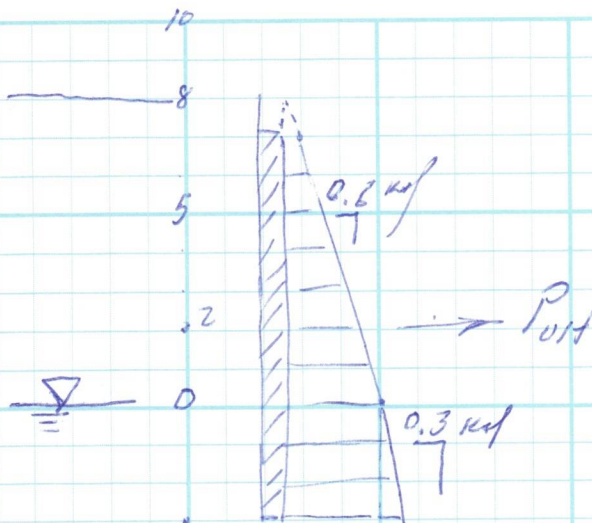
PROJECT: Fleming Portland
SUBJ: CSO Cofferdam
ITEM: Deadman Wall
Resistance

GAGNON ENGINEERING, INC.

Structural Consultants

198 MAIN STREET
GORHAM, MAINE 04038

DATE: 12/10/19
BY: RG
SHT: 1 of 1
PROJ: 901FP



$$P_{uH} = 0.6(8)4 + 0.6(8)(3) + \frac{0.3(3)^2}{2} - \frac{0.6(1)^2}{2} = 34.6 \text{ k/ft}$$



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-484-OE

Issued Date: 01/29/2020

John Allen
H.B. FLEMING, INC.
89 Pleasant Ave
South Portland, ME 04106

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Crane Link-Belt LS218 - Back Cove
Location: Portland, ME
Latitude: 43-39-52.38N NAD 83
Longitude: 70-15-53.66W
Heights: 0 feet site elevation (SE)
120 feet above ground level (AGL)
120 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

****SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION****

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination did not include an evaluation of the permanent structure associated with the use of this temporary structure. If the permanent structure will exceed Title 14 of the Code of Federal Regulations, part 77.9, a separate aeronautical study and FAA determination is required.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (718) 553-4199, or Dianne.Marin@FAA.GOV. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-484-OE

Signature Control No: 428546204-429188578

(TMP)

Dianne Marin
Technician

Additional Condition(s) or Information for ASN 2020-ANE-484-OE

Proposal: To construct and/or operate a(n) Crane to a height of 120 feet above ground level, 120 feet above mean sea level.

Location: The structure will be located 2.22 nautical miles northeast of PWM Airport reference point.

Case Description for ASN 2020-ANE-484-OE

Temporary crane to construct excavation support for proposed subsurface ground water treatment

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Aeronautical study revealed that the temporary structure will not exceed any Part 77 obstruction standard. Aeronautical study confirmed that the temporary structure will have no effect on any existing or proposed arrival, departure or en route instrument/visual flight rules (IFR/VFR) operations or procedures. Additionally, aeronautical study confirmed that the temporary structure will have no physical or electromagnetic effect on the operation of air navigation and communications facilities and will not impact any airspace and routes used by the military. Based on this aeronautical study, the FAA finds that the temporary structure will have no adverse effect on air navigation and will not impact any aeronautical operations or procedures.

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

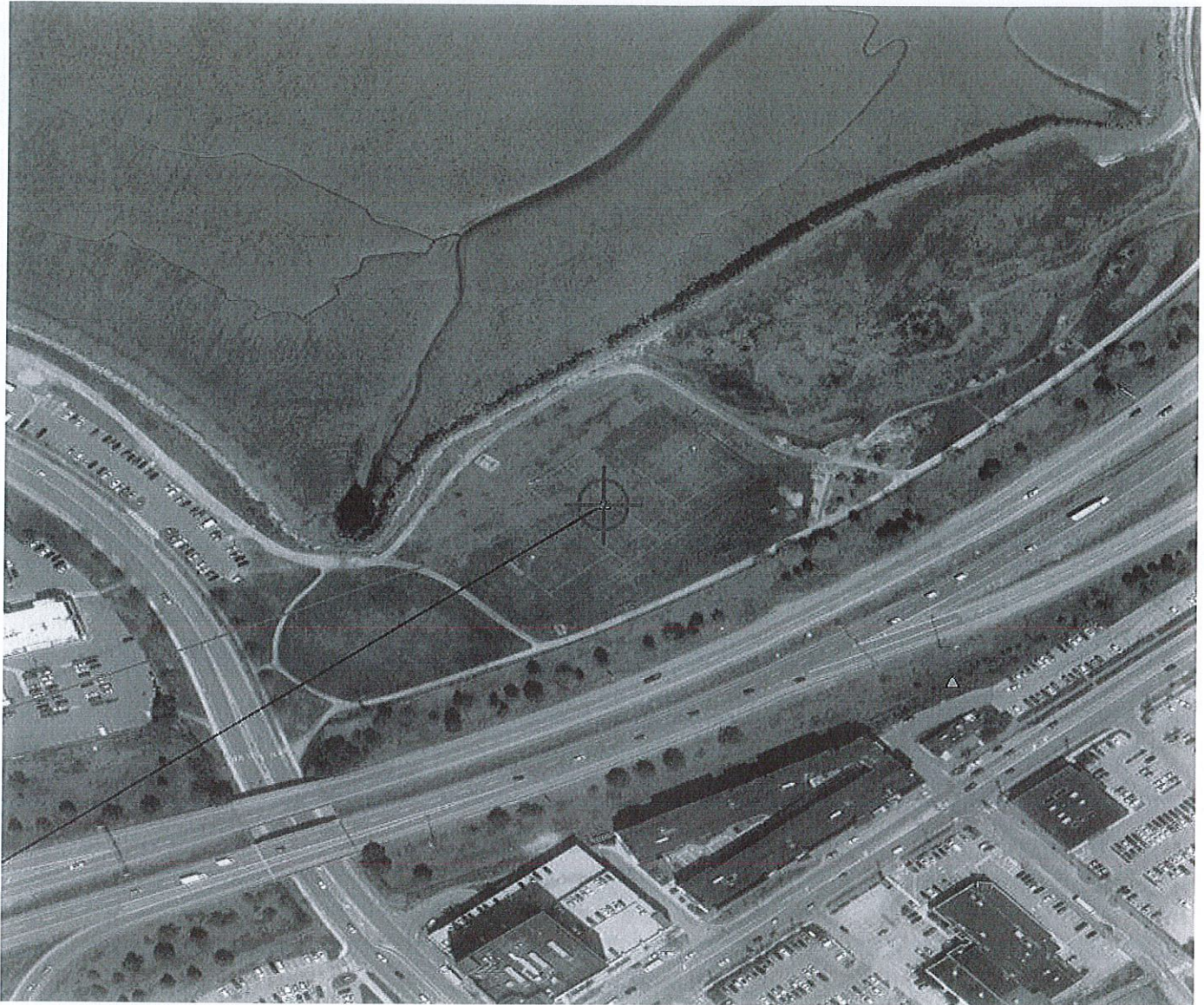
It is required that the manager of PORTLAND INTL JETPORT, (207) 756-8310 be notified at least 3 business days prior to the temporary structure being erected and again when the structure is removed from the site.

It is required that the manager of Portland Intl ATCT, (202) 552-1401 be notified at least 3 business days prior to the temporary structure being erected and again when the structure is removed from the site. Additionally, please provide contact information for the onsite operator in the event that Air Traffic Control requires the temporary structure to be lowered immediately.

This determination expires on 07/29/2021 unless extended, revised, or terminated by the issuing office.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed within 5 days after the temporary structure is dismantled.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.





**Bradley Roland** <brad@portlandmaine.gov>

Financial Capacity Letter

1 message

Brendan T. O'Connell <boconnell@portlandmaine.gov>

Mon, Sep 16, 2019 at 8:35 AM

To: "Hefler, Karen L" <Karen.L.Hefler@maine.gov>

Cc: Bradley Roland <brad@portlandmaine.gov>

Hi Karen

The City of Portland has the financial capacity to move forward with the Back Cove South Storage facility prior to being accepted for a SRF program loan. Let me know if you need anything else.

Regards,

Brendan T. O'Connell
Finance Director
City of Portland
P: (207) 874 8642
F: (207) 874 8652



CITY OF PORTLAND
Danielle P. West-Chuhta
Corporation Counsel

Michael I. Goldman
Associate Counsel

Jennifer L. Thompson
Associate Counsel

Anne M. Torregrossa
Associate Counsel

August 8, 2019

Ms. Karen L. Hefler, P.E
Maine Dep of Environmental Protection
Bureau of Land and Water Quality
Div of Engineering & Technical Assistance
State House Station #17
Augusta, ME 04333-0017

Re: Back Cove South Storage Facility RFP #19039

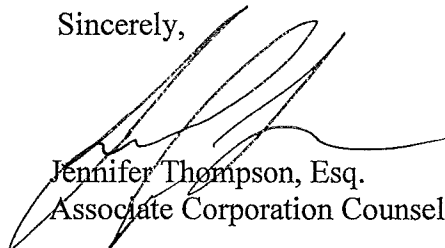
Dear Ms. Hefler:

I am providing this letter to inform you that I have reviewed the plans and supporting documents for the above referenced project, and I am of the opinion that the City of Portland possess all proper interests in the sites and rights of way for this project. In addition, I am of the opinion that all sewer and storm mains, laterals and other improvements constructed pursuant to the plans for this project will be properly located within said sites and right of way.

Thank you for your attention to this matter. If you have any questions of need additional information, please feel free to contact me.

Should you have any questions pertaining to the above, please contact me at 874-8480.

Sincerely,



Jennifer Thompson, Esq.
Associate Corporation Counsel

JLT/teb
cc: Bradley Roland

REVISIONS	NO.	DATE	DESCRIPTION	BY	CHKD.
	1	10/06/88	NAME CHANGE PCL NO. 1	T.W.S.	
	2	12/07/88	CHANGED COA. 25+16.35 TO 22		
	3		RIGHT OF PREBLE ST.	D.O.H.	
	4	2/20/89	TOP OF BANK, TEMP WORK LIMIT LINE		
	5		FROM 22+40 TO 28+50 PREBLE ST. B.I. D.O.H.		

ITEM	FIGURED	PLOTTED	CHECKED
BASE LINE			
TOPOGRAPHY			
RAW LINES			
AREAS			
LOW MON.			
CO. RECORD			

NOTE:

HILDRETH BROADCASTING CO. HAS A R/W ACROSS LAND OF RIVERSIDE REALTY CORP. AND CLIFTON M. BRYANT FROM THE CATWALK TO THEIR LAND TO INSTALL & MAINTAIN TRANSMISSION & ELECTRICAL LINES.

NOTE:

THERE IS A R/W OVER A STRIP OF LAND OWNED BY SWEARINGEN MOTORS CO. MARKED, PROPOSED ST. SAID R/W TO BE USED IN COMMON WITH ALL ABUTTING OWNERS AND TO MAKE USE OF SAME AS IS COMMON TO THE USE OF A STREET.

CITY OF PORTLAND
(BACK COVE PARK)
PARCEL NO. (1009-3) 6
LAND TAKEN = 4790± SF UPLAND
8,7940± SF FLATS
92,730± SF TOTAL = 2.13± AC.

DRAINAGE EASE (1)
SEWER EASEMENT RIGHTS
TEMP WORK RIGHTS (2)
TOTAL AREA UNKNOWN
(VAST HOLDINGS)

CURVE NO. (3)
Δ = 97° 28' 56" RT.
D = 12° 11' 07"
T = 535.99'
L = 800.00'
R = 470.20'
E = 242.80'

CURVE (103)
Δ = 86° 06' 16" RT.
D = 7° 00' 00"
T = 764.67'
L = 1230.06'
R = 818.51'
E = 301.16'

ARAM MONGALIAN
PARCEL NO. (1013)
LAND TAKEN = 915± SF UPLAND
8,915± SF FLATS
9830± SF TOTAL
TEMP WORK RIGHTS (1)
TOTAL AREA = 28,380± SF.

THE CANAL NATIONAL BANK OF PORTLAND
BEATRICE M. KELLEY BROOKS WHITEHOUSE
TRUSTEES UNDER THE WILL OF
EDWARD DEERING NOYES JR.
BEATRICE M. KELLEY
ITEM NO. (1001-3) 3
RIGHTS SEE NOTES 1-2-3
TEMP WORK RIGHTS (2)

NOTE 1
THIS LOT SUBJECT TO RIGHTS TO EXCAVATE A CHANNEL ACROSS FLATS TO GOVERNMENT CHANNEL ALSO RIGHTS TO USE ANY OTHER CHANNEL IF EXCAVATED ACROSS THIS PARCEL.

HILDRETH BROADCASTING CO.
RIGHTS TO CONSTRUCT AND MAINTAIN A STEEL TOWER & AND THE RIGHT TO INSTALL & MAINTAIN COPPER WIRE RADIALS
ALSO A R/W BY A CATWALK ACROSS THE FLATS OWNED BY WINSLOW & CO.
HILDRETH BROADCASTING CO.
ITEM NO. (1012-2) 2
RIGHTS (SEE NOTE ABOVE)

WINSLOW & CO. INC.
PARCEL NO. (1002-3) 3
LAND TAKEN = 2,79± AC. FLATS
TEMP WORK RIGHTS
TOTAL AREA = 12.71± AC.

NOTE 3
THIS LOT SUBJECT TO USE OF WHARF AND ANY EXTENSION THEREOF, AND PASSAGEWAY LEADING THERETO.

NOTE 2
THIS LOT SUBJECT TO RIGHT OF WAY THRU FLATS TO GOVERNMENT CHANNEL WITH RIGHTS TO USE CHANNEL IF EXCAVATED ACROSS THIS PARCEL.

MAINE STATE HIGHWAY COMMISSION
RIGHT OF WAY MAP

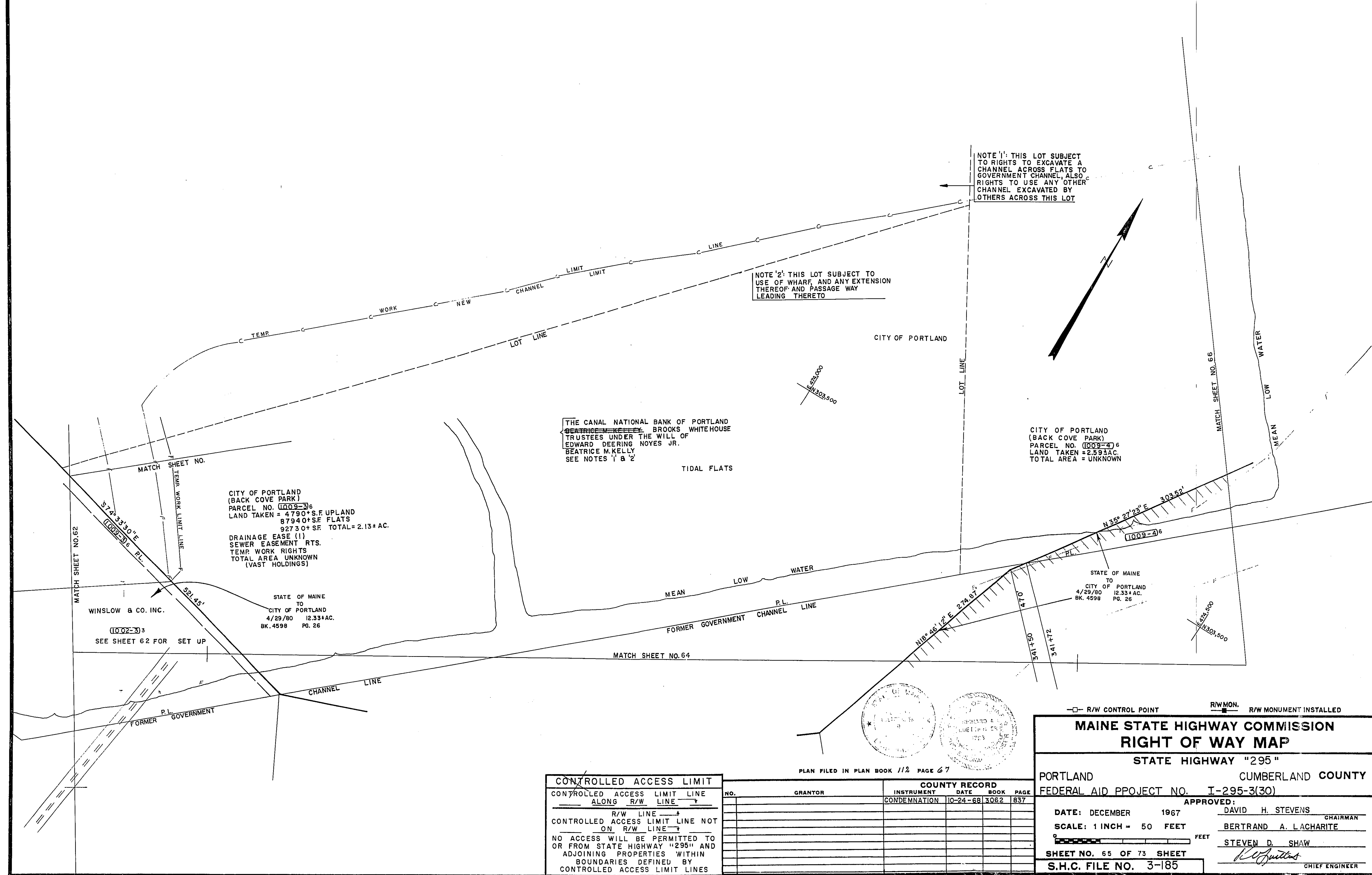
PORTLAND STATE HIGHWAY "14" 295 CUMBERLAND COUNTY
FEDERAL AID PROJECT NO. U-014-1(11) 1-295-3(30) PREBLE ST. EXT.

DATE: MARCH 1967
SCALE: 1 INCH = 50 FEET
SHEET NO. 63 OF 73 SHEET
S.H.C. FILE NO. 3-185

APPROVED:
DAVID H. STEVENS CHAIRMAN
BERTRAND A. LACHARITE
STEVEN D. SHAW
CHIEF ENGINEER

NO.	GRANTOR	INSTRUMENT	DATE	BOOK	PAGE
		CONDEMNATION	10/24/68	3062	837
		CONDEMNATION	11/5/71	3199	1

ITEM	FIGURED	PLOTTED	CHECKED
BASE LINE			
TOPOGRAPHY			
R W LINES			
AREAS			
R W MON.			
CO. RECORD			



CONTROLLED ACCESS LIMIT

CONTROLLED ACCESS	LIMIT	LINE
ALONG R/W	LINE	LINE

R/W LINE →

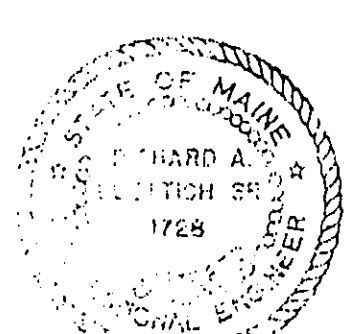
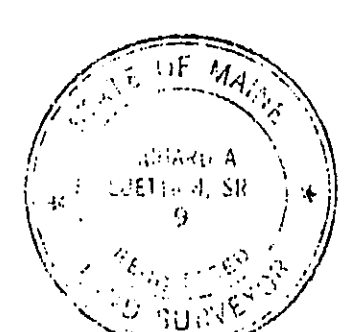
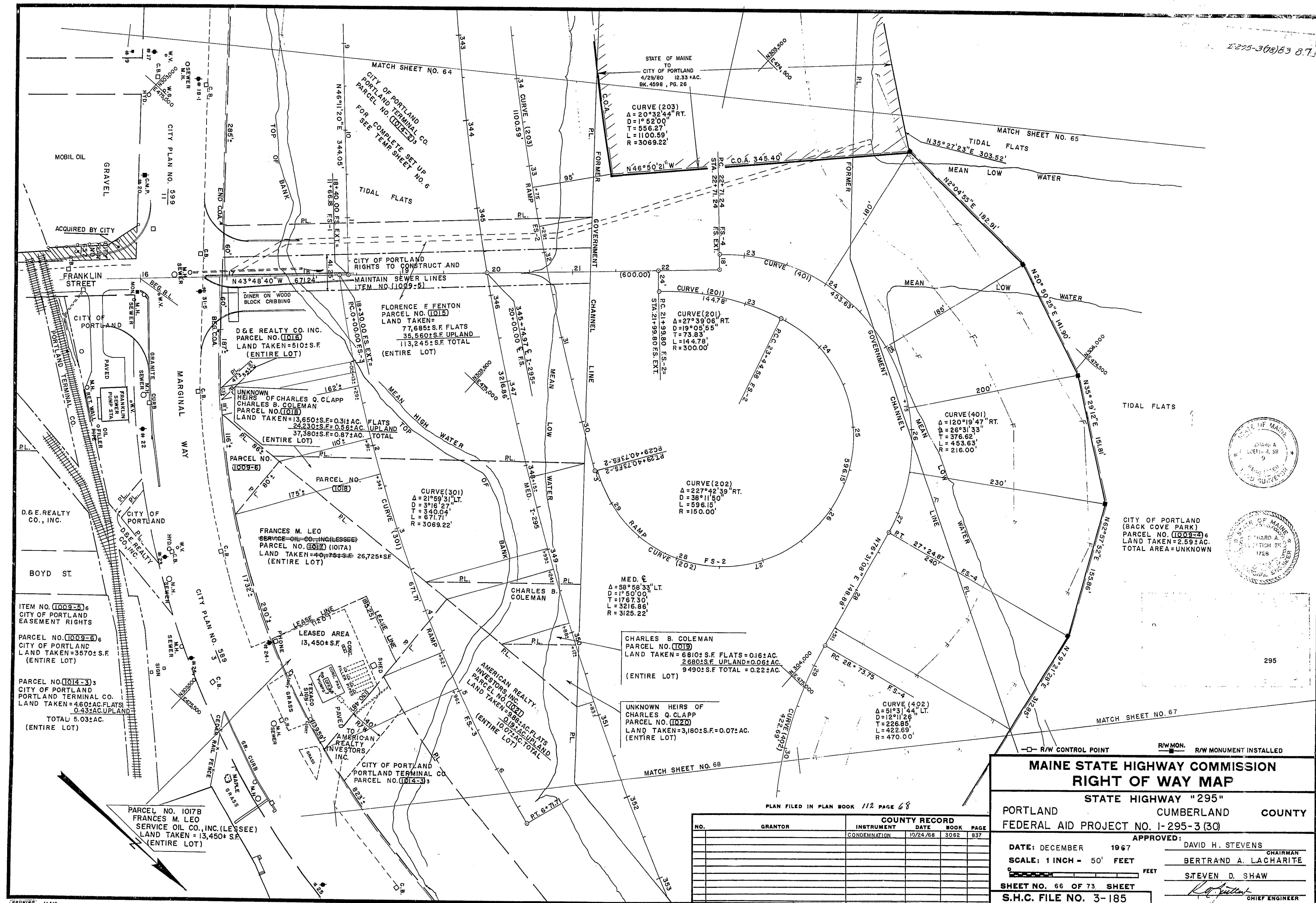
CONTROLLED ACCESS LIMIT LINE NOT
ON R/W LINE →

NO ACCESS WILL BE PERMITTED TO
OR FROM STATE HIGHWAY #295* AND
ADJOINING PROPERTIES WITHIN
BOUNDARIES DEFINED BY
CONTROLLED ACCESS LIMIT LINES

[illegible]

☐ R/W CONTROL POINT	☒ R/W MON.
R/W MONUMENT INSTALLED	
MAINE STATE HIGHWAY COMMISSION RIGHT OF WAY MAP	
STATE HIGHWAY "295"	
PORTLAND	CUMBERLAND COUNTY
FEDERAL AID PROJECT NO. <u>I-295-3(30)</u>	
APPROVED:	
DATE: DECEMBER 1967	DAVID H. STEVENS CHAIRMAN
SCALE: 1 INCH = 50 FEET 	BERTRAND A. LACHARITE CHIEF ENGINEER
SHEET NO. 65 OF 73 SHEET	STEVEN D. SHAW  CHIEF ENGINEER
S.H.C. FILE NO. <u>3-185</u>	

225-3(78)53 8.7.



NO.	DATE	DESCRIPTION	BY
1	10/16/68	ADDED LEASED AREA PARCEL (1017)	D.S.H.
2	10/16/68	ADDED "UNKNOWN" TO HIERS OF	D.S.H.
3	10/16/68	CHARLES Q. CLAPP (1018) (1020)	D.S.H.
4	12/16/68	CHANGED P.C. 1017 TO DIT & D78	D.S.H.
5			

ITEM	FIGURED	PLOTTED	CHECKED
BASE LINE			
TOPOGRAPHY			
R.W. LINES			
AREAS			
R.W. MON.			
CO. RECORD			

COUNTY RECORD		DATE		BOOK	PAGE
NO.	GRANTOR	INSTRUMENT	DATE	BOOK	PAGE
		CONDEMNATION	10/24/68	3062	837

MAINE STATE HIGHWAY COMMISSION

RIGHT OF WAY MAP

STATE HIGHWAY "295"

PORTLAND CUMBERLAND COUNTY

FEDERAL AID PROJECT NO. 1-295-3(30)

APPROVED:

DATE: DECEMBER 1967

SCALE: 1 INCH = 50' FEET

SHEET NO. 66 OF 73 SHEET

S.H.C. FILE NO. 3-185

DAVID H. STEVENS

CHAIRMAN

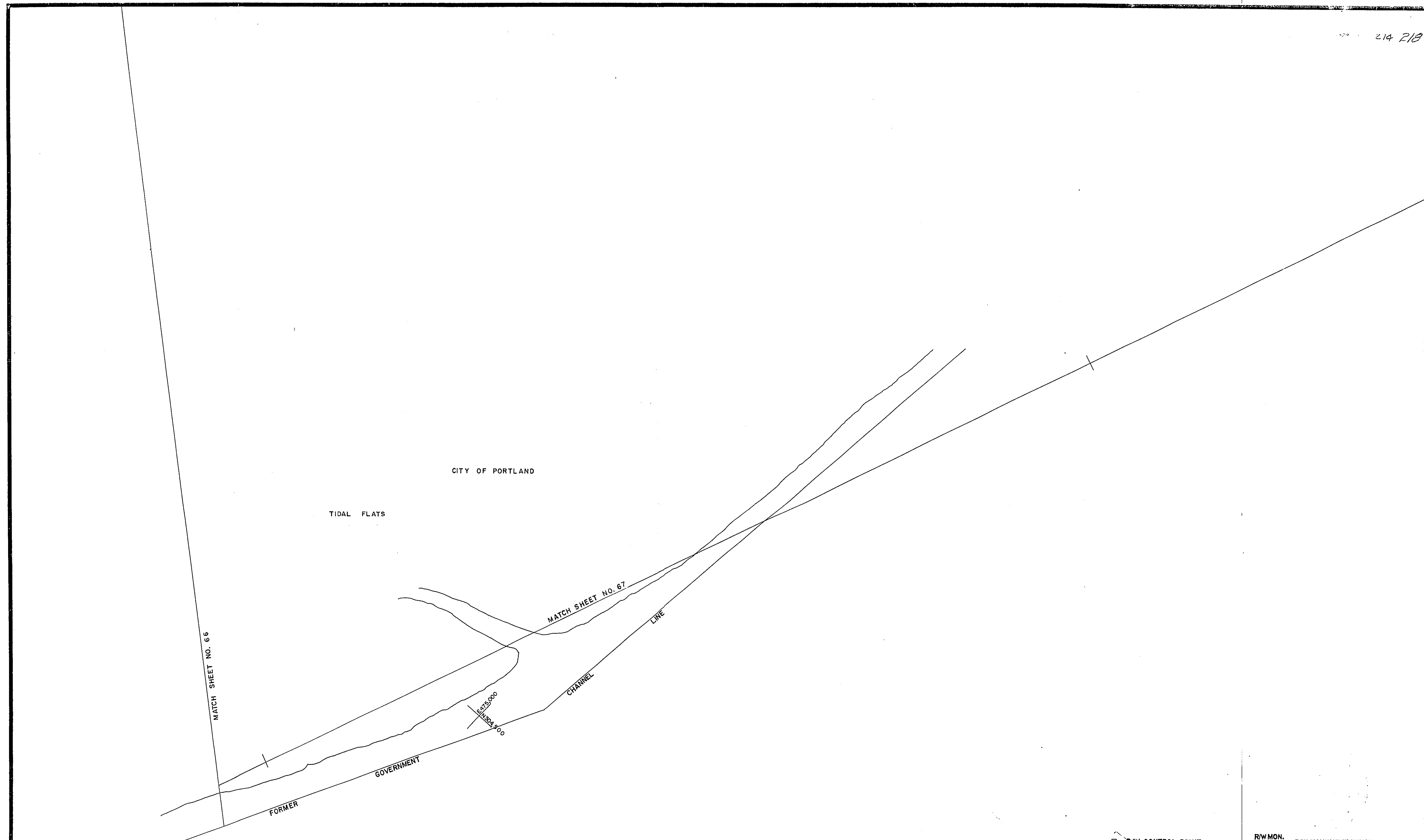
BERTRAND A. LACHARITE

STEVEN D. SHAW

CHIEF ENGINEER

REVISIONS		FIGURED		PLOTTED		CHECKED	
NO.	DATE	DESCRIPTION	BY	NO.	DATE	DESCRIPTION	BY
1							
2							
3							
4							
5							

ITEM	FIGURED	PLOTTED	CHECKED
BASE LINE			
TOPOGRAPHY			
R/W LINES			
AREAS			
R/W MON.			
CO. RECORD			



CONTROLLED ACCESS LIMIT
CONTROLLED ACCESS LIMIT LINE
ALONG R/W LINE
R/W LINE
CONTROLLED ACCESS LIMIT LINE NOT
ON R/W LINE
NO ACCESS WILL BE PERMITTED TO
OR FROM STATE HIGHWAY "295" AND
ADJOINING PROPERTIES WITHIN
BOUNDARIES DEFINED BY
CONTROLLED ACCESS LIMIT LINES

COUNTY RECORD		DATE		BOOK		PAGE	
NO.	GRANTOR	INSTRUMENT	DATE	BOOK	PAGE		
		CONDEMNATION	10-24-68	3062	837		

PLAN FILED IN PLAN BOOK 112 PAGE 69

MAINE STATE HIGHWAY COMMISSION	
RIGHT OF WAY MAP	
STATE HIGHWAY "295"	
PORTLAND	CUMBERLAND COUNTY
FEDERAL AID PROJECT NO. I-295-3(30)	
APPROVED:	
DATE: DECEMBER 1967	DAVID H. STEVENS CHAIRMAN
SCALE: 1 INCH = 50 FEET	BERTRAND A. LACHARITE
	STEVEN D. SHAW
SHEET NO. 67 OF 73 SHEET	CHIEF ENGINEER
S.H.C. FILE NO. 3-185	

FLOOD HAZARD DEVELOPMENT APPLICATION

Preble St. Soccer Fields, Portland, Maine

(All applicants must complete entire application)
[60.3(e)]

Application is hereby made for a Flood Hazard Development Permit as required under Article II of the Floodplain Management Ordinance of Portland, Maine, for development as defined in said ordinance. This permit application does not preclude the need for other municipal permit applications.

Owner: City of Portland Brad Roland, P.E. Address: 212 Canco Road

Phone No.: 207-874-8840 Portland, Maine 04103

Applicant: Same as owner Address: _____

Phone No.: _____

Contractor: Sargent Corp., Glenn Adams Address: 378 Bennoch Road

Phone No.: 207-817-7560 Stillwater, Maine 04489

LEGAL DESCRIPTION

Is this part of a subdivision? ☐ Yes ☒ No If yes, give the name of the subdivision and lot number:

Subdivision: _____ Lot #: _____

Tax Map: 034A Lot #: D001

Address: 244 Preble Street
Street/Road Name

Zip Code: Portland, 04101
Town/Zip Code

General explanation of proposed development: Existing soccer field. Install below grade CSO tank and raise existing soccer field grade 2 to 3 feet in elevation.

Estimated Value of Proposed Development: \$ No Structures

Proposed Lowest Floor elevation [for new or substantially improved structure]: No Structure

OTHER PERMITS

Are other permits required from State or Federal jurisdictions? ☒ Yes ☐ No
If yes, are these other permits attached? ☒ Yes ☐ No ☐ Not Applicable

Federal and State Permits may include but are not limited to: ME/DEP/Natural Resource Protection Act, Site Location of Development Act, Metallic Mineral Exploration, Advanced Exploration and Mining; USACE/Section 9 & 10 of the Rivers and Harbors Act/ Section 404 of the Clean Water Act; Federal Energy Regulation Commission.

SEWER AND WATER

Sewage Disposal: ☐ Public ☐ Private ☒ Not Applicable Type _____
☐ Existing ☐ Proposed
Water Supply: ☒ Public ☐ Private B-9

(This section to be completed by Municipal Official)

LOCATION

Flooding Source (name of river, pond, ocean, etc.): Ocean

☐ V1-30 Zone ☐ VE Zone ☐ AE Zone ☒ A1-30 Zone ☐ A Zone ☐ AO Zone ☐ AH Zone
☐ FRINGE ☐ FLOODWAY (1/2 width of floodplain in A Zone)

Base Flood Elevation (bfe) at the site 10 NGVD [Required for New Construction or Substantial Improvement]

Lowest floor elevation of proposed or existing structure N/A NGVD [Required for New Construction or Substantial Improvement]

If proposed development is in an AE or A1-30 Zone and cross section data is available in the Flood Insurance Study, please note the nearest cross section reference letter and elevation of base flood at nearest cross section above and below the site.

Cross Section Letter	Base Flood Elevation	None
Above Site <u> </u>	Above Site <u> </u>	
Below Site <u> </u>	Below Site <u> </u>	

Basis of unnumbered A Zone bfe determination:

- ☐ From a Federal Agency: ☐ USGS ☐ USDA/NRCS ☐ USACE ☒ Other City of Portland
☐ From a State Agency: ☐ MDOT ☐ Other
☒ Established by Professional Land Surveyor
☐ Established by Professional Engineer ☐ HEC/RAS ☐ HEC II ☐ HY 7 ☐ TR20 ☐ TR55 ☐ Quick-2
☐ Other
☒ Highest Known Water Level
☐ Other (Explain) 10 - 100 Year Flood Elevation

VALUE

If the development involves work on an existing structure, enter the Market Value of existing structure before improvements:
\$ N/A

☐ New Construction or Substantial Improvement ☒ Minor improvement or minor addition to existing development

TYPE OF DEVELOPMENT

Check the appropriate box to the left of the type(s) of development requested and complete information for each applicable line:

- | | | | |
|---|---|--|--|
| ☐ 1. Residential Structure | Dimensions | | Cubic Yards |
| ☐ 1a. New Structure | <u> </u> | ☐ 7. Filling ³ | <u> </u> |
| ☐ 1b. Add to Structure | <u> </u> | ☐ 8. Dredging | <u> </u> |
| ☐ 1c. Renovations/repairs/maintenance | <u> </u> | ☐ 9. Excavation | <u> </u> |
| ☐ 2. Non-Residential Structure | | ☐ 10. Levee | <u> </u> |
| ☐ 2a. New Structure | <u> </u> | ☐ 11. Drilling | |
| ☐ 2b. Add to Structure | <u> </u> | | Number of Acres |
| ☐ 2c. Renovations/repairs/maintenance | <u> </u> | ☐ 12. Mining | <u> </u> |
| ☐ 2d. Floodproofing | <u> </u> | ☐ 13. Dam: Water surface to be created | <u> </u> |
| ☐ 3. Accessory Structure | <u> </u> | ☐ 14. Water Course Alteration | <u> </u> |
| ☐ 4. Functionally Dependent Use: | | Note: Detailed description must be attached with copies of all applicable notifications, state and federal permits. | |
| ☐ 4a. Dock | <u> </u> | ☐ 15. Storage of equipment or materials | |
| ☐ 4b. Pier | <u> </u> | ☐ 16. Sewage Disposal System | |
| ☐ 4c. Boat Ramp | <u> </u> | ☐ 17. Water Supply System | |
| ☐ 4d. Other | <u> </u> | ☒ 18. Other: Explain | Installation of CSO Subsurface |
| ☐ 5. Paving | <u> </u> | | Storage Tank and Raise Existing Soccer Field |
| ☐ 6. Conditional Use (Lobster/Fish Shed seaward of mean high tide) | <u> </u> | | Grade 2 to 3 feet in Elevation at Preble Street. |
| | | | Approx. 9,000 C.Y. of fill to be installed. |

Note: Conditional Use requires add'l. information due to specific standards, public hearing, and Planning Board review.

¹ Certain prohibitions apply in Velocity Zone

Attach a Site Plan – Drawn to scale with north arrow.

- Show property boundaries, floodway, and floodplain lines.
- Show dimensions of the lot.
- Show dimensions and location of existing and/or proposed development on the site.
- Show areas to be cut and filled.

Attach Statement – describing in detail how each applicable development standard in Article VI will be met.

For New Construction or Substantial Improvement also show:

- Existing and proposed grade elevations adjacent to the walls of the structure done by a Professional land Surveyor, Architect, or Engineer.
- Location and elevation of temporary elevation reference marks on the site.

Special Note:

Substantial Improvement is defined as any reconstruction, rehabilitation, addition or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement. Please refer to the floodplain management ordinance, Article XIV, for more complete definitions of New Construction and Substantial Improvement.

Structures in Velocity Zones are not permitted on fill or excavations. Structures must be built on open foundation systems, i.e., columns, piles, posts. Certification of structural design, specifications, plans and construction methods completed by a Professional Engineer or Architect shall accompany the application as required in Article VLL.3. of the floodplain management ordinance.

The applicant understands and agrees that:

- The permit applied for, if granted, is issued on the representations made herein;
- Any permit issued may be revoked because of any breach of representation;
- Once a permit is revoked all work shall cease until the permit is reissued or a new permit is issued;
- Any permit issued on this application will not grant any right or privilege to erect any structure or sue any premises described for any purposes or in any manner prohibited by the ordinances, codes, or regulations of the municipality;
- The applicant hereby gives consent to the Code Enforcement Officer to enter and inspect activity covered under the provisions of the Floodplain management Ordinance;
- If issued, the permit form will be posted in a conspicuous place on the premises in plain view; and,
- If issued, the permit will expire if no work is commenced within 180 days of issuance.

I hereby certify that all the statements in, and in the attachments to this application are a true description of the existing property and the proposed development project.

Owner: _____

Bradley A. Roland

Signature

Date: 04-17-2020

or

Authorized Agent: _____

Signature

Date: _____

(This section to be completed by Municipal Official)

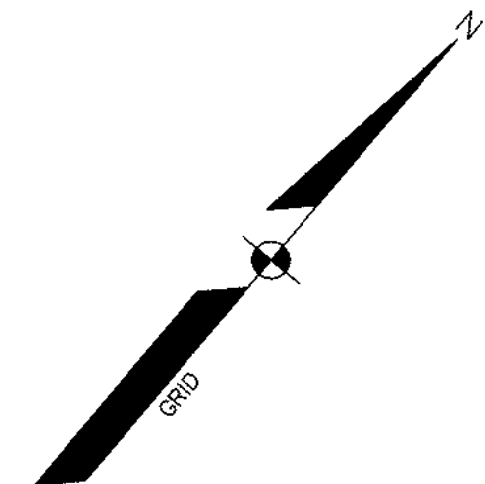
Date: Submitted 5/14/20; Fee Paid N/A; Reviewed by CEO 5/14/20; Reviewed by Planning Board _____

Permit # PL-000592-2019 Issued by Ann B. Machado Date 5/14/2020



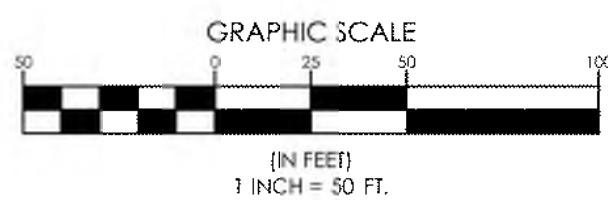
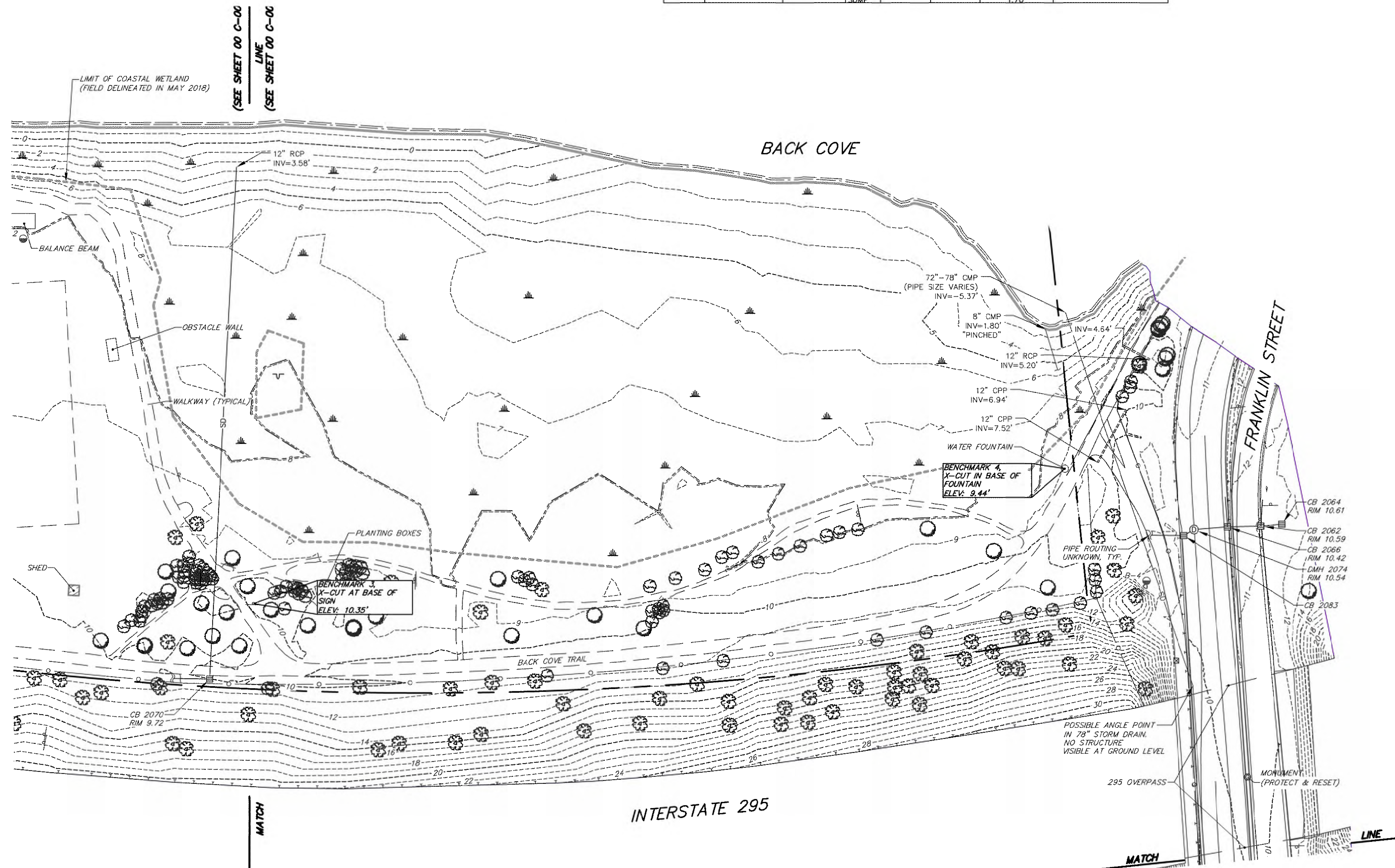
ELEVATION REFERENCE MARKS		
REFERENCE MARK	ELEVATION IN FT. (MOUTH)	DESCRIPTION OF LOCATION
RM 28	68.09	Dike at locality of mouth mark on Creek about 100 feet from S. 24 mile mark along the Gamma Bank or Farall Islands. 17 miles upstream along Grand Avenue from the top of Gamma Bank intersection of Sage Street and Victoria Street.
RM 29	38.29	Gravel pit set on top of granite floor floor with volcanic material approximately 6.85 mile northwest along Grand Avenue from Sage Street, about 100 feet from intersection of Victoria Street. 9.5 feet from the top of north slope of S. 24 mile Stream and 8.8 feet southward of school house on "Tree Hill".
RM 30	26.58	North end of map of concrete foundation of Victoria Bank building for No. 354 Folsom Avenue. 26 feet southward of north corner of building on level street, approximately 0.85 mile northwest of S. 24 mile Creek near intersection of Michigan Street.
RM 31	31.68	Alkali sample set in roadbed of street formerly at corner of Upper Folsom Street and intersection of Franklin Street and Maryland Way.
RM 32	9.99	Shops at corner of Washington Street and 19th Street, below present ground level 250 feet south of E. Folsom Company. 127 Maryland Way, and 362 feet north of intersection of Folsom Street and Maryland Way. 27.5 feet southwest of intersection of Maryland Way.
RM 33	38.80	Dike set vertically in northwest face of concrete foundation of 2 storey brick building, 65 feet northwest of Sage Street. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream.
RM 34	32.01	Dike set vertically on road side of S. 24 mile Creek. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream.
RM 35	22.03	Shoreline at low water level at the north end of an artificial spit of Connecticut Street, 250 feet westward of high point. 28 feet south of hole No. 239, about 100 feet from No. 222 Connecticut Street.
RM 36	28.34	Dike set vertically in roadbed of Victoria Street, about 100 feet from S. 24 mile Creek. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream.
RM 37	32.23	Dike set vertically in roadbed of S. 24 mile Creek, about 100 feet from S. 24 mile Creek. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream.
RM 38	15.66	Dike set vertically in roadbed of S. 24 mile Creek, about 100 feet from S. 24 mile Creek. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream. 1.5 mile from the Gamma Bank at locality of S. 24 mile Stream.

¹ *Annals, Georgia Geological Survey* 6: 1925.[illegible]



LEGEND	
EXISTING	
	BENCHMARK
	BUILDING
	EDGE PAVEMENT
	EDGE CONCRETE
	PAVEMENT PAINT
	EDGE GRAVEL
	CURB LINE
	EDGE OF WATER
	WATER IRRIGATION
	HIGHEST ANNUAL TIDE
	CONTOURS
	GUARD RAIL
	CHAIN LINK FENCE
	EDGE WETLAND
	WETLANDS
	UPLANDS
	DECIDUOUS TREE
	CONIFEROUS TREE
	SIGN
	LIGHT POLE
	UTILITY POLE
	MONITORING WELL
	SANITARY MANHOLE
	DRAINAGE MANHOLE
	CATCH BASIN
	CULVERT

LEGEND	
EXISTING OTHERS	
	WATER
	SANITARY MANHOLE
	SANITARY SEWER
	DRAINAGE MANHOLE
	STORM DRAIN
	CATCH BASIN



EXISTING STRUCTURE TABLE							
POINT #	STRUCTURE TYPE	RIM EL.(FT)	IN/OUT	MATERIAL	SIZE (IN.)	ELEVATION (FT.)	COMMENTS
2062	CATCH BASIN	10.59	IN	RCP	6	4.89	SEEMS TO BE SLEEVE
			IN	CPP	12	4.69	
			OUT	CPP	15	4.54	
			SUMP	CPP	15	4.59	
2064	CATCH BASIN	10.61	OUT	CPP	12	4.70	
			SUMP	CPP	12	2.51	
2066	CATCH BASIN	10.42	IN	CPP	12	4.47	
			IN	RCP	12	4.24	
			OUT	CPP	18	3.77	
			SUMP	CPP	18	3.44	
2074	STORM MH	10.54	IN	CPP	18	4.12	
			OUT	CPP	18	3.82	
			SUMP	CPP	18	3.44	
			SUMP	CPP	18	3.44	
2083	CATCH BASIN	10.30	IN	CPP	18	2.53	
			OUT	CPP	18	2.29	
			SUMP	CPP	18	1.70	
			SUMP	CPP	18	1.70	

PLS OR PE

INDICATIVE
DESIGN ONLY
RFP DOCUMENT
GUIDELINE FOR
DESIGN ONLY
NOT FOR CONSTRUCTION

DESIGNED	CHECKED
TSL	JIB
A. OAM 10-16-18 ISSUED FOR RFP	
REV: BY: DATE:	STATUS:
THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHNICS, INC. ANY ALTERATIONS AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHNICS, INC.	

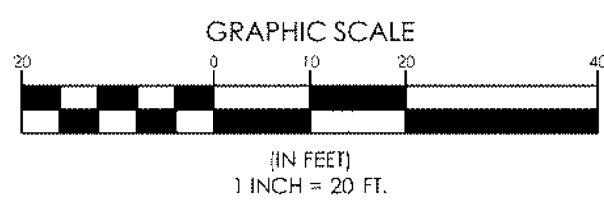
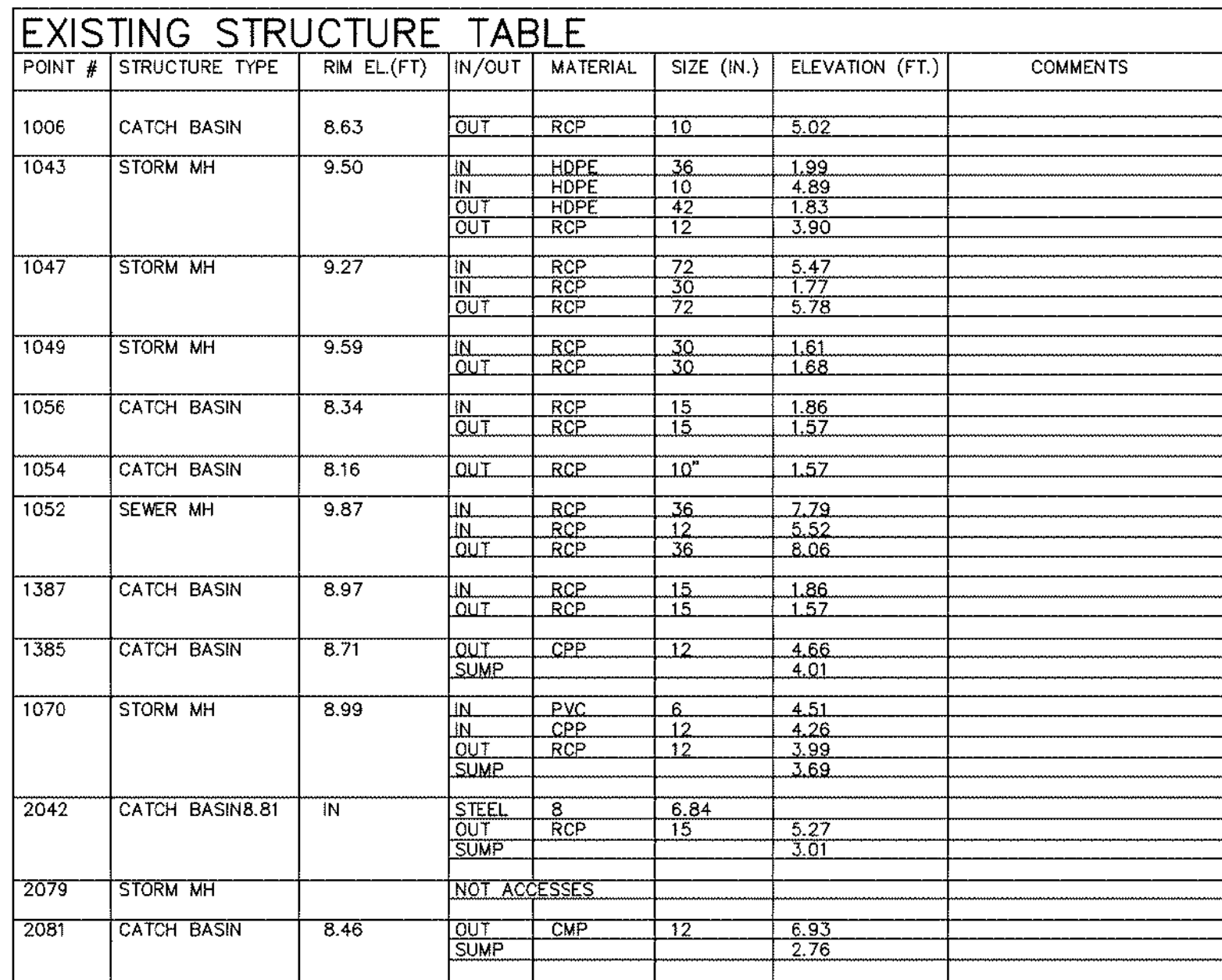
SEBAGO TECHNICS
AECOM TECHNICAL SERVICES, INC.
TWO CITY CENTER SUITE 200
PORTLAND, ME 04101
PHONE: 207.775.2800
www.sebagotechnics.com

TOPOGRAPHIC SURVEY
OF:
BACK COVE SOUTH STORAGE FACILITY
BACK COVE PARK & FRANKLIN STREET
PORTLAND, MAINE
FOR:
CITY OF PORTLAND PUBLIC WORKS
55 PORTLAND STREET
PORTLAND, MAINE 04101

PROJECT NO.	SCALE
17025	1" = 50'

SHEET 00 C-003

17025 EC.dwg, 1/16/23



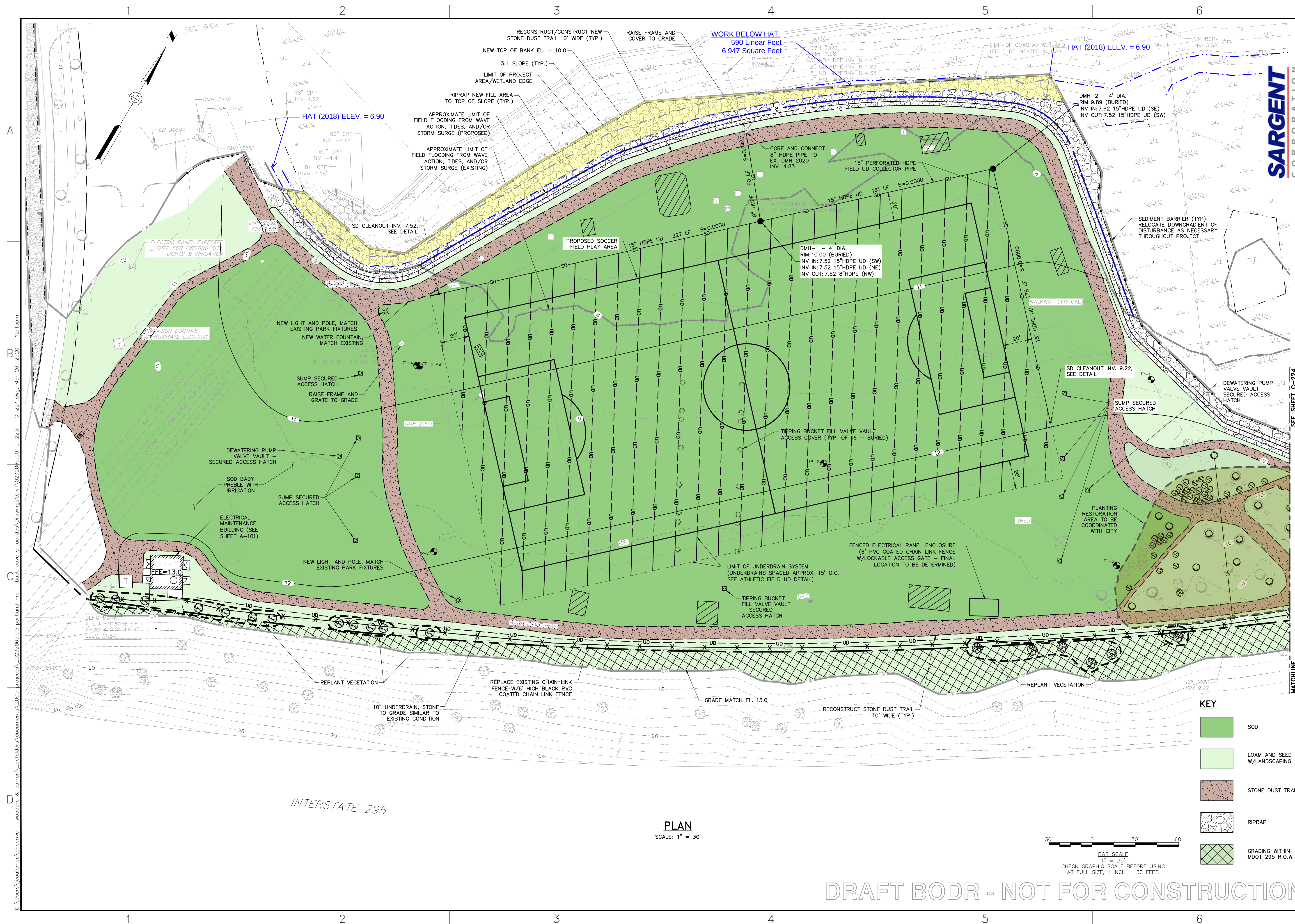
					DESIGNED	CHECKED
					TSL	JLB
A	OAM	10-16-18	ISSUED FOR RFP			
REV:	BY:	DATE:	STATUS:			
THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAQO TECHNICS, INC. ANY ALTERATIONS AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAQO TECHNICS, INC.						

TOPOGRAPHIC SURVEY
 OF:
 BACK COVE SOUTH STORAGE FACILITY
 BACK COVE PARK & FRANKLIN STREET
 PORTLAND, MAINE
 FOR:
 CITY OF PORTLAND PUBLIC WORKS
 55 PORTLAND STREET
 PORTLAND, MAINE 04101

PROJECT NO.	SCALE
17025	1" = 20'

SHEET 00 C-004

17025 EC 4W10 TAB-EC4



41 Hutchins Drive
Portland, Maine 04102
800.228.4262 | www.woodardcurran.com

 **WOODARD
& CURRAN**

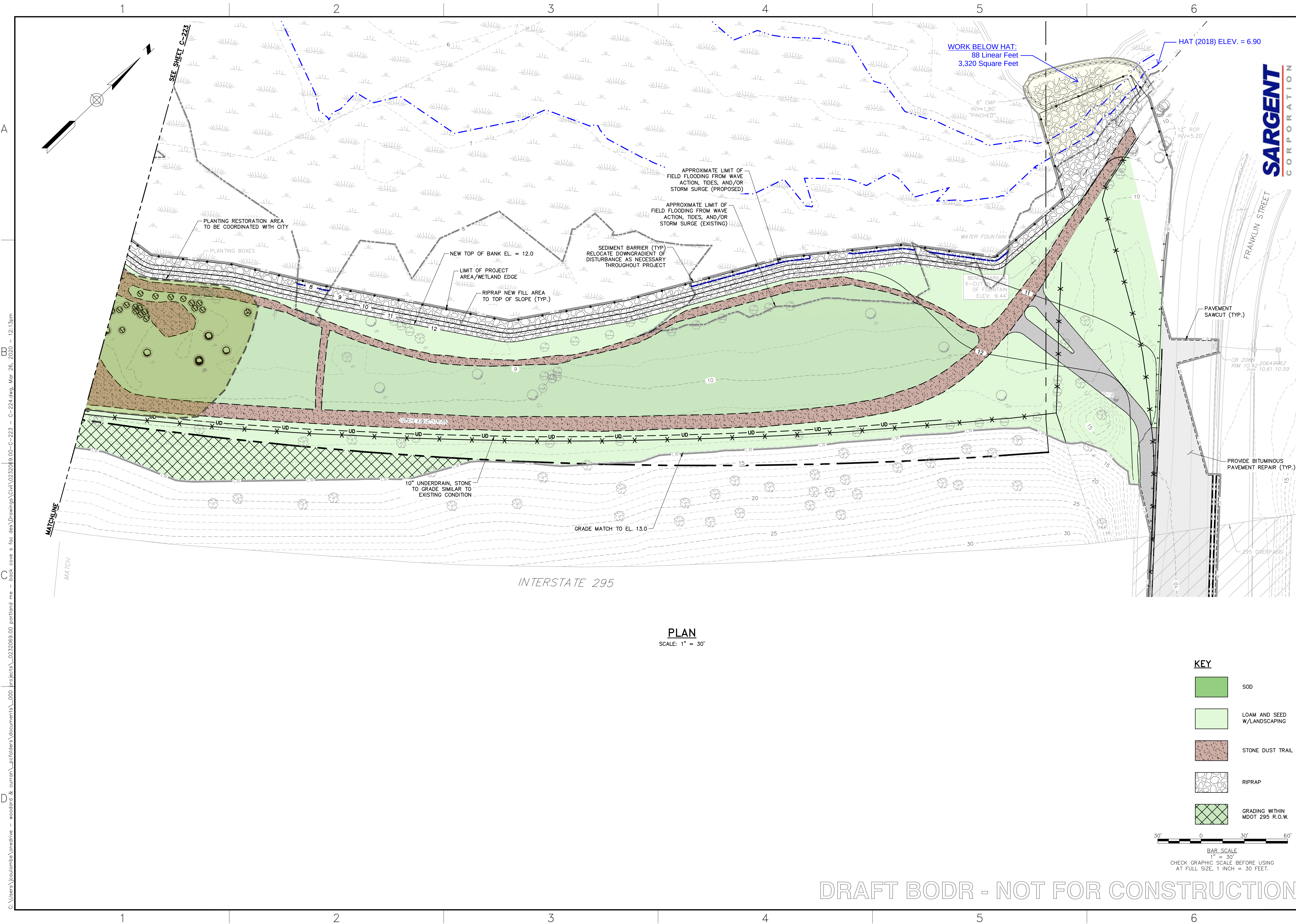
COMMITMENT & INTEGRITY DRIVE RESULTS

THIS DOCUMENT IS THE PROPERTY OF WOODARD & CURRAN, INC. AND ITS CLIENT. IT IS TO BE USED FOR THE SPECIFIC PROJECT AND NOT BE REPRODUCED OR MODIFIED, WITHOUT WRITTEN PERMISSION. IT IS HEREBY FORWARDED TO YOU FOR YOUR INFORMATION ONLY.

[illegible]

FINAL GRADING AND SITE RESTORATION PLAN - 1

CITY OF PORTLAND PUBLIC WORKS PORTLAND, MAINE		BACK COVE SOUTH STORAGE FACILITY	
JOB NO.: 0232069.00			
DATE: APRIL 2020			
SCALE: AS NOTED			
SHEET:		25	OF 96
C-223			



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41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com

WOODARD & CURRAN

COMMITMENT & INTEGRITY DRIVE RESULTS

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DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 26 OF 96

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

FINAL GRADING AND SITE
RESTORATION PLAN - 2

C-224

DRAFT BODR - NOT FOR CONSTRUCTION

FLOOD HAZARD DEVELOPMENT PERMIT

For Minor Development

Preble St. Soccer Fields, Portland, Maine
(For Development not considered a Substantial Improvement)

This Flood Hazard Development Permit allows minor development as provided in Article V.F.3. of the Floodplain Management Ordinance of Portland, Maine, for development in a Special Flood Hazard Area as defined in said ordinance. Development authorized by this permit must be adequately anchored to prevent flotation, collapse, or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. be constructed with materials resistant to flood damage and be constructed by methods and practices that minimize flood damage. This permit is issued based on documentation that the information provided in the Flood Hazard Development Permit Application is in compliance with the Floodplain Management Ordinance.

Tax Map: 034A D001 Lot #: _____

Project Description: Existing soccer field. Install below grade CSO tank and raise
existing soccer field grade 2 to 3 feet in elevation.

The permittee understands and agrees that:

- The permit is issued on the representations made herein and on the application for permit;
- The permit may be revoked because of any breach of representation;
- Once a permit is revoked all work shall cease until the permit is reissued or a new permit is issued;
- The permit will not grant any right or privilege to erect any structure or use any premises described for any purposes or in any manner prohibited by the ordinances, codes, or regulations of the municipality;
- The permittee hereby gives consent to the Code Enforcement Officer to enter and inspect activity covered under the provisions of the Floodplain Management Ordinance;
- The permit form will be posted in a conspicuous place on the premises in plain view; and,
- The permit will expire if no work is commenced within 180 days of issuance.

I hereby certify that all the statements in, and in the attachments to this permit are a true description of the existing property and the proposed development project.

Owner: _____ Date: _____

or

Authorized Agent: _____ Date: 5-14-20


Signature

Ann B. Machado

Issued by: _____ Date: 5/14/20

Permit #: PL-000592-2019

LICENSE REVIEW ROUTING SHEET

PROJECT MANAGER: Christine Woodruff

ORDER TYPE:

				DRAFT
X	ORIGINAL ORDER (N)		CONDITION COMPLIANCE (C)	3PI
	MINOR REVISION (M)		TRANSFER (T)	SEND TO REGISTRY
	AMENDMENT (A)		AFTER-THE-FACT	CORRECTED ORDER

Copies of **NRPA's** that need to be sent to the **Registry** must have box checked above.

APPLICANT NAME:	City of Portland Department of Public Works Attn: Brad Roland		
APPLICANT ADDRESS:	250 Canco Road Portland, ME 04103	Phone #:	(207) 874-8801
E-MAIL ADDRESS: (License will be e-mailed to this address when decision is made)	brad@portlandmaine.gov		
PROJECT LOCATION: (town, county)	Portland, Cumberland County	PROJECT #	L-28331-2F-A-N L-28331-FS-B-N L-28331-4E-C-N L-28331-4D-D-N
APPLICATION TYPE:(Use Site/NRPA or NRPA/SW)	NRPA	ATS#:	84622, 85209, 85210, 85211
ISSUES/COMMENTS:			
ACCEPTANCE DATE:	June 25, 2019		
AGENT NAME:	Sebago Technics Inc. Attn: Owens McCullough, PE		
AGENT ADDRESS:	75 John Roberts Road, Suite 4A South Portland, ME 04106	Phone #:	(207) 200-2073
E-MAIL ADDRESS: (License will be e-mailed to this address when decision is made)	omccullough@sebagotechnics.com		

Final copies of Variance orders go automatically to the **Town & IFW**. List others to receive a copy here:

Karen.L.Hefler@maine.gov		
--	--	--

ABSTRACT

• *City of Portland (Portland) (approval):* In Department Order #L-28331-2F-A-N / L-28331-FS-B-N / L-28331-4E-C-N / L-28331-4D-D-N, the Department approved the construction of four underground storage tanks for combined stormwater and sanitary sewage with a combined capacity of 3.5 million gallons that includes filling in and adjacent to coastal wetland areas and combined sewer outfalls. The proposed tanks will be located under the existing soccer field near Interstate 295 on the south side of Back Cove. The project is located between Preble Street and the Franklin Arterial exit ramp of Interstate 295 in the City of Portland.

REVIEWED BY	SIGNATURE	OK DATE
ENFORCEMENT STAFF (if enforcement involved):		
REGIONAL SUPER:		3/30/2020
Ret'd to PROJ. MGR:		
Div. Director:		



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

IN THE MATTER OF

CITY OF PORTLAND	) NATURAL RESOURCES PROTECTION ACT
DEPARTMENT OF PUBLIC WORKS	) ACTIVITY ADJACENT TO RESOURCE
Portland, Cumberland County	) COASTAL WETLAND FILL
BACK COVE SOUTH	) SIGNIFICANT WILDLIFE HABITAT
CSO STORAGE FACILITY	) COASTAL SHORELINE STABILIZATION
L-28331-2F-A-N (approval)	)
L-28331-FS-B-N (approval)	)
L-28331-4E-C-N (approval)	) WATER QUALITY CERTIFICATION
L-28331-4D-D-N (approval)	) FINDINGS OF FACT AND ORDER

Pursuant to the provisions of 38 M.R.S. §§ 480-A–480-JJ, Section 401 of the Federal Water Pollution Control Act (33 U.S.C. § 1341), and Chapters 310, 315, and 335 of Department rules, the Department of Environmental Protection has considered the application of CITY OF PORTLAND with the supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. PROJECT DESCRIPTION:

A. Summary: The City of Portland is working under an Administrative Consent Agreement with the State of Maine Department of Environmental Protection to abate combined sewer overflows. The applicant proposes to change the grade in and adjacent to a coastal wetland in Back Cove to construct underground storage tanks for 3.5 million gallons (MG) of combined sewage as part of that agreement's updated 2013 Combined Sewer Overflow (CSO) Tier III Long Term Control Plan (LTCP) which will reduce the annual combined sewer overflow volume from 150 MG to 18 MG. The underground storage tanks are known as the Back Cove South Storage Facility (BCSSF) and it is proposed to be located in Back Cove Park, part of which is also known as the Preble Street soccer field. The proposed tanks will be located in old fill material and the material excavated will be used on site to raise the surface grade approximately two to three feet between the coastal wetland and the toe of the slope of Interstate 295. Raising the grade will include shoreline stabilization consisting of 24 inches of 12-inch riprap over non-woven geotextile. The project includes a sewer separation project on Preble Street that extends a new sanitary sewer main down Preble Street from the intersection with Baxter Boulevard into Back Cove Park to the underground tanks that are proposed to be located under the existing soccer field. Also included in the project are a new sanitary sewer force main in Marginal Way starting near the intersection with Diamond Street that then follows Franklin Street under I-295 and then extends to the proposed tanks. A new 72-inch stormdrain and a new 72-inch combined sewer in Franklin Street with outfalls into Back Cove just west of the end of the off ramp are also proposed. The project is detailed on a set of plans the first of which is titled "City of Portland Public Works, Portland, Maine, Back Cove South Storage Facility, W&C Project No.

0232069.00, March 28, 2019,” with a most recent date on any of the plans of March 28, 2019. The applicant has also submitted erosion control information on plans titled “City of Portland Public Works, Portland, Maine, Back Cove South Storage Facility, Erosion Control Plan (Preble Park)” prepared by Woodard & Curran and dated November 2019. The project site will be located on parts of Preble Street, Marginal Way, Franklin Street, and in Back Cove Park between Preble Street and Franklin Street.

The applicant submitted a Permit by Rule Notification Form (PBR #67907) pursuant to Chapter 305 Permit by Rule Standards Sections 2 and 7 (06-096 Ch. 305, § 7, last amended June 8, 2012) for activities adjacent to protected natural resources and outfall pipes for the stormdrain and combined sewer overflow outfalls which was accepted by the Department on June 4, 2019.

The applicant submitted a Permit by Rule Notification Form (PBR# 69351) pursuant to the provisions of 38 M.R.S. § 420-D, and Chapter 500 Stormwater Management Rules (06-096 C.M.R. Chap. 500 and 502, last amended August 12, 2015) which was accepted by the Department on February 6, 2020 for disturbing more than an acre.

B. Current Use of the Site: The current use of the project location is city streets and a developed city park that is maintained as lawn, soccer field, walking paths, and landscaped areas. The portion of the Back Cove frontage in the park near the soccer field is partially stabilized with riprap. The parcel is identified as Lot B001 on Map 442 of the City of Portland’s tax maps.

2. EXISTING SCENIC, AESTHETIC, RECREATIONAL OR NAVIGATIONAL USES:

The Natural Resources Protection Act (NRPA), in 38 M.R.S. §480-D(1), requires the applicant to demonstrate that the proposed project will not unreasonably interfere with existing scenic, aesthetic, recreational and navigational uses.

In accordance with Chapter 315, *Assessing and Mitigating Impacts to Scenic and Aesthetic Uses* (06-096 C.M.R. Chap. 315, effective June 29, 2003), the applicant submitted a copy of the Department's Visual Evaluation Field Survey Checklist as Appendix A to the application along with a description of the property and the proposed project. The applicant also submitted several photographs of the proposed project site and surroundings including an aerial photograph of the project site. Department staff visited the project site on July 3, 2019.

The proposed project is located on Back Cove, which is a scenic resource visited by the general public, in part, for the use, observation, enjoyment and appreciation of its natural and cultural visual qualities. Back Cove is open water at high tide and mud flat at low tide; the number of users of Back Cove is limited due to the nature of this resource. Back Cove is located in an urban setting and it is surrounded by development, including a heavily used public trail (Back Cove Trail). A portion of the Back Cove Trail is within the project area. The project area is visible by the users of the trail and from the coastal wetland. When the project is completed it will have the same visibility as the existing site.

When the project is completed the overall look of the project will be similar to the existing conditions to the casual observer with the exception that the grade of the whole site will be higher, a new small electrical building, new manholes, additional riprap shoreline stabilization, new outfalls, and slightly revised soccer field and landscaping. The applicant will plant Northern Bayberry (*Myrica pensylvanica*) along the northern and eastern sections of the soccer field to reduce the visual impact of the project from the resource. The plantings are shown on a plan a copy of Plan C-201 labeled "Erosion Control Plan (Preble Park)" that was submitted with an email dated March 24, 2020. The applicant must monitor the plantings and the plantings must be replaced or maintained as necessary to achieve 85% survival after one full growing season.

Based on the information submitted in the application and the site visit, the Department determined that the location and scale of the proposed activity is compatible with the existing visual quality and landscape characteristics found within the viewshed of the scenic resource in the project area.

The Department determined that based on the nature of the proposed project and its location, there are no existing recreational or navigational uses of the resource that would be unreasonably impacted.

The Department finds that the proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational or navigational uses of the coastal wetland, provided that the applicant monitors and maintains the plantings as described above.

3. SOIL EROSION:

The NRPA, in 38 M.R.S. §480-D(2), requires the applicant to demonstrate that the proposed project will not cause unreasonable erosion of soil or sediment nor unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.

The applicant has submitted an erosion control plan for the project that includes details of how the fill adjacent to Back Cove will be stabilized with riprap, outfall stabilization, and a dewatering plan for use during construction.

The Department finds that the activity will not cause unreasonable erosion of soil or sediment nor unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.

4. HABITAT CONSIDERATIONS:

The NRPA, in 38 M.R.S. §480-D(3), requires the applicant to demonstrate that the proposed project will not unreasonably harm significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life.

According to the Department's Geographic Information System (GIS) database there are mapped Shorebird Feeding, Shorebird Roosting areas located in the coastal wetland and upland areas of Back Cove Park within the proposed project area, as well as Tidal Waterfowl and Wading Bird Habitat in the coastal wetland. Shorebird Feeding areas, Shorebird Roosting areas, and Tidal Waterfowl and Wading Bird habitat are Significant Wildlife Habitats as defined by the NRPA Chapter 355. The proposed Northern Bayberry plantings between the soccer field and the coastal wetland will provide some buffering in between the soccer field, the walking trail and these habitats. The Maine Department of Inland Fisheries and Wildlife (MDIFW) reviewed the proposed project and stated that minimal impacts to the habitats are anticipated.

The Department finds that the activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life.

5. WATER QUALITY CONSIDERATIONS:

As discussed in Finding 3, the applicant proposes to use erosion and sediment control measures during construction to minimize impacts to water quality from siltation. Clean angular stone and geotextile will be used to stabilize the shoreline.

The Department does not anticipate that the proposed project will violate any state water quality law, including those governing the classification of the State's waters.

6. WETLANDS AND WATERBODIES PROTECTION RULES:

The applicant proposes to fill approximately 33,600 square feet of coastal wetland to raise the grade of the Back Cove Park as a means of disposal for the excess fill material left over from the installation of the underground storage tanks and recreate the soccer field and trails. The NRPA defines a coastal wetland as all tidal and subtidal lands; all areas with vegetation present that is tolerant of salt water and occurs primarily in a salt water or estuarine habitat; and any swamp, marsh, bog, beach, flat or other contiguous lowland that is subject to tidal action during the highest tide level for the year in which an activity is proposed as identified in tide tables published by the National Ocean Service. Portions of Back Cove Park that are currently maintained as a soccer field, walking trails and lawn area are also contiguous lowland that is subject to tidal action during the highest tide level for the year which makes them coastal wetlands by definition even though they are developed. The majority of the coastal wetland to be filled by this project is currently developed, however, a portion is located in the upper intertidal area that does not contain salt tolerant vegetation or has remnants of previous riprap stabilization efforts (approximately 3,600 square feet), and a small amount is located in the upper intertidal area that contains salt tolerant vegetation (approximately 5,800 square feet).

The *Wetlands and Waterbodies Protection Rules*, 06-096 C.M.R. Chapter 310 (last amended November 11, 2018), interpret and elaborate on the Natural Resources Protection Act (NRPA) criteria for obtaining a permit.

The rules guide the Department in its determination of whether a project's impacts would be unreasonable. A proposed project would generally be found to be unreasonable if it would cause a loss in wetland area, functions and values, and there is a practicable alternative to the project that would be less damaging to the environment. Each application for a NRPA permit that involves a coastal wetland alteration must provide an analysis of alternatives in order to demonstrate that a practicable alternative does not exist.

The wetlands proposed to be impacted by the project are wetlands of special significance because they are coastal wetlands as defined in Chapter 310, § (4). For an activity proposed in, on or over a wetland of special significance, practicable alternative less damaging to the environment is considered to exist and the impact is unreasonable, unless the activity is described in Chapter 310, § 5(A); this section allows projects that are necessary for health and safety. The NRPA definition of health and safety per Chapter 310, § 3(K) includes an activity undertaken to improve public health and safety which specifically includes providing for the safe disposal of waste water. The purpose of the proposed project is to provide combined sewage storage tanks to reduce the volume of the combined sewer overflow discharges to Back Cove and to provide for safe disposal of a higher volume of wastewater at the wastewater treatment facility. This project meets the definition of a health or safety project.

A. Avoidance. An applicant must submit an analysis of whether there is a practicable alternative to the project that would be less damaging to the environment and this analysis is considered by the Department in its assessment of the reasonableness of any impacts. The applicant submitted an alternatives analysis for the proposed project completed by Sebago Technics and dated June 2019. The purpose of the project is to construct 3.5 MG of storage to reduce combined sewer overflow discharges to the coastal wetland, to also dispose of the excess excavated materials on site which will reduce disposal fees in the event that contaminated fill materials are encountered in the excavations, and to raise the elevation of the developed area of Back Cove Park so that it can continue to be used as a soccer field, Back Cove Trail and other areas that are maintained as lawn. The applicant has submitted an alternatives analysis titled "Back Cove South CSO Storage Conduit and Tank Alternatives" prepared by Sebago Technics dated January 9, 2018. This study evaluated twelve alternatives that took into consideration economic, social and environmental impacts for each alternative. The initial screening narrowed the alternatives down to five. The five alternatives included a storage conduit in Marginal Way, a 2.5 MG tank in Back Cove Park plus a shallow storage conduit in Marginal Way, a 2.5 MG tank in Back Cove plus a deep conduit in Marginal Way, the proposed 3.5 MG tank in Back Cove Park, and expand the Franklin Street pump station and provide alternative storage at CSO 20, or at the Portland Water District's East End Wastewater Treatment Plant. Engineering analysis of each alternative were completed to determine the feasibility of each alternative. The proposed project was selected as the preferred site because it was the lowest cost alternative and it focuses overhead and maintenance activities to one facility that will be easier to manage, inspect and maintain. The applicant considered spreading the fill material deeper in a smaller area of the site away from the protected natural resources instead of spreading the fill in a thinner layer to the edge of the undeveloped wetlands but the geotechnical review of this

design alternative raised concerns about settlement issues due to the underlying soft marine clay in both the soccer field area and along the Back Cove Trail area on the east side of the park. The applicant concluded that there is no alternative to the proposed project that avoids impacts to the coastal wetland and meets the project purpose.

B. Minimal Alteration. In support of an application and to address the analysis of the reasonableness of any impacts of a proposed project, an applicant must demonstrate that the amount of coastal wetland to be altered will be kept to the minimum amount necessary for meeting the overall purpose of the project. The applicant has minimized wetland impacts and impacts to areas adjacent to protected natural resources by placing the proposed storage tanks in an upland area and limiting the placement of the excess fill to those areas that are mostly already maintained as developed park areas. The applicant also proposes to construct 1.5 horizontal to one vertical side slopes for the edge of the fill slopes to minimize the extension of the toe of the slopes into the resource. The applicant stated that the proposed project minimizes impacts to the coastal wetland to the greatest extent practicable.

C. Compensation. In accordance with Chapter 310, § 5(C)(7), the Department may waive the requirement for compensation if it determines that any impact to the wetland functions and values will be insignificant. The proposed project is located in coastal wetlands that are developed or are immediately adjacent to developed land; the developed wetland areas no longer have wetland functions and values other than some flood storage value because the park is within the 100-year floodplain. The reduced combined sewer overflows to Back Cove that will result from the proposed storage project will improve the water quality of Back Cove which in turn should improve the wetland functions and values in the undeveloped coastal wetland areas of Back Cove. The Department of Inland Fisheries and Wildlife has determined that the project will not have an adverse effect on wildlife. For these reasons, the Department determined that compensation is not required.

The Department finds that the applicant has avoided and minimized coastal wetland impacts to the greatest extent practicable, and that the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project.

7. OTHER CONSIDERATIONS:

The Department finds, based on the design, proposed construction methods, and location, the proposed project will not inhibit the natural transfer of soil from the terrestrial to the marine environment, will not interfere with the natural flow of any surface or subsurface waters, and will not cause or increase flooding. The proposed project is not located in a coastal sand dune system, is not a crossing of an outstanding river segment, and does not involve dredge spoils disposal or the transport of dredge spoils by water.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S. §§ 480-A–480-JJ and Section 401 of the Federal Water Pollution Control Act:

- A. The proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational, or navigational uses provided that the applicant monitors and maintains vegetation as described in Finding 2.
- B. The proposed activity will not cause unreasonable erosion of soil or sediment.
- C. The proposed activity will not unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.
- D. The proposed activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine, or marine fisheries or other aquatic life.
- E. The proposed activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.
- F. The proposed activity will not violate any state water quality law including those governing the classifications of the State's waters.
- G. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.
- H. The proposed activity is not on or adjacent to a sand dune.
- I. The proposed activity is not on an outstanding river segment as noted in 38 M.R.S. § 480-P.

THEREFORE, the Department APPROVES the above noted application of CITY OF PORTLAND to fill 33,600 square feet of coastal wetland, fill upland areas adjacent to a protected natural resource, stabilize the shoreline and alter significant wildlife habitat in order to install combined sewer storage tanks, reconstruct a trail and a soccer field, and associated activities as described herein, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations:

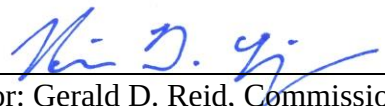
- 1. Standard Conditions of Approval, a copy attached.
- 2. The applicant shall take all necessary measures to ensure that its activities or those of its agents do not result in measurable erosion of soil on the site during the construction of the project covered by this approval.
- 3. Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

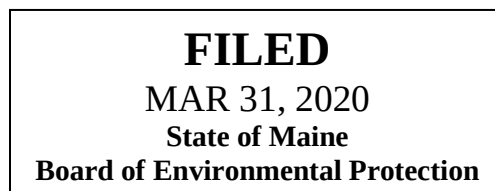
4. The applicant shall monitor the Northern Bayberry plantings and the plantings shall be replaced or maintained as necessary to achieve 85% survival after one full growing season.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED IN AUGUSTA, MAINE, THIS 31ST DAY OF MARCH, 2020.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: 
For: Gerald D. Reid, Commissioner



PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

CGW/L28331ANBNCNDN/ATS#84622, 85209, 85210, 85211



Natural Resources Protection Act (NRPA) Standard Conditions

THE FOLLOWING STANDARD CONDITIONS SHALL APPLY TO ALL PERMITS GRANTED UNDER THE NATURAL RESOURCES PROTECTION ACT, 38 M.R.S. § 480-A ET SEQ., UNLESS OTHERWISE SPECIFICALLY STATED IN THE PERMIT.

- A. Approval of Variations From Plans. The granting of this permit is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation.
- B. Compliance With All Applicable Laws. The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.
- C. Erosion Control. The applicant shall take all necessary measures to ensure that his activities or those of his agents do not result in measurable erosion of soils on the site during the construction and operation of the project covered by this Approval.
- D. Compliance With Conditions. Should the project be found, at any time, not to be in compliance with any of the Conditions of this Approval, or should the applicant construct or operate this development in any way other the specified in the Application or Supporting Documents, as modified by the Conditions of this Approval, then the terms of this Approval shall be considered to have been violated.
- E. Time frame for approvals. If construction or operation of the activity is not begun within four years, this permit shall lapse and the applicant shall reapply to the Board for a new permit. The applicant may not begin construction or operation of the activity until a new permit is granted. Reapplications for permits may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.
- F. No Construction Equipment Below High Water. No construction equipment used in the undertaking of an approved activity is allowed below the mean high water line unless otherwise specified by this permit.
- G. Permit Included In Contract Bids. A copy of this permit must be included in or attached to all contract bid specifications for the approved activity.
- H. Permit Shown To Contractor. Work done by a contractor pursuant to this permit shall not begin before the contractor has been shown by the applicant a copy of this permit.



DEP INFORMATION SHEET

Appealing a Department Licensing Decision

Dated: November 2018

Contact: (207) 287-2452

SUMMARY

There are two methods available to an aggrieved person seeking to appeal a licensing decision made by the Department of Environmental Protection's (DEP) Commissioner: (1) an administrative process before the Board of Environmental Protection (Board); or (2) a judicial process before Maine's Superior Court. An aggrieved person seeking review of a licensing decision over which the Board had original jurisdiction may seek judicial review in Maine's Superior Court.

A judicial appeal of final action by the Commissioner or the Board regarding an application for an expedited wind energy development (35-A M.R.S. § 3451(4)) or a general permit for an offshore wind energy demonstration project (38 M.R.S. § 480-HH(1)) or a general permit for a tidal energy demonstration project (38 M.R.S. § 636-A) must be taken to the Supreme Judicial Court sitting as the Law Court.

This information sheet, in conjunction with a review of the statutory and regulatory provisions referred to herein, can help a person to understand his or her rights and obligations in filing an administrative or judicial appeal.

I. ADMINISTRATIVE APPEALS TO THE BOARD

LEGAL REFERENCES

The laws concerning the DEP's *Organization and Powers*, 38 M.R.S. §§ 341-D(4) & 346; the *Maine Administrative Procedure Act*, 5 M.R.S. § 11001; and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 C.M.R. Ch. 2.

DEADLINE TO SUBMIT AN APPEAL TO THE BOARD

The Board must receive a written appeal within 30 days of the date on which the Commissioner's decision was filed with the Board. Appeals filed more than 30 calendar days after the date on which the Commissioner's decision was filed with the Board will be dismissed unless notice of the Commissioner's license decision was required to be given to the person filing an appeal (appellant) and the notice was not given as required.

HOW TO SUBMIT AN APPEAL TO THE BOARD

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017. An appeal may be submitted by fax or e-mail if it contains a scanned original signature. It is recommended that a faxed or e-mailed appeal be followed by the submittal of mailed original paper documents. The complete appeal, including any attachments, must be received at DEP's offices in Augusta on or before 5:00 PM on the due date; materials received after 5:00 pm are not considered received until the following day. The risk of material not being received in a timely manner is on the sender, regardless of the method used. The appellant must also send a copy of the appeal documents to the Commissioner of the DEP; the applicant (if the appellant is not the applicant in the license proceeding at issue); and if a hearing was held on the application, any intervenor in that hearing process. All of the information listed in the next section of this information sheet must be submitted at the time the appeal is filed.

INFORMATION APPEAL PAPERWORK MUST CONTAIN

Appeal materials must contain the following information at the time the appeal is submitted:

1. *Aggrieved Status.* The appeal must explain how the appellant has standing to maintain an appeal. This requires an explanation of how the appellant may suffer a particularized injury as a result of the Commissioner's decision.
2. *The findings, conclusions, or conditions objected to or believed to be in error.* The appeal must identify the specific findings of fact, conclusions regarding compliance with the law, license conditions, or other aspects of the written license decision or of the license review process that the appellant objects to or believes to be in error.
3. *The basis of the objections or challenge.* For the objections identified in Item #2, the appeal must state why the appellant believes that the license decision is incorrect and should be modified or reversed. If possible, the appeal should cite specific evidence in the record or specific licensing requirements that the appellant believes were not properly considered or fully addressed.
4. *The remedy sought.* This can range from reversal of the Commissioner's decision on the license or permit to changes in specific permit conditions.
5. *All the matters to be contested.* The Board will limit its consideration to those matters specifically raised in the written notice of appeal.
6. *Request for hearing.* If the appellant wishes the Board to hold a public hearing on the appeal, a request for public hearing must be filed as part of the notice of appeal, and must include an offer of proof in accordance with Chapter 2. The Board will hear the arguments in favor of and in opposition to a hearing on the appeal and the presentations on the merits of an appeal at a regularly scheduled meeting. If the Board decides to hold a public hearing on an appeal, that hearing will then be scheduled for a later date.
7. *New or additional evidence to be offered.* If an appellant wants to provide evidence not previously provided to DEP staff during the DEP's review of the application, the request and the proposed evidence must be submitted with the appeal. The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered in an appeal only under very limited circumstances. The proposed evidence must be relevant and material, and (a) the person seeking to add information to the record must show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process; or (b) the evidence itself must be newly discovered and therefore unable to have been presented earlier in the process. Specific requirements for supplemental evidence are found in Chapter 2 § 24.

OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

1. *Be familiar with all relevant material in the DEP record.* A license application file is public information, subject to any applicable statutory exceptions, and is made easily accessible by the DEP. Upon request, the DEP will make application materials available during normal working hours, provide space to review the file, and provide an opportunity for photocopying materials. There is a charge for copies or copying services.
2. *Be familiar with the regulations and laws under which the application was processed, and the procedural rules governing your appeal.* DEP staff will provide this information on request and answer general questions regarding the appeal process.
3. *The filing of an appeal does not operate as a stay to any decision.* If a license has been granted and it has been appealed, the license normally remains in effect pending the processing of the appeal. Unless a stay of the decision is requested and granted, a license holder may proceed with a project pending the outcome of an appeal, but the license holder runs the risk of the decision being reversed or modified as a result of the appeal.

WHAT TO EXPECT ONCE YOU FILE A TIMELY APPEAL WITH THE BOARD

The Board will formally acknowledge receipt of an appeal, and will provide the name of the DEP project manager assigned to the specific appeal. The notice of appeal, any materials accepted by the Board Chair as supplementary evidence, any materials submitted in response to the appeal, and relevant excerpts from the DEP's application review file will be sent to Board members with a recommended decision from DEP staff. The appellant, the license holder if different from the appellant, and any interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. The appellant and the license holder will have an opportunity to address the Board at the Board meeting. With or without holding a public hearing, the Board may affirm, amend, or reverse a Commissioner decision or remand the matter to the Commissioner for further proceedings. The Board will notify the appellant, the license holder, and interested persons of its decision.

II. JUDICIAL APPEALS

Maine law generally allows aggrieved persons to appeal final Commissioner or Board licensing decisions to Maine's Superior Court (see 38 M.R.S. § 346(1); 06-096 C.M.R. Ch. 2; 5 M.R.S. § 11001; and M.R. Civ. P. 80C). A party's appeal must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other person, an appeal must be filed within 40 days of the date the decision was rendered. An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S. § 346(4).

Maine's Administrative Procedure Act, DEP statutes governing a particular matter, and the Maine Rules of Civil Procedure must be consulted for the substantive and procedural details applicable to judicial appeals.

ADDITIONAL INFORMATION

If you have questions or need additional information on the appeal process, for administrative appeals contact the Board's Executive Analyst at (207) 287-2452, or for judicial appeals contact the court clerk's office in which your appeal will be filed.

Note: The DEP provides this INFORMATION SHEET for general guidance only; it is not intended for use as a legal reference. Maine law governs an appellant's rights.



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

**MAINE GENERAL PERMIT (GP)
AUTHORIZATION LETTER AND SCREENING SUMMARY**

BRAD ROLAND, P.E.
CITY OF PORTLAND
250 CANCO ROAD
PORTLAND, MAINE 04103

CORPS PERMIT # NAE-2020-00916
CORPS GP ID# 20-215
STATE ID# PBR

DESCRIPTION OF WORK:

Fill approximately 3,805 s.f. of intertidal substrate at two locations in Back Cove, off Franklin Street and Interstate 295 at Portland, Maine in order to update an existing stormwater outfall and armor approximately 550 linear feet of shoreline. This work is shown on the attached plans entitled "SITE LOCATION MAP" in one sheet dated "02/08/2019", "CSO 18 OUTFALL PLAN", "CSO 18 OUTFALL PROFILE", "ATHLETIC FIELD RESOURCE IMPACT IMPACTS", and "ATHLETIC FIELD RESOURCE IMPACT SECTIONS" in four sheets dated "APRIL 2020".

See ADDITIONAL CONDITIONS attached.

LAT/LONG COORDINATES: 43.666416° N -70.262383° W USGS QUAD: PORTLAND WEST, ME

I. CORPS DETERMINATION:

Based on our review of the information you provided, we have determined that your project will have only minimal individual and cumulative impacts on waters and wetlands of the United States. Your work is therefore authorized by the U.S. Army Corps of Engineers under the Federal Permit, the Maine General Permit which can be found at: <https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/> Accordingly, we do not plan to take any further action on this project.

You must perform the activity authorized herein in compliance with all the terms and conditions of the GP [including any attached Additional Conditions and any conditions placed on the State 401 Water Quality Certification including any required mitigation]. Please review the enclosed GP carefully, including the GP conditions beginning on page 5, to familiarize yourself with its contents. You are responsible for complying with all of the GP requirements; therefore you should be certain that whoever does the work fully understands all of the conditions. You may wish to discuss the conditions of this authorization with your contractor to ensure the contractor can accomplish the work in a manner that conforms to all requirements.

If you change the plans or construction methods for work within our jurisdiction, please contact us immediately to discuss modification of this authorization. This office must approve any changes before you undertake them.

Condition 37 of the GP (page 16) provides one year for completion of work that has commenced or is under contract to commence prior to the expiration of the GP on October 13, 2020. You will need to apply for reauthorization for any work within Corps jurisdiction that is not completed by October 13, 2021.

This authorization presumes the work shown on your plans noted above is in waters of the U.S. Should you desire to appeal our jurisdiction, please submit a request for an approved jurisdictional determination in writing to the undersigned.

No work may be started unless and until all other required local, State and Federal licenses and permits have been obtained. This includes but is not limited to a Flood Hazard Development Permit issued by the town if necessary.

II. STATE ACTIONS: PENDING [X], ISSUED [], DENIED [] DATE _____

APPLICATION TYPE: PBR: X, TIER 1: _____, TIER 2: _____, TIER 3: _____, LURC: _____, DMR LEASE: _____, NA: _____

III. FEDERAL ACTIONS:

JOINT PROCESSING MEETING: 2APR2020 LEVEL OF REVIEW: CATEGORY 1: _____ CATEGORY 2: X

AUTHORITY (Based on a review of plans and/or State/Federal applications): SEC 10 _____, 404 _____, 10/404 X, 103 _____

EXCLUSIONS: The exclusionary criteria identified in the general permit do not apply to this project.

FEDERAL RESOURCE AGENCY OBJECTIONS: EPA NO, USF&WS NO, NMFS NO

If you have any questions on this matter, please contact my staff at 207-623-8367 at our Augusta, Maine Project Office. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

GREENAN.COLIN.M. Digitally signed by
1546383926 GREENAN.COLIN.M.1546383926
Date: 2020.04.16 08:42:03 -04'00'

COLIN M. GREENAN
PROJECT MANAGER
MAINE PROJECT OFFICE

DELGIUDICE.FRAN
KJ.1228916567

FRANK J. DEL GIUDICE
DATE
CHIEF, PERMITS & ENFORCEMENT BRANCH
REGULATORY DIVISION

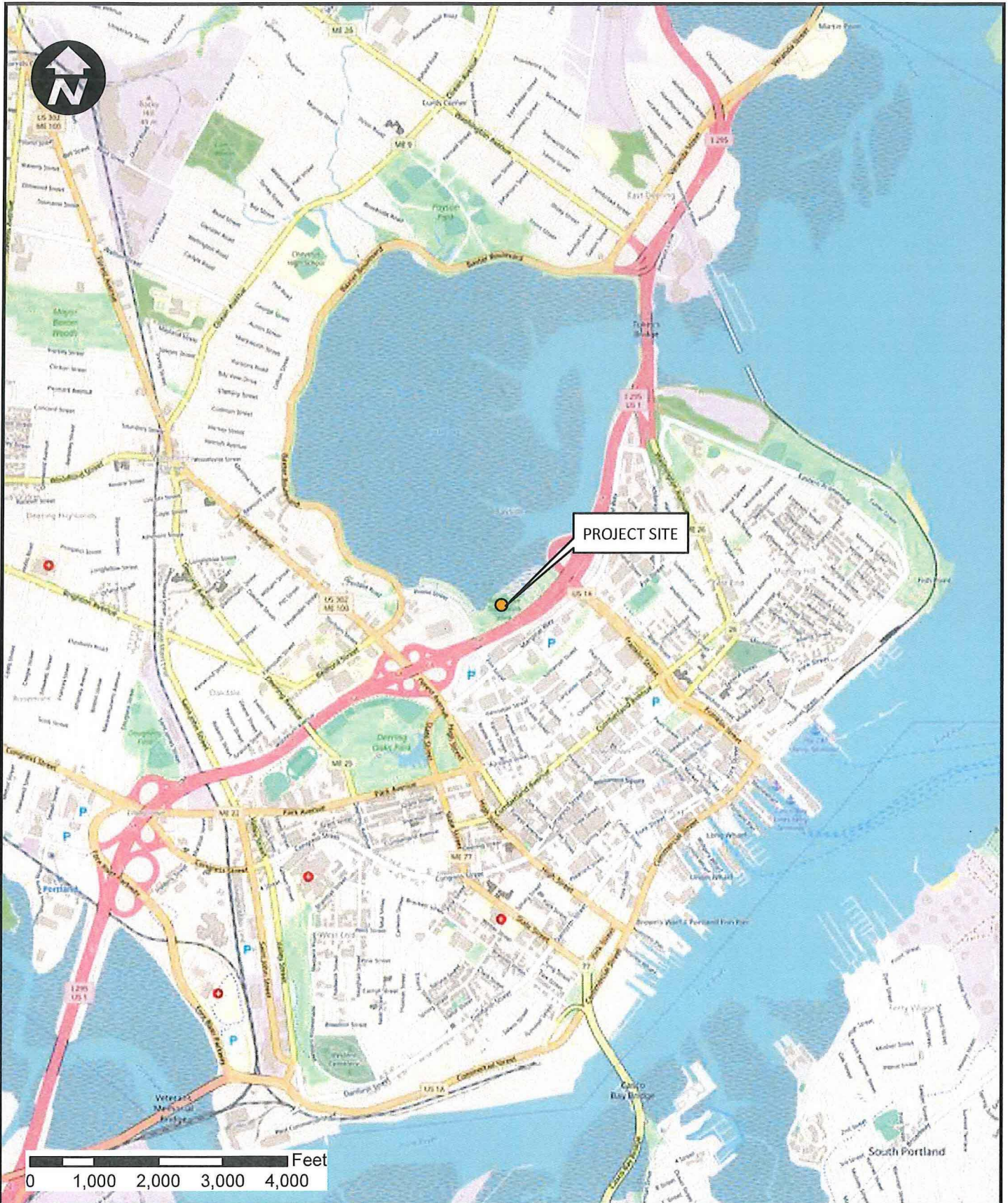
16APR2020



**US Army Corps
of Engineers®**
New England District

**PLEASE NOTE THE FOLLOWING ADDITIONAL CONDITIONS FOR
DEPARTMENT OF THE ARMY
GENERAL PERMIT
NO. NAE-2020-00916**

1. This authorization requires you to 1) notify us before beginning work so we may inspect the project, and 2) submit a Compliance Certification Form. You must complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated starting date. You must complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work. **The forms are attached after the plans.**
2. The permittee shall assure that a copy of this permit is at the work site whenever work is being performed and that all personnel performing work at the site of the work authorized by this permit are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made a part of any and all contracts and sub-contracts for work which affects areas of Corps of Engineers' jurisdiction at the site of the work authorized by this permit. This shall be done by including the entire permit in the specifications for the work. If the permit is issued after construction specifications but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. The term "entire permit" includes permit amendments. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps of Engineers jurisdiction.
3. Adequate sedimentation and erosion control devices, such as geotextile silt fences or other devices capable of filtering the fines involved, shall be installed and properly maintained to minimize impacts during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices shall be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.
4. All exposed upland soils resulting from the construction shall be promptly seeded and mulched in order to achieve vegetative stabilization.
5. All intertidal work shall be conducted in-the-dry in order to minimize potential impacts to local water quality and essential fish habitat.



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TECHNICS

WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd. - Suite 4A
South Portland, ME 04106
Tel. 207-200-2100

TITLE SITE LOCATION MAP
FOR: CITY OF PORTLAND, MAINE

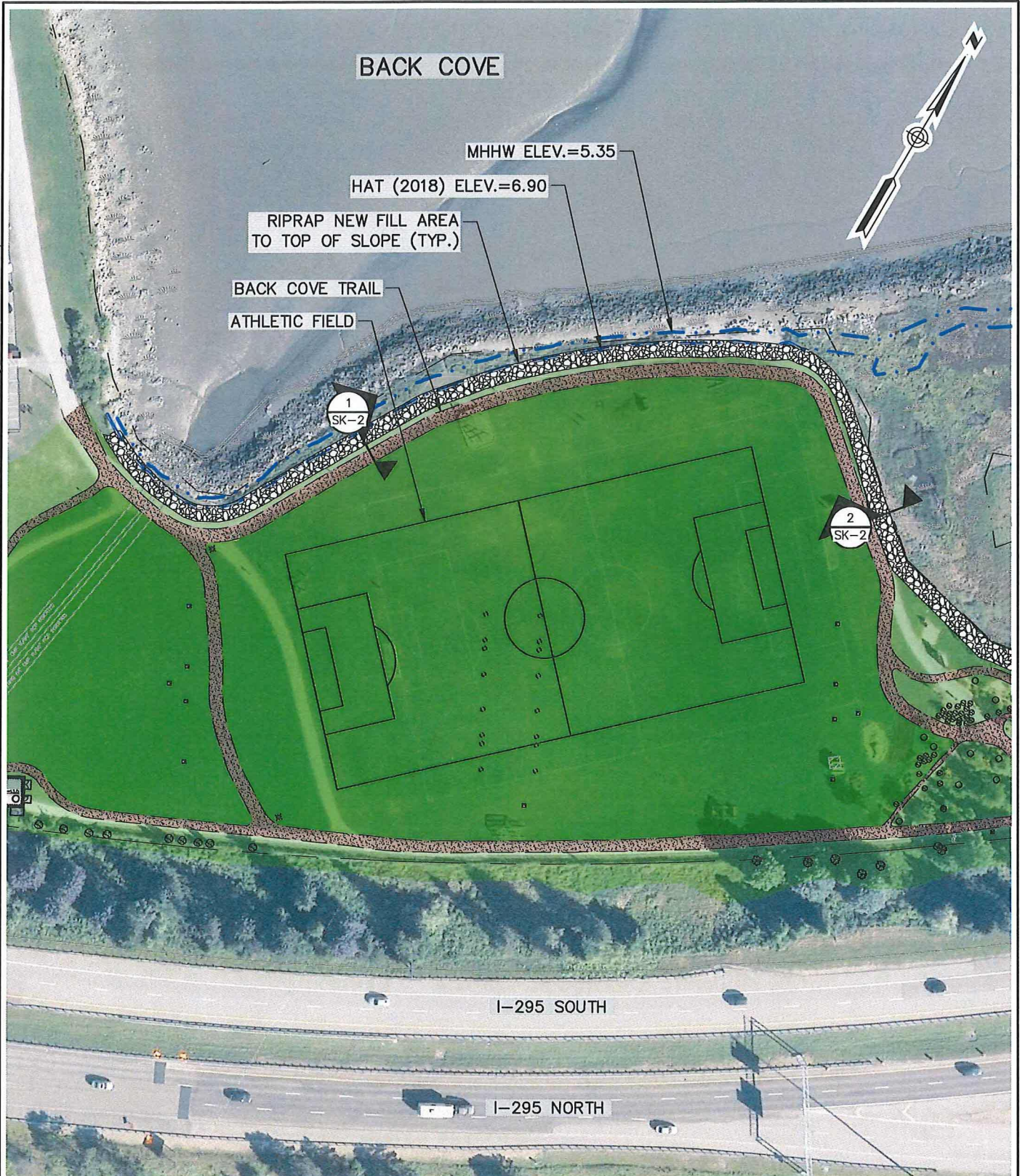
LOCATION:
Back Cove
Portland, ME

INFORMATION:
Basemap: Open StreetMap

SCALE: 1" = 2,000'

DATE: 02/08/2019

C:\Users\Jcoulombe\OneDrive - Woodard & Curran\PC\Folders\Documents\000 PROJECTS\0232069.00 Portland ME - Back Cove S Fac Des\Drawings\Civil\0232069.00-C-223 - C-224.dwg, Mar 31, 2020 - 2:11pm JCOULOMBE



NOTES:

- MLLW ELEV. = -4.5
- IMPACT ALONG BANK: 550 LINEAR FEET
- IMPACT BELOW HAT(2018): 1535 SQUARE FEET



41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

**ATHLETIC FIELD
RESOURCE IMPACTS**

DESIGNED BY: KJT
DRAWN BY: JBC
CHECKED BY: MDLM
0232069.00-C-223 - C-224.dwg

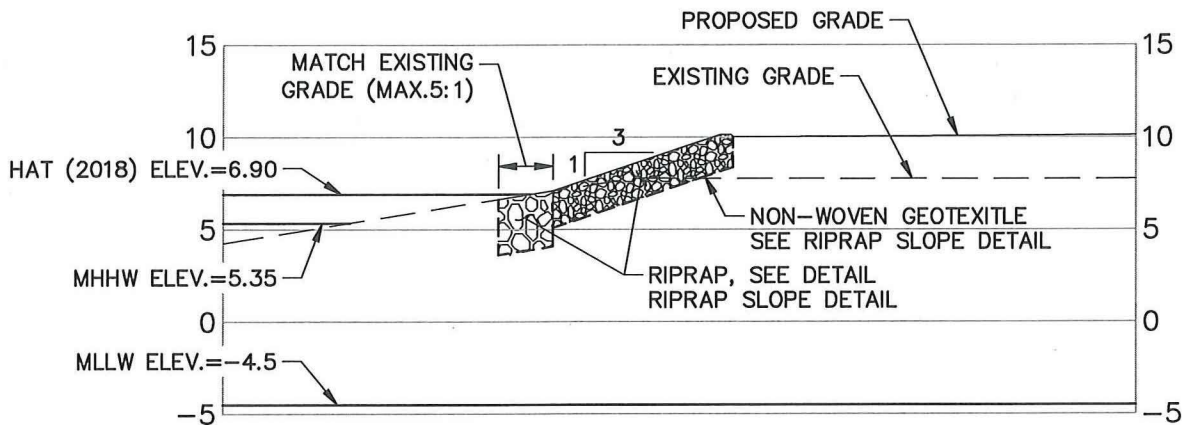
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH STORAGE

JOB NO: 0232069.00
DATE: APRIL 2020
SCALE: 1" = 100'

SK-1

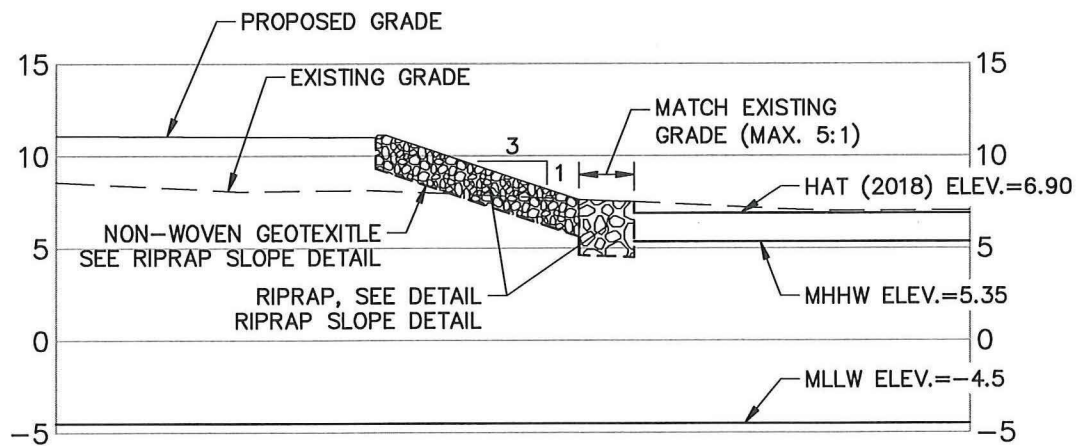
C:\Users\jcolombe\OneDrive - Woodard & Curran\PC\Folders\Documents\000 PROJECTS\0232069.00 Portland ME - Back Cove S Fac Des\Drawings\Civil\0232069.00-C-223 - C-224.dwg, Mar 31, 2020 - 2:11pm JCOLOMBE



SECTION 1

SCALE: 1" = 10'

1
SK-1



SECTION 2

SCALE: 1" = 10'

2
SK-1



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Portland, Maine 04102
866.426.4262 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

ATHLETIC FIELD RESOURCE IMPACTS SECTIONS

DESIGNED BY: KJT
DRAWN BY: JBC
CHECKED BY: MDLM
0232069.00-C-223 - C-224.dwg

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH STORAGE

JOB NO: 0232069.00
DATE: APRIL 2020
SCALE: 1" = 10'

SK-2

C:\Users\jcolombe\OneDrive - Woodard & Curran\PC\Folders\Documents\000 PROJECTS\0232069.00 Portland ME - Back Cove S Fac Des\Drawings\Civil\0232069.00-C-223 - C-224.dwg, Mar 31, 2020 - 2:11pm, jcolombe



41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

CSO 18 OUTFALL PLAN

DESIGNED BY: KJT
DRAWN BY: JBC

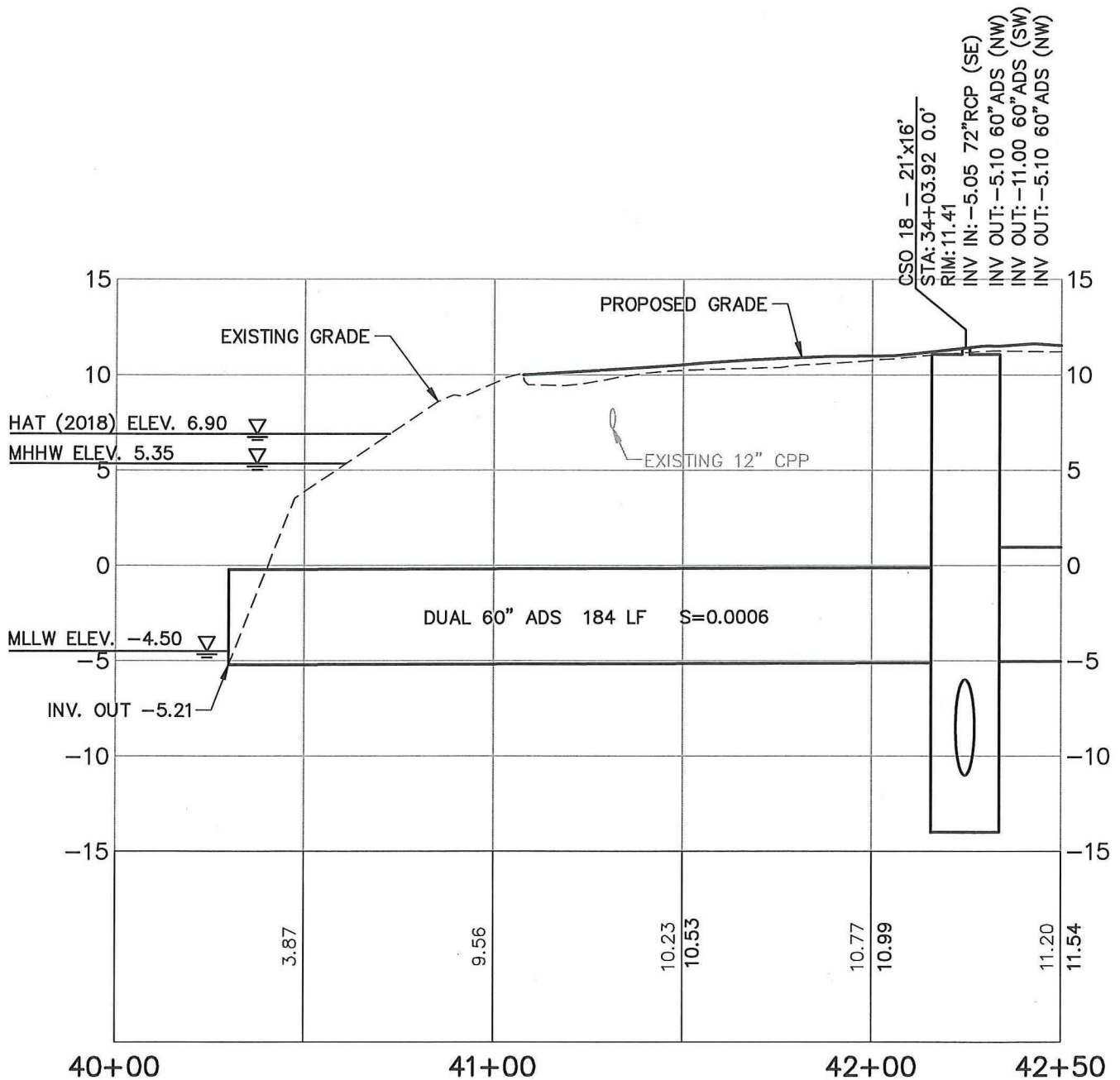
CHECKED BY: MDLM
0232069.00-C-223 - C-224.dwg

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH STORAGE

JOB NO: 0232069.00
DATE: APRIL 2020
SCALE: 1" = 50'

SK-3



PROFILE STA. 40+00 TO STA. 42+50

HORIZONTAL SCALE: 1" = 40'
 VERTICAL SCALE: 1" = 8'



41 Hutchins Drive
 Portland, Maine 04102
 800.426.4262 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

CSO 18 OUTFALL PROFILE

DESIGNED BY: KJT
 DRAWN BY: JBC
 CHECKED BY: MDLM
 0232069.00-ACOE SK-4.dwg

CITY OF PORTLAND PUBLIC WORKS
 PORTLAND, MAINE

BACK COVE SOUTH STORAGE

JOB NO: 0232069.00
 DATE: APRIL 2020
 SCALE: 1" = 50'

SK-4



**US Army Corps
of Engineers®**
New England District

**GENERAL PERMIT
WORK-START NOTIFICATION FORM**
(Minimum Notice: Two weeks before work begins)

EMAIL TO: colin.m.greenan@usace.army.mil

-or-

MAIL TO: Colin M. Greenan
U.S. Army Corps of Engineers, New England District
Maine Project Office
442 Civic Center Drive, Suite 350
Augusta, Maine 04330

A Corps of Engineers Permit (NAE-2020-00916) was issued to Brad Roland, P.E., City of Portland. The permit authorized the permittee to fill approximately 3,805 s.f. of intertidal substrate at two locations in Back Cove, off Franklin Street and Interstate 295 at Portland, Maine in order to update an existing stormwater outfall and armor approximately 550 linear feet of shoreline.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

Telephone: () _____ () _____

Proposed Work Dates: Start: _____

Finish: _____

PERMITTEE'S SIGNATURE: _____ DATE: _____

PRINTED NAME: _____ TITLE: _____

FOR USE BY THE CORPS OF ENGINEERS

PM: GREENAN Submittals Required: No

Inspection Recommendation: random Maine General Permit compliance



**US Army Corps
of Engineers®**
New England District

(Minimum Notice: Permittee must sign and return notification
within one month of the completion of work.)

COMPLIANCE CERTIFICATION FORM

Corps of Engineers Permit No: NAE-2020-00916

Name of Permittee: Brad Roland, P.E., City of Portland

Permit Issuance Date: April 16, 2020

Please sign this certification and return it to the following address upon completion of the activity and any mitigation required by the permit. You must submit this after the mitigation is complete, but not the mitigation monitoring, which requires separate submittals.

* MAIL TO: U.S. Army Corps of Engineers, New England District *
* Policy & Technical Support Branch *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

Printed Name

Date of Work Completion

() _____
Telephone Number

() _____
Telephone Number

04/06/2017

DEPARTMENT OF ENVIRONMENTAL PROTECTION
PERMIT BY RULE NOTIFICATION FORM
 (For use with DEP Regulation, Natural Resources Protection Act- Permit by Rule Standards, Chapter 305)
 PLEASE TYPE OR PRINT IN BLACK INK ONLY

APPLICANT INFORMATION (Owner)		AGENT INFORMATION (If Applying on Behalf of Owner)	
Name:	City of Portland Dept of Public Works	Name:	Sebago Technics, Inc
Mailing Address:	250 Canco Road	Mailing Address:	75 John Roberts Road, Suite 4A
Town:	Portland	Town:	South Portland
State and Zip Code:	ME 04103	State and Zip Code:	ME 04106
Daytime Phone #:	207-874-8801	Daytime Phone #:	207-200-2073
Email Address:	brad@portlandmaine.gov	Email Address:	omccullough@sebagotechnics.com
PROJECT INFORMATION			
Part of a larger project? (check one):	☐ Yes ☐ No	After the Fact? (check one):	☐ Yes ☐ No
Project involves work below mean low water? (check one):		☐ Yes ☐ No	Name of waterbody: Back Cove
Project Town:	Portland	Project Location (Address):	Franklin Street
Brief Project Description:	installation of 2 new storm-drainage pipes and replacing an existing CSO outfall pipe.		
Brief Directions to Site:	Northeast on Canco Road (0.2 mi) turn right onto Washington Ave (1.2 mi) use right 2 lanes to take ramp onto I-295 S/ME-26 S/US1S to Forest Ave to Baxter Blvd to Prebble Str		

PERMIT BY RULE (PBR) SECTIONS (Check at least one): I am filing notice of my intent to carry out work which meets the requirements for Permit By Rule (PBR) under DEP Rules, Chapter 305. I and my agents, if any, have read and will comply with all of the standards in the Sections checked below.

- | | | |
|--|---|--|
| ☒ Sec. (2) Act. Adj. to Protected Natural Res. | ☐ Sec. (10) Stream Crossing | ☐ Sec. (17) Transfers/Permit Extension |
| ☐ Sec. (3) Intake Pipes | ☐ Sec. (11) State Transportation Facil. | ☐ Sec. (18) Maintenance Dredging |
| ☐ Sec. (4) Replacement of Structures | ☐ Sec. (12) Restoration of Natural Areas | ☐ Sec. (19) Activities in/on/over significant vernal pool habitat |
| ☐ Sec. (5) REPEALED | ☐ Sec. (13) F&W Creation/Enhance/Water Quality Improvement | ☐ Sec. (20) Activities located in/on/over high or moderate value inland waterfowl & wading bird habitat or shorebird feeding & roosting areas |
| ☐ Sec. (6) Movement of Rocks or Vegetation | ☐ Sec. (14) REPEALED | |
| ☐ Sec. (7) Outfall Pipes | ☐ Sec. (15) Public Boat Ramps | |
| ☐ Sec. (8) Shoreline stabilization | ☐ Sec. (16) Coastal Sand Dune Projects | |
| ☐ Sec. (9) Utility Crossing | | |

NOTE: Municipal permits may also be required. Contact your local code enforcement office for more information. Federal permits may be required for stream crossings and for projects involving wetland fill. Contact the Army Corps of Engineers at the Maine Project Office for more information.

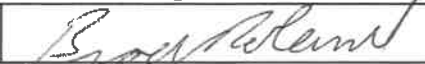
NOTIFICATION FORMS CANNOT BE ACCEPTED WITHOUT THE NECESSARY ATTACHMENTS

- ☒ **Attach** all required submissions for the PBR Section(s) checked above. The required submissions for each PBR Section are outlined in Chapter 305 and may differ depending on the Section you are submitting under.
- ☒ **Attach** a check for the correct fee made payable to: "Treasurer, State of Maine". The current fee for NRPA PBR Notifications can be found at the Department's website: <http://www.maine.gov/dep/feesched.pdf>
- ☒ **Attach** a location map that clearly identifies the site (U.S.G.S. topo map, Maine Atlas & Gazetteer, or similar).
- ☒ **Attach Proof of Legal Name** if applicant is a corporation, LLC, or other legal entity. Provide a copy of Secretary of State's registration information (available at <http://icrs.informe.org/nei-sos-icrs/ICRS?MainPage=x>) Individuals and municipalities are not required to provide any proof of identity.

I authorize staff of the Departments of Environmental Protection, Inland Fisheries & Wildlife, and Marine Resources to access the project site for the purpose of determining compliance with the rules.

I also understand that this PBR becomes effective 14 calendar days after receipt by the Department *unless the Department approves or denies the PBR prior to that date.*

By signing this Notification Form, I represent that the project meets all applicability requirements and standards in the rule and that the applicant has sufficient title, right, or interest in the property where the activity takes place.

Signature of Agent or Applicant:		Date:	2/19-06-03
----------------------------------	---	-------	------------

Keep a copy as a record of permit. Send the form with attachments via certified mail or hand deliver to the Maine Dept. of Environmental Protection at the appropriate regional office listed below. The DEP will send a copy to the Town Office as evidence of the DEP's receipt of notification. No further authorization by DEP will be issued after receipt of notice. Permits are valid for two years. **Work carried out in violation of any standard is subject to enforcement action.**

AUGUSTA DEP
17 STATE HOUSE STATION
AUGUSTA, ME 04333-0017
(207)287-7888

PORTLAND DEP
312 CANCO ROAD
PORTLAND, ME 04103
(207)822-6300

BANGOR DEP
106 HOGAN ROAD
BANGOR, ME 04401
(207)941-4570

PRESQUE ISLE DEP
1235 CENTRAL DRIVE
PRESQUE ISLE, ME 04769
(207)764-0477

OFFICE USE ONLY	Ck.#	Date	Staff	Staff	After Photos
PBR #	FP		Acc. Date	Def. Date	



SEBAGO
TECHNICS

WWW.SEBAGOTECHNICS.COM
75 John Roberts Rd. - Suite 4A
South Portland, ME 04106
Tel. 207-200-2100

TITLE SITE LOCATION MAP
FOR: CITY OF PORTLAND, MAINE

LOCATION:
Back Cove
Portland, ME

INFORMATION:
Basemap: Open StreetMap

SCALE: 1" = 2,000'
DATE: 02/08/2019

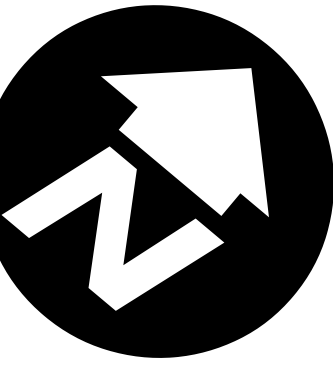
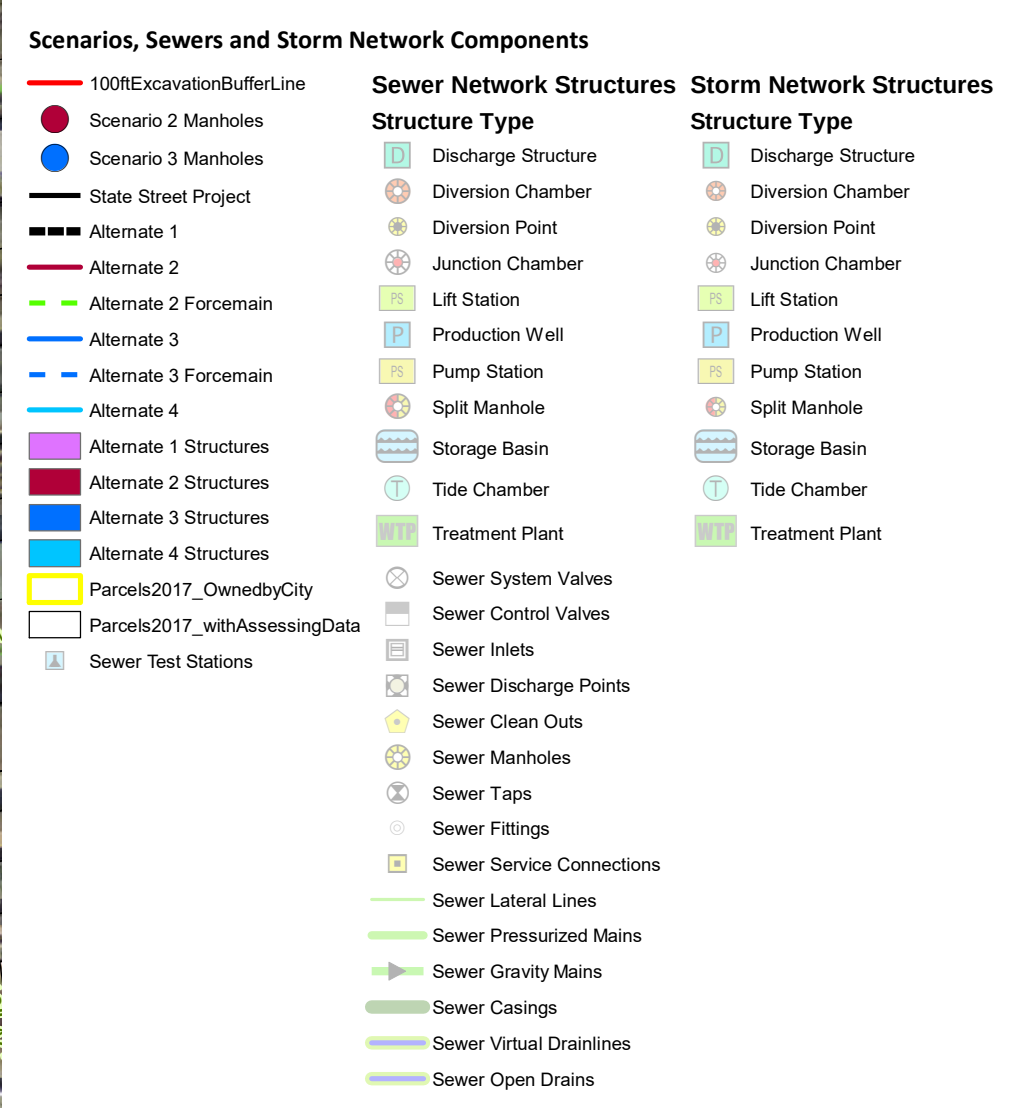
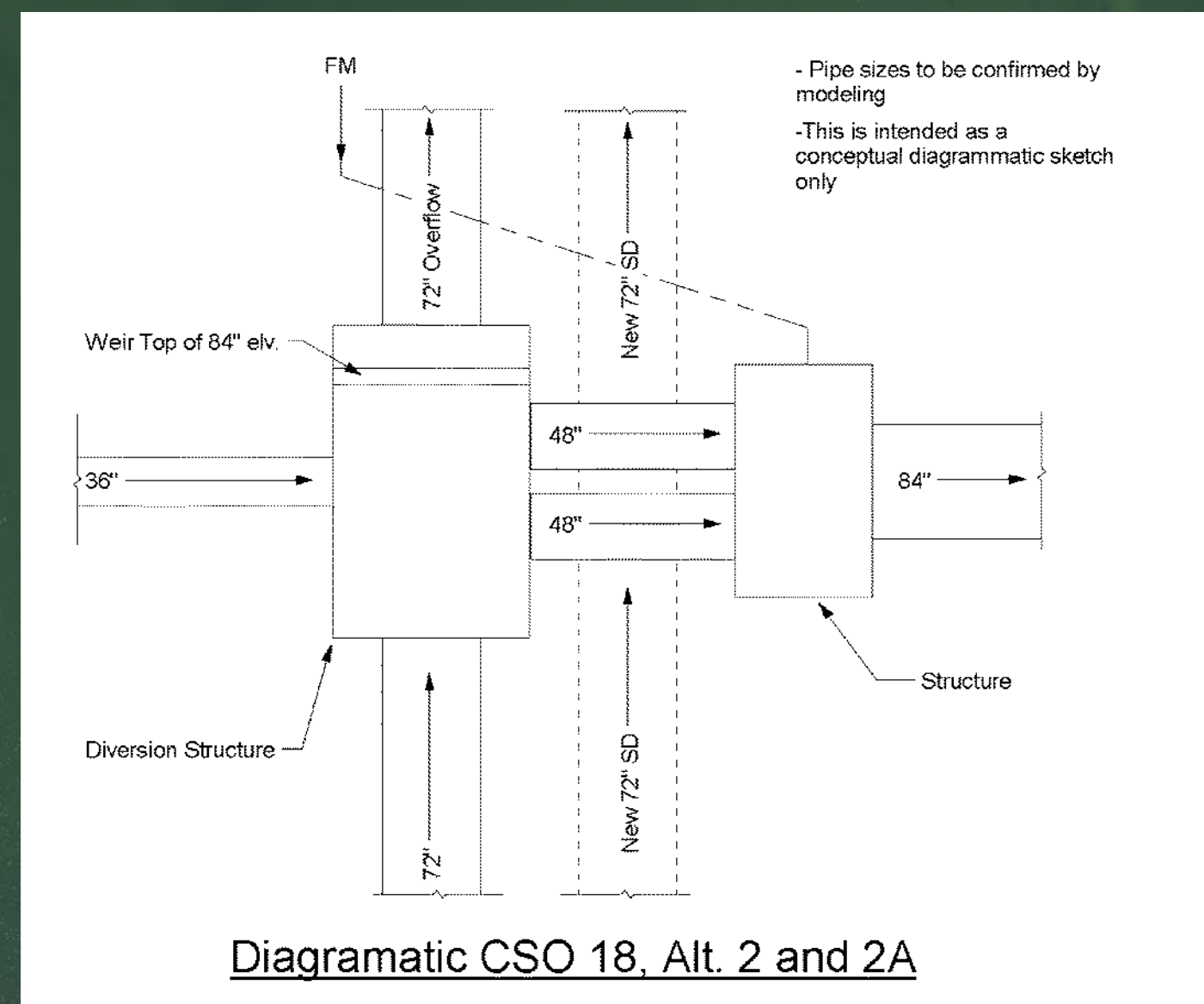
Franklin Outfall





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TECHNICS
CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

AECOM



DATA SOURCES

2017 ORTHOIMAGERY
2017 PARCEL MAPPING
2006 LIDAR DERIVED CONTOURS
2017 CITY UTILITY DATA

B	OAM	12/07/2017	REVISED TO REMOVE ALTERNATE 2 & 3
A	OAM	8/24/2017	ISSUED FOR REVIEW/GENERAL PLANNING
REV:	BY:	DATE:	STATUS:

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHNICS, INC. ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHNICS, INC.

SIBAGO
TECHNICS

75 John Roberts Rd. - Suite 1A South Portland, ME 04106 Tel: 207-200-2100	250 Goodard Rd. - Suite B Lewiston, ME 04240 Tel: 207-783-5656
---	--

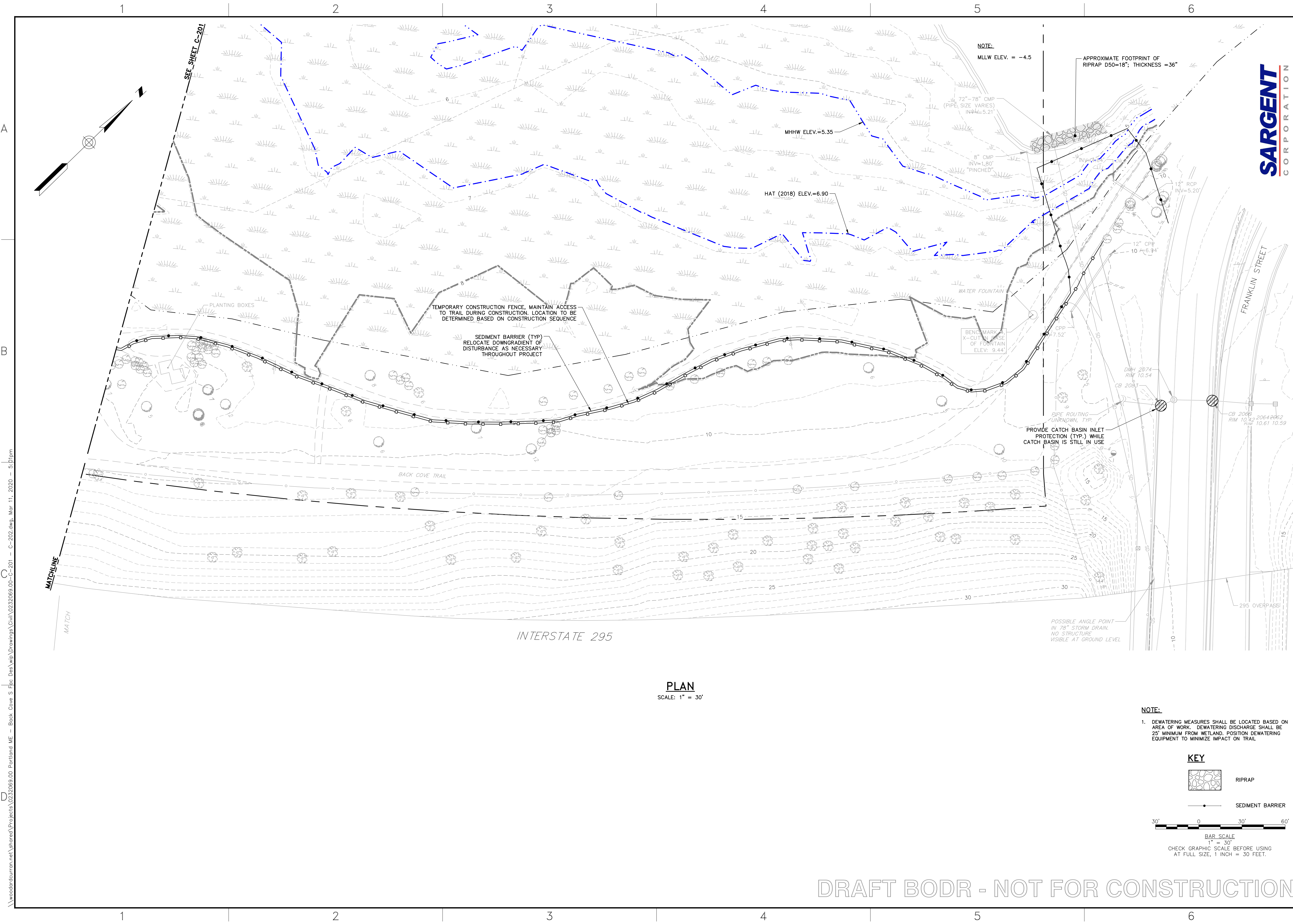
OF:
BACK COVE SOUTH CONDUIT STORAGE PROJECT

FOR:
CITY OF PORTLAND, MAINE
389 CONGRESS STREET
PORTLAND, ME 04101

DATE	SCALE
12-12-2017	1" = 150'

SHEET 1 OF 1

17025 Worksheetv2.MXD



woodwardcurran.net\shared\Projects\0232069.00 Portland ME - Back Cove S Flood Des\wp Drawings\Civil\0232069.00-C-201 - C-202.dwg, Mar 11, 2020 - 5:17pm

41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com

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& CURRAN

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COMMITMENT & INTEGRITY DRIVE RESULTS

REV	DESCRIPTION	DATE

CHECKED BY: MCLM
DESIGNED BY: KJT
DRAWN BY: JBC
0232069.00-C-201 - C-202.DWG

EROSION CONTROL PLAN (TRAIL)

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: FEBRUARY 2020
SCALE: AS NOTED
SHEET: 4 OF 92

C-202

DRAFT BODR - NOT FOR CONSTRUCTION



Owens McCullough

From: IFWEnvironmentalreview <IFWEnvironmentalreview@maine.gov>
Sent: Monday, February 3, 2020 10:04 AM
To: Owens McCullough
Cc: Brad Roland, P.E. (brad@portlandmaine.gov); Zitske, Brad
Subject: RE: Review Request--Back Cove Combined Sewer Overflow, Portland

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Owens,

Thank you for the additional information—it was extremely helpful in better understanding the project. Given the complexity of this important work adjacent to Back Cove, we understand the need for the project duration and the need to keep the work flow continuous. No work window is recommended.

Thanks again,

John

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
284 State Street, 41 SHS
Augusta, Maine 04333-0041
Tel (207) 287-5254; Cell (207) 446-5145
Fax (207) 287-6395
www.mefishwildlife.com



Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.

From: Owens McCullough <omccullough@sebagotechnics.com>
Sent: Monday, January 27, 2020 3:35 PM
To: IFWEnvironmentalreview <IFWEnvironmentalreview@maine.gov>
Cc: Brad Roland, P.E. (brad@portlandmaine.gov) <brad@portlandmaine.gov>
Subject: FW: Review Request--Back Cove Combined Sewer Overflow, Portland

EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Afternoon John,

I wanted to follow-up on the City of Portland's Underground Combined Sewer Overflow Project under the soccer fields at the Preble Street Soccer fields and Recreational area along Back Cove in Portland. We had reached out to your office as part of the original NRPR permitting process and were provided the attached review letter which included some suggested timing restrictions. We are now getting close to finishing the permitting and the beginning of construction on this EPA and Maine DEP mandated project.

Our biggest challenge with the project is that it is a very large and involved underground tank project (3.5 million gallons) that has been mandated by the US EPA and Maine DEP under a consent decree to reduce combined overflows into the Portland harbor. As such, the tank, which when completed will be completely underground with the soccer field above returned to its former playing surface about 2 feet higher in elevation for sea level resiliency reducing CSO's by approximately 85%. The project (attached plans) has been located as far as practicable from Back Cove and therefore located close to I-295. The tank will require about a 28' feet deep phased excavation with sheet piling to stabilize the adjacent highway to accommodate the tank construction. By virtue of the size of the project, construction is going to take approximately 1.5 years during which time the project will be continually worked on. The project area will be wholly located within the active Preble Street Park and Soccer fields and will not directly occur within any of the abutting marine habitat areas.

The project is intended to improve the overall water quality of Back Cove and Portland Harbor through a significant reduction in CSO's (85% reduction) into the bay which will have a positive impact on water quality and habitats. The IF&W provided letter had recommended that construction should not occur between May 1 and June 20 or between August 1 and October 1, which are critical time periods for migrating shorebirds. Given the complexity of this project and time needed to install the sheet piling; excavation and installation of the tank will take about 1.5 years of continual work to complete the project. As a result, it is not logistically possible to phase or stop construction during the time periods suggested without compromising the integrity of the excavation and adjacent lands. The suggested restrictions would also prolong construction, substantially increasing costs to the City and Rate Payers and likely cause more impact than a one-time consolidated construction period. The City is also under a MDEP mandate to complete the project within an accelerated time period. As indicated, we have strived to locate the tank excavation as far from the resources as possible with none of the work occurring within any of the resources. Work will be confined to the existing active soccer and play fields along with the recreational trails and existing developed lands.

The project is likely to start this late winter and will be completed in the early summer of 2022. We offer this information for the departments consideration of project timing. If you have any questions or would like to meet and learn more about the project please let me know.

Thank you, Owens

Owens McCullough, PE, LEED-AP

Senior Vice President, Strategy & Client Development

Sebago Technics, Inc. | An Employee-Owned Company
75 John Roberts Rd., Suite 4A, South Portland, ME 04106
Office: 207.200.2100 | Direct: 207.200.2073 | Fax: 207.856.2206
omccullough@sebagotechnics.com | www.sebagotechnics.com



From: Perry, John <John.Perry@maine.gov>

Sent: Tuesday, August 28, 2018 10:45 AM

To: Owens McCullough <omccullough@sebagotechnics.com>
Subject: Review Request--Back Cove Combined Sewer Overflow, Portland

Hi Owens,

Attached is MDIFW's response to your request for information for the Back Cove Combined Sewer Overflow project in Portland—please let me know if you need additional information.

Also, please email any future requests to IFWEnvironmentalreview@maine.gov

Thanks,

John

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
284 State Street, 41 SHS
Augusta, Maine 04333-0041
Tel (207) 287-5254; Cell (207) 446-5145
Fax (207) 287-6395
www.mefishwildlife.com



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Permit

Permit NO. **EX2020-02122**

Permit Type: **DPW Excavation Permit**

Work Classification: **Excavation - Block Permit**

Permit Status: **Issued**

Issue Date: **03/25/2020**

Expiration: **04/24/2020**

Location Address

244 Preble St., Portland, ME 04101

Contacts

Sargent Corporation
P O Box 435, Stillwater, ME 04489
(207)817-7650
Applicant/Preparer
gadams@sargent-corp.com

Sargent Corporation
P O Box 435, Stillwater, ME 04489
(207)817-7650
Licensed Excavator
gadams@sargent-corp.com

Glenn Adams
P O Box 4354 378 Bennoch Rd., Stillwater, 04489
(207)827-4435
Agent/Representative
gadams@sargent-corp.com

Description: Excavation permit for the City of Portland - Back Cove South Storage Facility Project. Phase 1A and 1B including mobilization, site preparation, and preliminary earthwork.

Fees	Amount
Total:	

Payments	Amt Paid
Total Fees	
Amount Due:	

Available Inspections:	
Inspection Type	
DPW Excavation Inspection	1001

Director of Public Works - Christopher Branch

REQUEST FOR APPROVAL OF TIMING OF ACTIVITY (DMR)

This form is for use in obtaining approval from the **Department of Marine Resources (DMR)** for the timing of certain projects in accordance with Chapter 305 Permit by Rule Standards.

To be filled out by applicant: (Instructions are on the back of this form)

1. **Applicant's name:** City of Portland, C/O Bradley Roland

Address: 212 Canco Road

Portland, ME 04103

telephone: (207) 874-8840

Agent:

Owens A. McCullough, P.E.

Sebago Technics, Inc.

75 John Roberts Road, Suite 4A

South Portland, ME 04106

Direct: (207) 200-2073

omccullough@sebagotechnics.com

2. I plan to perform the following activity (please check the appropriate box):

☐ **Sec. 3 Intake pipes** (tidal waters only)

☐ **Sec. 4 Replacement of structures** (tidal waters only)

☒ **Sec. 7 Outfall pipes** (tidal waters only)

☐ **Sec. 9 Utility crossings** (any location if performed between Oct. 2 and July 14)

☐ **Sec. 12 Restoration of natural areas** (tidal waters only)

☐ **Sec. 15 Public boat ramps** (tidal waters only)

☐ **Sec. 18 Maintenance dredging** (tidal waters only)

3. **Brief description of project:** [please include the name of the stream or waterbody, if known]

The project is for the installation of two 72" stormwater outfall pipes and one 6' x 8' box culvert to replace the existing combined sewer overflow (CSO) outfall that drains from the City of Portland into Back Cove. CSO will be redirected to a proposed 3.5 million gallon tank in Back Cove Park. This project will result in an 85% reduction in CSO to back cove from this outfall. Two 72" outfall pipes accommodate CSO overflow exceeding design storm and one 6' x 8' box culvert for separate storm drainage. It is anticipated that this project will take a minimum of 1.5 years. No specific activity window is requested due to coordination logistics.

4. I plan to perform this activity between the dates of May 15, 2020 and June 15, 2022.
(start date) (end date)

5. I have included a map showing the location of my project.

***[Please note that if no location map is provided, no approval will be granted by DMR]**

6. Send completed form to: **DMR Environmental Coordinator**
P. O. Box 8, West Boothbay Harbor, ME 04575-008

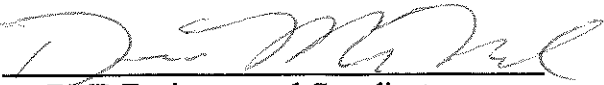
For agency use only:

The Department has reviewed the proposed timing of the activity identified above and:

☒ approves of the project's timing as proposed.

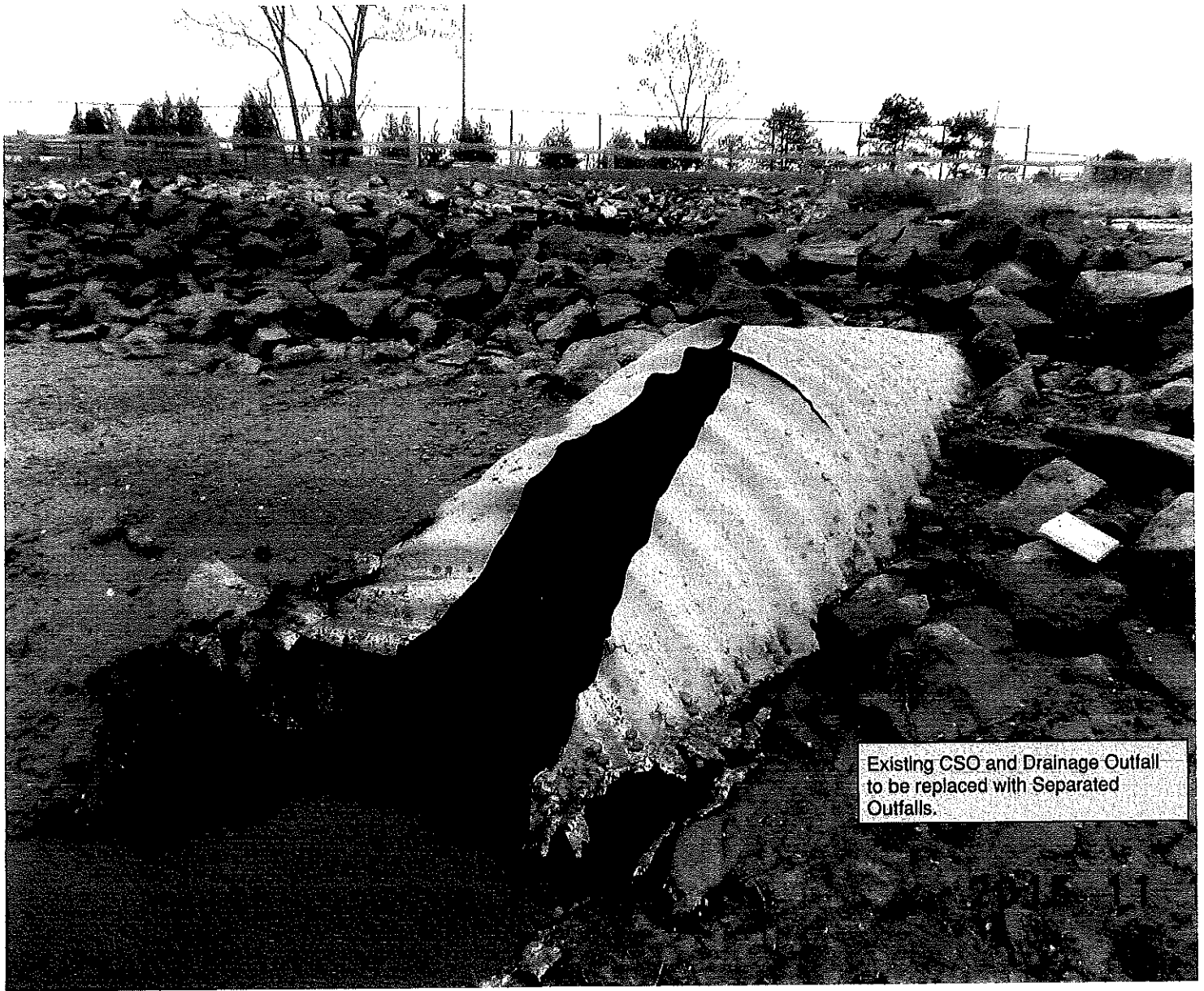
☐ requires that the project's timing be changed to occur between _____ and _____
(start date) (end date)

☐ Other comments: _____


DMR Environmental Coordinator

17 March 2020
Date





Existing CSO and Drainage Outfall
to be replaced with Separated
Outfalls.

NOTICE OF INTENT TO COMPLY WITH MAINE CONSTRUCTION GENERAL PERMIT

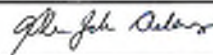
PLEASE TYPE OR PRINT IN BLACK INK ONLY

Name of Applicant (Owner):		Sargent Corporation		Applicant Mailing Address:		378 Bennoch Rd., P.O. Box 435	
Town/City:		Stillwater		State:		ME	
Daytime phone: (with area code)		207-827-4435		Email if available:		gadams@sargent-corp.com	
Project Location: (Town/City):		Portland, Maine		UTM Northing: (if known)		15864237.34	
Map #:		034A		Lot #:		D001	
UTM Easting: (if known)		1306040.96		Size of disturbed area proposed:		8.3 Acres	
Creating a common plan of development or sale?		Yes		No ☒		Part of a larger project?	
						Yes	
						No ☒	
Name of waterbody(ies) to which the disturbed area drains, or name municipality if drains to an MS4:				Back Cove/Casco Bay			
Does site drain to an Impaired Waterbody (C)? If so, give name:				N/A			
Detailed directions to site, including address if available:				From I-295 south, take exit 6B. Turn right onto Forest Ave. Turn right onto Baxter Ave for 0.1 mile. Turn right onto Preble Street for 0.2 miles. Turn left. Arrive at 244 Preble St., Portland, ME.			
Description of project and its purpose:				Design-build construction contract for the City of Portland's RFP 19039, Back Cove South Storage Facility. 3.5 million gallon CSO Storage and related piping and road construction per Maine DEP consent decree for reduction of CSOs.			

I am filing notice of my intent to carry out work which meets the requirements of the Construction General Permit (effective 3/10/03). I have a copy of the Construction General Permit. I have read and will comply with all of the standards. I have attached all the required submittals. *Notification forms cannot be accepted without the necessary attachments.*

- ☒ ALL: A check (non-refundable) made payable to: "Treasurer, State of Maine." See DEP fee schedule for correct fee. You must know # of acres being permitted to determine the fee.
- ☒ ALL: A U.S.G.S. topo map or Maine Atlas & Gazetteer map with the project site clearly marked.
- ☒ ALL: Drawing of the proposed activity (site plan).
- ☒ ALL: An ESC plan.
- ☐ IF this form is not being signed by the landowner or lessee of the property, attach documentation showing authorization to sign.
- ☒ IF any construction activity will occur in essential habitat, attach written approval from the Dept. of Inland Fisheries & Wildlife.

I authorize staff of the Departments of Environmental Protection to access the project site for the purpose of determining compliance with the general permit. I also understand that **this permit is not valid until approved by the Department or 14 days after receipt by the Department, whichever is less.**

Signature of Applicant:		Date:	2-26-19
-------------------------	---	-------	---------

Keep the bottom copy as a record of permit. Send the form with attachments via certified mail to the Maine Dept. of Environmental Protection at the appropriate regional office. The DEP will send a copy to the Town Office as evidence of the DEP's receipt of notification. No further authorization by DEP will be issued after receipt of notice. Check with DEP Staff to determine the expiration date on this permit. **Work carried out in violation of any standard is subject to enforcement action.**

OFFICE USE ONLY	Ck.#	132254	Date	3/19/2020	Staff	ZZ	Staff	ZZ	After Photos
NOI #	FP	149.00	Acc. Date	4/12/2020	Def. Date	3/23/2020			

SARGENT

C O R P O R A T I O N

P.O. Box 435
Stillwater ME 04489

Machias Savings Bank
Machias, Maine
52-7453/2112

132254

DATE 03/17/2020

\$ ****149.00

Pay:*****One hundred forty-nine dollars and no cents

TO
THE
ORDER
OF

TREASURER, STATE OF MAINE
39 STATE HOUSE STATION
AUGUSTA, ME 04333-39

Robert R. Sargent

L/MEPT-FF06

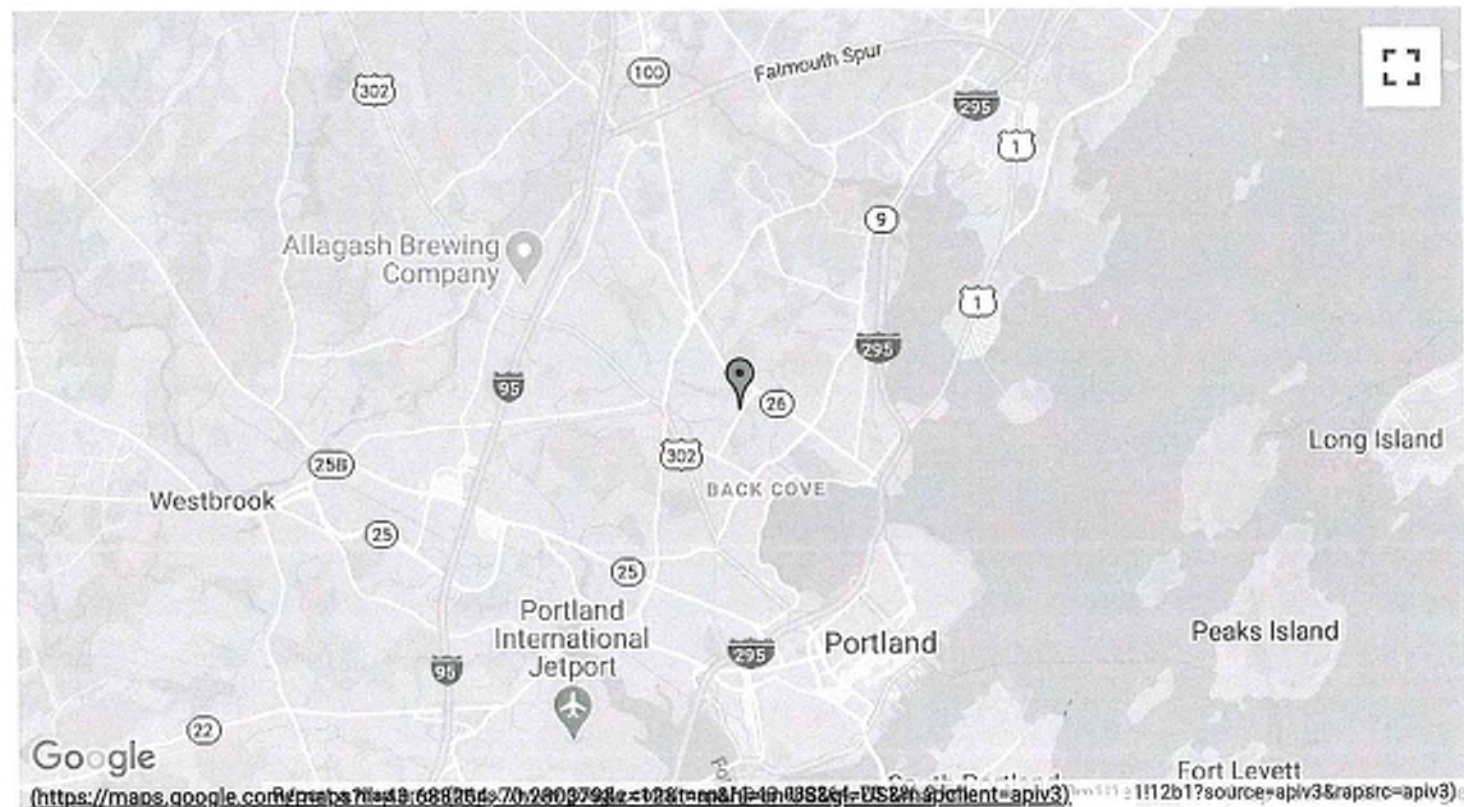


Maine Department of Environmental Protection

[Home](#) → [Contact Us](#) → [Office Locations](#) → SMRO

DEP Southern Maine Regional Office

312 Canco Road, Portland, ME 04103, Phone: (207) 822-6300, Fax: (207) 822-6303



DEP Southern Maine Regional Office ([javascript:closerLook\(0\)](#))
312 Canco Road, Portland, Maine 04103

Credits



Copyright © 2019
All rights reserved.



61 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

SITE LOCATION MAP

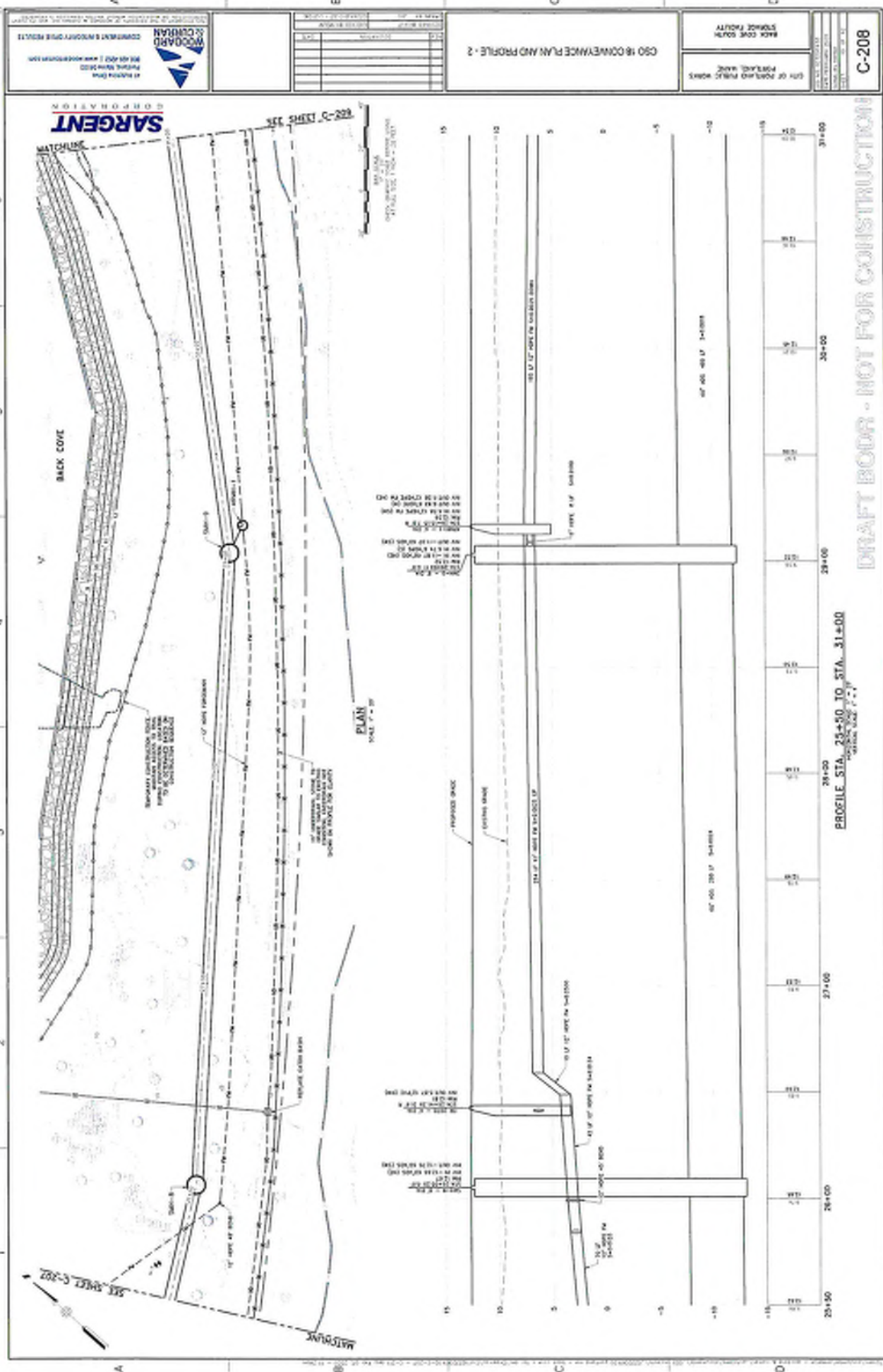
DESIGNED BY: JBC CHECKED BY: MDM
DRAWN BY: JBC 03/10/09-09-SITE LOCATION.dwg

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH STORAGE FACILITY

DATE: FEBRUARY
SCALE: 1" = 200'

Site Location



DRAFT BOOK - NOT FOR CONSTRUCTION

PROFILE STA. 25+50 TO STA. 31+00

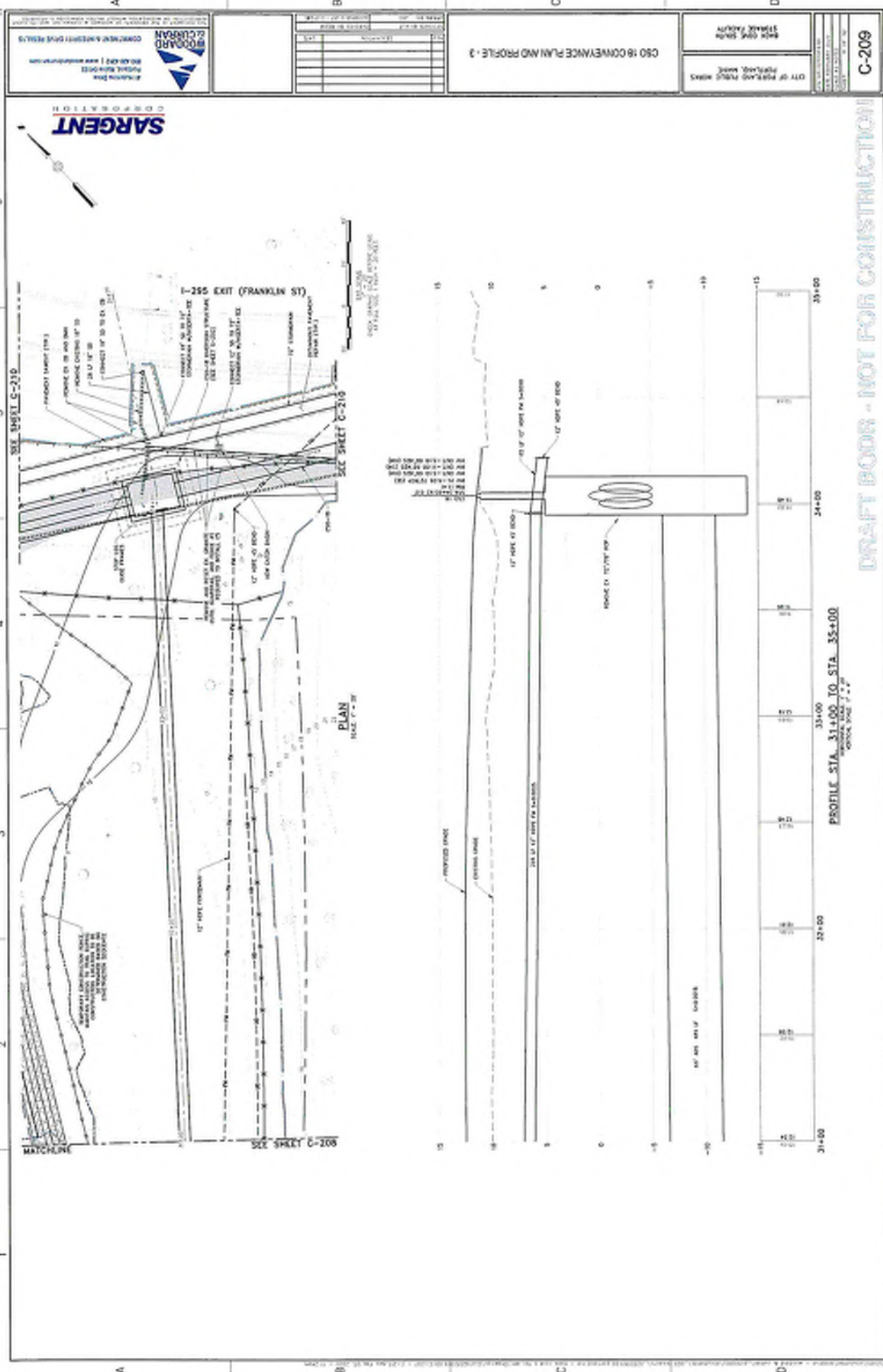
C-208

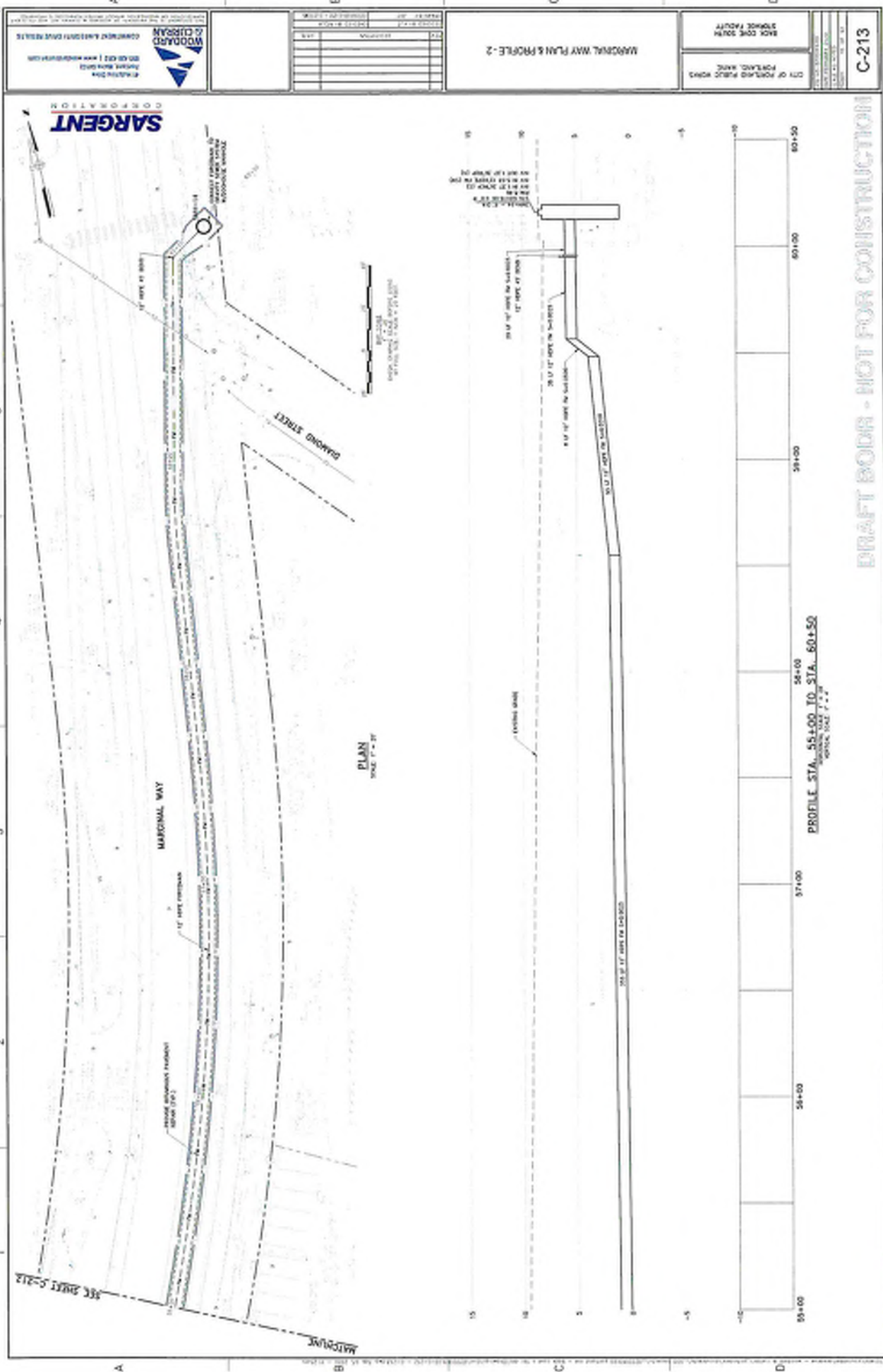
DATE: 10/10/2018	BY: J. J. J.
CHECKED: 10/10/2018	BY: J. J. J.
DATE: 10/10/2018	BY: J. J. J.
DATE: 10/10/2018	BY: J. J. J.

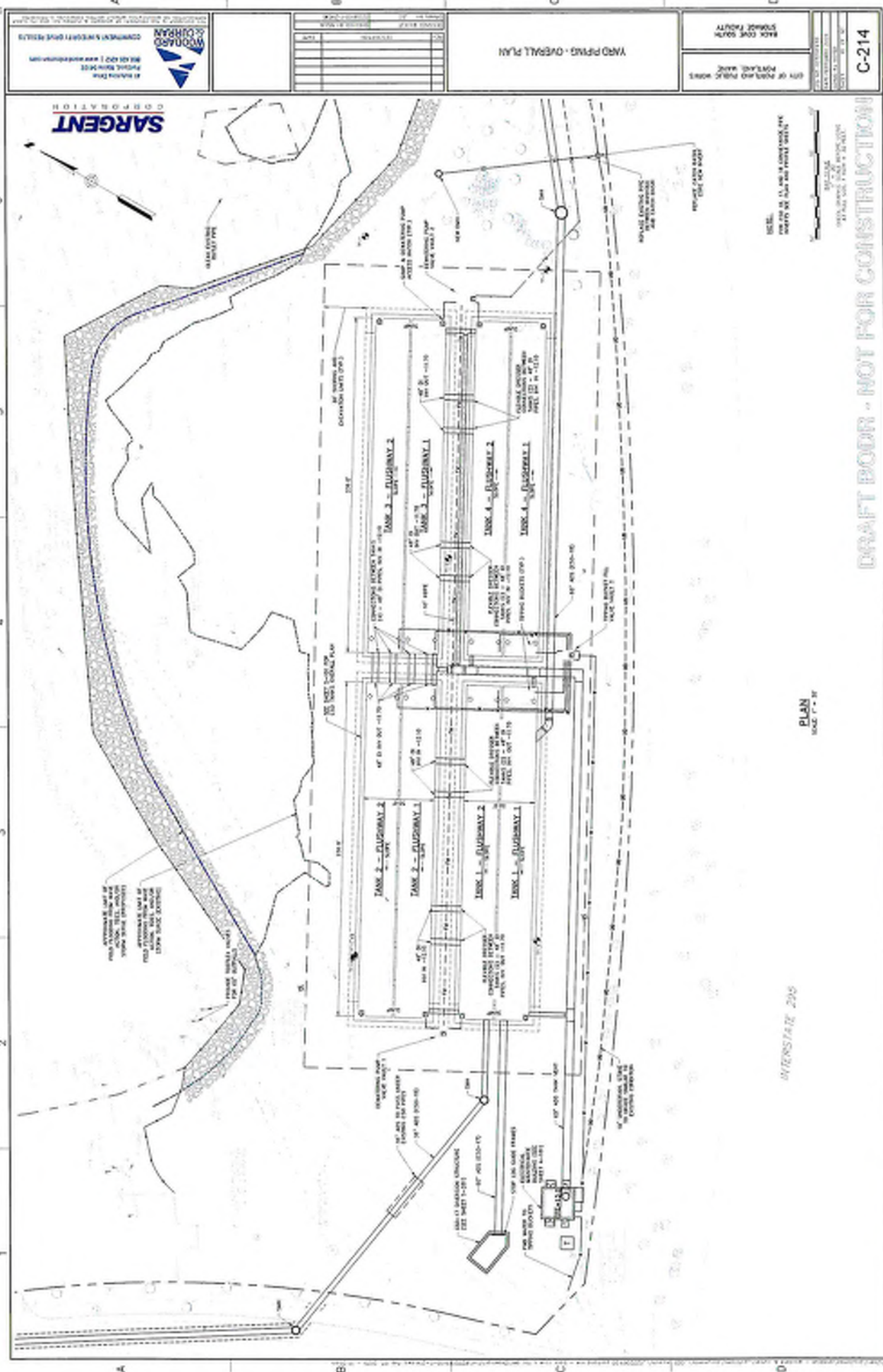
CONVEYOR SYSTEM PLAN AND PROFILE - 2

NO.	DESCRIPTION	DATE
1	CONVEYOR SYSTEM PLAN AND PROFILE - 2	10/10/2018
2	CONVEYOR SYSTEM PLAN AND PROFILE - 2	10/10/2018
3	CONVEYOR SYSTEM PLAN AND PROFILE - 2	10/10/2018
4	CONVEYOR SYSTEM PLAN AND PROFILE - 2	10/10/2018
5	CONVEYOR SYSTEM PLAN AND PROFILE - 2	10/10/2018
6	CONVEYOR SYSTEM PLAN AND PROFILE - 2	10/10/2018
7	CONVEYOR SYSTEM PLAN AND PROFILE - 2	10/10/2018
8	CONVEYOR SYSTEM PLAN AND PROFILE - 2	10/10/2018
9	CONVEYOR SYSTEM PLAN AND PROFILE - 2	10/10/2018
10	CONVEYOR SYSTEM PLAN AND PROFILE - 2	10/10/2018

WOODWARD CLARK
CORPORATION
CONSULTING & ENGINEERING
10000 WOODWARD CLARK DRIVE
FARMINGTON, CT 06030
(860) 671-1000
WWW.WOODWARDCLARK.COM







WOODWARD CLARK
CORPORATION

COMMERCIAL & INDUSTRIAL GROUP SERVICES
P.O. Box 1000
Burlington, NC 27219
Phone: 704/261-1000
Fax: 704/261-1001
www.woodwardclark.com

YARD PAVING - OVERALL PLAN

CITY OF BURLINGTON PUBLIC WORKS
1000 North Main Street
Burlington, NC 27219
Phone: 704/261-1000
Fax: 704/261-1001
www.burlingtonnc.gov

C-214

DRAFT BOOK - NOT FOR CONSTRUCTION

PLAN
SCALE 1" = 30'

INTERSTATE 290

NOTE:
1. ALL DIMENSIONS ARE
IN FEET AND INCHES.
2. ALL DIMENSIONS ARE
TO CENTERLINE UNLESS
NOTED OTHERWISE.

EROSION AND SEDIMENTATION CONTROL NOTES

1. THE PROJECT SHALL CONFORM WITH THE REQUIREMENTS OF THE STATE INSPECTION GENERAL PERMIT IF APPLICABLE.
2. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED AS SHOWN ON THESE PLANS. NO ALTERATIONS SHALL BE MADE WITHOUT THE WRITTEN APPROVAL OF THE INSPECTION GENERAL.

Temporary Erosion Control Measures

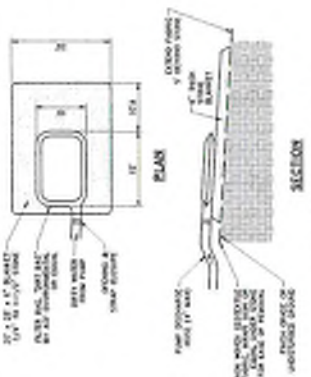
Measure	Details For Use	Timing, Activity, and Location
Sedimentation Barrier	All	Before any construction, during activities of work to be performed, and after completion of work to be performed.
Vegetation Control	All	Before and throughout, until soil is covered by vegetation or mulch.
Catch Basin Protection	All	Before and throughout, until catch basin is installed and maintained.
Best Control	All	During the project, until water and erosion control is established.
Temporary Sealing	All	After the project, until the area is covered and vegetation is established.
Mulch	All	After the project, until the area is covered and vegetation is established.
Water Bar	All	During the project, until the area is covered and vegetation is established.
Stitching	All	During the project, until the area is covered and vegetation is established.

PERMANENT EROSION CONTROL

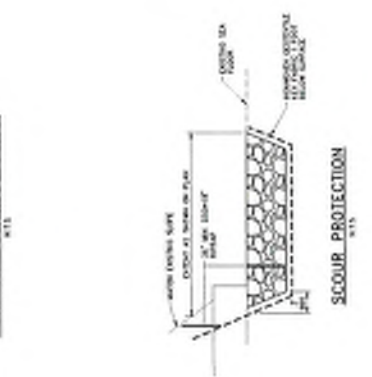
Measure	Details For Use	Timing, Activity, and Location
Channel - Best Control	All	Before and throughout, until the area is covered and vegetation is established.
Channel - Best Control	All	Before and throughout, until the area is covered and vegetation is established.
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Channel - Best Control	All	Before and throughout, until the area is covered and vegetation is established.

Vegetation

Measure	Details For Use	Timing, Activity, and Location
Channel - Best Control	All	Before and throughout, until the area is covered and vegetation is established.
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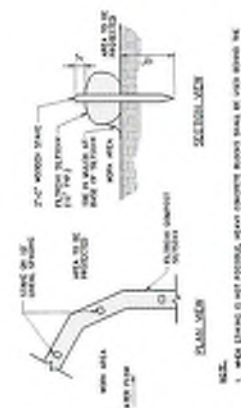
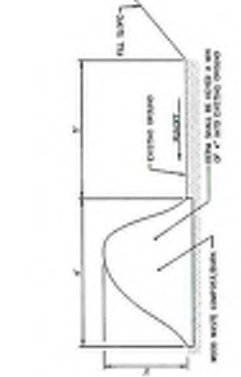


SCOUR PROTECTION



1. THE WOOD WASTE COMPOST/BARK FILTER BERM SHALL BE USED IN ALL AREAS WHERE EROSION CONTROL IS REQUIRED.
2. THE WOOD WASTE COMPOST/BARK FILTER BERM SHALL BE USED IN ALL AREAS WHERE EROSION CONTROL IS REQUIRED.
3. THE WOOD WASTE COMPOST/BARK FILTER BERM SHALL BE USED IN ALL AREAS WHERE EROSION CONTROL IS REQUIRED.
4. THE WOOD WASTE COMPOST/BARK FILTER BERM SHALL BE USED IN ALL AREAS WHERE EROSION CONTROL IS REQUIRED.
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10. THE WOOD WASTE COMPOST/BARK FILTER BERM SHALL BE USED IN ALL AREAS WHERE EROSION CONTROL IS REQUIRED.

WOOD WASTE COMPOST/BARK FILTER BERM DETAIL



SILTATION BARRIER - SILTISOXX

1. THE SILTATION BARRIER SHALL BE USED IN ALL AREAS WHERE EROSION CONTROL IS REQUIRED.
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10. THE SILTATION BARRIER SHALL BE USED IN ALL AREAS WHERE EROSION CONTROL IS REQUIRED.

1 2 3 4 5 6

A B C D

WOODWARD-CUNNINGHAM
CORPORATION & ASSOCIATES, INC.
40 Hudson Drive
Piscataway, NJ 08854
Tel: 908.941.1000
Fax: 908.941.1001
www.woodward-cunningham.com

C-305

QTY OF POSTS AND BRUSH MATS
APPROXIMATELY 1000
10' x 10' x 1/2"

10' x 10' x 1/2" BRUSH MATS
10' x 10' x 1/2" BRUSH MATS
10' x 10' x 1/2" BRUSH MATS

CIVIL DETAILS - 4

DATE: 10/1/01

BY: J. WOODWARD

CHK: J. WOODWARD

APP: J. WOODWARD

REV: 10/1/01

SEE PLUGGED

SEE

SEE

SEE

TABLE 1. 4" DIA. OF DRAIN

TYPE	SIZE	SPACING	NOTES
1"	4"	12"	1"
2"	4"	12"	2"
3"	4"	12"	3"
4"	4"	12"	4"
5"	4"	12"	5"
6"	4"	12"	6"
7"	4"	12"	7"
8"	4"	12"	8"
9"	4"	12"	9"
10"	4"	12"	10"

NOTES:

- 1. DRAINAGE SHALL BE PROVIDED FOR ALL AREAS OF THE SLAB.
- 2. DRAINAGE SHALL BE PROVIDED FOR ALL AREAS OF THE SLAB.
- 3. DRAINAGE SHALL BE PROVIDED FOR ALL AREAS OF THE SLAB.
- 4. DRAINAGE SHALL BE PROVIDED FOR ALL AREAS OF THE SLAB.
- 5. DRAINAGE SHALL BE PROVIDED FOR ALL AREAS OF THE SLAB.
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- 9. DRAINAGE SHALL BE PROVIDED FOR ALL AREAS OF THE SLAB.
- 10. DRAINAGE SHALL BE PROVIDED FOR ALL AREAS OF THE SLAB.

TYPICAL THRUST BLOCK DETAIL

ATHLETIC FIELD UNDERDRAIN DETAIL

1 2 3 4 5 6

A B C D

1 2 3 4 5 6

A B C D

1 2 3 4 5 6

A B C D

1 2 3 4 5 6

A B C D

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Megan McDevitt

From: Owens McCullough <omccullough@sebagotechnics.com>
Sent: Monday, February 3, 2020 10:08 AM
To: Brad Roland, P.E. (brad@portlandmaine.gov); Megan McDevitt; Mignone, Kate
Subject: FW: Review Request--Back Cove Combined Sewer Overflow, Portland [Filed 03 Feb 2020 10:26]

All,

Please see below from IF&W. No work window.

Thanks, Owens

From: IFWEnvironmentalreview <IFWEnvironmentalreview@maine.gov>
Sent: Monday, February 3, 2020 10:04 AM
To: Owens McCullough <omccullough@sebagotechnics.com>
Cc: Brad Roland, P.E. (brad@portlandmaine.gov) <brad@portlandmaine.gov>; Zitske, Brad <Brad.Zitske@maine.gov>
Subject: RE: Review Request--Back Cove Combined Sewer Overflow, Portland

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Owens,

Thank you for the additional information—it was extremely helpful in better understanding the project. Given the complexity of this important work adjacent to Back Cove, we understand the need for the project duration and the need to keep the work flow continuous. No work window is recommended.

Thanks again,

John

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
284 State Street, 41 SHS
Augusta, Maine 04333-0041
Tel (207) 287-5254; Cell (207) 446-5145
Fax (207) 287-6395
www.mefishwildlife.com



Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.

From: Owens McCullough <omccullough@sebagotechnics.com>
Sent: Monday, January 27, 2020 3:35 PM
To: IFWEnvironmentalreview <IFWEnvironmentalreview@maine.gov>
Cc: Brad Roland, P.E. (brad@portlandmaine.gov) <brad@portlandmaine.gov>
Subject: FW: Review Request--Back Cove Combined Sewer Overflow, Portland

EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good Afternoon John,

I wanted to follow-up on the City of Portland's Underground Combined Sewer Overflow Project under the soccer fields at the Preble Street Soccer fields and Recreational area along Back Cove in Portland. We had reached out to your office as part of the original NRPR permitting process and were provided the attached review letter which included some suggested timing restrictions. We are now getting close to finishing the permitting and the beginning of construction on this EPA and Maine DEP mandated project.

Our biggest challenge with the project is that it is a very large and involved underground tank project (3.5 million gallons) that has been mandated by the US EPA and Maine DEP under a consent decree to reduce combined overflows into the Portland harbor. As such, the tank, which when completed will be completely underground with the soccer field above returned to its former playing surface about 2 feet higher in elevation for sea level resiliency reducing CSO's by approximately 85%. The project (attached plans) has been located as far as practicable from Back Cove and therefore located close to I-295. The tank will require about a 28' feet deep phased excavation with sheet piling to stabilize the adjacent highway to accommodate the tank construction. By virtue of the size of the project, construction is going to take approximately 1.5 years during which time the project will be continually worked on. The project area will be wholly located within the active Preble Street Park and Soccer fields and will not directly occur within any of the abutting marine habitat areas.

The project is intended to improve the overall water quality of Back Cove and Portland Harbor through a significant reduction in CSO's (85% reduction) into the bay which will have a positive impact on water quality and habitats. The IF&W provided letter had recommended that construction should not occur between May 1 and June 20 or between August 1 and October 1, which are critical time periods for migrating shorebirds. Given the complexity of this project and time needed to install the sheet piling; excavation and installation of the tank will take about 1.5 years of continual work to complete the project. As a result, it is not logistically possible to phase or stop construction during the time periods suggested without compromising the integrity of the excavation and adjacent lands. The suggested restrictions would also prolong construction, substantially increasing costs to the City and Rate Payers and likely cause more impact than a one-time consolidated construction period. The City is also under a MDEP mandate to complete the project within an accelerated time period. As indicated, we have strived to locate the tank excavation as far from the resources as possible with none of the work occurring within any of the resources. Work will be confined to the existing active soccer and play fields along with the recreational trails and existing developed lands.

The project is likely to start this late winter and will be completed in the early summer of 2022. We offer this information for the departments consideration of project timing. If you have any questions or would like to meet and learn more about the project please let me know.

Thank you, Owens

Owens McCullough, PE, LEED-AP

Senior Vice President, Strategy & Client Development
Sebago Technics, Inc. | An Employee-Owned Company
75 John Roberts Rd., Suite 4A, South Portland, ME 04106



From: Perry, John <John.Perry@maine.gov>
Sent: Tuesday, August 28, 2018 10:45 AM
To: Owens McCullough <omccullough@sebagotechnics.com>
Subject: Review Request--Back Cove Combined Sewer Overflow, Portland

Hi Owens,

Attached is MDIFW's response to your request for information for the Back Cove Combined Sewer Overflow project in Portland—please let me know if you need additional information.

Also, please email any future requests to IFWEnvironmentalreview@maine.gov

Thanks,

John

John Perry
Environmental Review Coordinator
Maine Department of Inland Fisheries and Wildlife
284 State Street, 41 SHS
Augusta, Maine 04333-0041
Tel (207) 287-5254; Cell (207) 446-5145
Fax (207) 287-6395
www.mefishwildlife.com



Correspondence to and from this office is considered a public record and may be subject to a request under the Maine Freedom of Access Act. Information that you wish to keep confidential should not be included in email correspondence.

Submittal

Job: 39703
PORTLAND- BCS STORAGE FACILITY
244 Preble St.
Portland, ME 04101

Spec Section No: General 1

Submittal No: 1

Revision No: 0

Sent Date: 3/20/2020

Spec Section Title: Site-Specific and General Safety Plan

Submittal Title: Site Specific and General Safety Plan

Contractor:
SARGENT CORPORATION

Other:
Portland Public Works
Bradley Roland

SHOP DRAWING / SUBMITTAL REVIEW

☒ REVIEWED ☐ REVIEWED WITH CHANGES NOTED
☐ REVISE AND RESUBMIT ☐ REJECTED

SUBMITTAL WAS REVIEWED FOR DESIGN CONFORMITY AND GENERAL CONFORMANCE TO CONTRACT DOCUMENTS ONLY. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING DIMENSIONS AT JOBSITE FOR TOLERANCE, CLEARANCE, QUANTITIES, FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF HIS WORK WITH OTHER TRADES AND FULL COMPLIANCE WITH CONTRACT DOCUMENTS

By: GJA Date: 3-20-20

Sargent Corporation

Architect's Stamp

Engineer's Stamp



Excellence for Generations.

SITE SPECIFIC ADDENDUM

TO

2020 HEALTH AND SAFETY PLAN

FOR

Back Cove South Storage Facility
244 Preble Street
Portland, Maine 04101

Complies with 29 CFR 1926
OSHA Construction Industry Regulations

Prepared by:

SARGENT CORPORATION
378 BENNOCH ROAD
P.O. BOX 435
STILLWATER, ME 04489

Arthur Herbest, Field Safety Specialist

February 27, 2020

1.0 EMERGENCY TELEPHONE NUMBERS

1.1 MEDICAL EMERGENCY / AMBULANCE 911

1.2 MEDICAL FACILITY

Work Health 207-879-3466
195 Four River Parkway
Suite 300
Portland, ME 04102

If Work Health is closed when injury occurs, take the injured employee to:

Maine Medical Center - Emergency Department 207-662-0111
22 Bramhall Street, Portland, ME 04102

(Maps and directions to medical facilities are posted in the office trailer)

1.3 FIRE 911

Portland Fire Department 207-874-8400(Non-Emergency)
380 Congress Street
Portland, ME 04101

1.4 POLICE 911

Portland Police Department 207-874-8479 (Non-Emergency)
109 Middle Street
Portland, ME 04101

1.5 CUMBERLAND COUNTY SHERIFF 207-693-3369

1.6 Maine DEP Oil Spill Reporting 800-482-0777

1.7 Maine DEP (Hazardous Materials Spill) 800-452-4664

1.8 NATIONAL RESPONSE CENTER 800-424-8802

1.9 NEW ENGLAND POISON CENTER 800-222-1222

1.10 DIG SAFE 888-344-7233

1.11 Public Utilities Commission (PUC) 207-287-3838

1.11 Owner Representatives:

Owner: City of Portland

Senior Project Engineer: Brad Roland - City of Portland 207-874-8840

Construction Inspector: Mike Kane - Sebago Technics 207-329-4602

1.12 General Contractor – Sargent Corporation:

Project Manager: Glenn Adams 207-827-4435
207-215-2055 (cell)

Operations Manager: Doug Morrison 207-827-4435
207-478-3401 (cell)

Superintendent and
Site Safety Manager: Ian McCarthy 207-478-0010 (cell)

Safety Director: Adam Kasprzak 207-827-4435
207-745-4817 (cell)

Field Safety Specialist Arthur Herbest 207-943-3395 (cell)

2.0 GENERAL INFORMATION

2.1 This Site-Specific Addendum to the 2020 Sargent Corporation Health and Safety Plan (HASP) is submitted to The City of Portland, Maine for the project at the Back Cove South Storage Facility project in Portland, Maine. It has been prepared in accordance with 29 CFR 1926, Occupational Safety and Health Administration (OSHA) Construction Standards and the 2020 Sargent Corporation HASP (attached), both of which are hereby incorporated by reference.

2.2 The purpose of this site-specific HASP is to provide health and safety guidelines and minimum requirements for Sargent Corporation site personnel during construction of the Back Cove South Storage Facility project. It is intended to identify known hazards as well as those that may reasonably be expected, and to discuss plans for protecting workers at the site.

The safety requirements of this plan will be available to all Sargent Corporation site personnel who will be required to acknowledge an understanding of the safety requirements contained herein. All subcontractors performing work for Sargent Corporation on site will be provided with a copy of the 2020 HASP and the Site-Specific Addendum and shall be required to perform their work in

accordance with its provisions. All parts of this plan, including emergency phone numbers and site maps, will be maintained at the site field office.

3.0 BACKGROUND

3.1 Site Location. The Back Cove South Storage Facility project is located primarily in Back Cove Park, with a street address of 244 Preble Street in Portland, Maine. Other project work areas include: Preble St. from the park to Baxter Boulevard, I-295 Exit 7 southbound to Marginal Way, and along Marginal Way to Diamond St.

3.2 Site History and Hazard Assessment: The site is an urban area of Portland that was initially filled between the 1850's and 1870's. The area was also regraded and filled during the construction of I-295 in the early 1960's. Additional urban fill was likely added to the site during the subsequent growth and reconfiguration of the Bayside neighborhood of Portland both before and after the construction of I-295.

4.0 SCOPE OF WORK

For the Back Cove South Storage Facility project, the following will be included within the scope of work: The proper handling of potential contaminated soil and groundwater that are expected to be disturbed during construction. This project is expected to disturb approximately 80,000 cubic yards (CY) of material and generate approximately 40,000 CY of surplus material that will need to be removed from or reused on the project site.

5.0 CONSTRUCTION HAZARDS

5.1 Anticipated Potential Hazards:

- Noise
- Airborne Dusts
- Fire / Explosion
- Infections to wounds
- Struck by Construction Equipment
- Equipment Rollover
- Excavation/trenching (falls, cave-ins, slumps, shears)
- Confined Space Entry
- Heat and/or Cold Stress
- Exposure to Contaminated soil
- Water Accumulation

6.0 MITIGATION OF CONSTRUCTION HAZARDS

Site Safety & Health Officer (SSHO). Ian McCarthy is the project superintendent and SSHO. The SSHO shall be responsible to ensure all Sargent Corporation employees at the site have received the required training regarding safe work practices and procedures prior to commencing work.

During any time period when the project superintendent cannot be present at the site during working hours, he shall designate an alternate site supervisor. The alternate site supervisor shall have at least one-year construction work experience, OSHA 30-hour construction safety training, and training in the proper use of the air monitoring equipment at the site.

In addition to the SSHO, a Sargent Corporation Safety Department representative will visit the site on a weekly basis.

During the bi-weekly project meetings, Safety will be the first item addressed on the agenda.

This Section addresses the anticipated potential hazards of the project and the means of lessening or eliminating those hazards. In addition, the Project Superintendent shall oversee the preparation of a Sargent Corporation **Preparatory Inspection (P3)** form and a **Job Hazard Analysis (JHA)** for each major work item. Some of the major purposes of the P3 and JHA are to:

- Describe the work item being performed.
- Identify all potential hazards associated with the work; and
- Define the means and methods that will be used to reduce or eliminate the hazards and complete the task safely.

Safety Task Assessment (STA). Each foreman or crew supervisor shall complete an STA form and review it with his/her crewmembers prior to starting work each day. The STA is a tool used to assess and communicate with the crew regarding specific hazards they are likely to encounter during the day's work.

Competent Person. A competent person means one who can identify existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

The project superintendent shall assign a competent person to each crew performing work on the project. In most cases, the foreman who directs the crew's work is the competent person.

6.1 Accident Reporting /Investigation

All accidents or near missies will be reported to the site Superintendent immediately. A report will be completed and forward to Sargent Corporation's

Safety Director. A copy of the incident report will be forwarded to the city of Portland representative within 24 hours.

6.2 Action Levels: The following action levels are defined in accordance with OSHA Standards:

- Oxygen: <19.5% or > 22.0%
- Combustible Gas: 10% of LEL
- Carbon Monoxide: 35 ppm (ceiling and TWA), 100 ppm (STEL)
- Hydrogen Sulfide: 10 ppm (ceiling and TWA), 15 ppm (STEL)
- Volatile Organic Compounds: 8-hr TWA – 100 ppm.
STEL (15 minutes) – 250 ppm
Low alarm – 50 ppm; High alarm – 100 ppm
- Noise > 90 dBA

6.2.1 Respirator Use. Respirators shall be available for voluntary use for dust control to all workers in Regulated Areas.

An employee who is required to wear a respirator shall first receive a medical evaluation to ensure he/she is physically fit for respirator use. Once the employee is medically cleared, he/she shall be fitted to the proper size respirator and trained in its use as required in the 2020 Sargent Corporation HASP.

6.2.2 Dust Control. Water shall be applied to active travel ways and work areas as needed to control dust.

6.3 Personal Protective Equipment (PPE) / Emergency Response Equipment

At minimum, all workers at the site shall wear Level D PPE, including work clothing in good condition, work boots with protective hard toes, hard hats, safety glasses, and high visibility reflective vests and gloves as work requires.

Emergency response equipment will be maintained in like-new condition and be inspected and tested on a scheduled, routine basis, with records of inspection maintained.

6.4 Fall Hazards

Positive fall protection is required for all workers exposed to a potential fall of 6 feet or more to a lower level. This shall be accomplished by means of one or more of the following:

- Standard railings including top rails, mid-rails, and toe-boards.

- Harness, lanyard, and 5000-pound anchor point for 100% tie-off.
- Hole covers; and/or
- Physical barricades shall be erected to effectively keep employees at least 6 feet away from the fall hazard.

6.5 Confined Spaces

Should it be necessary for an employee to enter a confined space on the project the employee shall be properly trained as required by CFR 1926, Subpart AA, the Sargent Corporation HASP, and all permit required confined space requirements including emergency rescue procedures shall be in effect.

6.6 Construction Equipment

6.6.1 Authorized Operators. Only properly trained and experienced personnel shall operate equipment and trucks. All equipment and trucks shall be equipped with seatbelts in good condition, and all operators and truck drivers shall be required to use them.

6.6.2 Zero Accidents. All construction trucks and equipment shall be equipped with working backup or travel alarms. Workers on the ground shall wear high visibility reflective vests. Employees will be cautioned during site safety meetings to be aware of moving equipment and to watch out for other workers. All employees shall gain the operator's attention before approaching construction equipment.

6.6.3 Equipment Maintenance. Prior to greasing or servicing equipment and trucks, operators and mechanics shall remove the keys or otherwise disable the equipment and tag it out or service. All buckets, forks, blades, dump bodies and other attachments shall be completely lowered or properly blocked to prevent movement. Employees shall wear all required PPE when servicing equipment.

6.7 Protection of Buried Utilities

A thorough underground utilities check will be conducted before the commencement of the construction project through the services of DIG-SAFE for public utilities, and the proper municipal departments for private on-site utilities. The locations of all underground utilities within project work areas shall be indicated by means of paint marks at the ground surface. Utility paint markings shall be maintained for the duration of all excavation, drilling, and other subsurface work.

6.8 Trenches and Excavations

All trenches and excavations shall be conducted in strict conformance with OSHA standards as outlined in CFR 1926, Subpart P.

6.9 Lockout / Tagout

All motorized equipment shall be shut off, the key removed, and an 'Out of Service' tag prominently displayed before greasing or providing other maintenance procedures.

6.10 Hazardous Communication (Hazcom)

Each contractor and subcontractor shall submit Safety Data Sheets (SDS) to the project superintendent for each hazardous material they will use on the project. SDS's shall be available for the use of all employees. A list of the hazardous materials in use at the site shall be posted in the office trailer. Contractors and subcontractors are responsible to train their employees in the safe use of any necessary hazardous materials.

6.11 Unknown Materials (Needles)

In the event any worker encounters any materials with hazard labels, needles or any other indications that leads the worker to suspect they might contain hazardous materials, he/she shall stop work immediately and contact the project superintendent for further direction. Then a representative of the city of Portland will be notified.

6.12 Other Construction Hazards

There are other potential hazards that are common to construction work sites. The Site Superintendent will address these potential hazards by completing and communicating **Preparatory Inspections (P3)** and **Job Hazard Analyses (JHA)** for all major work items, during site inspections, and at weekly safety meetings.

Each foreman will complete a **Safety Task Assessment (STA)** each day for the item he/she is working on and go over it with the crew.

Workers shall be advised of known potential hazards at the site prior to beginning work and thereafter as needed. All workers on site are encouraged to be observant of site safety and health hazards and to report them to their immediate supervisor and the site superintendent.

7.0 FACILITIES

7.1 Hygiene

Antibacterial hand cleaners shall be available at the office trailer, at each bathroom facility, and near designated employee break areas. Workers shall wash their hands before eating, smoking or other hand to mouth contact activities. Such hand to mouth activities shall only be done in approved areas. Scheduled break times for workers must be of enough length to satisfy this requirement.

7.2 Bathroom Facilities

Sanitary bathroom facilities shall be near work areas. Bathroom facilities shall include hand-washing stations with antibacterial hand cleaners. Trash cans will be present for the disposal of any contaminated PPE.

7.3 Break Areas

The Superintendent shall designate a clean area for workers to take coffee and lunch breaks.

8.0 FIRST AID

8.1 Cover Wounds

All existing cuts and scrapes should be properly bandaged and protected before coming to work.

8.2 Site First Aid

Wounds that occur while working shall be cleaned, disinfected and bandaged immediately. First aid kits for this purpose shall be located at the office trailer and in Foreman vehicles. Several persons at the project site are trained and certified in first aid and CPR. In general, Sargent Corporation project supervisors, foremen, cost control managers, and mechanics have received this training.

8.3 Medical Facility

If medical attention beyond site first aid is required, a supervisor trained in first aid and CPR shall accompany the injured employee to the medical facility at **Work Health** for evaluation and treatment. Work Health is located at 195 Fore River Parkway Suite 300, Portland, Maine. A location map with printed directions is provided and will be posted on the wall in the office trailer. The phone number for Work Health is 207-879-3466.

If an injury that requires medical assistance occurs when Work Health is closed, the injured employee will be taken to the Maine Medical Center located at 22 Bramhall Street, Portland, Maine.

8.4 Medical Emergencies

For all emergencies, call 911 for assistance at the site. Do not attempt to transport a person needing emergency care to the hospital. Directions to the project site shall be posted near site telephones to assist the caller in giving clear directions to emergency response crews.

8.5 Eyewash Station

All workers shall always wear safety glasses. Foreign objects in eyes must be removed immediately. An eyewash station shall be in the office trailer.

9.0 FIRE PREVENTION

9.1 Fire Extinguishers

Fire extinguishers shall be available for use in the office and storage trailers, in Sargent Corporation trucks, and in foremen pickup trucks. Use fire extinguishers on small fires only. For larger fires call 911 to alert the fire department.

9.2 Fires

In the event of a fire on or within the site, personnel shall communicate the situation to coworkers, and all workers shall evacuate the area immediately to a safe location upwind of the fire. Workers shall only attempt to put out small fires that can be extinguished with a fire extinguisher.

9.4 No Smoking Policy

Smoking will not be allowed anywhere on site or within company vehicles or equipment. Smoking will only be permitted during breaks at a designated smoking area.

9.4 Ventilate Enclosed Areas

Work areas shall be ventilated as necessary to ensure that all work is performed at less than 10 percent of the lower explosive level (LEL).

10.0 SPILL PREVENTION & CONTROL

Sargent Corporation's Spill Prevention & Control plan is in the Health and Safety Plan, Section IX, subsection 6.0 "Oil and Fuel Spills". All spills will be handled according to the established procedures in the plan.

11.0 EVACUATION & EMERGENCY SITE ACCESS

The project superintendent shall designate a prearranged meeting location in the event of an emergency that requires evacuation from the site's work area(s). Evacuation routes and prearranged meeting locations shall be reviewed with each worker who is new to the site, and again with all personnel whenever evacuation routes are modified.

In the case of an emergency, begin evacuation immediately since any delay could result in a more dangerous situation. Stay upwind of vapors and smoke. Stay uphill of spills.

In case of an emergency, all site access points will be opened for use by emergency services personnel and vehicles. In the case of an off-hours emergency, keys to the gate locks will be given to the Portland Police Department and Portland Fire Department. Sargent Superintendent and Project Safety Officer Ian McCarthy will coordinate the hand-over of these keys at the time or before the gates start to be locked on a nightly basis.

The security fence being used on this project will be made-up of movable panels. In the event of an emergency, any of these panels can be removed quickly by hand in order to provide site access or egress.

11.0 PEDESTRAIN FOOT TRAFFIC

A security fence will be installed around the project to help keep the general public safe from construction activity. Access around the project site on existing sections of the Back Cove Trail will be maintained at all times. If no existing sections of trail are available, then temporary sections will be created out of similar materials with reasonable grade changes to continue to allow for foot, bicycle and wheelchair access. Signs will be placed around the site to direct traffic in the correct and hazard-free direction.

12.0 MODIFICATIONS TO HASP

Any modifications to this HASP shall be made in writing, accompanied by all supporting documentation, and signed by the Sargent Corporation Safety Director and by the Site Superintendent / Safety & Health Officer

13.0 SAFETY COMMITTEE

A project safety committee, comprised of Design-Build Project Manager Glenn Adams, Southern Maine Regional Operations Manager Doug Morrison, Project Superintendent Ian McCarthy, and Field Safety Specialist Arthur Herbest will meet on site within 48 hours of any OSHA-recordable incident occurring on site and also as-needed, to address unsafe work conditions and practices. The times of these meetings will be made available to the City, and their representatives are welcome to participate. Results of these meetings will be shared with our subcontractors and the City. Sargent Corporation also has a behavior modification program in place to address these types of situations. The safety committee will see that this program is followed over the course of the project.



Excellence for Generations.

ACKNOWLEDGMENT

TO BE SIGNED AND RETURNED TO THE SITE SUPERINTENDENT

I have received and carefully read the Sargent Corporation Site Specific Health and Safety Plan for the **Back Cove South Storage Facility project**, Portland, Maine. I understand and agree to abide by all OSHA, and Sargent Corporation safety rules and guidelines, and understand that any violation may result in my removal from the project.

Signature: _____ Print Name: _____

Company/Employer Name (if other than Sargent Corporation): _____

WITNESS

I certify that this individual has received adequate training in all aspects of this Site-Specific Health and Safety plan and is knowledgeable in the use and care of all required PPE.

Sargent Corporation Site Superintendent / Site Safety & Health Officer:

Signature: _____ Date: _____



HEALTH & SAFETY PLAN

2020

SARGENT CORPORATION

**378 BENNOCH ROAD
P.O. BOX 435
STILLWATER, ME 04489
207-827-4435**

**363 CALEF HIGHWAY
EPPING, NH 03042
603-734-2132**

**11139 AIRPARK ROAD, SUITE 1
ASHLAND, VA 23005
804-368-7118**

TABLE OF CONTENTS

I.	SARGENT CORPORATION SAFETY POLICY	1
1.0	Policy Statement	1
2.0	Objectives	2
3.0	Organization and Responsibilities.....	3
4.0	Subcontractor Responsibilities.....	5
5.0	Site Specific Health and Safety Plans	5
6.0	Drug and Alcohol Free Workplace Policy	6
	<i>Notice to Employees – Drug and Alcohol-Free Workplace</i>	<i>7</i>
7.0	Project Safety Meetings	7
8.0	Project Safety Inspections.....	8
9.0	OSHA and MSHA Inspections	8
10.0	Employee Safe Acts Policy.....	10
11.0	Progressive Employee Counseling Policy.....	11
	<i>Behavior Modification Report (form).....</i>	<i>12</i>
II.	SAFETY REQUIREMENTS FOR NEW EMPLOYEES.....	13
1.0	Policy Statement for New Employees.....	13
2.0	Hiring Procedure	13
3.0	<i>Sargent Corporation’s Summary of Safety Rules</i>	<i>13</i>
4.0	<i>New Employee Orientation Checklist (form)</i>	<i>16</i>
III.	ACCIDENT PREVENTION PLAN: INCIDENT INVESTIGATION & REPORTING	17
1.0	Introduction.....	17
2.0	Reporting Requirements	17
3.0	Incident Investigation.....	17
4.0	Employee Injury Investigation.....	18
	<i>Incident Investigation Report (form)</i>	<i>19</i>
5.0	Property Damage Claims	27
6.0	Prevention of Lost Time Injuries	27
7.0	First Aid	28
8.0	OSHA Record Keeping Requirements.....	28
IV.	SAFE WORK PRACTICES / STANDARD OPERATING PROCEDURES	30
1.0	Personal Protective Equipment (PPE).....	30
2.0	Fall Protection Plan.....	32

3.0	Hot Work – Welding and Cutting Operations.....	38
4.0	Hoisting and Rigging Equipment.....	40
5.0	Concrete and Concrete Form Work	46
6.0	Electrical Tools	46
7.0	Housekeeping.....	47
8.0	Fire Protection.....	47
9.0	Lifting... ..	48
10.0	Equipment Safety.....	49
11.0	Traffic Work Zone Safety	52
12.0	Working Over or Near Water.....	53
13.0	Blasting Safety	53
14.0	Working Alone.....	54
V.	TRENCHING AND EXCAVATION	55
1.0	Definitions.....	55
2.0	Trenching and Excavation Requirements	55
3.0	Excavations Near Buried Utility Lines	58
4.0	Digging in Contaminated Soils	60
VI.	CONFINED SPACE ENTRY PROGRAM.....	61
1.0	Definitions.....	61
2.0	Requirements for Entry into ALL Confined Spaces	62
3.0	Additional Requirements for Entry into Permit Required Confined Spaces.....	63
	<i>Confined Space Entry Permit (Form)</i>	68
	<i>Confined Space Entry Definitions & Permit Requirements (Instructions)</i>	69
VII.	LOCKOUT/TAGOUT/TRYOUT PROGRAM.....	70
1.0	Purpose.....	70
2.0	Scope and Application	70
3.0	Definitions.....	70
4.0	Program Elements.....	71
5.0	Lockout/Tagout/Tryout Procedures	72
6.0	Procedures for Restart	73
7.0	Employee Training.....	73

8.0	Lockout/Tagout/Tryout Requirements at Construction Sites	74
9.0	Lockout/Tagout/Tryout Requirements at Stillwater Maintenance Shop	75
10.0	Lockout/Tagout/Tryout Requirements at Stillwater Welding Shop	79
VIII.	ELECTRICAL PROTECTION PROGRAM.....	82
1.0	Policy Statement	82
2.0	Electrical Safety and Awareness Training	82
IX.	HAZARDOUS MATERIAL EXPOSURE	83
1.0	Hazard Communications (HAZCOM) Policy	83
2.0	Definitions.....	83
3.0	HAZCOM Standard Procedures	85
4.0	Hazardous Materials Handling Projects	87
5.0	Lead in Construction and Lead Abatement Plan	91
	<i>Summary of Lead in Construction and Lead Abatement Standards (chart)</i>	97
	<i>Lead in Construction Permit (form)</i>	98
6.0	Oil and Fuel Spills	99
X.	RESPIRATORY PROTECTION PLAN	101
1.0	Purpose.....	101
2.0	Scope and Application	101
3.0	Responsibilities	102
4.0	Program Elements.....	102
5.0	Silica Exposure Control Plan	104
	<i>Table 1: Specified Exposure Control Methods When Working With</i>	
	<i>Materials Containing Crystalline Silica</i>	105
6.0	Voluntary Respirator Use.....	111
	Appendix D	111
	<i>OSHA 29 CFR 1910.134 Appendix D (Instructions)</i>	111
XI.	HEARING CONSERVATION PROGRAM	116
1.0	Purpose.....	117
2.0	Scope and Application	117

3.0	Program Elements	117
4.0	Responsibilities	119
5.0	Hearing Conservation Controls	120
XII.	BLOODBORNE PATHOGEN EXPOSURE CONTROL PLAN.....	120
1.0	Exposure Control	121
	<i>Hepatitis B Virus Declination (form)</i>	134
	<i>Bloodborne Pathogen Exposure Report (form)</i>	136
XIII.	TRANSITE PIPE HANDLING PLAN.....	137
1.0	Scope and Application	137
2.0	Definitions.....	137
XIV.	FLEET SAFETY PLAN.....	142
1.0	Introduction.....	142
2.0	Motor Vehicle Safety Policy	142
3.0	Vehicle Use.....	142
4.0	Truck Driver Selection.....	144
5.0	Fleet Motor Carrier Requirements	146
6.0	Fleet Safety Requirements	148
7.0	Hours of Service and Log Books	150
	<i>Drivers Daily Log (Example)</i>	153
8.0	Alcohol and Controlled Substances	154
	<i>CMV Driver Requirements (Chart)</i>	157

I. SARGENT CORPORATION SAFETY POLICY

1.0 POLICY STATEMENT

It is the policy of **SARGENT CORPORATION** that all employees are entitled to work under safe and healthful conditions in the performance of their duties. We shall endeavor to maintain a safe and healthful workplace, provide safe working equipment, appropriate training, and necessary and appropriate personal protective equipment for all employees. To accomplish this policy, the company shall appoint a person to function as Safety Director.

The Safety Director shall be responsible for the formulation and implementation of the Health and Safety Plan, which includes the Safety Policy and Accident Prevention Plan. It shall be his/her responsibility to maintain current knowledge of state and federal safety regulations and to provide instructions to all managers and supervisors of methods of performing work consistent with those regulations. Although the Safety Director cannot be on each work-site on a continuing basis, he/she shall ensure the work is performed consistent with safety regulations and policies through timely employee training, job-site inspections, consulting with supervisors, documentation of violations of safety standards and follow up corrective actions.

Superintendents and foremen shall be responsible to plan and complete their project work in accordance with appropriate current knowledge of OSHA, MSHA, FMCSA, and company safety standards as provided by the Safety Director.

Superintendents and foremen are responsible not only for the quality and quantity of work produced by the people they supervise, but for their health and safety as well. Jobsite supervisors have the greatest opportunity to effect safe working conditions and safe attitudes. Since foremen have continued contact with crew members and are responsible for their supervision, they are also responsible to ensure that the work is performed in a manner consistent with the company's safety standards and with state and federal regulations. By virtue of training and/or experience, the foreman is usually the designated "competent person" for the work his/her crew performs. The competent person is responsible to identify existing and predictable hazards and has authorization to take prompt corrective measures to eliminate them.

The project superintendents, with the support of the Operations Managers, bear overall responsibility to ensure their crews and subcontractor crews perform the work in accordance with OSHA, MSHA, FMCSA, and **SARGENT CORPORATION** safety standards.

Superintendents shall hold weekly project safety meetings each Tuesday using the agenda developed for these meetings. Topics of employee safety will be appropriate for each project activity. These meetings shall be documented with the record sent to the Human Resource Department. The Safety Director shall monitor the meetings and attend as many as feasible.

Herbert R. Sargent, President/CEO

2.0 OBJECTIVES

- 2.1 Our objective is to eliminate or reduce the possibility of injury or illness of our employees. By accomplishing this, we protect the safety and well-being of the employee. We will also benefit from increased efficiency, fewer unplanned business interruptions from accidents, and lower insurance costs.
- 2.2 **Method of Obtaining Objectives.** The methods used to achieve our objective shall include the following procedures:
 - 2.2.1 Plan all work to avoid personal injury or illness, property damage, and loss of productive time;
 - 2.2.2 Use administrative measures such as Preparatory Inspections (P3), Job Hazard Analyses (JHA), and Safety Task Assessments (STA) to ensure work hazards are identified and properly addressed;
 - 2.2.3 Maintain an Incident Investigation process for prompt detection, documentation, and correction of faulty procedures, unsafe work practices, and unsafe conditions;
 - 2.2.4 Make available and require the use of personal protective equipment;
 - 2.2.5 Establish an effective system of tool and equipment inspection and maintenance;
 - 2.2.6 Establish a training and orientation program to maintain interest and cooperation of all levels of employment including the following:
 - 2.2.6.1 Provide appropriate training for all employees;
 - 2.2.6.2 Provide an employee orientation training program for all newly hired employees;
 - 2.2.6.3 Hold weekly safety meetings for all employees;
 - 2.2.6.4 Communicate and enforce safety requirements for all job operations; and
 - 2.2.6.5 Investigate all accidents to determine the causes and necessary corrective actions.

3.0 ORGANIZATION – RESPONSIBILITIES

3.1 President/CEO:

- 3.1.1 Approves and supports company Health and Safety policies.

3.2 Safety and Training Director:

- 3.2.1 Defines and implements the Health and Safety policies.
- 3.2.2 Oversees education and training programs as appropriate.
- 3.2.3 Collects and disseminates necessary information pertaining to applicable federal, state and company health and safety standards.
- 3.2.4 Provides appropriate information concerning health and safety standards to all supervisors.
- 3.2.5 Visits and inspects job sites and consults with supervisors to assure compliance with health and safety policies.

3.3 Division Operations Managers:

- 3.3.1 Provide oversight and support to assist Superintendents to assure compliance with applicable federal, state and company safety regulations as defined by the Health and Safety Plan (HASP).
- 3.3.2 Implement enforcement action as necessary to ensure the work is performed safely and in compliance with all applicable health and safety requirements.

3.4 Superintendents:

- 3.4.1 Assume overall jobsite safety responsibilities.
- 3.4.2 Assure compliance with applicable federal, state and company safety regulations as defined by the Health and Safety Plan (HASP).
- 3.4.3 Oversee and train foremen in their job responsibilities regarding safety as well as production.
- 3.4.4 Complete P3's and JHA's prior to starting major work items, and communicate with foremen and crewmembers.
- 3.4.5 Assign a competent person for each work item, who is capable of identifying existing and predictable hazards and who has authority to take prompt corrective action to eliminate them.
- 3.4.6 Review the daily STA's and provide constructive feedback to the foremen.

- 3.4.7 Hold and document crew safety meetings on a weekly basis. (Tuesday morning)
- 3.4.8 Assure that all accidents, injuries, and near misses are properly reported and thoroughly investigated, and that corrective action(s) are implemented as needed.
- 3.4.9 Assure that subcontractors comply with all federal, state and company health and safety standards.

3.5 **Foremen:**

- 3.5.1 Assume specific responsibility for the safety of their crew(s). In most cases, the crew foreman is assigned as the competent person for the work performed.
- 3.5.2 Be familiar with all federal, state and company health and safety standards from information provided by the Safety Director.
- 3.5.3 Mentor and train crew members to ensure they perform the work safely and efficiently.
- 3.5.4 Explain, train and enforce the use of all employee personal protective equipment and guards as required by OSHA, MSHA, FMCSA, and the company HASP.
- 3.5.5 Complete STA's on a daily basis and for each new task, and discuss them with crewmembers.
- 3.5.6 Report and investigate all accidents, injuries, and near misses, and take necessary action as directed by the superintendent.

3.6 **Employees:**

- 3.6.1 Work in accordance with federal, state and company health and safety standards.
- 3.6.2 Report unsafe conditions and work practices to a supervisor.

3.7 **Competent Person:**

- 3.7.1 A **competent person** is defined as one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- 3.7.2 A competent person shall oversee each project item performed. Most generally the foreman who is assigned to an item will be the competent person for the work associated with that item.

4.0 SUBCONTRACTOR RESPONSIBILITIES

- 4.1 Accident prevention on the job can only be successful with the cooperation of our subcontractors. All subcontractors shall comply with all details of applicable OSHA, MSHA, FMCSA standards **and with the SARGENT CORPORATION Health and Safety Plan.**
- 4.2 It is the responsibility of the **SARGENT CORPORATION** Project Superintendent to manage the provisions of this Health and Safety Plan with all Subcontractor employees, working through the subcontractor's on-site supervisor.
- 4.3 In all cases, subcontractors must report injuries and property damage and provide a copy of their Incident Investigation Report to the **SARGENT CORPORATION** Project Superintendent. A copy of this report shall be forwarded to the Human Resource Department in Stillwater.

5.0 SITE SPECIFIC HEALTH AND SAFETY PLANS

- 5.1 The **SARGENT CORPORATION** Health and Safety Plan shall be maintained in the field office at each project site and made available to all employees.
- 5.2 For those projects where it is anticipated that employees may be exposed to site specific hazards and/or hazardous materials not covered in this HASP, a project specific HASP will be developed to address these and other site specific issues, such as:
 - 5.2.1 Telephone numbers for emergency contact persons and agencies, owner representatives, and contractor or subcontractor contact persons.
 - 5.2.2 Site control elements including site map, communication procedures, and locations of occupational healthcare and emergency medical care facilities.
 - 5.2.3 Special hazards that may be encountered on the project and precautions associated with those hazards.
 - 5.2.4 Levels of Personal Protection Equipment required.
 - 5.2.5 Fire, explosion and emergency response guidelines.
 - 5.2.6 Site security.
 - 5.2.7 Other safety concerns unique to the project.
 - 5.2.8 At projects with long access roads which are not able to accommodate two-way traffic, a CB channel will be established, mile markers will be posted.

5.2.9 Jobsites with no established address or in a location where medical services are not reasonably available will post GPS coordinates.

5.2.9.1 A landing zone will be established with a minimum size of 100' x 100'.

5.2.9.2 The landing zone will be clear of overhead wires and reasonably flat.

5.2.10 When a general contractor, owner or owner's representative establishes a rule or requirement exceeding OSHA, MSHA or Sargent Corporation policy.

6.0 DRUG AND ALCOHOL FREE WORKPLACE POLICY

6.1 **Policy statement.** It is the policy of **SARGENT CORPORATION** to maintain a drug and alcohol free workplace. No employee shall be allowed to work while under the influence of drugs or alcohol.

6.2 The unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the workplace.

6.3 Any employee who is seen using illegal drugs or alcohol during working hours shall be subject to immediate suspension and possible termination of employment.

6.4 An employee who is suspected of being under the influence of illegal drugs or alcohol shall be removed from the job site and driven to a safe location.

6.5 **Prescription drugs.** An employee who is using prescription drugs shall inform his/her supervisor so that his/her job requirements can be altered to minimize possible injury to the employee and other employees.

6.6 **Pre-Employment drug testing.** **SARGENT CORPORATION** has a pre-employment Drug Testing Plan. Candidates for employment who are offered a position must submit to a test for illegal drugs. All offers of employment are conditioned on a negative test for illegal drugs.

6.7 **Post-Accident drug testing.** **SARGENT CORPORATION** has a Post-Accident Drug Testing Plan for employees who are operating company vehicles and for employees who are driving personal vehicles on company business.

6.7.1 Both alcohol and controlled substance tests will be administered to operators as soon as practical following an accident when:

6.7.1.1 The accident involves a human fatality (regardless of fault); or

6.7.1.2 The accident resulted in bodily injury with immediate medical treatment,
or

6.7.1.3 The accident resulted in disabling damage to a motor vehicle requiring it to be towed or transported away from the accident site.

6.7.2 If a driver refuses to test, it will be viewed by the company as a “positive” result

6.7.3 A “positive” alcohol and/or controlled substance outcome will result in disciplinary action up to and including termination

6.8 **Drug and Alcohol Policy Notice.** The following notice to employees is included in the **SARGENT CORPORATION** Employee Handbook and is posted at all jobsites:

NOTICE TO EMPLOYEES

It is the policy of **SARGENT CORPORATION** to provide a drug and alcohol free work site in accordance with Federal Regulations. Any employee who engages in the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance in the workplace will be subject to immediate suspension and possible termination of employment.

SARGENT CORPORATION has adopted a Pre-Employment Drug Testing Plan approved by the Maine Department of Labor. Candidates for employment who are offered a position must submit to a test for illegal drugs. All offers of employment at **SARGENT CORPORATION** are made conditioned on a negative test for illegal drugs.

7.0 PROJECT SAFETY MEETINGS

7.1 **Full Participation.** All employees shall participate in safety meetings to be held at project sites each week.

7.2 **Content.** The meetings will include discussion of standardized safety topics as well as issues or concerns specific to each project.

7.3 **Documentation.** Safety meeting documentation shall include a listing of the topics discussed and the names of all persons attending. Copies of safety meeting topics and attendance sheets shall be sent to the Safety Department in Stillwater.

7.4 **Subcontractor Safety Meetings.** Each subcontractor is required to hold and document weekly safety meetings for its employees, covering safety topics that are appropriate to the subcontract work and the project work environment.

8.0 PROJECT SAFETY INSPECTIONS

- 8.1 Each project Superintendent shall be responsible for conducting at least daily visual inspections of the project under his/her supervision to determine that the project is maintained in a condition that eliminates or reduces the potential for an accident or injury to company employees and other workers on the site and members of the public who gain access to or travel through or past the project site.
- 8.2 On a weekly basis, a written record shall be made by the Superintendent to document that these inspections are being performed, deficiencies identified, and corrective action(s) taken.
- 8.3 Items that must be inspected shall include but not be limited to:
 - 8.3.1 Open excavations/trenches are properly barricaded and guarded.
 - 8.3.2 Small tools are properly stored and secured.
 - 8.3.3 All storage and office areas are secured and locked.
 - 8.3.4 All highway signs are properly located, clean and visible.
 - 8.3.5 All lights and traffic control devices are in place and functioning properly.
 - 8.3.6 Equipment keys are removed and cabs locked and secured as appropriate.
 - 8.3.7 Floor and ground openings are covered or guarded, staging is secured/blocked, and ladders are removed or secured.
 - 8.3.8 Other items shall be inspected as appropriate for the project.
- 8.4 The Safety Director and/or Site Safety Specialist shall conduct safety audits of each project as often as possible and at least once per month.

9.0 OSHA and MSHA INSPECTIONS

- 9.1 **Full cooperation.** It is the policy of SARGENT CORPORATION to admit and cooperate with OSHA and MSHA Compliance Officers wishing to visit or inspect our project sites with as minimal disturbance to normal procedures as possible. The following procedures should be followed for all inspections.
- 9.2 **Assure Proper Identification.** All OSHA and MSHA Compliance Officers are required to carry and show an identity card (with photo) to properly identify themselves. Be sure to document the inspector's name for future reference.
- 9.3 **Ask The Purpose Of The Visit.** It could be a regularly scheduled general inspection, the result of an employee complaint, to inspect work in an OSHA focus area, an industrial hygiene inspection, or for other reasons.

- 9.4 **Opening Conference.** There should be an opening conference between the OSHA Compliance Officer and the Project Superintendent to discuss the purpose of the inspection. Answer all questions truthfully, but do not volunteer information other than what you feel would be beneficial towards the outcome of the inspection.
- 9.5 **Inspection.** The project superintendent or other site supervisor should accompany the OSHA or MSHA Compliance Officer during the inspection to explain or answer questions.
- 9.5.1 Under the law, the Compliance Officer may speak to any of our employees, either with a company representative present or in private.
- 9.5.2 If the inspector indicates a possible violation and/or takes a photo, please also take photos of the same area.
- 9.5.3 **Correct any violations or concerns noted by the OSHA or MSHA Compliance Officer immediately.**
- 9.5.4 If the safety concern cannot be corrected immediately, the work in violation shall be discontinued until the problem has been eliminated.
- 9.6 **Closing Conference.** There should be a closing conference where the OSHA Compliance Officer explains to the project superintendent what s/he saw and if s/he feels there were any violations.
- 9.6.1 Please feel free to discuss with the officer any situation that s/he brings up. The purpose of the closing conference is to allow you to explain your position and that of the company.
- 9.6.2 If an employee has knowingly violated an OSHA, MSHA, or **SARGENT CORPORATION** safety standard, it is appropriate to describe our Progressive Employee Counseling Policy to the Compliance Officer.
- 9.6.3 You should also take notes about the closing conference. **Remember – discussion is fine. Arguing is not.**
- 9.6.4 At the end of the conference, call and inform the Safety Director about the OSHA inspection. Notify the Aggregates Manager of MSHA inspections.
- 9.7 **Citations.**
- 9.7.1 If any citations are issued, the OSHA or MSHA Regional Office will send them to the Stillwater office.
- 9.7.2 Copies will be forwarded to the project site where they must be posted for a minimum of three (3) working days and until all violations are corrected.

- 9.7.3 Each citation will have an abatement period (specific date by which the violation must be corrected).

10.0 EMPLOYEE SAFE ACTS POLICY

10.1 Purpose.

- 10.1.1 As affirmed in this Health and Safety Plan, each employee will be provided with a workplace that is safe and maintains good health.
- 10.1.2 It is the intent of this Safe Acts Policy that each employee is responsible for and shall be held accountable for procedures that are conducted in violation of applicable federal or state regulations or company policies.

10.2 Policy Statement. It is the policy of **SARGENT CORPORATION** to hold accountable the person in the highest level of authority who has knowledge and control of workplace procedures that are conducted in violation of applicable federal or state regulations or company policies.

10.3 Disciplinary procedure.

- 10.3.1 Employees who have knowledge and/or control over conditions or actions in violation of safety regulations shall be disciplined according to the following guideline:

First Violation: Verbal warning with note to employee's personnel file.

Second Violation: Written warning.

Third Violation: Possible suspension without pay up to five work days.

Fourth Violation: May be subject to termination of employment.

- 10.3.2 Depending on the nature and degree of seriousness of the violation, an employee who knowingly places him/herself or others at risk of serious injury or death may be subject to a written warning, suspension without pay, or termination of employment without first having received a verbal warning.

- 10.3.3 An employee who causes an accident through a negligent act which results in property damage or personal injury (such as collision with equipment or vehicle) will be subject to immediate suspension without pay for a period of up to five working days without having first received a warning.

- 10.4 **Report Form.** Records of employee discipline will be documented on the “**Behavior Modification Report**” form found at the end of this section. Copies go to the employee, project superintendent, Vice President of Operations, and the Human Resources Department.
- 10.5 All records of discipline will remain in the employee’s personnel file for three years.
- 10.6 A person whose employment is terminated under this procedure will not be eligible for rehire with any division of the company without prior consideration and approval by Vice President of Operations.

11.0 PROGRESSIVE EMPLOYEE COUNSELING POLICY

- 11.1 It is the policy of **SARGENT CORPORATION** to afford each employee the opportunity to correct behaviors and attitudes that do not contribute to the efficient completion of goals. To this end, the following procedure shall be used when discussing employee behavior that must be improved.
 - 11.1.1 **First Incident.** The Project Superintendent or Department Head will hold an oral discussion with the employee which clearly indicates the nature of the unacceptable behavior, and the course of action which is required to correct the problem. Written documentation of the behavior and counseling session will be made with a copy placed in the employee’s file.
 - 11.1.2 **Second Incident.** The Project Superintendent or Supervisor will meet with the Human Resource Administrator and/or appropriate Operations Manager to discuss the employee’s behavior. Following this meeting, the appropriate manager in charge will meet with the employee to discuss and provide a written warning to the employee, which clearly indicates the nature of the unacceptable behavior, and corrective measures which are required. It will be emphasized to the employee that further inappropriate behavior will result in termination of his/her employment. The notice will be presented to the employee with a copy placed in the employee’s file.
 - 11.1.3 **Third Incident.** The employee may receive a suspension without pay for a period of up to five days, or his/her employment with the company may be terminated following notification of the Vice President of Operations, appropriate Operation Manager(s), and Human Resource Administrator with proper documentation in the employee’s personnel file.
- 11.2 Records of progressive employee counseling will be documented on the “**Behavior Modification Report**” form. Copies go to the employee, project superintendent, VP of Operations, and the Human Resources Department.
- 11.3 All records of discipline will remain in the employee’s personnel file for three years.
- 11.4 A person whose employment is terminated under this procedure will not be eligible for rehire by the company without prior consideration and approval by the VP of Operations.



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BEHAVIOR MODIFICATION REPORT

Instructions: This form should be used to document unacceptable and/or unsafe employee behavior. Please fax the completed form to the Human Resources Department immediately upon completion.		
Name of Employee:	Date of Behavior(s):	Date of Report:
Name of Superintendent Preparing Report:	Project Location:	Project Number:
Name(s) of Witness(es):		
Please indicate the general nature of the behavior(s): Attendance: Absent excessively Absent without permission Late Other	Action: Damage of company property Discrimination/harassment Unsatisfactory attitude Unsatisfactory job performance Other	Safety: Failure to wear/use PPE Horseplay Improper use of tools or equip. Violation of drug/alcohol policy Violation of other safety rules
Please describe the behavior(s) in detail (use additional pages if necessary):		
Please describe steps employee must take in order to correct behavior(s) (use additional pages if necessary):		
Please state all corrective or disciplinary measures taken: Verbally counseled/training (with this note to file) Written reprimand (this notice serves as reprimand) Employee immediately removed from project site Suspension without pay for _____ days Termination		
NOTES: While SARGENT CORPORATION attempts to use progressive discipline, it retains the right to forego less severe measures when it deems more severe measures, including discharge, are appropriate. The Human Resources Department must be consulted before an employee may be suspended or terminated. The Human Resources Department reserves the right to modify discipline imposed at a jobsite when records reveal that the employee has been previously disciplined or as circumstances warrant.		
Comments, if any, by employee:		
Signature of Supervisor certifying that behavior and corrective measures have been discussed with employee:		
Signature of employee indicating receipt of copy of report (note: report is still effective without signature):		
Signature indicating receipt by Human Resources Department:	Date Received:	

II. SAFETY REQUIREMENTS FOR NEW EMPLOYEES

1.0 POLICY STATEMENT FOR NEW EMPLOYEES

- 1.1 It is the policy of **SARGENT CORPORATION** that each employee has the right to work in an environment that is safe and healthful.
- 1.2 Each new employee shall receive a safety orientation prior to working on a construction jobsite.
- 1.3 Foremen shall ensure their crew members have been field trained for each task they are asked to complete.
- 1.4 Employees shall inform their foremen if they have not performed an assigned task before or if they feel they need additional training to safely perform the work.

2.0 HIRING PROCEDURE

- 2.1 Each employee shall be orientated to the company by a qualified person using the Health and Safety Plan as a guide.
- 2.2 All information outlined in the “New Employee Orientation Checklist”, as well as other appropriate information will be explained to the employee.
- 2.3 The completed “New Employee Orientation Checklist” shall be signed by the employee and the person providing the orientation, and filed at the Stillwater office along with other personnel information.
- 2.4 At the time that an employee is hired, he/she will be given a copy of “Sargent Corporation’s Summary of Safety Rules” to read and sign acknowledgement of receipt. The acknowledgement portion shall be filed in the employee’s personnel file.

3.0 SARGENT CORPORATION’S SUMMARY OF SAFETY RULES

- 3.1 Proper clothing shall be worn at ALL times. This includes long pants and a shirt or jersey with at least four-inch sleeves. Shorts, sweatpants, and tank tops are NOT permitted.
- 3.2 Safety toe work boots of at least ankle height in good condition shall be worn at ALL times on ALL projects. Sneakers, hiking boots or street shoes, even with safety toes, will NOT meet this requirement. Steel shank work boots are required for work on landfill closure projects as well as for demolition and building projects where there is likelihood of stepping on nails or other sharp objects and are recommended on all projects.
- 3.3 Hard hats shall be worn at ALL times on ALL projects except in offices or inside the cabs of vehicles or equipment.

Section II

- 3.4 Safety glasses shall be worn at ALL times on ALL projects except in offices or when an operator or driver is inside the enclosed cab of a vehicle or equipment.
- 3.5 Face and secondary eye protection (i.e.: face shield) shall be worn for high-risk tasks such as welding, chipping, grinding, pipe saw and chain saw use, and similar activities.
- 3.6 Hand protection shall be worn when handling materials with sharp edges or which are irritating to the skin.
- 3.7 High visibility vests appropriate for the type of work zone or project shall be worn at ALL times on projects except in offices.
- 3.8 The source of power must be disconnected and keys removed from ignition switches whenever it is necessary to do repair or maintenance work on power driven equipment. When working on electrical equipment, the disconnect switch must be locked out and tagged prior to repair.
- 3.9 Walkways and work areas must be kept clean and clear of tools, supplies, power cords and other tripping hazards. Good housekeeping is a must.
- 3.10 Ladders used in any situation must be secured from slipping and be in good condition. Stepladders shall be used on level and stable surfaces, and must be opened and locked.
- 3.11 Ladders shall be inspected prior to each use and removed from service if defective.
- 3.12 Fall protection (standard railings or personal fall arrest system) is required for all workers who are 6 feet or more above an adjacent surface on construction projects. This includes the assembly or disassembly or scaffolding, workers on ladders, and workers in buckets or on lifts of any kind. This standard applies to workers on manholes, retaining walls, roofs, and other structures, but it does not apply to all excavations and trenches. OSHA's General Industry standards require that fall protection is provided when exposed to a fall greater than 4 feet. MSHA requires protection when a fall hazard is present.
- 3.13 All electrical equipment shall be properly grounded. Three wire tool cords and extension cords in good condition are required. Ground fault circuit interrupters (GFCI) shall be installed on all temporary circuits of 120 volts.
- 3.14 All tools shall be inspected for defects or unsafe conditions prior to use. Unsafe tools shall be removed from service immediately and tagged as defective.
- 3.15 Do not use a tool or piece of equipment with which you are unfamiliar until you have received instructions on its use and have read all safety precautions contained in the owner's/operator's manual. Before approaching a piece of equipment establish eye contact with the operator.
- 3.16 Cables, ropes, booms, lifting equipment etc. shall be inspected before each use and shall be removed from service if defective.
- 3.17 Gasoline shall be handled and stored in approved safety cans. Engines shall be turned off during refueling. No smoking is permitted while refueling or handling fuel containers. Flammable materials shall be stowed away from ignition sources such as flames or batteries.

Section II

- 3.18 Open excavations that are accessible to others shall be guarded at all times by barriers. Manholes and floor openings shall be securely covered or guarded by railings.
- 3.19 Excavations and trenches more than 5 feet deep shall be shored with a trench box or sloped according to OSHA standards. No employee shall enter a trench more than 5 feet deep without this protection.
- 3.20 Excavations and trenches more than 4 feet deep shall be provided with a ladder, ramp, or other safe means of access/egress. In a trench, safe access must be provided within 25 feet of each employee in the trench.
- 3.21 Get help when lifting objects that are too heavy or awkward to be lifted alone. Under most circumstances, the maximum weight any employee should lift unassisted is 50 pounds.
- 3.22 Immediately report all accidents or injuries, however slight, to your foreman or superintendent.
- 3.23 **SARGENT CORPORATION** provides a drug free workplace. Employees who engage in unlawful manufacture, distribution, possession or use of a controlled substance will be subject to immediate suspension and possible termination of employment.
- 3.24 Any employee under the influence of alcohol or drugs on the job will be subject to immediate termination of employment.
- 3.25 Any employee fighting, provoking a fight or participating in horseplay on a project site will be subject to immediate suspension or termination of employment.
- 3.26 Any employee violating **SARGENT CORPORATION** safety policies will be subject to disciplinary action, up to and including immediate suspension or termination.
- 3.27 Employees observing an unsafe condition or work practice in the workplace shall bring it to the immediate attention their foreman or superintendent. If this fails to correct the situation, please call the Safety Director or the Training Administrator in Stillwater.

SAFETY IS EVERYONE'S BUSINESS.

CERTIFICATION

I certify that I have read and understand **SARGENT CORPORATION'S SUMMARY OF SAFETY RULES** and I agree to follow those rules while I am employed by **SARGENT CORPORATION**.

I further certify that I have been provided with a copy of **SARGENT CORPORATION'S** employee handbook. I acknowledge that I am an "Employee at Will," and either **SARGENT CORPORATION** or I may terminate my employment at any time, for any reason or no reason, with or without prior notice.

Date: _____

Employee Name (print) _____

Employee Signature _____

SARGENT CORPORATION
NEW EMPLOYEE ORIENTATION CHECKLIST

EMPLOYEE NAME: _____ DATE: _____

NAME OF PERSON COMPLETING ORIENTATION: _____

The person(s) providing the new employee orientation should review the following items and indicate either they have been reviewed or that they are not applicable. This form must accompany payroll information and be included in the employee file.

- Starting and quitting times ☐ YES ☐ N/A
- Time and length of coffee break ☐ YES ☐ N/A
- Time and length of meal break ☐ YES ☐ N/A
- Location of toilets..... ☐ YES ☐ N/A
- Employee's classification and rate of pay ☐ YES ☐ N/A
- Date of first paycheck and regular pay day ☐ YES ☐ N/A
- Mandatory direct deposit of paycheck (need paperwork within 2 weeks)..... ☐ YES ☐ N/A
- Who and where to call when unable to report to work (provide phone number) ☐ YES ☐ N/A
- Name of project superintendent ☐ YES ☐ N/A
- Reporting procedures for employee injuries and accidents..... ☐ YES ☐ N/A
- Read and sign 'Summary of Safety Rules' ☐ YES ☐ N/A
- Complete and sign W-4..... ☐ YES ☐ N/A
- Complete and sign I-9 and provide supporting documentation..... ☐ YES ☐ N/A
- Complete and sign employee setup form..... ☐ YES ☐ N/A
- Work dress requirements (shirt with sleeves, long pants, safety work boots) ☐ YES ☐ N/A
- Hard hat policy discussed and hard hat issued ☐ YES ☐ N/A
- High visibility vest policy discussed and vest issued ☐ YES ☐ N/A
- Safety glasses policy discussed and safety glasses issued..... ☐ YES ☐ N/A
- Fall protection policy discussed..... ☐ YES ☐ N/A
- EEO and sexual harassment policies explained..... ☐ YES ☐ N/A
- Employee has no physical limitation(s) to prevent him/her from doing work..... ☐ YES ☐ N/A
- Confined space entry explained ☐ YES ☐ N/A
- Use of drugs or alcohol during workday (including during coffee and lunch breaks) or reporting to work under the influence of
drugs or alcohol will result in immediate termination..... ☐ YES ☐ N/A
- Employee will report all unsafe working conditions and/or procedures to foreman or superintendent..... ☐ YES ☐ N/A
- Days and times of safety meetings explained..... ☐ YES ☐ N/A
- Employee will participate in all safety meetings..... ☐ YES ☐ N/A
- Hazardous materials exposure policy, SDS availability, and location and project chemical list discussed..... ☐ YES ☐ N/A
- Equipment greasing and maintenance requirements discussed in detail..... ☐ YES ☐ N/A
- Employee Evaluation Parameters ☐ YES ☐ N/A
- Employee Evaluation Questions ☐ YES ☐ N/A
- Other (specify): _____..... ☐ YES ☐ N/A

THESE ITEMS HAVE BEEN DISCUSSED WITH AND ARE UNDERSTOOD BY THE EMPLOYEE.

Supervisor Signature

Employee Signature

III. ACCIDENT PREVENTION PLAN: INCIDENT INVESTIGATION & REPORTING PROCEDURES

1.0 INTRODUCTION

- 1.1 **Investigation and Analysis.** A complete and accurate investigation and analysis of an accident or near miss provides an opportunity to address hazards that may not be obvious, or that result from a combination of circumstances. Because these categories of accidents account for the greater percentage of losses, in terms of injuries and property damage, **SARGENT CORPORATION** considers reporting and accident investigation an important and integral part of each Superintendent's and Foreman's responsibilities.

2.0 REPORTING REQUIREMENTS

- 2.1 Every incident involving a reported injury, property damage claim, or near miss shall be reported to the appropriate regional office and to Stillwater before the end of the workday.
- 2.2 The superintendent shall, in each case, submit an **Incident Investigation Report**.
- 2.3 Any case involving a hospital visit, lost time, vehicle damage or damage to property shall also be telephoned to the Stillwater office on the day it occurs. Please report injuries to Adam Kasprzak, Heather Hutchinson or Arthur Herbest, and report property damage claims to Kim Ryan.

3.0 INCIDENT INVESTIGATION

- 3.1 Incident investigations shall be the responsibility of the project Superintendent.
- 3.2 S/he shall conduct a thorough investigation of every accident involving property damage or employee injury.
- 3.3 The goal of an incident investigation is to locate and identify unsafe conditions or unsafe practices and to correct them. Consequently, one of the most important parts of the investigation is to determine the cause of the incident, the steps taken to correct the conditions, and the follow up actions needed to ensure there will be no reoccurrences. Photographs are very helpful for documenting the details of an incident.
- 3.4 The results of the incident investigation shall be reported on the "**SARGENT CORPORATION INCIDENT INVESTIGATION REPORT**" form.

4.0 EMPLOYEE INJURY INVESTIGATION

- 4.1 As soon as possible following the employee's notification of an injury, the Superintendent must complete an Incident Investigation Report. It is important that the report be as accurate and complete as possible. However, do not hold up a report because you lack some information. We can supplement missing information later.
- 4.2 All injuries shall be reported on a "**SARGENT CORPORATION INCIDENT INVESTIGATION REPORT**" form. This report is to be completed as soon as possible and sent to **Adam Kasprzak via email at akasprzak@sargent-corp.com**. Please be very specific as to the nature of the injury such as "laceration on third finger of right hand" or "muscle strain of lower left back". It is extremely important that we know what body parts are affected and the exact nature (as best you know) of the injury.
- 4.3 In the event that an injury requires a doctor visit, please contact Adam Kasprzak, Heather Hutchinson, or Arthur Herbest as soon as possible. For all medical emergencies call 911. For all other injuries requiring medical assistance, a supervisor must accompany the injured employee to the local occupational health facility that has been pre-approved by the Human Resource Department.
- 4.4 If the injury results in lost time from work, please indicate that appropriately on the form. Please note that if an employee misses time from work to seek medical attention on the day of the injury but returns to work the following day, this is NOT a lost time injury. Disability does not begin until the day following the injury. Please also pay the injured person for a full day on the date of injury if s/he leaves to seek medical attention.
- 4.5 For a minor injury that may or may not require first aid, please also complete an Incident Investigation Report and send it to **Adam Kasprzak at akasprzak@sargent-corp.com**. It will be kept on file in the event that medical treatment is necessary at a later date.



Incident Reporting Instructions

Injury

In the event of an injury, take care of the injured employee and then notify Adam Kasprzak as soon as possible at 207-745-4817. Complete the tab marked "injury" and forward it to kryan@sargent-corp.com and akasprzak@sargent-corp.com within 48 hours of the incident.

In the event of an OSHA-recordable injury, complete sheets "Investigation 1 and Investigation 2".

Near Miss

In the event of a "Near Miss", complete the tab marked "Near Miss" and send it kryan@sargent-corp.com and akasprzak@sargent-corp.com within 72 hours. You do not have to fill out all the pages of the form.

Property Damage

In the event of property damage, if the damage is to private property, client-owned property or equipment, or public property, complete the tab marked "Property Damage" only and send it to kryan@sargent-corp.com and tgardner@sargent-corp.com immediately and copy akasprzak@sargent-corp.com as well. You do not have to fill out all the pages of the form.

Equipment Damage

In the event of equipment damage, complete the tab marked "Property Damage" and send it to trichards@sargent-corp.com, kryan@sargent-corp.com and tgardner@sargent-corp.com immediately and copy akasprzak@sargent-corp.com as well. You do not have to fill out all the pages of the form.

Incident Investigation Summary

* Did the accident result in the death of one or more persons? ☐ Yes ☐ No		** Did the accident result in the loss of an eye? ☐ Yes ☐ No
** Did the accident result in the inpatient hospitalization of one or more persons? ☐ Yes ☐ No		Was medical treatment provided? ☐ Yes ☐ No
** Did the accident result in an amputation? ☐ Yes ☐ No		Was this a recordable injury or illness? ☐ Yes ☐ No

***** Fatalities must be reported to OSHA within 8 hours.

****** Inpatient hospitalizations, amputations, and eye loss incidents must be reported to OSHA within 24 hours.

You can report online at <https://www.osha.gov/html/Ramap.html>

Summary

Remember to send to Stillwater:

- ✓ Medical information
- ✓ Photographs
- ✓ Witness statement
- ✓ Copy of client reports
- ✓ Copy of STA
- ✓ Incident Report



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AN EMPLOYEE OWNED COMPANY

Incident Report

I am reporting a work-related: ☐ Injury ☐ Illness ☐ Exposure

Name of injured employee _____ Job title _____

Reported to: _____ Supervisor _____

Foreman _____ Foreman's Phone # _____

Date of injury _____ Time of injury _____ Reported date _____

Home phone or cell # ☐ Home ☐ Cell _____ DOB _____ Gender ☐ M ☐ F

Address _____ SSN _____

Where did the accident occur? _____

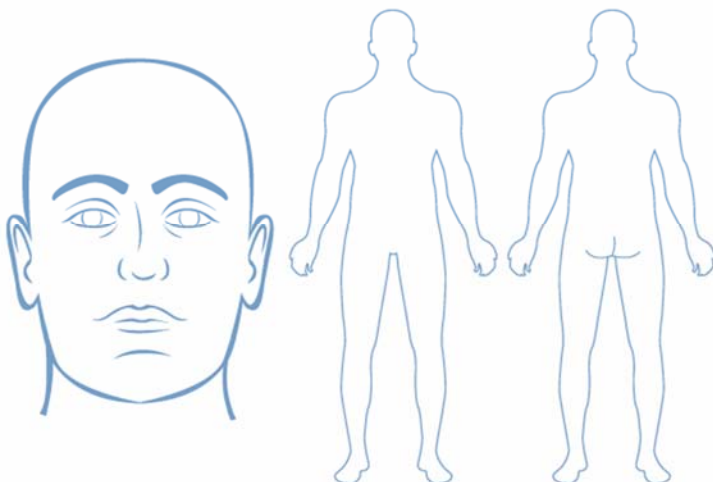
Is injury an aggravation of a previous injury? _____ If yes, explain _____

Witness _____ Phone # _____ Witness _____ Phone # _____

What Happened

What body part(s) were affected? _____

Place an "x" on all affected body parts.



- | | |
|--|-------------------------------------|
| ☐ Abrasion | ☐ Heat |
| ☐ Amputation | ☐ Hernia |
| ☐ Burn (chemical) | ☐ Inhalation |
| ☐ Burn (thermal) | ☐ Laceration |
| ☐ Cold | ☐ Puncture |
| ☐ Concussion | ☐ Rash |
| ☐ Contusion | ☐ Sprain |
| ☐ Crushing injury | ☐ Sting/bite |
| ☐ Damage to a body system | ☐ Strain |
| ☐ Electric shock | ☐ Other |
| ☐ Fracture | |
| Heart attack | |

Section III

Medical treatment? ☐ Yes ☐ No E/R? ☐ Yes ☐ No Ambulance ☐ Yes ☐ No
 What medical facility? _____

Type of Incident / Cause

☐ Caught in / caught between	☐ Repetitive motion	☐ Struck by
☐ Contact with	☐ Slip / trip / fall	☐ Struck against
☐ Exposure to	☐ Strain / sprain	☐ Other

Specific activity at the time of injury:

All equipment, tools, and materials directly related to and/or being used at time of injury:

Was the injury the result of an unsafe act? ☐ Yes ☐ No

Was the injury the result of an unsafe condition? ☐ Yes ☐ No

Was the injured employee trained to safely accomplish the task (s) he was working on? ☐ Yes ☐ No

Have eyewitnesses been interviewed? ☐ Yes ☐ No

Are there notes, sketches, observations, or photographs that might be helpful? ☐ Yes ☐ No

What is the root cause?

Are there changes that need to be made in policy or conditions? ☐ Yes ☐ No

Does the client need to be notified that an accident occurred? ☐ Yes ☐ No

Does the client need a copy of this report? ☐ Yes ☐ No

Claims - for office use only

☐	Minor	Restricted duty starts	
☐	Recordable	Restricted duty ends	
☐	Lost Time	Lost time starts	
☐	Recordable without lost time or restriction	Lost time ends	
			Other
			Full duty release

Name of person who completed this form:

Name:

Position:

Safety Director's Signature

Date:

Accident Investigation									
What went wrong?									
If a hazardous condition existed, why did it exist?									
If an unsafe act occurred, why did it occur?									
Was the employee tired? How many hours had s/he worked when the incident happened?									
Was the employee being rushed to complete this task?									
	Yes		No	If yes, explain.					
Were unsafe acts or hazardous conditions reported prior to the incident?									
	Yes		No	If yes, by whom? Explain.					
Have there been similar incidents or near misses prior to this one?									
	Yes		No	If yes, explain.					
Was the injury or exposure caused by the employee's willful misconduct, intoxication, or deliberate intent to injure him/herself or another?									
	Yes		No	If yes, explain.					
Was the injury a result of violation of established safety policies?									
	Yes		No	If yes, explain.					
Has the employee received training to perform this task safely?									
	Yes		No	If no, explain.					
Was adequate PPE provided and used for the task?									
	Yes		No	If no, explain.					
Explain any additional policies, personal factors, and environmental factors that led to hazardous condition or unsafe acts.									

Accident Investigation**Why did the accident or exposure occur?**

Unsafe workplace conditions (Check all that apply)

- ☐ Inadequate guard
☐ Unguarded hazard
☐ Safety device missing or defective
☐ Tool or equipment defective
☐ Work environment is hazardous
☐ Inadequate lighting
☐ Inadequate ventilation
☐ PPE not available
☐ Inadequate PPE
☐ Inadequate training
☐ Other

Unsafe acts (Check all that apply)

- ☐ Operating without license or permission
☐ Operating at unsafe speed
☐ Working on equipment that is not locked out
☐ Bypassing a safety device
☐ Using defective equipment
☐ Using equipment in an unapproved way
☐ Unsafe lifting
☐ Poor ergonomics
☐ Horseplay
☐ Distraction
☐ Failure to wear proper PPE
☐ Other

How can future incidents be prevented?**What changes do you suggest to prevent this from happening again?**

- | | |
|--|---|
| ☐ Stop this activity | ☐ Guard the hazard |
| ☐ Train/retrain the employee | ☐ Train/retrain the supervisor |
| ☐ Redesign the task steps | ☐ Engineer out hazard(s) of work environment |
| ☐ Write a new policy or work rule | ☐ Enforce existing policy or work rule |
| ☐ Inspect | ☐ PPE |
| ☐ Other | |

What should be (or has been) done to carry out the suggestion(s) checked above?

Investigation team members

Name:

Position:

Name of person who completed this form:

Name:

Position:

--	--

Job Number		Date Reported		Reported By:	
Jobsite		Time of Incident			

Description of Incident:	

[illegible][illegible]

Report Completed By:					Date:				



Property Damage Reporting Form

Employees involved with the incident		Date of Incident:	
Employee 1		Superintendent	
Employee 2		Foreman	
Employee 3			

Required action for damaged equipment:

☐ Document only	☐ Continue to operate	☐ Repair on jobsite
☐ Send to dealer for repair	☐ Send to shop for repair	☐ Replace equipment
☐ Other:		

Equipment incident type:

☐ Equipment hitting other equipment	☐ Equipment hitting other objects
☐ Equipment damage to overhead utilities	☐ Equipment damage to underground utilities
☐ Operator not in control of load/material	☐ Traffic accident
☐ Equipment driven off road	☐ Equipment rollover
☐ Other:	

Incident overview and statements:

To be completed for all employee(s) involved in the incident. Please describe the incident as completely as possible - attach additional pages, photos, sketches, etc. as needed.

Employee 1

--

Employee 2

--

Incident cause(s) and corrective actions:

Please include relevant background information such as employee's location/position in relation to surroundings and what employee was doing when the incident occurred. Please attach photos, sketches, diagrams, etc. as needed.

--

Section III

Sargent Corporation equipment involved in incident:									
Unit number		Make/Model		Operator					
Unit number		Make/Model		Operator					
Description of other damaged property:									
Owner's name									
Address									
Phone		(cell)		(home)		(work)			
Cause(s) contributing factors: (People, equipment, environment)									
What condition(s) or factors(s) contributed to the incident? (Check all that apply)									
☐	Inadequate training			☐	Improper equipment used				
☐	Rule violation or deviation from procedure			☐	Extreme temperatures				
☐	Lack of procedure enforcement			☐	Poor housekeeping				
☐	Unsafe work practices and procedures			☐	Equipment failure or defective				
☐	Inadequate warning system			☐	Air contamination or no ventilation				
☐	Inadequate guarding of equipment			☐	PPE not used or improper PPE				
☐	Equipment inspection insufficient or not performed			☐	Task too physically demanding				
☐	Hazard was not identified (No JHA or STA)			☐	Preexisting condition				
☐	Hazard identified but not addressed			☐	Other				
Explain:									
Program failure: (check all that apply)									
☐	Inadequate or no Job Hazard Analysis (JHA)			☐	Inadequate or no training				
☐	Inadequate or no Safety Task Analysis (STA)			☐	Poor housekeeping				
☐	Inadequate site safety inspection program			☐	Inadequate or no rule enforcement				
☐	Inadquate warning signs/barricades			☐	Equipment not inspected				
☐	Inadequate employee orientation or OJT			☐	Other				
Explain:									
Correction action taken to prevent recurrence (check all that apply)									
☐	Review/revise/recommunicate JHA			☐	Improve housekeeping				
☐	Review/revise/recommunicate STA			☐	Discuss incident with crew				
☐	Train/retrain employee(s)			☐	Performs equipment/tool inspection				
☐	Mark/remark hazards			☐	Upgrade equipment design				
☐	Enforce rules and procedures			☐	Use proper equipment				
☐	Increase frequency of site inspections			☐	Other				
☐	Install guards/safety devices								
Explain:									
Report completed by									
				Date					
Safety Director									
				Date					

5.0 PROPERTY DAMAGE CLAIMS

- 5.1 All claims of property damage or loss that involve **SARGENT CORPORATION** employees or agents shall be reported to Vice-President of Finance in Stillwater as soon as possible.
- 5.2 To facilitate the gathering of information, a **SARGENT CORPORATION INCIDENT INVESTIGATION REPORT** form must be completed and **emailed to Kim Ryan at krayan@sargent-corp.com** .
- 5.3 Whenever possible, please include photographs with reports of property damage or loss.

6.0 PREVENTION OF LOST TIME INJURIES

- 6.1 **SARGENT CORPORATION** is committed to reducing lost time injuries of our employees to zero.
- 6.2 **SARGENT CORPORATION** will provide meaningful alternate or light duty work for each injured employee who is unable to return to his/her regular duty. The alternate or light duty work assigned will be within the restrictions placed on the injured employee by the treating physician.
- 6.3 The injured employee, the employee's foreman, and the project superintendent shall review and strictly adhere to any restrictions recommended by the treating physician.
- 6.4 In the event an employee must lose time from work as a result of a workplace injury, the project superintendent and the safety director shall conduct a thorough investigation of the incident, including:
 - 6.4.1 A review of the incident investigation report completed by the superintendent and foreman.
 - 6.4.2 Interviews with the injured employee and/or witnesses to the incident.
 - 6.4.3 A determination of all factors including actions, procedures, and/or conditions that contributed to cause the injury.
 - 6.4.4 A determination of steps to be instituted to prevent recurrence.
 - 6.4.5 Communication to all operations managers and project superintendents of the causes of the lost time injury and resulting procedural changes, if any.

7.0 FIRST AID

- 7.1 In the absence of an infirmary, clinic, hospital, or physician, that is reasonably accessible in terms of time and distance to the worksite, a person who has a valid certificate in first aid shall be available at the worksite.
- 7.2 First aid training must be obtained from the American Red Cross, National Safety Council, or equivalent organization. Training shall be document and a certificate of training provided.
- 7.3 First aid supplies shall be easily accessible when required. First aid kits shall consist of appropriate items which will be adequate for the environment in which they are used. For construction operations, items shall be stored in a weather proof container with individually sealed packages of each type of item.
- 7.4 In addition to the availability of adequate first aid supplies, first aid kits will be periodically inspected and restocked as supplies are used. Materials that have met their expiration date will be removed. For construction operations, first aid kits shall be checked before being sent out to each job and at least weekly.
- 7.5 Proper equipment for prompt transportation of the injured person to a physician or hospital or a communication system for contacting necessary ambulance service shall be provided and posted at all projects.
- 7.6 Where the eyes or body of any person may be exposed to corrosive materials that could cause injury, suitable facilities shall be provided within the work area.

8.0 OSHA RECORD KEEPING REQUIREMENTS

- 8.1 **OSHA Form 300.** The Safety Director is responsible to keep the OSHA record keeping up to date.
 - 8.1.1 All employee injuries are recorded on a company database kept in Stillwater.
 - 8.1.2 The OSHA Form 300 must be kept on a calendar year basis. Work related injuries and illnesses must be recorded on the OSHA Form 300 if they result in any of the following:
 - 8.1.2.1 Death of the employee.
 - 8.1.2.2 One or more lost work days.
 - 8.1.2.3 Restrictions of work or motion outside the usual activities or responsibilities of the employee's work classification.

8.1.2.4 Loss of consciousness.

8.1.2.5 Transfer to another job as result of injury.

8.1.2.6 Medical treatment beyond first aid, including those involving broken bones, stitches, prescription medications taken, and/or repeat visits to a doctor, chiropractor or physical therapist for treatments or follow-up care.

8.2 **OSHA Form 300A.** This annual summary of injuries and illnesses shall be completed by the Safety Director and posted at each location where company employees report for work for the period February 1 to April 30 annually.

IV. SAFE WORK PRACTICES / STANDARD OPERATING PROCEDURES (Last revised 03/21/2017; Updated on 12/19/17.)

1.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- 1.1 **Construction Work Clothing.** All employees and subcontractor employees in construction work areas shall wear ankle length work pants and shirts with at least 4-inch sleeves. Short work pants and sleeveless shirts are not allowed on **SARGENT CORPORATION** project sites. All clothing shall be clean and in good condition at the start of each work shift.
- 1.2 **Head Protection.** All employees shall wear hard hats at construction project sites, borrow pits, and quarries at all times except in offices or inside the cab of a vehicle or equipment.
- 1.3 **Eye Protection.** Safety glasses shall be provided and worn on all projects and shop work areas at all times. The company reimbursement program for employees who purchase and wear prescription safety glasses with permanently attached side shields is detailed in the **SARGENT CORPORATION** Employee Handbook. Alternatively, the company will provide safety over-glasses.
- 1.4 **Face Protection.** Employees shall wear face shields in addition to safety glasses for all high-risk tasks such as welding, chipping and grinding metals, chipping concrete, using pipe saws and chain saws, and similar activities that cause flying debris.
- 1.5 **Foot Protection.** Safety toe work boots, maintained in good condition, shall be the minimum acceptable foot protection on all projects. Footwear shall be constructed of leather and/or other durable and puncture resistant materials. Safety toe sneakers, hiking boots, or street shoes shall not be allowed on any project.
- 1.6 **Hand Protection.** Gloves should be worn whenever practical or required to protect hands from cold, cuts, scratches, heat or abrasions when handling materials. The company will provide task specific hand protection for unusual working conditions, such as handling wet concrete, chemical exposure, welding or jack hammering.
- 1.7 **Hearing Protection.** Hearing protection shall be provided and worn whenever noise levels or duration of exposure cannot be reduced to below OSHA permissible exposure levels. For example, hearing protection is required when working with or near loud equipment such as a plate tamp, chain saw, pipe saw, impact tool, metal grinder, or sheet pile driver. (See also Section XI, Hearing Conservation Program.)
- 1.8 **Safety Vest.** Employees shall be provided with and required to wear high visibility appropriate for the work area. Employees may elect to buy and wear high visibility coats or tee shirts with reflective stripes at their own expense. Class 2 is the minimum requirement at all Sargent Corporation projects. An employee may remove the safety

vest while welding and conducting other hot work activities, so long as the work area is not in the right-of-way of a public roadway and is well protected from moving equipment, trucks, and other vehicles.

- 1.9 **Job Specific PPE.** Chain saw operators shall wear protective chaps in addition to head, eye, face, hearing, and foot protection. A plexiglass or other type protective debris shield shall be installed in front of the operator's front window when operating a hoe ram or performing demolition work.
- 1.10 **Other PPE** such as protective clothing, respiratory protection, and protective shields and barriers may also be required. The competent person shall provide and require the use of all PPE necessary to protect employees from hazards in their work area. For additional detail on appropriate selection and use of respiratory protection, refer to Section X of this Health & Safety Plan.
- 1.11 **Training.** Training should be provided to employees concerning when to wear PPE, what PPE should be worn, how to put on, take off and adjust PPE. Such training should include the limitations of the PPE as well as proper care, inspection and maintenance. When there is a reason to believe an employee who has been trained does not have the appropriate level of understanding and skill or there are changes in the workplace, the employee must be retrained. All PPE training should be documented.
- 1.12 **Other Consideration for PPE Use.** Protective equipment for eyes, face, head, and extremities, any protective clothing, respiratory devices, and protective shields and barriers, must be provided, used, and maintained in sanitary and reliable condition.
 - 1.12.1 PPE that fits poorly will not afford the necessary protection. Continued wearing of the device is more likely if it fits the wearer comfortably. Protective devices are generally available in a variety of sizes. Care should be taken to ensure that the right size is selected.
 - 1.12.2 If during inspection or during use it is determined any PPE is defective or damaged, it shall be discarded or tagged and removed from service until repaired.
- 1.13 **Employee Supplied/Owned PPE.** Where employees provide their own protective equipment, the employer must assure its adequacy, including proper maintenance, and sanitation of such equipment.
- 1.14 **Hazard Assessment for PPE.** Along with the standard activities listed below, an onsite hazard assessment must be completed as part of the Job Hazard Analysis (JHA) process. The JHA must be done prior to the job starting to determine what PPE might be needed on the job. All JHAs must be signed by the person completing the hazard assessment.

ACTIVITY	ADDITIONAL PPE REQUIRED
Chain saw and cutoff saw work	Face shield and hearing protection (ear plugs or muffs). Chain saw operators shall also wear protective chaps.
Hoe ramming with excavator hammer	A plexiglass sheet or other type protective debris shield shall be installed in front of the operator's front window.
Precasting	Rubber or cotton gloves to protect hands.
Operating small compactor (tamp).	Hearing protection (ear plugs or muffs).
Welding	Welding hood for eye and face protection and leather gloves to protect hands.
Cutting and burning	Welding goggles with minimum no. 5 shade lens.
Grinding and chipping	Face shield is required in addition to safety glasses.
Painting	Supplied air hood for respiratory protection.
Sand blasting	Sand blast hood for eye and face protection. HEPA respiratory protection (N95 half face disposable respirator at minimum). Do not sand blast lead paint.
Rock crushing and aggregate screening	Ear plugs or muffs for hearing protection and gloves to protect hands.

2.0 FALL PROTECTION PLAN

- 2.1 **Introduction.** This Fall Protection Plan is developed to provide specific guidelines and requirements for **SARGENT CORPORATION** personnel and subcontractor personnel for work performed on all projects. It complies with and includes by reference all OSHA Standards relative to fall protection as published in 29 CFR 1926. Where there are differing requirements between this Fall Protection Plan and OSHA Standards, the stricter of the standards shall govern.
- 2.2 **Fall Protection Policy.** Each employee shall be protected from falling when walking or working where there is a danger of falling 6 feet or more to a lower level. A fall prevention system shall be used wherever possible. These include guardrail systems, positioning devices, and barricade systems that effectively keep employees at least 15 feet away from the fall hazard. Where it is impossible or impractical to install a fall prevention system, a personal fall arrest system or safety net shall be used. Site specific fall protection plans will be developed and overseen by a qualified person.
- 2.3 **Employee Training.** Each employee who might be exposed to fall hazards shall be trained in the recognition and how to minimize fall hazards. When new hazards are identified or unsafe behavior is observed, retraining shall be performed with employees. All fall protection training should be documented.
- 2.4 A **Guardrail System** shall be capable of withstanding an outward or downward force of 200 pounds with a minimum of deflection.

- 2.4.1 Vertical supports shall be 2x4 lumber (minimum) or equivalent and shall be a maximum of 8 feet apart.
- 2.4.2 Top rails of 2x4 lumber (minimum) or equivalent shall be approximately 42 inches high (+/- 3 inches).
- 2.4.3 Mid-rails of 1x6 or 2x4 lumber (minimum) or equivalent shall be positioned half way between the top rail and the toe board.
- 2.4.4 Toe boards shall be a minimum of 1 x 4 lumber.
- 2.5 A **Positioning Device** may be used to effectively prevent an employee from being exposed to a fall hazard. The employee wears a harness and is tied to an anchor system such that the employee cannot reach the fall hazard. Ropes, anchors, and other components of the positioning device shall be capable of withstanding at least twice the combined weights of the persons tied to them.
- 2.6 A **Barricade System** may also be used to prevent employees from entering a potential fall hazard area. A barricade system is a physical obstruction such as Danger tape or other highly visible warning line that warns and limits access to the fall hazard. A barricade system shall be approximately waist high and shall be continuous such that it completely surrounds the affected employees or the fall hazard, and effectively keeps employees at least 15 feet away from the fall hazard.
- 2.7 **Personal Fall Protection.**
 - 2.7.1 When using a personal fall arrest system to provide required fall protection, 100% tie-off is required.
 - 2.7.2 Prior to using a personal fall arrest system to provide required fall protection, a plan shall be in place for effective and prompt rescue of any employee who falls while attached to the fall arrest system.
 - 2.7.3 Prior to using a personal fall arrest system and at least daily thereafter, each affected employee shall visually inspect his/her safety harness, shock absorbing or retractable lanyard, tie-off point, and all other components of the fall protection system. Any part found to have a defect shall be immediately removed from service and replaced.
 - 2.7.4 All personal fall protection equipment shall be 5000 pounds test. All lifelines and anchor points shall be 5000 pounds test per person attached to them. They shall be rigged such that the employee can neither free fall more than 6 feet, nor contact a lower level.
 - 2.7.5 Where repeated attachment and detachment of the lanyard is required to accomplish the task, two lanyards will be used to ensure 100% tie-off protection.

- 2.8 **Scaffolding.** Use of scaffolding shall comply with OSHA Subpart L. Listed below are some of the requirements. The complete section can be found in OSHA Construction Industry Regulations (29 CFR 1926).
- 2.8.1 Scaffolds shall be designed by a qualified person and shall be constructed and loaded in accordance with that design under the direction of the competent person. The competent person must ensure scaffolds are safe prior to use and shall affix a tag at each open point of access to scaffolds to indicate the current status of the scaffold (“OK to Use”, “Use with Personal Fall Arrest Only”, or “Do Not Use”).
 - 2.8.2 All scaffolding components including cross members, footing plates, etc. must be included in the scaffolding system. Unsafe equipment, components or conditions must be tagged by a competent person until corrected.
 - 2.8.3 Footing or anchorage for scaffolds shall be sound, rigid and capable of carrying the maximum intended load without settling. Unstable objects such as bricks and concrete blocks shall not be used to support scaffolds or planks. Scaffold systems must be erected plumb and level.
 - 2.8.4 Guardrail systems, including top-rails, mid-rails, and toe-boards shall be installed on all open sides and ends of platforms over 6 feet in height.
 - 2.8.4.1 Personal fall arrest systems may be used in lieu of standard railings. (Toe-boards are always required). Lanyard anchor points shall not be attached to the scaffolding.
 - 2.8.4.2 Barricade areas beneath the scaffold to prevent workers from working or walking beneath working areas of the scaffold.
 - 2.8.4.3 When workers are required to work or walk below a working level of the scaffold, a wire mesh screen shall be installed between the toe-boards and the top rails of the guardrail system.
 - 2.8.5 Each platform on all working levels of scaffolds shall be fully planked or decked between the front uprights and guardrail supports.
 - 2.8.5.1 Scaffolds and their components shall be capable of supporting at least four times the maximum intended load.
 - 2.8.5.2 Platform planks will be 2 x 10 minimum (full dimension and scaffold grade).
 - 2.8.5.3 Scaffold platforms and walkways shall be at least 18” wide.

- 2.8.5.4 The front edge of all platforms shall not be more than 14" from the face of the work unless guardrails or personal fall arrest systems are used.
- 2.8.5.5 All overlapping of platform planks shall be over scaffold support members. Planks shall be overlapped 12 inches (minimum) or secured to prevent movement.
- 2.8.5.6 Scaffold planks shall not extend over end supports less than 6 inches or more than 12 inches.
- 2.8.6 **Access.** A ladder, stair tower, or other means of safe access shall be provided.
 - 2.8.6.1 It is permissible to climb integral prefabricated scaffold access end frames so long as the rungs are evenly spaced and no more than 16³/₄ inches apart. Safe handholds shall be provided at least 3 feet above the platform being accessed.
 - 2.8.6.2 Climbing scaffold cross-bracing is prohibited.
- 2.8.7 Scaffolds with a height to width ratio of more than 4:1 shall be secured to building/structures at intervals not to exceed 30 feet horizontally and 26 feet vertically (20 feet vertically for scaffolds 3 feet wide or less).
- 2.8.8 Manually Propelled Mobile Scaffolds:
 - 2.8.8.1 The height of a freestanding mobile tower shall not exceed four times its minimum base dimension.
 - 2.8.8.2 All casters shall be provided with a positive locking device and shall be locked when employees are on the mobile scaffold.
 - 2.8.8.3 Employees shall not be allowed to ride on mobile scaffolds that are being moved.
- 2.8.9 Training shall be provided to all employees regarding hazards by qualified persons in the subject matter. Retraining is required where changes at the worksite present a hazard about which an employee has not been previously trained, where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard. Retraining is also necessary where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.
 - 2.8.9.1 Hazards including fall protection, electrical safety, falling object protection, scaffold use and load capacity should all be addressed in the training provided to employees.

- 2.9 **Ladders.** Design and use of ladders (manufactured or job-made) shall conform to OSHA Subpart X and ANSI (A14.1-1968) Standards. Listed below are some of the requirements.

2.9.1 General.

- 2.9.1.1 Ladder users shall read and follow all manufacturer instructions printed on the ladder. These instructions shall be clearly legible. Replacement ladder labels are available from the safety department.
- 2.9.1.2 Ladders shall be inspected prior to each use. Defective ladders shall be tagged out of service and shall not be used.
- 2.9.1.3 All ladders shall be secured against slipping. Ladders shall not be used on unstable, uneven, or slippery surfaces unless secured to prevent accidental displacement.
- 2.9.1.4 When ascending or descending a ladder, the user shall face the ladder and shall have both hands free in order to maintain three points of contact with the ladder.
- 2.9.1.5 Workers shall not carry tools and materials while ascending or descending a ladder, except in a tool belt designed for this purpose.

2.9.2 Portable Ladder – Manufactured:

- 2.9.2.1 All ladders used on construction projects shall have at minimum Type 1A Duty Rating (300 pound safe load capacity).
- 2.9.2.2 Portable ladders shall have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts. Portable ladders with metal side rails shall not be used.
- 2.9.2.3 The use of ladders with broken or missing rungs or steps, broken or split side rails or other faulty or defective components is prohibited.
- 2.9.2.4 Ladder feet shall be placed on a level and substantial base, and areas around the top and bottom shall be kept clear.
- 2.9.2.5 Ladders shall be pitched so that horizontal distance from top support to the foot of the ladder is no more than $\frac{1}{4}$ of the working length of ladder. (Note: A person standing upright at the foot of the ladder should be able to reach out and grasp the ladder rung at shoulder height.)
- 2.9.2.6 Portable ladders shall be secured to prevent movement during use. Ladders should be tied off whenever possible; otherwise another person must hold the top or bottom to prevent the ladder from slipping.

2.9.2.7 Side rails shall extend at least 36 inches above the landing. Grab rails should be installed when this is not practical.

2.9.2.8 Any employee using a ladder as a work platform shall be protected from falling by the use of a personal fall protection system when their feet are 6 feet or more above an adjacent lower level.

2.9.3 Stepladders:

2.9.3.1 Workers shall read and follow all manufacturer instructions printed on the ladder. These instructions shall be clearly legible. Replacement ladder labels are available from the safety department.

2.9.3.2 Stepladders may only be used in an open and latched position and shall never be used as a straight ladder.

2.9.3.3 The base of the stepladder must be on flat, level, and solid footing.

2.9.3.4 Workers shall keep both feet on the steps of the ladder and shall not stand or step on the top or top steps of the ladder. Workers shall not straddle or sit on the top of a stepladder.

2.9.3.5 Workers shall not overreach; the worker's belt buckle may not extend outside the side rails.

2.9.3.6 Fall protection is required when working on a stepladder positioned near a potential fall to a lower level such as a stairway or floor edge.

2.10 **Safe Access at Changes in Elevation.**

2.10.1 When employees need repeated access to a higher or lower level where the break in elevation is 19 inches or more, a stairway, ladder, ramp or other safe means of access shall be provided.

2.10.2 Safe access shall be provided into trenches and excavations. A ladder, ramp, or other safe means of access is required within 25 feet of any employee in a trench that is 4 feet or more in depth.

2.10.3 Ladders, stairways, or other safe climbing equipment shall be provided for access to elevated work areas. Employees shall not free climb on equipment, buildings, or other structures more than 6 feet high except when using 100% fall protection.

2.10.4 Jumping off equipment, trucks, or any elevated platform more than 4 feet high is likely to result in an injury and should be strictly avoided.

2.11 Aerial Lifts.

2.11.1 Prior to using an aerial lift (including a scissor lift) all users shall be trained in the safe and proper use of the lift by a qualified person. A complete inspection of the lift and test of the lift controls shall be performed and documented daily.

2.11.2 All persons using aerial lifts (including scissor lifts) shall be protected from falling by use of a personal fall arrest system. Anchor points shall be at or below the mid-rails, and worker's feet shall remain on the floor of the lift. Climbing on the rails or the edge of the basket is prohibited. Modifications to the equipment shall not be made without written approval from the manufacturer.

2.11.3 Load limits specified by the manufacturer shall not be exceeded. Lifts will not operate within 10 feet of overhead electrical lines.

2.12 Hole Covers. A secure cover or standard railing including mid-rails and toe boards shall protect all floor openings, holes, manholes, catch basins and other open top structures.

2.13 Protection from Falling Objects.

2.13.1 Whenever possible, elevated work shall be scheduled such that areas beneath the elevated workers are not used as walk or work areas for other workers. Use barricades and/or red "Danger" tape to prevent access to these areas.

2.13.2 When workers are required to walk or work beneath other workers, screens and/or canopies shall be erected as necessary to protect them from falling objects, and warning tape and/or warning signs shall be erected to warn workers of the overhead hazard.

2.13.3 Toe boards are required on all elevated work platforms 6 feet or more high wherever it is possible a person may access the area beneath the work platform.

2.13.4 Tools, materials, etc. shall not be tossed or thrown from one level to another.

2.13.5 Materials, supplies, equipment, concrete buckets and other objects shall not be craned over people.

3.0 HOT WORK – WELDING/CUTTING OPERATIONS

3.1 A Fire Extinguisher shall be immediately available for all hot work operations.

3.2 Fire Watch. For hot work where there is a fire hazard (flammable liquids, gases, or solids), a fire watch shall be posted and water hose will be used where practical.

- 3.2.1 The assigned fire watch must be trained in the use of fire extinguishing equipment and familiar with the facilities for sounding an alarm in the event of a fire.
- 3.2.2 When a fire watch is required, they shall be maintained at least a half hour after the welding or cutting operation is completed.
- 3.3 **Eye and Face Protection.** A welder or cutter and helper shall use both eye and face protection.
- 3.4 **Gas cylinders.** All gas cylinders shall be handled in accordance with OSHA Standards.
 - 3.4.1 Gas cylinders shall be transported and stored in vertical position.
 - 3.4.2 Gas cylinders shall be secured or chained upright to prevent tipping.
 - 3.4.3 Caps shall be installed on gas cylinders when not in use.
 - 3.4.4 Oxygen shall not be stored with any fuel gases. Oxygen shall be stored a minimum distance of 20 feet from fuel gas cylinders and other combustible materials in storage or separated by a noncombustible barrier with a fire resistance rating of at least 30 minutes.
- 3.5 **Arc Welding.**
 - 3.5.1 Frames of all Arc welding/cutting machines shall be grounded unless mounted on a rubber tire vehicle.
 - 3.5.2 All ground connections shall be inspected daily to ensure they are mechanically strong and adequate for the required current.
 - 3.5.3 All cables shall be completely insulated and flexible – capable of handling maximum current requirements.
 - 3.5.4 Repairs or splices in cable shall be insulated with a capacity equal to that of the original cable, and shall not be allowed within 10' of the electrode holder.
 - 3.5.5 Welding shields shall be used whenever employees may be exposed to welding flash.
- 3.6 **Other Requirements.**
 - 3.6.1 Training. Cutters or welders and their supervisors shall be trained in the safe operation of their equipment and safe use in the surrounding work area.
 - 3.6.2 If the object to be welded or cut cannot readily be moved, all moveable fire hazards should be removed from the work area.

- 3.6.3 If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shields, fire blankets, etc. shall be used to confine the heat, sparks and slag and to protect the immovable fire hazards.
- 3.6.4 If fire hazards cannot be taken to a safe place or guards cannot be used to confine heat, sparks, slag and protect the immovable fire hazards, the welding/cutting shall not be performed.
- 3.6.5 Before welding/cutting is permitted the area shall be inspected, and when required, a written permit shall be used to authorize welding and cutting operations.
- 3.6.6 Any welding, cutting or burning of lead base metals, zinc, cadmium, mercury, beryllium or exotic metals or paints not listed here shall have proper ventilation or respiratory protection.
- 3.6.7 Operators of equipment should report any equipment defect or safety hazards and discontinue use of equipment until its safety has been assured. Repairs shall be made only by qualified personnel.

4.0 HOISTING AND RIGGING EQUIPMENT

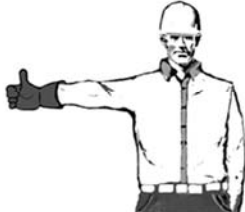
4.1 Cranes.

- 4.1.1 Use of cranes shall comply with OSHA 1926 Subpart CC – Cranes and Derricks in Construction, and manufacturer’s specifications and limitations.
- 4.1.2 Proof of a current yearly inspection performed by a qualified person shall be affixed to each crane or shall be kept on file at project sites.
- 4.1.3 Crane operators shall be trained and qualified for the type(s) of crane they are operating. Proof of crane operator’s qualifications shall be kept on file at project sites.
- 4.1.4 Rated load capacities and recommended operating speeds, warnings or instructions shall be conspicuously posted on all equipment. Operators of cranes shall comply with all manufacturer procedures applicable to the operational functions of equipment, including its use with attachments. Any modifications or additions must be approved by the manufacturer and provided in writing. A registered professional engineer must be qualified with respect to the equipment involved, and must ensure the original safety factor of the equipment is not reduced.

- 4.1.5 Competent person(s) shall inspect and document all cranes prior to use each day. In addition, rigging equipment and/or lifting devices shall be inspected prior to and during use. Safety devices on all equipment must be in proper working order before operations begin. If any of the devices are not in proper working order the equipment must be taken out of service and operations must not resume until the device is working properly again.
- 4.1.6 Accessible areas within the swing radius of the rotating superstructure of the crane shall be barricaded to prevent an employee from being struck or crushed by the crane.
- 4.1.7 Materials shall not be craned over workers. Only employees essential to the crane operation are permitted to be within the fall zone, and they shall not be directly under the load.
- 4.1.8 The minimum clearance from live electrical lines to any part of the crane or its load shall be: a) 10 feet for power lines up to 50kV; b) 15 feet for 50kV – 200kV; c) 20 feet for 200kV – 350 kV; d) 25 feet for 350 kV – 500 kV; e) 35 feet for 500 kV – 750 kV; or f) 45 feet for 750kV – 1000kV.
- 4.1.9 To prevent encroachment/electrocution, when a crane is capable of reaching within 20 feet of a live electrical line, a warning line shall be erected and maintained at the minimum approach distance. If the operator is unable to see the warning line, there shall be a dedicated spotter who is in continuous contact with the operator.
- 4.1.10 Persons giving signal directions to crane operators must have documented proof of signal training. When using hand signals, the Standard Method shall be used. A hand signal chart shall be posted on the equipment or conspicuously posted in the vicinity of the hoisting operation. A copy of the standard hand signals for controlling mobile crane operations is shown on the following pages.
- 4.1.11 Equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met.
- 4.1.12 All manufacturer procedures and prohibitions must be complied with when assembling and disassembling equipment. In addition, assembly/disassembly of equipment must be directed by a competent and qualified person.
- 4.1.13 Whenever there is a safety concern, the operator must have the authority to stop and refuse to handle loads until a qualified person has determined that safety has been assured.



Standard Hand Signals FOR CONTROLLING MOBILE CRANE OPERATIONS

 HOIST With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles.	 LOWER With arm and index finger pointing down, hand and finger make small circles.	 USE MAIN HOIST A hand taps on top of the head. Then regular signal is given to indicate desired action.	 USE WHIPLINE (Auxiliary Hoist) With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action.
 BOOM UP With arm extended horizontally to the side, thumb points up with other fingers closed.	 BOOM DOWN With arm extended horizontally to the side, thumb points down with other fingers closed.	 MOVE SLOWLY A hand is placed in front of the hand that is giving the action signal. (Hoist slowly shown in example.)	 SWING With arm extended horizontally, index finger points in direction that boom is to swing.
 BOOM DOWN AND RAISE THE LOAD With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired.	 BOOM UP AND LOWER THE LOAD With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired.	 STOP With arm extended horizontally to the side, palm down, arm is swung back and forth.	 EMERGENCY STOP With both arms extended horizontally to the side, palms down, arms are swung back and forth.

 TRAVEL With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel.	 DOG EVERYTHING Hands held together at waist level.	 TRAVEL (BOTH TRACKS) Rotate fists around each other in front of body; direction of rotation away from body indicates travel forward; rotation towards body indicates travel backward. (For crawler cranes only)	 TRAVEL (ONE TRACK) Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel. (For crawler cranes only)
 TELESCOPE OUT (TELESCOPING BOOMS) With hands to the front at waist level, thumbs point outward with other fingers closed.	 TELESCOPE IN (TELESCOPING BOOMS) With hands to the front at waist level, thumbs point at each other with other fingers closed.	 TELESCOPE OUT (TELESCOPING BOOMS) One hand signal. One fist in front of chest with thumb tapping chest.	 TELESCOPE IN (TELESCOPING BOOMS) One hand signal. One fist in front of chest, thumb pointing outward and heel of fist tapping chest.

4.2 **Other Hoisting Equipment – Excavators, Loaders, and Forklifts.**

- 4.2.1 Excavators and loaders shall be operated by employees the company has designated as authorized operators based on their training and experience. The ‘Authorized Operator List’ is maintained and made available by the Safety Department.
- 4.2.2 Forklift operators shall have a certification card for each class or type of forklift they are operating in their possession to document their training and ability to safely operate the equipment. Copies of forklift certification cards are kept in the employee’s personnel files in Stillwater. (Note: A loader with forks is not a forklift.)
- 4.2.3 Steel sheets and trench boxes may be transported by a forklift or a loader with forks, but shall not be transported on a loader bucket. Large and ungainly objects shall be secured to the forks if necessary to ensure they are under the operator’s control at all times and will not slide off the forks.
- 4.2.4 The minimum clearance from live electrical lines to any part of an excavator/ loader/ forklift or its load is 10 feet for power lines up to 50kV. For power lines carrying more than 50 kV, the minimum clearance is 10 feet plus an additional 0.4 inch for every 1 kV over 50 kV.

4.3 **Rigging Equipment and Safe Rigging Practices**

- 4.3.1 Materials shall be rigged by a qualified rigger, who by his/her knowledge, training, and/or experience has demonstrated the ability to analyze the weight, shape, and other rigging requirements for the materials and properly rig the load.
- 4.3.2 Slings and other rigging equipment used to lift materials shall be properly certified, inspected, and stored, and shall be used only for that purpose. Rigging equipment shall be inspected by a qualified person prior to each use. Additionally, chain slings shall be inspected annually by a qualified third party rigging inspector, and the results of the inspection shall be documented and available for review.
- 4.3.3 Rigging equipment not in use shall be removed from the immediate work area so as not to present a hazard to employees. Defective rigging equipment shall be immediately tagged out of service and shall not be used.
- 4.3.4 Light duty web slings are often included with the delivery of rolls of HDPE liner, geosynthetic materials, and other fabrics. These are intended as single use slings, to facilitate loading and unloading the rolls, and they shall not be used for other general duty lifting purposes on jobsites. They may be used to drag HDPE pipe if desired, but they must be clearly marked “NOT FOR LIFTING”.

- 4.3.5 Rated sling capacities as determined by the sling manufacturer shall not be exceeded. Wire rope sling capacities can be found on a rigger's reference card, the OSHA book, or by contacting the sling manufacturer. Sling capacities for chain and web slings shall be clearly labeled on the sling.
- 4.3.6 Rated capacities shall also be clearly labeled on all lifting devices and rigging hardware.
- 4.3.7 Tag line(s) shall be used when necessary to help control the load. No person shall be in direct contact with a suspended load while it is being transported.

4.4 **Positive Connection Requirements.**

- 4.4.1 Slings and other rigging equipment shall in all cases be connected to the hoisting equipment by means of a safety hook with latch, clevis, or other lifting device that has been specifically designed to create a positive attachment. Slings shall not be wrapped around buckets, bucket teeth, or loader/forklift forks. Hydraulic quick-connect pins shall not be used as rigging attachment points.
- 4.4.2 In general, a positive connection is not required between the rigging equipment and the material being lifted. However, the competent person shall determine if a positive connection is necessary in order to safely lift and move the load.
- 4.4.3 Exception: When using a chain or wire rope sling to lift a steel sheet, the sling shall be securely attached to the sheet by means of a shackle, safety hook, or other positive attachment device. In a circumstance where the competent person determines that neither of the sling connection points could be accessed safely after the sheet has been secured in place, s/he document the reasons for not using a positive attachment. The daily STA shall be used for this purpose and to communicate with the crew all precautions that will be taken to protect workers and the public if the steel sheet is dropped.

5.0 CONCRETE AND CONCRETE FORM WORK

- 5.1 **Rebar Caps.** All exposed vertical reinforcing steel (rebar) less than 6' in height (or of any height where employees are working above the rebar) shall be properly capped to protect workers against impalement. Where commercially available caps are used, use "flattops" for impalement protection; "mushroom" caps may only be used for scratch protection on horizontal rebar.
- 5.2 **Powered Concrete Trowels.** Powered, rotating concrete trowel machines shall be equipped with a dead man switch.
- 5.3 **Concrete Buckets.**
 - 5.3.1 Riding in/on concrete buckets for any reason is prohibited.
 - 5.3.2 No employee shall walk or work under suspended buckets and loads.
 - 5.3.3 Suspended buckets and loads shall not be swung over crewmembers under any circumstance.
- 5.4 **Self-propelled Concrete Buggies** shall be driven in accordance with an established traffic pattern to minimize collision.

6.0 ELECTRICAL TOOLS

- 6.1 **Inspection.** All electrical tools shall be in good repair. Electrical tools, power cords, GFCI's, and other portable electrical equipment shall be inspected prior to each use.
- 6.2 **Power Cords.** Cords shall be of the three-wire type except for double insulated tools.
- 6.3 **GFCI Required.** All temporary power circuits, used to power hand tools at 120 volts, shall be equipped with a Ground Fault Circuit Interrupter. Use of an extension cord is considered temporary power and shall be used with a GFCI.
- 6.4 **Bulb Guards.** All lighting fixtures shall be equipped with a bulb guard.
- 6.5 **Dedicated Circuit for Lighting.** All temporary light strings shall be attached directly to a dedicated circuit for that purpose. Extension cords shall not be used with temporary lighting.

7.0 HOUSEKEEPING

- 7.1 Good housekeeping is one of the best indications that a job is being well controlled and efficiently run. Further, poor housekeeping contributes to a host of hazards ranging from trip hazards to fire hazards.
- 7.2 **Responsibility for Good Housekeeping.**
 - 7.2.1 It is the responsibility of the every person on a job to correct poor housekeeping as the job progresses, not after the work is done.
 - 7.2.2 While it is everyone's responsibility to ensure good housekeeping, it shall be the foreman and superintendent's job to assure that it is an ongoing practice.
 - 7.2.3 Subcontractors shall be responsible for their own housekeeping duties, and **SARGENT CORPORATION** superintendents shall enforce this common sense rule.
- 7.3 **Trip Hazards.** A continuous effort to eliminate trip hazards, remove flammable debris, stack lumber, remove or bend nails from scrap and generally keep work areas free of hidden traps and hazards contributes greatly to efficiency on our jobsites and the safety of our employees.
- 7.4 **Slippery Surfaces.** Snow shall be removed from stairways, travelways, work areas, and platforms. Icy walking/working surfaces shall be sanded to prevent slips and falls wherever possible. Ice cleats shall be worn on large jobsites where it is not possible or practical to sand all slippery walking/working surfaces.

8.0 FIRE PROTECTION

- 8.1 **Flammable Liquids.** Gasoline and other flammable liquids shall be handled and stored in metal containers that meet OSHA standards (safety gasoline cans) and labeled to indicate content.
- 8.2 **Fire Extinguishers shall be Available at all Project Sites.**
 - 8.2.1 All fire extinguishers shall be rated for Class A, B, and C fires. They shall be located, mounted, and identified so they are readily available and easily accessible to employees.
 - 8.2.2 A fire extinguisher shall be mounted in each office and storage trailer.
 - 8.2.3 A fire extinguisher is required within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used or stored. This requirement does not apply to integral fuel tanks of vehicles or equipment.

- 8.2.4 Fire extinguishers are required in all commercial motor vehicles and in all cranes.
 - 8.2.5 20 pound (minimum) fire extinguishers are required on fuel trucks, skid tanks, and other vehicles or tanks used to transport, store, or dispense more than 60 gallons of flammable or combustible liquids.
 - 8.2.6 Fire extinguishers are required at locations of cutting and/or welding activities.
 - 8.2.7 Fire extinguishers shall be mounted in building construction work areas, one (1) for each 3000 square feet, at least one for each floor level, and one within 100 feet of all workers in protected areas.
 - 8.2.8 Training shall be provided to familiarize employees with the general principles of fire extinguisher use and the hazards involved in incipient/initial stage firefighting measures. Refresher training shall be provided annually.
- 8.3 **Fire Extinguisher Inspection Requirements.**
- 8.3.1 Fire extinguishers shall be inspected at least annually by a qualified person who has been trained and certified to do so. S/he keeps a written documentation of the inspection and attaches a new annual inspection tag on the extinguisher.
 - 8.3.2 Each fire extinguisher must be inspected monthly by the user or other designated person. Monthly inspections are documented on the inspection tag by date and inspector's initials.
- 8.4 **Fire Extinguisher Limitations.**
- 8.4.1 Fire extinguishers may only be used to put out newly started small fires fueled by non-hazardous flammable or combustible materials.
 - 8.4.2 Never fight a fire that is rapidly spreading or one that is burning hazardous or unknown materials.
 - 8.4.3 When in doubt, back off and call 911 or the local fire department.

9.0 LIFTING

9.1 Lifting Limitations.

- 9.1.1 Company personnel shall seek assistance when lifting heavy objects. Help is also needed when the shape or size of the object makes it awkward to lift.

9.1.2 Under normal conditions, the weight limit for unassisted lifts is fifty (50) pounds. The competent person may increase or decrease this weight limit in certain situations, depending on the lifting conditions.

9.1.3 Objects weighing more than one hundred (100) pounds and ungainly objects that are difficult to keep hold of shall not be lifted by hand, even with help. Use mechanized equipment for all such lifts.

9.2 Use Proper Lifting Techniques.

9.2.1 Plan ahead. Clear a path, avoid twisting or bending, and if lifting with another person, make sure both of you agree with the plan.

9.2.2 Lift close to your body. This makes you a stronger and more stable lifter.

9.2.3 Keep your feet shoulder width apart to maintain a solid, stable base while lifting.

9.2.4 Bend your knees and keep your back straight. Practice the lifting motion before you lift the object, and focus on keeping your spine straight.

9.2.5 Tighten your stomach muscles and lift with your legs. Leg muscles are many times stronger than back muscles – let that strength work in your favor.

9.2.6 If you are straining, get help. It's just not worth the damage that can be caused by attempting to lift a heavy or awkward object.

10.0 EQUIPMENT SAFETY

10.1 Authorized Equipment Operators.

10.1.1 Only qualified operators and drivers are authorized to operate **SARGENT CORPORATION** equipment and vehicles.

10.1.2 Operators and drivers in training shall do so under the oversight and supervision of a qualified person.

10.1.3 A listing of authorized operators shall be made available to superintendents periodically and upon request.

10.2 License Requirements. All employees who drive vehicles or operate equipment on a public way shall be required to hold a valid operator's license issued by the state of residency and appropriate for the class vehicle being operated or driven.

- 10.3 **Operator Responsibility.** The equipment operator or truck driver is responsible and shall be held accountable for the safe operation of the equipment or truck s/he operates.
- 10.3.1 The operator or driver shall not move his/her equipment in either direction until the path is determined to be clear of obstructions and other workers. A spotter must be used if the operator is unable to clearly determine that their path is clear of obstructions or workers.
- 10.3.2 No operator shall lift any person in the bucket of the equipment.
- 10.3.3 No person shall be allowed to ride on the side of any piece of equipment or in the back of a truck or pickup.
- 10.4 **Daily Equipment Inspection.** Each operator shall perform a safety check at the beginning of each shift. The operator shall submit a completed “Equipment Inspection Checklist” to the supervisor on a daily basis.
- 10.5 **Daily Truck Inspection.** Each truck driver shall inspect the truck and shall submit a completed “Driver’s Vehicle Inspection Report” to the supervisor on a daily basis.
- 10.6 **Equipment Lockout/Tagout for Maintenance.** Prior to greasing or performing maintenance on equipment or trucks, the machine shall be shut off and the key removed from the ignition switch, all elevated buckets, blades, and other potential sources of energy shall be lowered to the ground, blocked up, or otherwise controlled, and an “out-of-service” tag shall be placed in a conspicuous location on the machine.
- 10.7 **Lockout/Tagout for Connecting Equipment.** When directing a truck driver or equipment operator into position to hook to a haul-behind attachment, tow a stuck or disabled vehicle, or pull any other object, employees shall at no time be located between the moving equipment and the object it is being connected to. The moving equipment shall be stopped with the motor shut off and the brake set before an employee is allowed to go between two pieces of equipment to make a connection.
- 10.8 **Backup/Travel Alarm and Warning Horn.** Each piece of equipment capable of two-directional travel shall be equipped with a working reverse/travel alarm and warning horn, and shall be placed out of service immediately if the alarm or horn becomes inoperative.
- 10.9 **Visibility Requirements.**
- 10.9.1 All field employees shall wear high visibility apparel.
- 10.9.2 Field employees shall make eye contact with the equipment operator before approaching the equipment!

10.9.3 All cab glass shall be kept clean and clear of obstructions so visibility by the operator or driver is not impaired.

10.10 **Distance from Dumping Trucks.** Keep personnel and equipment well clear of dumping trucks – they may roll over.

10.11 **Minimum Clearance Distance from Overhead Power Lines.**

10.11.1 Vertically moving parts of equipment such as excavator booms, loader buckets, or dumping truck bodies shall be kept at least 10 feet away from energized overhead power lines at all times. Warning signs and tape, barricades, spotters, and/or other preventive measures shall be taken as necessary to ensure this standard is met.

10.11.2 If the overhead power utility company installs an insulated wrap around the line to prevent arcing or flashing, the clearance requirement may be reduced as determined by the manufacturer of the insulated wrap and the utility owner.

10.11.3 The 10 foot clearance requirement does not apply to an overhead power line that has been de-energized and grounded by the utility owner.

10.12 **Seatbelt Requirements.**

10.12.1 Seatbelts shall be installed and maintained in good condition in all motor vehicles and in all mobile equipment.

10.12.2 Seatbelts need not be provided in equipment which is designed expressly for stand-up operation, or which does not have a rollover protective structure (ROPS) or adequate canopy protection.

10.12.3 All persons riding in equipment, trucks, and other vehicles shall be in seats designed for that purpose, and shall fasten the seatbelts where provided.

10.13 **Safe Access to Equipment.**

10.13.1 When the equipment is equipped with steps, stairways, or ladders for personnel access, this equipment shall be maintained in good condition.

10.13.2 For equipment with built-in ladders, employees shall face the ladder and use three points of contact while entering or exiting the equipment.

10.13.3 Jumping from the equipment to the ground is prohibited.

10.14 **Full Time Operator Awareness.** The use of hand held cellular/mobile phones and other similar devices is not permitted while operating equipment or driving a commercial

motor vehicle. These and other distracting activities such as eating, drinking, or adjusting the radio increase the risk of having an accident.

11.0 TRAFFIC WORK ZONE SAFETY

- 11.1 **Compliance Requirements.** Employee work zones that are exposed to public vehicle traffic shall be set up in compliance with the most current edition of the Manual on Uniform Traffic Control Devices (MUTCD).
- 11.2 **Employee Visibility.** Employees shall at minimum wear ANSI Class 2 high visibility safety vests with reflective striping. Class 3 safety apparel is required for work on interstate highways and for night work on all public roadways.
- 11.3 **Traffic Control Devices.**
 - 11.3.1 A competent person under the direction of the project superintendent shall be responsible for the selection, placement, and maintenance of traffic control devices in compliance with the MUTCD.
 - 11.3.2 Barricades, signs, and other traffic control devices shall be used as necessary to safeguard open manholes, trenches, excavations, and other safety hazards, or to control traffic during construction operations.
 - 11.3.3 Barricades and warning devices will be lighted at night as necessary.
- 11.4 **Flagger Requirements.**
 - 11.4.1 Flaggers shall be trained and certified in accordance with applicable state and local regulations.
 - 11.4.2 Stop/slow sign paddles and two-way radios or other means of communication between flaggers are required.
 - 11.4.3 The flagger shall face oncoming traffic and have a planned escape route at all times.
 - 11.4.4 The flagger's personal vehicle shall be parked well off the travel way of the road and where it will not interfere with the flagger's planned escape route.

12.0 WORKING OVER OR NEAR WATER

12.1 Compliance Requirements.

- 12.1.1 Employees working over or near water, where danger of drowning exists, shall be provided with U.S. Coast Guard approved life jackets or buoyant work vests.
- 12.1.2 Prior to and after each use, the life jackets or buoyant work vests shall be inspected for defects which would alter their strength or buoyancy.
- 12.1.3 Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations. Distance between ring buoys shall not exceed 200 feet.
- 12.1.4 At least one lifesaving skiff shall be immediately available at locations where employees are working over water or adjacent to water.

12.2 Additional Items. Take the time to identify short duration work near water as well as access to water sources as significant potential hazards. An example would include setting up a pump and generator for filling water trucks or tanks.

- 12.2.1 No one shall be allowed to work alone when near or above a water hazard.
- 12.2.2 The skiff must be in the water or capable of being quickly launched.
- 12.2.3 The skiff must be equipped with both motor (which will provide sufficient power for the current) and oars.
- 12.2.4 The skiff shall be inspected and the motor started each day prior to working near or over water.

13.0 BLASTING SAFETY

13.1 Compliance Requirements.

- 13.1.1 Equipment shall not be operated within 50 feet of loaded holes.
- 13.1.2 When a misfire is found, all employees shall move to an area safely outside any danger zone.
- 13.1.3 If a misfire is found, the blasting contractor shall be notified immediately and work will not resume in the area until determined to be safe by the blaster.

14.0 WORKING ALONE

- 14.1 When performing any type of hazardous work, employees shall not work alone.
- 14.2 If it is necessary for someone to arrive at, periodically monitor, or stay at a project alone; a call in person shall be identified and checked in with on a predetermined schedule.

V. TRENCHING AND EXCAVATION

(Last revised 12/13/2019)

1.0 DEFINITIONS

- 1.1 **Competent Person:** One who is capable of identifying existing and predictable hazards in the surroundings or working conditions that are unsanitary, hazardous, and dangerous to employees or which do not meet applicable OSHA Standards, and who has been given the authorization and responsibility to take prompt corrective measures to eliminate them.
- 1.2 **Trench:** A narrow excavation (in relation to depth and length) made below the surface of the ground. In general, its depth is greater than its width, but the width of a trench (measured at the bottom) is not greater than 15 feet.
- 1.3 **Shield (Shoring):** A structure that is able to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Shields used in trenches are usually referred to as trench boxes and manhole boxes.
- 1.4 **Tabulated Data:** Tables and charts approved by a registered professional engineer and used to design and construct a protective system.
- 1.5 **Sloping System:** A method of protecting workers from cave-ins by excavating to incline the walls of a trench or excavation so that the top is larger than the bottom. The angle of incline required to prevent a cave-in varies with differences in several factors. Nearly all sloping systems shall be inclined at 1½ feet horizontal to 1 foot vertical.
- 1.6 **Stable Rock:** Natural solid ledge that is free of excessive cracks and fissures, such that it can be excavated with vertical sides and will remain intact while exposed.
- 1.7 **Hazardous Atmosphere:** An atmosphere which by means of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic or otherwise harmful, may cause death, illness or injury.

2.0 TRENCHING & EXCAVATION REQUIREMENTS

The following are minimum requirements for excavating or trenching. (see OSHA 29 CFR 1926 Subpart P for detailed regulations).

- 2.1 **Daily Inspections.** A competent person shall conduct daily inspections of excavations and the surrounding areas before the start of work for evidence of possible cave-ins, failure of the protection system, a hazardous atmosphere or any other dangerous condition. These inspections and the steps taken to correct potential dangerous conditions shall be documented in their field book, daily report or other appropriate file.

- 2.2 **Protection from Cave-in.** Walls or faces of all excavations in which employees are exposed to danger from falling or moving earth or which are greater than 5 feet shall be guarded by shoring, sloping or equivalent means.
- 2.3 **Soils Classifications:**
- 2.3.1 **Stable Rock:** natural solid ledge that can be excavated with vertical sides and remain intact while exposed.
- 2.3.2 **Type A:** cohesive soils without cracks or fissures: clay, sandy clay, hardpan.
- 2.3.3 **Type B:** angular gravel, crushed rock, silt, loam, dry rock that is not stable.
- 2.3.4 **Type C:** gravel, sand, submerged soil, wet soil.
- 2.4 **Requirements for Excavation Slope Stability:**
- 2.4.1 **Stable Rock:** vertical
- 2.4.2 **Type A:** 5-20 feet deep – slope at $\frac{3}{4}$ foot horizontal to 1 foot vertical ($\frac{3}{4}$:1).
(Note: Simple slope excavations that are less than 8 feet deep and will be open less than 24 hours may be sloped at $\frac{1}{2}$:1.)
Decrease slopes if there are signs of distress.
- 2.4.3 **Type B:** 5-20 feet deep – slope at 1:1.
Decrease slopes if there are signs of distress.
- 2.4.4 **Type C:** 5-20 feet deep – slope at $1\frac{1}{2}$:1
Decrease slopes if there are signs of distress.
- Benching is not allowed in type C soils.**
- 2.5 **Soil Classification Requirements.** All soils types except solid rock and Type C must be defined in accordance with OSHA 1926 Subpart P, Appendix A, by a soils engineer, geologist, or other qualified person with training and experience in soil classification. Written certification of soil type(s) other than Type C, together with specific locations and depths for those soil type(s), shall be kept on record at the project site. **All soil shall be treated as Type C unless it is recertified as described above.** All ledge cuts shall be treated as Type C unless the sidewalls are solid rock without cracks or fissures.
- 2.6 **PE Design for Holes over 20 Feet Deep.** A registered professional engineer (PE) shall design protective systems for excavations and trenches greater than 20 feet (as measured from the original existing ground surface). Design specifications shall be kept on site.
- 2.7 **Trench Box Tabulated Data.** If trench boxes or manhole boxes are used, copies of the tabulated data for the make and model of each box shall be on site.

- 2.8 **Steel Sheets Used in Shoring Systems.** Soil walls at the spreader ends of a trench box or manhole box must be protected from collapse either by proper sloping or by inserting a 1 inch thick steel sheet or other adequate protective barrier between the soil wall and the end of the trench box or manhole box. PE designs for uses and limitations of steel sheets in shoring systems are included in the Trench Box Tabulated Data notebooks.
- 2.9 **18-Inch Requirement for Box/Slope Combination.** When trench protection is accomplished by means of a combination of trench boxes and sloping, then the trench box must extend 18" above the bottom of the sloped side, in order to prevent materials from falling into the trench shield.
- 2.10 **Trench Box within 2 feet of Trench Floor.** Earth excavation is permitted to a level not to exceed two (2) feet below the bottom of a trench box, but only if there are no indications of soil loss from beneath or behind the trench box. Shoring protection must extend to the bottom of the trench if necessary to prevent soils from entering the trench.
- 2.11 **Spoils Piles at least 2 feet from Edge of Hole.** Excavated material must be placed at least two (2) feet from the edge of the excavation. Tools, equipment and other materials shall not be placed where they could fall or roll into an excavation.
- 2.12 **Fall Protection near Trenches and Excavations.**
- 2.12.1 Only those employees who are directly involved in the trenching operation shall be allowed within 6 feet of the trench. Barricades or other effective means shall be used as directed by the competent person to prevent employees from falling into trenches.
- 2.12.2 Walkways shall be provided where employees are required or permitted to cross over trenches. Walkways that are 6 feet or more above a lower level shall include guardrails.
- 2.12.3 Trench shields shall be backfilled, or other adequate provisions shall be made to ensure employees cannot fall between the excavation sidewalls and the trench shield.
- 2.13 **Falling Object Protection.** All surface encumbrances located so as to create a hazard to employees shall be removed or supported as necessary to protect employees.
- 2.14 **Support Adjacent Structures.** Sidewalks, pavements and other structures adjacent to a trench or excavation shall not be undermined unless a support system or other method of employee protection is provided.
- 2.15 **Water Accumulation.** Excavations and trenches shall be dewatered before being entered by personnel, and during operations as necessary. Employees shall not work in excavations where water is accumulating unless steps have been taken to protect the employees from the hazards posed by water accumulation.

- 2.16 **Safe Access.** All trenches and excavations greater than four (4) feet in depth shall be provided with a ladder, ramp, or other means of safe egress. For trenches, safe egress shall be provided at intervals such that each employee in the trench is within twenty-five (25) feet of an egress point. If ladders are used to provide safe egress, they shall be properly set up according to the manufacturers' instructions and secured from movement while in use.
- 2.17 **No Exposure to Overhead Loads.** No employee shall be permitted under equipment buckets or suspended loads handled by loading or digging equipment. Loads shall not be hoisted or suspended over any employee or other person.
- 2.18 **High Visibility.** Employees shall be provided with and wear high visibility vests with reflective stripes.
- 2.19 **Excavations / Trenches as Confined Spaces.** Excavations and trenches greater than four (4) feet in depth are by definition confined spaces. They shall be treated as permit- required confined spaces whenever there is a likelihood of a hazardous or oxygen deficient atmosphere, engulfment, or other hazardous condition.
- 2.20 **Control of Hazardous Atmospheres:**
 - 2.20.1 Trenches and excavations: Where oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist (i.e. sewer line trenches or excavations in landfills) the atmosphere shall be tested and ventilated as necessary before employees enter excavations greater than 4 feet in depth.
 - 2.20.2 Manholes, catch basins, and similar structures: Any enclosed structure more than four feet in depth must have its atmosphere tested prior to entry for oxygen content and to determine the presence of explosive or toxic gases. Follow all permit-required confined space entry procedures.
- 2.21 **Protection for Unattended Excavations.** All trenches and excavations shall be filled, covered, or otherwise barricaded and protected prior to being left unattended. All test pits or excavations shall be backfilled as soon as their purpose is completed.

3.0 EXCAVATIONS NEAR BURIED UTILITY LINES

- 3.1 **Locate Underground Utilities.** The locations of all underground utility lines shall be determined prior to opening an excavation. Utility companies and other utility owners shall be contacted, advised of the proposed work and asked to establish the location of the underground utility prior to the start of actual excavation.
- 3.2 **One Call System.** For all excavation, grading, and other ground breaking projects, we are required by law to call the appropriate "One Call" Utility Notification Service in the state we are working in. In most cases, a minimum of 3 normal business days (72 hours) notification is required before a permit is issued. The "one call" permits are valid for at least 30 days in all states. Some states have longer duration permits. Ask when you call.

- 3.3 **DIG SAFE.** For projects in Maine, New Hampshire Vermont, and Massachusetts, call DIG SAFE at 800-225-4977. **Sargent Corporation's** Dig Safe Numbers are: 16836 for New England Division projects, and 37722 for Bangor Division projects.
- 3.4 **MISS UTILITY.** For projects in Maryland, Virginia, and North Carolina, call MISS UTILITY at 800-552-7001.

A “One Call” ticket should be renewed at least 3 days before its expiration date.

- 3.5 **Nonmember Utilities.** The “One Call” service notifies their member utilities only (typically electric power, communications, and natural gas companies.) We are responsible to notify all other utility owners who may have buried utility lines in our work area (typically water and sewer companies and private companies or landowners.) In Maine, look for non-member utilities in your project area at www.oktodig.com. The State of New Hampshire has a book of nonmember utilities available.

- 3.6 For **gas line notification**, please also call “One-Call” in the following states:

Delaware, MD, Northern VA	800-257-7777
New York	800-962-7962
North Carolina	800-632-4949
Pennsylvania	800-242-1776
Virginia	800-552-7001
West Virginia	800-245-4848

- 3.7 **De-energize Electric Lines.** Buried electrical cables expected or encountered during excavation shall be de-energized prior to digging whenever possible. Soils around electrical conduits may be removed using hand tools and extreme caution under the supervision of a competent person.
- 3.8 **18-Inch Safety Zone.** The law requires us to dig by hand within 18 inches of a marked underground utility line until the line is exposed. (The safety zone is 24 inches in Virginia and Delaware, and 36 inches in Montgomery County, Maryland.)
- 3.9 **If You Hit A Utility Line:**

- 3.9.1 Immediately notify the affected utility company.
- 3.9.2 If the damage creates a safety concern, call the fire department and take immediate steps to safeguard health and property.
- 3.9.3 All incidents in which buried utility lines are damaged, disturbed, threatened, or are improperly marked **must be reported to the Public Utilities Commission (PUC)**. Conduct a thorough incident investigation using the Incident Investigation Report Form. If possible, include photos showing the damaged utility and any remaining utility markings on the ground surface. Contact the Safety Director in Stillwater who will prepare and submit the required PUC report.

3.9.4 Non-compliance with the above PUC rules may result in fines of \$5000 or more.

3.10 Overhead Utility Lines.

3.10.1 Equipment with parts capable of vertical movement, such as excavators and dump trucks, shall maintain a separation of at least 10 feet from overhead electric lines.

3.10.2 Use operator training, warning signs, flagging, or other effective means as necessary to ensure equipment operators and truck drivers are aware at all times of the existence and location of overhead power and other utility lines.

4.0 DIGGING IN CONTAMINATED SOILS

4.1 **HAZWOPER Projects.** In accordance with 29 CFR 1926.65, **Hazardous Waste Operations and Emergency Response**, the following operations require that employees involved receive 40-hour training and 8-hour annual refresher training, when appropriate:

4.1.1 Cleanup operations required by a governmental body (Federal, State or Local) involving an identified hazardous waste site.

4.1.2 Corrective actions involving cleanup operations at sites covered by Resource Conservation and Recovery Act (RCRA) of 1976.

4.1.3 Voluntary cleanup operations at sites recognized by Federal, State or Local governmental bodies as uncontrolled waste sites.

4.1.4 Operations involving hazardous wastes that are conducted at treatment, storage and disposal sites.

4.1.5 Emergency Response operations for releases of hazardous substances, or for substantial threats of releases of hazardous substances.

4.1.6 When designated by the Safety Director for **SARGENT CORPORATION**.

4.2 **Recognition and Response.** All employees performing their duties in situations where there is a potential of encountering contaminated soils shall be trained to identify the contaminated soils and react properly. In all cases, the first response shall be to evacuate the area and ensure that employees shall not be exposed to potentially hazardous materials. Appropriate company officials and State and/or Federal Agencies shall be contacted for guidance and direction.

4.3 **Medical Surveillance.** Employees who are or may be exposed to hazardous substances on projects as described above shall be enrolled in a medical surveillance program in accordance with 29 CFR 1926.65(f).

VI. CONFINED SPACE ENTRY PROGRAM

(Last revised 02/01/2016; updated 12/04/2017)

1.0 DEFINITIONS

- 1.1 **Competent Person** means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who is authorized by the company to take prompt corrective measures to eliminate them.

Any entry into a confined space shall be overseen by a competent person.

- 1.2 **Confined Space** means space or work area that: a) is large enough for an employee to enter and perform work; and b) is not designed or intended for continuous human occupancy; and c) has a limited or restricted means of entry or exit.

Examples of confined spaces include but are not limited to trenches, sewers, manholes, catch basins, culverts, tunnels, tanks, vessels, chests, attics, and crawl spaces. It also includes open top spaces greater than 4 feet deep such as pits, bins, tubs, silos, vaults, etc.

- 1.3 **Non-Permit Confined Space** means a confined space that does not contain or have the potential of containing any hazard capable of causing death or serious harm.

Examples of non-permit confined spaces may include trenches in a safe location and new manhole structures that have not been piped or backfilled.

- 1.4 **Permit-Required Confined Space (PRCS)** means a confined space where there is an existing or potential hazard, or where the work in the space could create a hazard.

1.4.1 Such hazards include: a) hazardous atmosphere; b) liquid or solid materials that could engulf an entrant; c) inwardly sloping walls or floor, or other configuration of the space that could cause an entrant to become trapped; d) electrical, mechanical, chemical, or biological hazards; or e) any other recognized serious safety or health hazard, such as potential falls, falling objects, fires, and poisonous insects or animals.

1.4.2 Each confined space shall be considered a **permit-required confined space** unless and until the competent person specifically confirms that the space does not have an existing or potential hazard of any kind.

1.4.3 Because of poor ventilation and the potential for a hazardous atmosphere, **all manholes, catch basins, and other top entry structures found on earthwork construction projects shall be considered permit-required confined spaces as soon as the pipes are installed or the structure is backfilled.**

2.0 **REQUIREMENTS FOR ENTRY INTO ALL CONFINED SPACES**

- 2.1 **Safe Working Procedures and Conditions.** Work in a confined space shall be conducted in accordance with all OSHA and SARGENT CORPORATION safety standards.
- 2.2 **A Competent Person shall oversee all confined space entry work.** Prior to entry into a confined space, the competent person shall conduct a thorough survey of the space to determine if there are any existing or potential hazardous materials or conditions.
- 2.3 **Training.** Each employee who enters into a confined or enclosed space shall be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of any protective or emergency equipment required. Training will be documented on the confined space entry permit for the space. This instruction shall include a review of the Safety Data Sheets (SDS) for all hazardous materials that are present in the confined space or will be used inside the space.
- 2.4 **Confirm Safe Atmosphere.** Prior to entry into a confined space, the competent person shall use a properly calibrated air monitoring instrument to determine that the atmosphere in the space provides a safe work environment. The instrument(s) used shall at a minimum measure the oxygen content of the air and identify the presence of any combustible gases, carbon monoxide, or hydrogen sulfide. The following acceptable levels shall be maintained prior to entry:
- 2.4.1 Oxygen (O₂): Between 19.5% and 23.5% (fresh air contains 20.9% O₂)
- 2.4.2 Combustible Gases: 10% of Lower Explosive Limit (LEL) maximum
- 2.4.3 Toxics:
- | | <u>CEILING</u> | <u>8-hr. TWA</u> | <u>15 min. STEL</u> |
|--|----------------|------------------|---------------------|
| a) Carbon monoxide (CO) – | 35 ppm | 35 ppm | 100 ppm |
| b) Hydrogen sulfide (H ₂ S) – | 10 ppm | 10 ppm | 15 ppm |
| c) Other – Any known toxic gas or hazardous substance that could reasonably be expected to exist in the space shall be monitored and maintained below the OSHA Permissible Exposure Limit (PEL). | | | |
- 2.4.4 Total Dust – Below 50 micrograms of respirable crystalline silica per cubic meter of air (µg/m³), averaged over an 8 hour day.
- 2.5 **Access and Lighting.** Safe access and sufficient lighting shall be provided for work in all confined spaces.

3.0 ADDITIONAL REQUIREMENTS FOR ENTRY INTO PERMIT REQUIRED CONFINED SPACES

- 3.1 **Permit Space Entry Communications and Coordination.** Prior to performing permit entry operations, affected employers shall obtain all available information regarding known and potential hazards in the permit required confined space(s). They shall provide this information to all persons who will enter the permit space, and to all other entities whose activities could potentially result in a hazard in the space.
- 3.2 **Entry Team Members.** The confined space entry team shall at minimum include a) one or more entrants, b) an attendant, and c) an entry supervisor who shall also be the competent person. The entry supervisor may fill a dual role and also function as an entrant or an attendant.
- 3.3 **Entry Team Training Requirements.** All team members shall be trained in their assigned duties:
 - 3.3.1 The **Entry Supervisor** (person authorizing entry) shall be a confined space **Competent Person** who is trained in confined space entry procedures and shall be responsible to:
 - 3.3.1.1 Determine that the entry permit contains all the required information before authorizing or allowing entry.
 - 3.3.1.2 Determine that the necessary procedures, practices, and equipment for safe entry, and a rescue plan are in place before allowing entry.
 - 3.3.1.3 Verify at appropriate intervals, that entry operations remain consistent with the terms of the entry permit, and that acceptable entry conditions are maintained.
 - 3.3.1.4 Cancel the entry authorization and require all entrants to evacuate the space whenever acceptable entry conditions are not present.
 - 3.3.1.5 Take the necessary measures for concluding an entry operation, such as closing off a permit space and canceling the permit when the work authorized by the permit has been completed.
 - 3.3.1.6 The entry supervisor may at the same time be an entrant or attendant so long as s/he has the proper training.

3.3.2 The **Attendant** shall be trained in confined space entry procedures and shall be responsible to:

- 3.3.2.1 Stay in continual contact with entrants in the space. An attendant shall only monitor a single entry point and may not leave his/her post for any reason. The attendant shall evacuate all entrants from the confined space or wait for a trained replacement attendant before leaving the immediate area of the confined space.
- 3.3.2.2 Maintain a count of the number of workers in the confined space at all times.
- 3.3.2.3 Monitor activities both inside and outside the space and recognize conditions that could pose a potential hazard to those in the space.
- 3.3.2.4 Order the immediate evacuation of the entrant(s) if s/he observes any of the following:
 - a) A condition not allowed by the permit (i.e. hot work, abrasive blasting, solvent usage or unauthorized work practices/procedures);
 - b) Behavioral changes in the entrant(s), such as euphoria (feeling good or giddiness) or unexpected laughing that may result from an oxygen deficiency or excessive exposure to certain gases or vapors;
 - c) Situations outside the space that could endanger those inside (i.e. a pool of spilled solvent or a vehicle idling near the ventilation intake);
 - d) An uncontrolled circuit or a leaking fluid line in the space.
- 3.3.2.5 Use emergency equipment and practices to begin **non-entry** rescue procedures (i.e. calling for emergency assistance by phone or radio and/or using the tripod and winch to extract an entrant who is unable to self-rescue). The attendant shall not allow an unauthorized person to attempt rescue.
- 3.3.2.6 An attendant shall never attempt an in-space rescue unless s/he:
 - a) Has been relieved by another trained attendant; and
 - b) Has been trained and equipped as necessary to safely perform the rescue procedure.

3.3.3 The **Entrant(s)** shall be trained in confined space entry procedures and shall be responsible to:

- 3.3.3.1 Recognize any hazardous condition or substance they might be exposed to during entry. They must be aware of the signs and symptoms of exposure to the hazard, understand the possible consequences, and know the proper procedures for safely eliminating the hazard or avoiding exposure to it.
- 3.3.3.2 Maintain contact and communication with the attendant and follow his/her direction immediately at all times and without question.

3.3.3.3 Wear a harness attached to a mechanical winch for vertical entry.

3.3.3.4 Exit the space under any of the following conditions:

- a) When ordered by the attendant;
- b) When a gas meter or other evacuation alarm sounds;
- c) If they become aware of an uncontrolled hazard in the space; or
- d) If they believe they are in any danger.

3.4 **Confined Space Entry Permit.**

3.4.1 The entry supervisor shall begin filling out a Confined Space Entry Permit form before allowing entry into the space and s/he shall maintain it as long as people are in the space. The entry permit documents all appropriate steps that are taken to protect employees in the space and comply with the requirements of this Section.

3.4.2 The entry permit expires and must be terminated when: a) the planned work is completed; or b) the work shift is completed for the day; or c) there is an emergency evacuation.

3.4.3 New entry permits shall be completed each day before re-entry into the same space.

3.4.4 A separate entry permit shall be completed for each new permit space entered.

3.4.5 The entry permit shall be maintained in the immediate vicinity of the PRCS. The supervisor shall make the entry permit available upon request from any official or authority.

3.4.6 Copies of all entry permits shall be delivered to the Safety Department at Stillwater on a weekly basis.

3.5 **Full Time Attendant.** The attendant shall be continuously stationed at the entrance of the permit space for the duration of entry operations. Reliable means shall be provided for communication between the attendant and entrant(s), and for contacting emergency services and/or rescue.

3.6 **Eliminate / Control Hazards.** All necessary steps shall be taken to control all existing or potential hazards in the space, such as:

3.6.1 Using lockout and tagout procedures.

3.6.2 Purging and/or blocking pipelines.

3.6.3 De-watering and/or pre-cleaning contaminants from the space.

3.6.4 Posting warning signs and sufficient barricades to prevent unauthorized entry and to protect entrants from external hazards.

3.6.5 Using proper PPE.

- 3.6.6 Initiating other engineering and/or administrative controls as appropriate.
- 3.7 **Ensure Safe Atmosphere.** Air monitoring shall be conducted prior to entry and on a full time basis while people are inside the PRCS. Mechanical ventilation shall be provided as necessary to maintain safe breathing conditions.
- 3.7.1 If a safe atmosphere cannot be maintained on a continual basis, an entry plan reviewed and approved by the Safety Director shall be in place prior to entry, and entrant(s) shall comply with all requirements of the approved entry plan.
- 3.7.2 If a safe atmosphere cannot be maintained on a continual basis, only properly trained personnel who are wearing appropriate respiratory protective equipment shall be allowed to enter the space.
- 3.7.3 When conditions are immediately dangerous to life or health (IDLH) and the confined space is occupied, rescue services must be on-site.
- 3.8 **Lockout / Tagout (LOTO).** After the confined space environment has been made safe for work, the entry supervisor shall take all necessary precautions, including LOTO procedures to prevent the accidental release of hazardous energy in the space and/or to keep unwanted liquids, gases or solids from entering into the confined space during occupancy. See Section VII of this HASP for LOTO requirements.
- 3.9 **Confined Space Rescue Requirements.** While the preferred means of rescuing an entrant from a confined space is always self-rescue, there shall be a plan in place for the emergency rescue of an ill or injured person from the space.
- 3.9.1 **Non-entry rescue plan.**
- 3.9.1.1 For vertical entry into a structure, a mechanical retrieval device (tripod and winch) shall be attached to each entrant. If the retrieval device is also being used to provide entry into the space, a secondary means of fall protection shall be provided. **Never use a rescue retrieval device to raise or lower materials or equipment.**
- 3.9.1.2 For horizontal entry, a lifeline from the entrance shall be attached to each entrant, and standby personnel shall be available to pull the entrant(s) from the space.
- 3.9.2 **Alternate Permit Entry Plan.** Non-entry rescue procedures listed in 3.9.1 may not be required if all of the following conditions are met:
- 3.9.2.1 The competent person has determined that the **only** actual or potential hazard in the permit-required confined space is an atmospheric one; and
- 3.9.2.2 The competent person confirms and documents on the Confined Space Entry Permit that continuous forced ventilation alone is sufficient to maintain safe atmospheric conditions; and
- 3.9.2.3 Mechanical ventilation is used to force a continuous supply of fresh air into the space for the duration of entry operations; and

- 3.9.2.4 The entrant tests the atmosphere within the space on a continuous basis to ensure that the forced air ventilation is preventing an accumulation of a hazardous atmosphere; and
 - 3.9.2.5 All entrants into the space wear harnesses and there is a retrieval system available at the site; and
 - 3.9.2.6 The entrant(s) shall exit the space immediately if **any** hazard (including but not limited to an atmospheric hazard) arises within the space; and
 - 3.9.2.7 The attendant shall not enter the confined space to assist with a rescue or for any reason until he/she is replaced by another qualified attendant.
- 3.9.3 **Other Approved Rescue Plans.** In the event the established rescue procedures described in this section are impossible or impractical for a particular confined space, a **written** effective rescue plan shall be reviewed and approved by the Safety Director. The approved rescue plan shall be in place and all members of the CSE team shall be trained to execute the plan prior to entry.
- 3.10 **Multi-Employer Worksites.** When employees from more than one employer are working simultaneously in a permit space, procedures to coordinate entry operations, in consultation with the controlling contractor, shall be developed and implemented. These procedures apply to the permit space or elsewhere on the worksite where their activities could, either alone or in conjunction with the activities within a permit space, foreseeably result in a hazard within the confined space. The coordinated operations is intended to prevent employees of one employer from endangering the employees of any other employer.
- 3.11 This plan shall be reviewed annually for accuracy and to ensure employees working in confined spaces are effectively protected from hazards.

CONFINED SPACE ENTRY PERMIT

EMERGENCY NUMBER: 911 Project Loc: _____ Project No: _____
 Site Specific Emergency No: _____ Project Superintendent: _____
 Stillwater Office: 207-827-4435 Date: _____ Time: _____ AM / PM
 Competent Person / Entry Supervisor (please print): _____

1. Location and description of the Confined Space: _____
2. Purpose of Entry: _____
3. Existing or Potential Hazard(s) of the permit space: _____
4. Other Concerns/Precautions Taken: _____

- Please see following page for confined space entry definitions and permit requirements -

Confined Space Entry Preparation

	Yes	N/A
All CSE team members are trained.		
Air quality is monitored and safe.		
Each entrant wears a rescue harness.		
Effective communications are in place? Method: Visual / Verbal / Radio / Phone		
Rescue plan is discussed and in place:		
Rescue Plan Tripod/winch attached to entrants?		
(or) Alternate Entry procedure used? (see 9.b. on following page)		
(or) Other written and approved rescue plan is in place? Describe:		
Dewatering required?		
Ladders inspected and in place?		
Sufficient lighting in space?		
Lines blanked / plugged and blocked?		
Energy sources locked and tagged out?		
Blower required for air quality?		
Respiratory Equipment Required? Type used?		
Other Required Permits for Space? List:		
Other		

Time Permit Issued: _____ AM/PM

Time Permit Expires: _____ AM/PM

Tools, Equipment & Materials in Confined Space:

CSE Team Members

Authorized Entrants (print)	Time In	Time Out

Attendant: (print): _____

Entry Supervisor (signature): _____

Actual Time Permit Terminated: _____ AM/PM

Date Permit Terminated: _____

Comments: _____

**PLEASE RETURN PERMIT TO STILLWATER
OFFICE AFTER ENTRY IS TERMINATED**

Atmosphere Testing Results

Gas Meter ID:		Time			
	PEL				
Oxygen	>19.5% <23.5%				
Flammable Gas	<10% LEL				
Hydrogen Sulfide	<10 PPM				
Carbon Monoxide	<35 PPM				

CONFINED SPACE ENTRY DEFINITIONS & PERMIT REQUIREMENTS

1. **Competent person** means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who is authorized by Sargent Corporation to take prompt corrective measures to eliminate them. In most cases, the foreman in charge of the PRCS is the *competent person* for the entry. **A Competent Person shall oversee all confined space entry work.**
2. **Confined space** means a space that:
 - a. Is large enough for an employee to enter and perform work; and
 - b. Is not designed or intended for continuous human occupancy; and
 - c. Has a limited or restricted means of entry or exit.
3. **Permit Required Confined Space (PRCS)** means a confined space where there is an existing or potential hazard, or where the work in the space might create a hazard. A manhole, catch basin, or other top entry structure is a PRCS as soon as the pipes are installed or the structure is backfilled.
4. **Training requirements.** A PRCS Entry Team shall include at minimum a **supervisor, attendant,** and one or more **entrants** (Note: an entry supervisor may also serve as an attendant or entrant, as long as he/she is properly trained and equipped for the job. The **attendant** shall not perform any work that takes his/her attention away from entrants in the space at any time.). All PRCS entry team members shall be trained in their specific job duties.
5. A **Confined Space Entry Permit** shall be completed before entering a PRCS. A separate entry permit is required for each PRCS entered.
6. **A confined space entry permit must be terminated when:**
 - a. The planned work is completed, or
 - b. The work shift ends, or
 - c. There is an emergency evacuation.
 After an entry permit has been terminated, a new entry permit must be completed before anyone is allowed to re-enter the space.
7. A **4-gas meter** shall be used to monitor air quality before and during entry into a PRCS.
8. If **respiratory equipment** of any type is required, its use shall be in full compliance with the Sargent Corporation Respiratory Protection Plan, including training, medical evaluation, and annual fit test.
9. A **rescue plan** shall be in place and discussed with all PRCS team members, using one or more of the following rescue procedures:
 - a. **Non-entry Rescue:** Each person who enters into a PRCS shall wear a harness which is connected to a retrieval line to allow rescue by personnel who do not enter the PRCS. A mechanical winch shall be used for rescue from vertical entry structures such as manholes and catch basins. A rope may be used for horizontal rescue so long as there are no obstacles that could impede the rescue.
 - b. **Alternate Entry Procedure:** If the only potential hazard is atmospheric, entrants may be disconnected from the mechanical winch provided that all of the following are in place:
 - One or more mechanical blowers are used to provide continuous fresh air ventilation; and
 - Entrants continuously monitor the air quality using a 4-gas meter; and
 - The blowers alone are capable of maintaining safe breathing air conditions in the PRCS; and
 - The entrant is wearing a harness; and
 - A mechanical winch is on site and readily available for use if needed.
 - c. **Other Approved Rescue Plans:** Must be in writing and approved by the Safety Director.

VII. LOCKOUT/TAGOUT/TRYOUT PROGRAM

(Updated on 03/24/2017; Updated 11/30/17; Updated 11/16/18.)

1.0 PURPOSE

- 1.1 The purpose of this energy control program is to protect **SARGENT CORPORATION** employees and subcontractor employees from unexpected energizing or start-up of machines or equipment or the release of stored energy, hazardous materials or gases that could cause injury.
- 1.2 This program establishes the requirements for isolation and control of potentially hazardous energy, including but not limited to electrical, chemical, thermal, hydraulic, pneumatic, mechanical and gravitational energy.

2.0 SCOPE AND APPLICATION

- 2.1 This program applies to all employees and subcontractor employees performing installation, service (including greasing), maintenance, or any other work on systems, machines, or equipment in which the unexpected start up or the release of stored energy, or hazardous materials or gases could cause injury to employees.
- 2.2 This lockout/tagout/tryout program complies with 29 CFR 1910.147 OSHA General Industry Regulations.

3.0 DEFINITIONS

- 3.1 **Affected Employee.** An employee whose job requires him/her to operate or use a machine or equipment on which maintenance, service, or repair is being performed under this lockout/tagout/tryout policy, or whose job requires him/her to work in an area in which such maintenance or repair is being performed.
- 3.2 **Authorized Employee.** An employee who locks and/or tags machines or equipment out of service in order to perform maintenance, service, or repair on that machine or equipment. An affected employee becomes an authorized employee when his/her job duties include maintenance, service, or repair of a system, machine, or equipment under this lockout/tagout/tryout program.
- 3.3 **Compliance with Lockout/Tagout/Tryout Program.** All employees are required to comply with the restrictions, limitations, and requirements of this program. Authorized employees are required to perform the lockout/tagout/tryout procedures as defined below. All employees, upon observing a machine or piece of equipment which is locked and/or tagged out of service shall not attempt to start, energize, or use that machine or equipment. An employee who violates the provisions of this program shall be subject to

disciplinary action including possible immediate termination of employment as provided in this Health and Safety Plan.

- 3.4 **Energy Source** means any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, gravitational, or other energy.
- 3.5 **Maintenance, Service, and/or Repair.** Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, lubricating, cleaning, unjamming, adjusting, changing tools or worn parts, and/or any other work on systems, machines, or equipment where an employee may be exposed to the unexpected energization or startup of the equipment or the release of hazardous energy.

4.0 PROGRAM ELEMENTS

- 4.1 The main power disconnect device or other energy isolating device which controls a source of potentially hazardous energy or material flow shall be locked out and tagged out of service whenever employees are performing maintenance, service and/or repairs on machinery or equipment.
- 4.2 Each authorized employee shall be protected from any unexpected energy release or material flow by locking out the system, machinery, or equipment and attaching a tag in a conspicuous location on the system, machinery, or equipment to indicate it cannot be started.
- 4.3 The foreman, mechanic, operator or other qualified employee who supervises the work on locked out energy systems, machinery, or equipment is responsible for implementing the lockout/tagout procedures. Each authorized person is responsible to include their individual locks and tags on the system, machine, or equipment on which they are performing service or repairs.
- 4.4 When machinery or equipment energy systems are incapable of being locked out, the Safety Department shall be contacted for approved tagout procedures.
- 4.5 For work on large process systems, each affected employee may be required to individually lock/tag the energy source or equipment. In this case, it is permissible for the supervisor to install a company lock and tag on the energy source. The key to the company lock must then be secured in a "group lock box" or comparable mechanism by the locks of each affected employee. The supervisor's lock must remain on the system until all employees are accounted for in a safe location and each has removed his/her lock from the "group lock box."
- 4.6 The project supervisor is authorized to remove an affected employee's lock/tag if necessary. The supervisor may remove the employee's lock/tag only after determining that the employee is no longer in the vicinity of the equipment and has failed to remove the lock through error. The supervisor must notify the employee that the lock/tag has

been removed before the employee returns to the work site in order to ensure his/her safety.

- 4.7 Where more than one authorized employee is engaged in working on machinery or equipment, each of them shall lock and tag the energy isolating device out of service. Lockout hasps, boxes, and/or other lockout devices for multiple employees shall be provided for this purpose.
- 4.8 Pressure shall be eliminated from any pneumatic or hydraulic lines that activate a mechanism or machine, and the valve holding back the activating substance shall be locked out before an employee works on that mechanism or machine.
- 4.9 Mechanisms under spring tension or compression shall be blocked, clamped, secured in position, or the compression or tension totally relieved before being worked on by an employee.
- 4.10 Heavy machinery, equipment or parts thereof, which are suspended or held aloft by the use of slings, hoists or jacks shall be substantially blocked or cribbed to prevent falling or shifting before employees are allowed to work under or between them.
- 4.11 Bulldozer and scraper blades, excavator and loader buckets, dump bodies and similar hydraulically controlled equipment, shall be either fully lowered or blocked when being repaired or when not in use. All controls shall be in a neutral position, with the motors stopped and brakes set, unless work being performed requires otherwise.
- 4.12 All company owned trucks with dump bodies shall be equipped with a positive means of support, permanently attached, and capable of being locked in position to prevent accidental lowering of the body while maintenance or inspection work is being done.
- 4.13 Whenever wheeled equipment is parked, the parking brake shall be set. Equipment parked on inclines shall have the wheels chocked and the parking brakes set.
- 4.14 When directing equipment into position to hook to a haul-behind attachment, tow a stuck or disabled vehicle, or pull any other object, employees shall at no time be located between the moving equipment and the object it is being connected to. The moving equipment shall be stopped with the motor shut off and the brake set before the connection is made.
- 4.15 A periodic inspection of the energy control procedure shall be conducted at least annually to ensure the procedures are accurate and requirements of this section are being followed.

5.0 LOCKOUT/TAGOUT/TRYOUT PROCEDURES

- 5.1 Authorized employees shall use the following lockout/tagout/tryout procedures prior to conducting service, maintenance or repair work on machinery or equipment. If more

than one energy source is involved, each source must be locked and tagged out of service before work may begin.

- 5.2 Notify all affected employees of the lockout/tagout.
- 5.3 Shut off the equipment or machine.
- 5.4 Locate the energy isolating devices, such as ignition switches, electric control panels, or control valves, and isolate the system, equipment, or machinery from there.
- 5.5 Lock and tag the energy isolating devices out of service.
- 5.6 Reduce or eliminate stored residual energy by chocking, blocking, blanking, bleeding, grounding, or other effective means.
- 5.7 **Verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.**

6.0 PROCEDURES FOR RESTART

- 6.1 When the equipment or machine is ready to be returned to normal operating condition the following procedures shall be followed.
- 6.2 Check the equipment and area to ensure all nonessential items have been removed, guards have been reinstalled and the equipment is operationally intact.
- 6.3 Verify the controls are in the neutral or off position and all employees have been safely positioned or removed from the area.
- 6.4 Notify affected employees that the work has been completed and the equipment is ready to be returned to normal operation.
- 6.5 Remove the lockout and tagout devices and reenergize equipment. Each person must remove their own lock. Under no circumstance may a lock or isolating device be removed by another person.

7.0 EMPLOYEE TRAINING

- 7.1 **SARGENT CORPORATION** shall provide training to ensure employees understand the purpose and function of the lockout/tagout/tryout program. The training must provide employees with the knowledge and skills necessary for the safe application, usage and removal of the energy control measures and devices. All training shall be documented.

- 7.2 Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy and the methods and means necessary for isolation and control.
- 7.3 Each affected employee shall be instructed in the purpose and use of the program.
- 7.4 All other employees whose work operations are or may be in an area where machines or equipment are locked out shall be instructed about the procedures and dangers relating to attempts to restart or reenergize them.
- 7.5 Employee retraining shall be provided for all authorized and affected employees whenever there is a change in machines, equipment or processes that present a new hazard. Retraining shall also occur when there is a change in the energy control procedures.

8.0 LOCKOUT/TAGOUT/TRYOUT AT CONSTRUCTION SITES

- 8.1 **Mobile equipment, trucks, crushers, screening plants, and other construction equipment with an electric starter such as a generator, compressor, or mulcher.**
 - 8.1.1 The operator, mechanic, or other authorized person providing repairs, maintenance, or service shall remove the ignition key and keep it in his/her possession at all times.
 - 8.1.2 If there are multiple keys to the equipment, such as with Caterpillar equipment, the master switch must also be shut off.
 - 8.1.3 If the equipment does not have a removable switch key, the equipment shall be disabled by other means, such as by removing the battery cables.
 - 8.1.4 An “Out of Service / Do Not Start” tag (or other tag with a similar message) shall be attached in a conspicuous location such as on the steering wheel, next to the ignition switch, or on the driver’s side door handle.
 - 8.1.5 If the equipment motor must be started in order for the authorized mechanic to diagnose the problem and/or perform repairs, the operator or other qualified person shall be stationed to guard the controls at all times and shall maintain communication with the mechanic.
 - 8.1.6 Reduce or eliminate residual stored energy by chocking, blocking, bleeding, and/or grounding.
 - 8.1.7 **Verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.**

8.2 Maintenance, service, and/or repairs on all other project related systems, equipment, and machines that have one or more sources of hazardous energy.

- 8.2.1 The project supervisor shall be responsible to ensure all affected and authorized employees are protected from an unexpected startup or release of stored energy by performing the work in strict compliance with the requirements of this lockout/tagout program.
- 8.2.2 Each authorized employee shall lock and tag the energy source(s) out of service. A lock box, lockout hasps, and/or other effective means shall be provided for this purpose.
- 8.2.3 The supervisor shall maintain his/her lock(s) on the system, equipment, or machine until he/she has confirmed **all** of the following:
 - a. It is now safe to start up, or all potential energy sources have been removed or disabled; and
 - b. All affected employees have been advised that the lockout has ended; and
 - c. All authorized employees have removed their locks and are in a safe location.

8.3 Before starting work on a locked out system, equipment or machine, always be sure to verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.

8.4 Procedures for restart are detailed in §6.0 above.

9.0 LOCKOUT/TAGOUT/TRYOUT AT THE STILLWATER MAINTENANCE SHOP

9.1 Mobile Equipment, trucks, crushers, screening plants, and other construction equipment equipped with an electric starter such as a generator, compressor, or mulcher.

- 9.1.1 Each authorized employee working on the equipment or truck shall lock and tag it out of service. Each lock and tag shall include the name of the authorized employee.
- 9.1.2 If only one employee is performing the service or maintenance, he/she may lock it out by removing the ignition key and keeping the key in his/her possession and control at all times. S/he shall also tag the equipment out of service.
- 9.1.3 If there are multiple keys to the equipment, such as with Caterpillar equipment, or if the equipment does not have a removable switch key, the equipment shall be disabled by another effective means, such as by removing the battery cables from the battery and locking them together to prevent their reattachment.

- 9.1.4 If more than one employee is performing the service or maintenance, each of them shall lock and tagout the equipment. Lock boxes and/or lockout hasps shall be provided for this purpose.
- 9.1.5 “Out of Service / Do Not Start” tag(s) (or other tag(s) with a similar message) shall be attached in a conspicuous location such as on the steering wheel, next to the ignition switch, or on the driver’s side door handle.
- 9.1.6 If the equipment motor must be left running in order for the mechanic to diagnose the problem and/or perform the repairs, a qualified person shall be stationed to guard the controls at all times and shall maintain communication with the mechanic.
- 9.1.7 Reduce or eliminate residual stored energy by chocking, blocking, bleeding, and/or grounding.
- 9.1.8 **Verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.**
- 9.2 **Drills, saws, grinders, lathes, and other power tools and milling machines.**
 - 9.2.1 A power tool or machine shall be locked and tagged out of service when an authorized employee performs maintenance, repair, and/or service operations on the tool or machine.
 - 9.2.2 Lockout/tagout procedures shall also be in effect when changing bits, blades, wheels, and machine attachments, and while making adjustments to a machine when the unexpected startup of the machine could cause an accident or injury.
 - 9.2.3 **Machine Shop.** (Lock and tag all disconnects and switches prior to starting work on any of the equipment listed in a-g below)
 - a. American Lathe #1: Disconnect switch is located on the wall behind the lathe.
 - b. Monarch Lathe: Locking control switch is located on the back of the lathe.
 - c. Surface Grinder: Disconnect switch is located on the wall behind the Monarch lathe.
 - d. Welder #2: Disconnect switch is located on support beam next to the welder.
 - e. American Lathe Turnmaster #2: Turn off, unplug quick disconnect located behind the lathe at Panel B-13-15-17.
 - f. Toshiba Boring Mill VZ8 (Grey#1): Shut of power on the machine, lockout Panel D 9,11,13 in the off position.
 - g. Toshiba Boring Mill VZ8 (Green #2): Shut of power on the machine, lockout power in the off position at Breaker ‘From Transformer 3’.

9.2.4 **Plug and Cord Connected Power Tools.**

- a. Unplug power tools before changing bits, blades, wheels, and similar attachments.
- b. Unplug power tools before making adjustments to the tool whenever the unexpected startup of the tool could cause an accident or injury.
- c. A power tool that is found to be defective or one that requires service shall be tagged out of service until the defect is repaired or service completed.

9.3 **150 Ton Hydraulic Press.** Disconnect and tag the power cord and plug. Release any stored energy.

9.4 **Compressed Air System (Old System) Note: As of March 2017 used as air storage and back-up system.**

9.4.1 There are two air compressors in the maintenance shop: one is next to the overhead door at the west end of the shop and the other is upstairs in the paint bay. These air compressors are tied together as one system – they must both be locked and tagged out of service before performing work on either of them or on individual parts of the system that cannot be isolated from the system by valves.

9.4.2 To work on the system as a whole or on one or both compressors:

- a. Shut off, lock and tag the shop compressor disconnect switch box K which is located next to the overhead door on the north wall of the small tools maintenance area.
- b. Shut off, lock and tag the paint room compressor disconnect switch located on the back wall of the compressor room.
- c. Drain the tanks by means of petcocks on the shop tank and ball valve on the paint bay tank.
- d. Drain the air hoses and tools.

9.4.3 To work on the automatic lube system, paint bay airline system, or another individual airline:

- a. Close, lock and tag the ball valves that isolate the airline requiring service.
- b. Drain the air hose and air tools in the work area.

9.5 To work on the **Ingersoll Rand Compressor**, with the air system in the shops active.

9.5.1 Shut off power using the on/off button, secure switch in the off position at Panel PP-B#20, close primary valve #1, and use bleed valve to drain pressure.

9.6 To work on the air system in the Maintenance Shop.

- 9.6.1 Shut off power to the Ingersoll Rand Compressor using the on/off button, lock and tag the switch in the off position at Panel PP-B#20, close and lock primary valve #1. Next, follow the steps detailed in sections 9.4.1, 9.4.2 and 9.4.3 above.
- 9.6.2 To work on an individual airline:
 - a. Close, lock and tag the ball valve(s) that isolate the airline requiring service.
 - b. Drain the air hose and tool in the work area.
- 9.7 **Overhead Cranes.** Shut off, lock and tag the disconnect switch box or circuit breaker for the crane requiring service. For cord and plug connected cranes, unplug and tag the power cord out of service.
 - 9.7.1 5-ton crane #1: Switch box is located on the support post next to the small tools maintenance area.
 - 9.7.2 5-ton crane #2: Switch box is located next to walk-in door along the south wall.
 - 9.7.3 2-ton crane #3 and #4 in the small tools maintenance area: Circuit breaker #1 in Panel D4, which is located on the north wall next to the overhead door.
 - 9.7.4 Overhead cranes in machine shop: Disconnect and tag the power cord and plug.
- 9.8 **Steam Cleaner in Wash Bay.**
 - 9.8.1 Shut off, lock, and tag circuit breakers 20-22-24 in Panel B located on the North wall in the machine shop.
 - 9.8.2 Release the water pressure with the cleaning wand.
 - 9.8.3 Wait until all parts of the cleaner are cool to the touch.
- 9.9 **Boiler Heating System.**
 - 9.9.1 Boiler: Shut off, lock, and tag the electric switch on the control box on the boiler; also lock and tag out breaker number 7 in Panel E located on the North wall to eliminate power to the control box. Wait one-half hour for the boiler to cool down.
 - 9.9.2 Hot water lines: Shut off, lock, and tag gate valves in the furnace room.
 - 9.9.3 Circulators: Shut off, lock, and tag disconnect switches in the furnace room.
 - 9.9.4 Heating units in shop: Shut off, lock, and tag electric switches on ceiling units.

- 9.9.5 Heating units in paint bay: Shut off, lock, and tag the switch on the right side of circuit breaker #5 in Panel E in the furnace room.
- 9.9.6 Intake and exhaust fans for roof units in paint bay: Shut off, lock, and tag disconnect switches in the furnace room.
- 9.10 **Oil / Water Separator in Sludge Room.** Shut off, lock, and tag the electric switch box on the south wall of the sludge room.
- 9.11 **Before starting work on a locked out system, equipment or machine, always be sure to verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.**
- 9.12 **Procedures for restart are detailed in §6.0 above.**

10.0 LOCKOUT/TAGOUT/TRYOUT AT THE STILLWATER WELDING SHOP

- 10.1 **Construction Equipment and Trucks.** Lockout/tagout/tryout procedures are detailed in §9.1 above.
- 10.2 **Drills, saws, grinders, lathes, and other power tools and milling machines.**
 - 10.2.1 A power tool or machine shall be locked and tagged out of service when an employee performs maintenance, repair, and/or service operations on the tool or machine.
 - 10.2.2 Lockout/tagout/tryout procedures shall also be in effect when changing bits, blades, wheels, and other machine attachments, and while making adjustments to a machine when the unexpected startup of the machine could cause an accident or injury.
 - 10.2.3 Hydraulic (450-Ton) press break in new shop: Shut off, lock, and tag the lockout switch which is located on the hydraulic press control panel.
 - 10.2.4 Burn Table: Shut off, lock, and tag circuit breaker #19 in panel LP-2.
 - 10.2.5 **Plug and Cord Connected Power Tools.**
 - a. Unplug power tools before changing bits, blades, wheels, and similar attachments.
 - b. Unplug power tools before making adjustments to the tool whenever the unexpected startup of the tool could cause an accident or injury.
 - c. A power tool that is found to be defective or one that requires service shall be tagged out of service until the defect is repaired or service completed.

10.3 **Welding Machines.**

10.3.1 The welders and their corresponding disconnect switches are numbered alike. Shut off, lock, and tag the appropriate disconnect switch.

10.3.2 For cord and plug connected welders, unplug the welder and attach an “Out of Service / Do Not Start” tag (or a tag with similar message) on the power cord.

10.4 **Compressed Air System.**

10.4.1 To work on the air compressor or the system as a whole:

- a. Shut off, lock, and tag circuit breaker #9 in panel PP-C.
- b. Close valve #7, lock and tag, inside the maintenance shop.
- c. Drain the two connected air tanks.
- d. Close valve #11 inside the welding shop.
- e. Drain the air hoses and tools.
- f. Unplug the air dryer.

10.4.2 To work on an individual airline:

- a. Close, lock and tag the ball valve(s) that isolate the airline requiring service.
- b. Drain the air hose and tool in the work area.

10.5 **Overhead Cranes.** Shut off, lock, and tag the disconnect switch or the circuit breaker for the crane requiring service.

10.5.1 5-ton crane in old shop: Disconnect switch is located on the crane bridge. Circuit breaker #1 in panel PP-C disconnects power to the switch.

10.5.2 5-ton crane in new shop: Disconnect switch is located on the south wall of the new shop. Circuit breaker #13 in panel PP-B disconnects power to the switch.

10.5.3 Jib cranes in new shop: The four jib cranes and their corresponding disconnect switches are numbered alike. Shut off, lock, and tag the appropriately labeled disconnect switch which is mounted on the wall near each jib crane.

10.6 **Air Handlers.** The eight air handlers and their corresponding disconnect switches are numbered alike. Shut off, lock, and tag the appropriately labeled disconnect switch which is mounted on the wall near the air handler.

10.7 **Furnaces.**

10.7.1 Furnace in old shop: Shut off, lock, and tag circuit breaker #19 in panel LP-1.

10.7.2 Furnace in new shop: Shut off, lock, and tag circuit breaker #18 in panel LP-2.

- 10.8 **Before starting work on a locked-out system, equipment or machine, be sure to verify the effectiveness of the energy isolation by testing the operating controls while all personnel are safely removed from the area.**
- 10.9 Procedures for restart are detailed in §6.0 above.

VIII. ELECTRICAL PROTECTION PROGRAM

(Updated on 12/29/17).

1.0 POLICY STATEMENT

- 1.1 **SARGENT CORPORATION shall comply with applicable OSHA standards concerning employee protection from electrical hazards as published in 29 CFR 1926 Subpart K, through the use of Ground Fault Circuit Interrupters (GFCI).**

2.0 ELECTRICAL SAFETY AND AWARENESS TRAINING

- 2.1 Employees shall be trained in and familiar with the safety-related work practices that pertain to their respective job assignments.
- 2.2 Safety-related work practices shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts. The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards when work is performed near or on equipment or circuits which are or may be energized.
- 2.3 Live parts to which an employee may be exposed shall be deenergized before the employee works on or near them.
- 2.4 When a qualified person is working in the vicinity of overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table S5 (below). **Sargent Corporation does not have employees qualified to work on or in the vicinity of overhead lines.**

TABLE S5 - Voltage range (phase to phase) and Minimum approach distance

300 V and less	Avoid Contact
Over 300 V, not over 750 V	1 ft. 0 in. (30.5 cm)
Over 750 V, not over 2k V	1 ft. 6 in. (46 cm)
Over 2 kV, not over 15 kV	2 ft. 0 in. (61 cm)
Over 15 kV, not over 37 kV	3 ft. 0 in. (91 cm)
Over 37 kV, not over 87.5 kV	3 ft. 6 in. (107 cm)
Over 87.5 kV, not over 121 kV	4 ft. 0 in. (122 cm)
Over 121 kV, not over 140 kV	4 ft. 6 in. (137 cm)

IX. HAZARDOUS MATERIAL EXPOSURE

(Last revised 02/04/2016)

1.0 HAZARD COMMUNICATIONS (HAZCOM) POLICY

- 1.1 It is the policy of **SARGENT CORPORATION** to comply with all applicable regulatory standards for hazard communications as enacted by OSHA (29 CFR 1926.59 and 1910.1200), MSHA (30 CFR Part 47), and the Federal Motor Carrier Safety Administration.
- 1.2 Under this HAZCOM policy, we shall provide employees with all information necessary for the safe use, handling, and storage of hazardous chemicals.
- 1.3 This policy includes guidelines on identification of chemical hazards, employee training, and the preparation and proper use of container labels, placards and other types of warning devices. It is intended to be consistent with the provisions of the **United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS), Revision 3.**

2.0 DEFINITIONS

- 2.1 **Carcinogen:** a chemical is considered to be a carcinogen if it is determined to be a potential cancer-causing agent.
- 2.2 **Chemical:** any element, compound or mixture of elements and/or compounds.
- 2.3 **Combustible Liquid:** any liquid having a flashpoint at or above 100° F (37.8° C), but below 200° F (93.3° C), except any mixture having components with flashpoints of 200° F (93.3° C), or higher, the total volume of which make up 99% or more of the total volume of the mixture.
- 2.4 **Container:** means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank or the like that contains a hazardous chemical. For the purpose of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.
- 2.5 **Corrosive:** a chemical that causes visible destruction of or alterations in living tissue by chemical action at the site of contact.
- 2.6 **Employee:** a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies.
- 2.7 **Employer:** a person engaged in a business where chemicals are either used, distributed or are produced for use or distribution, including a contractor or subcontractor.

- 2.8 **Explosive:** a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure or high temperature.
- 2.9 **Flammable Liquid:** any liquid having a flashpoint below 100° F (37.8° C), except any mixture having components with flash points of 100° F (37.8° C) or higher, the total of which make up 99% or more of the total volume of the mixture.
- 2.10 **Flashpoint:** the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when exposed to a flame.
- 2.11 **Hazardous Chemical:** any chemical that is a physical hazard or a health hazard.
- 2.12 **Hazard Warning:** any words, pictures, symbols or combination thereof appearing on a label or other appropriate form of warning which convey the hazard(s) of the chemical(s) in the container(s).
- 2.13 **Irritant:** a chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact.
- 2.14 **Label:** any written, printed or graphic material displayed on or affixed to containers of hazardous chemicals.
- 2.15 **Pictogram:** a sign or picture that is intended to convey specific information about the hazards of a chemical.
- 2.16 **Safety Data Sheet (SDS):** written or printed material concerning a hazardous chemical.
- 2.17 **Signal Word:** “Danger” (more severe) and “Warning” (less severe) are signal words used to alert workers of the relative hazards of a chemical.
- 2.18 **Oxidizer:** a chemical other than a blasting agent or explosive that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.
- 2.19 **Physical Hazard:** a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.
- 2.20 **Water-Reactive:** a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

3.0 HAZCOM STANDARD PROCEDURES

3.1 Chemical Inventory.

- 3.1.1 **SARGENT CORPORATION** maintains an inventory of all known chemicals in use. The Superintendent at each project site shall maintain a listing of all chemicals used at the site. The chemical inventory list shall be posted where it is available for all employees at the project site.
- 3.1.2 Site specific hazardous materials brought onto the work site shall be added to the posted chemical inventory list.

3.2 Container Labeling.

- 3.2.1 All chemicals on site shall be stored in their original or approved containers with a proper label attached, except small quantities for immediate use. Any container not properly labeled should be given to a foreman or superintendent for labeling or proper disposal.
- 3.2.2 Workers may dispense chemicals from the original container to a smaller secondary container so long as it is intended for immediate use. The secondary container must be labeled as to its contents. Any chemical left in a secondary container after work is completed must be returned to the original container.
- 3.2.3 No unmarked containers of any size are to be left unattended in the work area.
- 3.2.4 **SARGENT CORPORATION** will rely on the manufacturer applied labels whenever possible, and will ensure that these labels are maintained. Containers that are not labeled or on which the manufacturer's label has been removed will be relabeled.
- 3.2.5 **SARGENT CORPORATION** project Superintendents shall ensure that each container is labeled with the identity of the hazardous chemical contained and any appropriate hazard warnings.

3.3 Safety Data Sheets (SDS).

- 3.3.1 SDS's shall be available in the office trailer at each project site for all chemicals contained on the project chemical inventory list.
- 3.3.2 Supervisors shall review the SDS for a hazardous chemical with all affected employees before assigning employees to work with the chemical.
- 3.3.3 Employees working with a hazardous chemical may request a copy of the SDS. Requests for SDS's may be made to project superintendents, or the Safety Director.

3.4 **Employee Training.**

- 3.4.1 The project superintendent shall ensure employees are trained to work safely with hazardous chemicals prior to using or coming in contact with them.
- 3.4.2 Employees at each project site shall be trained to know about and recognize any hazardous chemicals being used at the site. New employees shall be trained as they are orientated at the project site.
- 3.4.3 Employee training will include appropriate topics such as:
 - 3.4.3.1 Methods that may be used to detect a release of a hazardous chemical in the workplace.
 - 3.4.3.2 Physical and health hazards associated with chemicals on site.
 - 3.4.3.3 Protective measures to be taken.
 - 3.4.3.4 Safe work practices.
 - 3.4.3.5 Information of the Hazard Communication Standard including:
 - a) Labeling, pictograms, and warning systems, and
 - b) An explanation of Safety Data Sheets.

3.5 **Personal Protective Equipment.**

- 3.5.1 The project superintendent shall provide each employee with the required PPE that is appropriate for the chemical(s) to which he/she is being exposed.
- 3.5.2 Any employee found in violation of PPE requirements shall be subject to disciplinary actions as provided in this HASP.

3.6 **Emergency Response.**

- 3.6.1 Any incident of over-exposure or spill of a hazardous chemical must be reported to a supervisor at once.
- 3.6.2 The foreman or superintendent shall be responsible for ensuring that proper emergency response actions are taken in over-exposure or spill situations.

3.7 **Chemical Hazards of Non-Routine Tasks.**

- 3.7.1 Superintendents shall inform employees of any special tasks that may arise which would involve possible exposure to hazardous chemicals.
- 3.7.2 Review of safe work procedures and use of required PPE shall be conducted prior to the start of such tasks.
- 3.7.3 Where necessary, signs and barricades shall be used to indicate the nature of the hazard involved.

3.8 **Informing Other Site Workers about Known Chemical Hazards.**

- 3.8.1 Sargent Corporation subcontractor employees are required to adhere to the provisions of this Hazard Communication Policy.
- 3.8.2 Information on hazardous chemicals known to be present shall be exchanged with other contractors and/or subcontractors on the project site. Employers shall be responsible for providing necessary information to their employees.
- 3.8.3 Other on-site employers will be provided with a copy of **SARGENT CORPORATION's** Hazard Communication Policy upon request.

3.9 **Posting Requirements.** **SARGENT CORPORATION** will post information about OSHA's Hazard Communications Standard (Right to Know Law) in the office trailer at each project site so that it is available to all employees.

4.0 **HAZARDOUS MATERIALS HANDLING PROJECTS**

- 4.1 **Applicability.** The following are examples of projects where the requirements of this paragraph shall be implemented. They are generally recognized as sites requiring hazardous materials handling or having other special hazards to which employees are likely to be exposed, but similar conditions may be encountered on other construction sites as well.
 - 4.1.1 Superfund Sites with or without National Priority List (NPL) designation. For these projects, all personnel working within the boundaries of the contaminated zone(s) must have had a 40-hour training course in Hazardous Waste Operations and Emergency Response (HAZWOPER) and current year 8-hour refresher training as defined in OSHA 29 CFR 1926.65. They must also be enrolled in a medical surveillance program with a baseline physical examination and a follow up examination at least every 12 months.
 - 4.1.2 Projects that are designated by the owner or engineering firm as requiring 40-hour trained personnel by contract specifications. Examples are sites such as landfill closings that may involve relocation of refuse and installation of leachate collection systems.
 - 4.1.3 Projects that are designated by the Safety Director or Operations Manager to require 40-hour trained employees and/or personal protection greater than Level D because of special hazards to which employees may be exposed.
- 4.2 **Hazardous Materials Handling Policy.** It is the policy of **SARGENT CORPORATION** to provide employees working at Hazardous Materials sites with proper levels of training, personal protective equipment, engineering controls, and defined work procedures to control health and safety hazards.

4.3 Levels of Personal Protection.

4.3.1 **LEVEL D:** This level of protection is the minimum standard for construction workers and includes:

- 4.3.1.1 Hardhat.
- 4.3.1.2 Safety glasses.
- 4.3.1.3 Sturdy work boots with safety toe, in good condition.
- 4.3.1.4 Long work pants in good condition.
- 4.3.1.5 Shirt with 4-inch minimum sleeves.
- 4.3.1.6 Outer clothing appropriate for weather conditions.

4.3.2 **LEVEL D – MODIFIED:** This level of protection is usually the minimum for hazardous materials handling projects, and includes all items listed for Level D, plus:

- 4.3.2.1 Chemical resistant or chemical proof suit (Tyvek).
- 4.3.2.2 Inner and outer gloves.
- 4.3.2.3 Chemical resistant boots (over the work boots).
- 4.3.2.4 All sleeves and leg openings taped to gloves/boots using duct tape.
- 4.3.2.5 Training in the proper methods of donning and doffing and disposal of the protective clothing.

4.3.3 **LEVEL C:** This level of protection includes all items listed for Level D – Modified, plus:

- 4.3.3.1 Chemical resistant or chemical proof suit with hood.
- 4.3.3.2 Half or full-face respirator.
- 4.3.3.3 Respirator cartridges appropriate for the atmospheric contaminants to be encountered.
- 4.3.3.4 Compliance with and training in the Respiratory Protection Plan.
- 4.3.3.5 Medical evaluation prior to respirator use.

4.3.4 **LEVEL B:** This level of protection includes all items of Level D – Modified, plus a self-contained breathing apparatus (SCBA) or supplied air respirator.

4.3.5 **LEVEL A:** This level of protection includes all items of Level D plus full body encapsulation and SCBA.

4.4 Planning For Hazardous Materials Handling Projects.

4.4.1 Each such project shall be managed by a team comprised of:

- 4.4.1.1 Operations Manager.
- 4.4.1.2 Safety Director.
- 4.4.1.3 Project Manager.

- 4.4.1.4 Project Superintendent.
- 4.4.1.5 Estimator (first meeting only).
- 4.4.2 The Project Team will meet as soon as practical following award of the project to assign/clarify roles and discuss the following items:
 - 4.4.2.1 Project location and description.
 - 4.4.2.2 Owner and engineering firm requirements.
 - 4.4.2.3 Projected start/end dates.
 - 4.4.2.4 Description of all major project activities.
 - 4.4.2.5 Description of unique activities.
 - 4.4.2.6 Description of anticipated hazards.
 - 4.4.2.7 Determination of employee training requirements.
 - 4.4.2.8 Determination of levels of employee protection required at each phase of the project.
 - 4.4.2.9 Discussion of sequence of work.
 - 4.4.2.10 Timetable and person responsible for accomplishing the following major activities:
 - a. Development of the Site Specific Health and Safety Plan.
 - b. Date and location of pre-construction meeting.
 - c. Early submittal requirements.
 - d. Naming of initial crewmembers.
 - e. Personnel decontamination requirements.
 - f. Equipment decontamination requirements.
 - g. Anticipated/required environmental protection activities.
 - h. All required written plan submittals.
- 4.4.3 The Regional Operations Manager, Project Superintendent and Safety Director will meet on site with the project crew prior to the beginning of work involving the hazardous materials. The purpose of this meeting will include the following:
 - 4.4.3.1 Description and discussion of the project activities.
 - 4.4.3.2 Confirmation of required training and medical surveillance enrollment.
 - 4.4.3.3 Discussion of all phases of the Site Specific HASP.
 - 4.4.3.4 Discussion of the levels of personal protection required for each project phase.
- 4.4.4 The Safety Director shall meet with the Project Superintendent and the crew on site within one week after starting hazardous material handling operations for the purpose of reviewing general procedures and addressing concerns or questions of crewmembers.
- 4.4.5 The Project Team will meet within two weeks after starting hazardous material handling operations to assess the appropriateness of the levels of personal protection, general procedures, and required equipment and activities being used.

4.5 Standard Procedures for Hazardous Materials Handling Projects.

- 4.5.1 Crew and equipment decontamination facilities shall be fully functional prior to hazardous material handling.
- 4.5.2 In general, all activities involving exposed hazardous substances such as excavation/relocation of Municipal Solid Waste (MSW), excavation of soils contaminated by landfill leachate and live sewage shall be performed with LEVEL D - MODIFIED personal protection, at a minimum.
- 4.5.3 Air quality monitoring shall be performed on a continuous basis. If the following action levels are exceeded, levels of employee protection shall be upgraded as appropriate and as determined by the Safety Director.

Test For:	Action Level
Oxygen	- Less than 19.5% or more than 23.5%
Combustible Gases	- 10% of the LEL (lower explosive limit)
Hydrogen Sulfide	- 10 ppm (8-hour TWA)
Carbon Monoxide	- 35 ppm (8-hour TWA)
Volatile Organic Vapors	- 1 ppm for vinyl chloride or benzene; - 50 ppm if neither of these is present
Respirable Dust	- 50 micrograms of respirable crystalline silica per cubic meter of air ($\mu\text{g}/\text{m}^3$), averaged over an 8 hour day.

- 4.5.4 Dust control methods shall be implemented as necessary to maintain dust levels below the action level.
- 4.5.5 Levels of protection may be downgraded after the site is remediated.
- 4.5.6 No employee shall handle, transport or dispose of asbestos or asbestos containing materials. When asbestos materials are encountered, activity shall cease for remediation/removal by others. (Exception: See Transite Pipe Handling Plan in Section XIII of this HASP.)
- 4.5.7 Whenever drums or other containers of unknown content are encountered on projects, the operation shall stop, employees and equipment shall leave the immediate area and the contents of the drums or containers shall be determined. When analysis is complete, a plan to deal with the containers shall be developed and followed.
- 4.5.8 All subcontractor employees shall conduct their work in accordance with the policies of **SARGENT CORPORATION** and applicable OSHA Standards. It shall be the subcontractor's responsibility to provide its employees with appropriate training and protective equipment.

5.0 LEAD IN CONSTRUCTION AND LEAD ABATEMENT PLAN (Updated 12/11/17).

5.1 Introduction.

- 5.1.1 All employees who are required to work with lead containing materials shall be informed of the hazards, educated of the methods required to properly protect themselves from exposure and shall be trained to identify and properly handle and dispose of them.
- 5.1.2 This procedure is intended to safeguard employees against the hazards of lead exposure in accordance with 29 CFR 1926.62.
- 5.1.3 Lead is a common material found both in the home and workplace and commonly found in paints, batteries, solder, lubricants, etc. Lead exposure primarily occurs through inhalation or ingestion and may occur by absorption throughout. Organs within the body will absorb some of the lead and some will be excreted. Human contamination by lead can be measured by blood analysis.
- 5.1.4 Performing safe work practices and personal hygiene requirements as directed in this plan greatly reduces the potential for lead contamination to employees and possible lead exposure to family members.

5.2 Definitions.

- 5.2.1 **Permissible Exposure Limit (PEL):** The PEL is the maximum concentration, averaged over an 8-hour period, which is considered safe by OSHA Standard. The PEL for airborne lead is 50 micrograms of lead per cubic meter ($50 \mu\text{g}/\text{m}^3$) of breathing air averaged over an 8-hour period. The formula to determine the PEL for other exposure time periods is: $\text{PEL (in } \mu\text{g}/\text{m}^3) = 400 / \text{number of hours worked}$.
- 5.2.2 **Action Level:** The Action Level is the lowest concentration of hazardous materials which requires that employees must begin to use Personal Protective Equipment (PPE). The Action Level for airborne lead is 30 micrograms per cubic meter of breathing air ($30 \mu\text{g}/\text{m}^3$).
- 5.2.3 **Personal Protective Equipment:** Protective gear, including (but not limited to) gloves, coveralls or similar full body work clothing, adequate respiratory protection with HEPA filter cartridges, boots, hardhat, safety glasses, etc.

5.3 Training of Employees.

- 5.3.1 All employees who may be exposed to lead above the action level of $30 \mu\text{g}/\text{m}^3$ must receive information and training regarding hazards of lead exposure, protective measures that must be taken and other requirements of applicable

OSHA Standards. Training shall be provided at the time of hire, during orientation, or before initial assignment, and annually thereafter; unless the employee is no longer working where exposure above the action level is possible in accordance with the Hazard Communication Program. All lead training shall be documented.

5.4 **Blood Lead Testing.**

5.4.1 Any employee who will be exposed to lead above the action level shall have the opportunity for blood level analysis for lead. Although the employee is not required to have blood testing performed, the test is the only method available to determine the past and continuing exposure to lead.

5.4.2 Any employee exposed at or above the action level for more than 30 days in any 12 consecutive months shall have his/her blood analyzed for lead.

5.4.2.1 A level of lead in the blood above 25 µg/dl shall cause a work practice assessment by the supervisor and the Safety Department.

5.4.2.2 An employee whose blood level exceeds 40 µg/dl shall be removed from the lead contaminated environment until 2 consecutive blood analyses at 2-month intervals indicate that the blood lead level is below 40 µg/dl.

5.4.3 The Company's occupational health care provider will provide blood level testing as needed.

5.5 **Determining if a Material Contains Lead.**

5.5.1 When material which may contain lead must be repaired, demolished, burned, welded, blasted, ground, sanded or otherwise disturbed, the first step taken must be to determine if the coating contains lead using a "Lead Test Kit", or by using an x-ray florescence analyzer or through record keeping. Record keeping consists of determining through documentation whether or not the material contains lead.

5.5.2 If a material is known to be lead-free, through certification provided by a vendor or supplier, no further testing for lead need be performed.

5.5.3 In the event of an emergency repair or if it is impossible or impractical to determine if a material contains lead, either by record keeping or testing, then the material must be presumed to contain lead.

5.5.4 If it is determined a material contains lead, employees must abide by any signs/labels/assessment reports indicating the presence of lead containing materials. Appropriate work practices must be followed to ensure the lead containing materials are not disturbed.

5.6 Required Documentation.

- 5.6.1 Whenever **SARGENT CORPORATION** employees will perform a task that disturbs lead containing materials, the Competent Person shall complete the Lead in Construction Permit (copy attached) for each task performed.
- 5.6.2 All records involving lead abatement work shall be maintained at the home office in Stillwater, Maine for a period of at least 30 years. The records include but are not limited to:
 - 5.6.2.1 Lead surveys; and
 - 5.6.2.2 Lead abatement permits; and
 - 5.6.2.3 Personal air monitoring and blood lead level test results.

5.7 Air Quality Monitoring.

- 5.7.1 When work with lead containing materials is being performed, air monitoring shall be conducted to ensure no employee is exposed to airborne lead in excess of the Action Level (30 $\mu\text{g}/\text{m}^3$).
- 5.7.2 Monitoring procedure. The air quality within the breathing zone of a key employee(s) shall be monitored by use of a “Sensidyne” BDX 530 Air Sampling Pump (or equivalent) equipped with “AA” type filter cartridge. The cartridges shall be submitted to The Scott Lawson Group, LTD., 20 Chenell Drive, P.O. Box 3304, Concord, NH 03301 (or other competent laboratory) for analysis.
- 5.7.3 An **Initial Exposure Assessment** shall be conducted to determine if any employee may be exposed above the action level.
 - 5.7.3.1 Personal samples representative of a full shift shall be collected and analyzed for each job classification in each work area.
 - 5.7.3.2 If the initial exposure assessment reveals employee exposure is below the action level, additional monitoring is not required unless there is a change in conditions which may result in increased employee exposure to lead, such as but not limited to: changes in the work environment, equipment, process, control, personnel, or a new task has been initiated.
- 5.7.4 **Monitoring Frequency.** If the initial exposure assessment or a follow-up assessment reveals employee exposure above the action level, air quality monitoring shall be repeated every 3 months until at least two consecutive measurements, taken at least 7 days apart, are below the action level at which time monitoring may be discontinued except as provided in §5.7.3.2 above.

5.8 Personal Protective Equipment (PPE).

5.8.1 **Respiratory Protection.** All workers performing work on lead containing materials shall be provided with adequate respiratory protection for the task as described in OSHA 1926.62(d)(2) and 1926.62(f).

5.8.1.1 Until the employee exposure assessment is completed, it shall be assumed that airborne lead exposure is above the PEL and respiratory protection shall be provided and used for lead related tasks as follows:

- a. Half-face respirator with HEPA filters: manual demolition of structures, manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems.
- b. Full-face respirator with HEPA filters: using lead containing mortar, rivet busting, power tool cleaning without dust collection systems, cleanup activities where dry expendable abrasives are used, and abrasive blasting enclosure movement and removal.
- c. Supplied air system: abrasive blasting, cutting, and torch burning.

5.8.1.2 Once the actual employee exposure is known, respiratory protection shall be provided and used as follows:

- a. 0 - 30 $\mu\text{g}/\text{m}^3$: respiratory use is optional, at employee discretion.
- b. 31 – 500 $\mu\text{g}/\text{m}^3$: half-face respirator with HEPA filters.
- c. 501 – 2500 $\mu\text{g}/\text{m}^3$: full-face respirator with HEPA filters.
- d. Over 2500 $\mu\text{g}/\text{m}^3$: supplied air system.

5.8.1.3 All requirements of the **SARGENT CORPORATION** Respiratory Protection Plan (HASP Section X), including medical evaluation, training, respirator fit test, and maintenance shall be in effect.

5.8.2 Other PPE including but not limited to disposable gloves, coveralls, and boot covers shall be supplied and its use required as appropriate to ensure lead containing dusts are not carried from the site on employee clothing, boots, and equipment.

5.9 Personal Hygiene.

5.9.1 Employees who are exposed to lead contamination can greatly reduce the risk of exposure to themselves and to others through consistent and strict personal hygiene. Airborne lead dust will cling to clothing, hair, skin, tools and equipment and can be easily carried away from the workplace. Workers using Level C personal protection (described above) where airborne exposure to lead is above the PEL shall proceed as follows:

5.9.1.1 Prior to beginning work, employees shall don clean PPE.

- 5.9.1.2 When work is complete or when employees are leaving the work area, a HEPA vacuum shall be used to gather loose lead dust from the suit, face and respirator.
 - 5.9.1.3 While still wearing the respirator, remove all outer protective clothing. Place disposable contaminated items in a container designated for that purpose (typically a 6-mil poly bag or a sealable drum labeled "Lead").
 - 5.9.1.4 Wet-wipe the outside of the respirator and any exposed skin to remove lead containing dust; remove respirator cartridges. Dispose of lead contaminated materials and cleaning supplies in the properly labeled container.
 - 5.9.1.5 Remove the respirator and immediately proceed to the wash area; wash face, hands and any exposed skin; proceed to the shower area (where provided) for a full body shower including hair.
 - 5.9.1.6 Dispose of any 6-mil poly bags containing lead contaminated materials in "Lead" labeled drums for proper disposal along with other lead containing wastes from the project.
- 5.9.2 Health effects of lead exposure. Common symptoms of acute lead poisoning are loss of appetite, nausea, vomiting, stomach cramps, constipation, difficulty in sleeping, fatigue, moodiness, headache, joint or muscle aches, and anemia. Long term (chronic) overexposure to lead may result in severe damage to the blood-forming, nervous, urinary, and reproductive systems.

5.10 Site Preparation.

- 5.10.1 Prior to the beginning of work, the supervisor shall ensure that signs are posted to warn that lead containing materials work is ongoing, and that red barrier tape is placed around the perimeter of the work area. Plastic sheeting or other practical means shall be used as necessary to prevent lead containing dust from contaminating lower levels and adjacent areas. Whenever possible, dust-collecting attachments connected to a HEPA filtered vacuum shall be used on grinding and cutting tools.
- 5.10.2 Upon completion of the work, all remaining lead containing materials shall be cleaned and properly stored. All tools and other equipment exposed to lead contamination shall be decontaminated using water, wipes, HEPA vacuum, and/or other appropriate means. Shoveling, dry or wet sweeping, and brushing may be used only where other equally effective methods have been tried and found not to be effective. Compressed air shall not be used to remove lead from any surface.
- 5.10.3 Multi-Contractor Worksites. If employees working immediately adjacent to a lead abatement activity are exposed to lead due to the inadequate containment of

such job, they shall either be removed from the area until the enclosure breach is repaired or initial exposure assessment is performed.

5.10.4 A carrier licensed to transport lead containing wastes shall remove the temporary lead waste storage containers to a secure landfill licensed for lead disposal.

5.11 **Lead Paint.** Equipment and materials manufactured and painted prior to 1980 shall be tested for lead paint prior to sandblasting, grinding, cutting, or otherwise generating dusts or fumes from the painted surfaces.

5.12 Summary of Lead in Construction and Lead Abatement Standards

OSHA Requirements	< 30 µg/m ³	30 to 50 µg/m ³	> 50 µg/m ³
Sampling Frequency	Initial & with production change	Initial, with production change and at least every 6 months	Initial, with production change, and quarterly
Sampling Notification	Within 5 days in writing to employee	Within 5 days in writing to employee	Within 5 days in writing to employee plus description of corrective action
Written Compliance Program	None required	None required	Prior to commencing job and revised/updated every 6 months
Respiratory Protection	Provide if requested	Provide if requested	Provide, require use
Respirator Program	Yes, if respirators are used	Yes, if respirators are used	YES
Personal Protective Clothing	Level D	Level D	Level C, including Tyvek suit, gloves, boots, and respirator with HEPA filters
Housekeeping	Surfaces maintained as free as practicable from accumulations of lead containing dust. ❖ HEPA filtered vacuuming used wherever possible ❖ No compressed air to be used for cleaning clothing or surfaces ❖ Shoveling, brushing and dry or wet sweeping only as last resort		
Food, Beverages, Tobacco and Cosmetics	No restrictions	No restrictions	Prohibited in work area
Change Areas	Not required	Not required	Separate change area with clothes storage
Showers	Not required	Not required	Provided where feasible
Eating Facilities	No special requirements	No special requirements	Must be provided and be clean. Workers must wash hands & face prior to eating
Washing Facilities	Required	Required	Required
Medical Surveillance	Not required	Made available	Required
Employee Training	Required at initial start up	Required at initial start up	Required at initial startup and annually
Sign and Barriers	Not required	Not required	Required
Record Keeping:	Required	Required	Required
Exposure Records	Required if conducted	Required if conducted	Required
Medical Records	Required if used	Required if used	Required
Respirators			

5.13 LEAD IN CONSTRUCTION PERMIT

Project Location: _____ Date: _____

Supervisor: _____

Project Description: _____

1. Has work surface been tested for lead? _____ Yes _____ No

If yes, state test method: _____

If no, state why not: _____

2. Give a brief description of lead hazards/procedures:

3. PPE required: _____ Tyvek _____ Gloves _____ Respirator _____ Boots

_____ Area barricaded/sign erected; access restricted to employees involved.

_____ Change room set up with disposal bags.

_____ Air quality monitoring in place.

_____ Hygiene Facilities in place.

_____ Housekeeping addressed.

FINAL CLEARANCE CHECK LIST

_____ Work area decontaminated with HEPA Vacuum or damp cleanup.

_____ Contaminant material removed & properly disposed of.

_____ PPE decontaminated & properly disposed of.

_____ Barricades and signs removed.

Signature of person issuing permit_____
Signature of supervisor

6.0 OIL & FUEL SPILLS

6.1 Reporting Requirements.

6.1.1 The **U. S. Environmental Protection Agency** (EPA) requires a telephone report to the National Response Center at 800-424-8802 for any oil spill that causes a film or “sheen” on a navigable surface water body or its adjoining shoreline.

6.1.2 The state of **Maine** requires that each oil, gasoline, and diesel fuel spill shall be reported to the Department of Environmental Protection (DEP) within two hours after the spill.

6.1.2.1 There is no minimum quantity for this requirement.

6.1.2.2 Under Maine law, a person responsible for an oil spill is exempt from civil enforcement penalties so long as the discharge is reported within two hours of its discovery and is promptly cleaned up to the DEP’s satisfaction.

6.1.2.3 The contacts and call numbers for oil spill reporting in Maine are:

- | | |
|------------------------------|--------------|
| a. Emergency Spill Statewide | 800-482-0777 |
| b. Augusta Area | 207-287-3901 |
| c. Bangor Area | 207-941-4570 |
| d. Portland Area | 207-822-6300 |
| e. Presque Isle Area | 207-764-0477 |

6.1.3 In **New Hampshire**, an oil spill of 25 gallons or more must be immediately reported to the Department of Environmental Services (DES) Waste Management Division at 603-271-3899 (Monday through Friday, 8 a.m. to 4 p.m.), or to the New Hampshire Department of Safety at 800-346-4009 (24 hours/day).

6.1.4 In **North Carolina**,

6.1.5 In **Vermont**, the Department of Environmental Conservation (DEC) Waste Management Division’s Spill Response Team assesses the environmental impact of hazardous materials spills, oversees the cleanup of spills, and enforces environmental regulations triggered by spills. To report an oil or other petroleum spill, call 802-241-3888 during business hours, or 800-641-5005 for 24 hour reporting. For more information about reporting requirements, call Marc Roy at 802-241-3874.

6.1.6 In **Virginia**, an oil spill of 25 gallons or more must be immediately reported to the nearest Department of Environmental Quality (DEQ) regional office.

6.1.6.1 The call numbers for the Virginia regional offices are:

- | | |
|-----------------------------------|--------------|
| a. Northern Virginia – Woodbridge | 703-583-3800 |
| b. Valley Region – Harrisonburg | 540-574-7800 |

- c. West Central Region – Roanoke 540-562-6700
- d. Piedmont Region – Glen Allen 804-527-5020
- e. Southwest Region – Abingdon 276-676-4800
- f. South Central Region – Lynchburg 434-582-5120
- g. Tidewater Region – Virginia Beach 757-518-2000

6.1.7 In **Maryland**, an oil spill of any quantity must be reported to the Maryland Department of the Environment (MDE) Emergency Response Division, usually within two hours of the spill incident. Call 866-633-4686 for 24 hour spill reporting. The Emergency Response office number is 410-537-3932.

6.1.8 Reporting requirements vary from state to state. In the event of an oil spill in a state not listed above, please contact your Safety Director or Project Manager to research the local reporting requirements.

6.2 **Cleanup Requirements.**

6.2.1 All petroleum spills must be immediately cleaned up and removed from project sites.

6.2.2 In general, a small and localized spill should be cleaned up and taken to an approved landfill for disposal. In Maine, oil contaminated soils, absorbent pads, and other cleanup waste materials are classified as “non-hazardous special wastes”.

6.2.3 Larger quantities of contaminated soils may be recycled at a paving plant or other approved facility.

6.2.4 Your state environmental agency reporting contact will provide guidance in the most cost effective and environmentally safe means to dispose of oil contaminated soils.

X. RESPIRATORY PROTECTION PLAN

(Updated 11/29/17)

1.0 PURPOSE

- 1.1 **Provide Protection from Respiratory Hazards.** SARGENT CORPORATION has determined that employees may be exposed to respiratory hazards during routine work operations. These hazards may include dusts, mists and other particulates, as well as gases and vapors. The purpose of this program is to ensure that all employees are protected from these respiratory hazards.
- 1.2 **Primary Line of Defense.** Engineering controls such as general or local ventilation and use of wet methods when cutting or sanding concrete, rock, asphalt, and similar products shall be used whenever possible to prevent atmospheric contamination and silica exposure in the workplace. Respirators are to be used as the primary control of respiratory hazards only where engineering and administrative controls alone cannot control the hazards, or while engineering controls are being installed.

2.0 SCOPE AND APPLICATION

- 2.1 **Required Use of Respirators.** This program applies to all employees who are required to wear respirators during normal work activities, and during some non-routine or emergency activities. This section does not allow for work in situations where atmospheric conditions are immediately dangerous to life or health (IDLH).
- 2.2 **Voluntary Use of Respirators.** Voluntary use is when an employee chooses to wear a respirator, even though the use of a respirator is not required by either the employer or by any OSHA standard.
 - 2.2.1 An employee who voluntarily uses a respirator (except those who voluntarily use a dust mask) shall also be subject to the elements of this program that pertain to medical evaluation and procedures for cleaning, inspecting, storing, discarding, and otherwise maintaining respirators.
 - 2.2.2 Any employee who voluntarily wears a respirator shall be provided with the information and requirements for non-mandatory respirator usage (Appendix D) as detailed in §6.0 of this Respiratory Protection Plan.
 - 2.2.3 Except for the requirements of Appendix D, employees who voluntarily wear filtering face pieces (dust masks) are not subject to the other elements of this Respiratory Protection Plan.

3.0 RESPONSIBILITIES

- 3.1 **The Safety Director** is responsible for this program and has full authority to make decisions to ensure the safety of employees.
- 3.2 **Supervisors** must ensure that employees follow all elements of this program.
- 3.3 **All Employees** must wear a respirator when required and follow proper respiratory protection procedures.

4.0 PROGRAM ELEMENTS

- 4.1 **When Respirators are Required.** Each employee performing intrusive work in a hazardous atmosphere shall be provided with and be required to use proper respiratory protection whenever engineering controls alone cannot eliminate the hazard. Employees whose work causes them to be exposed to silica dust, such as rock crushing operations or cutting/sanding pavement or concrete, shall use wet methods to eliminate as much dust as possible. If any dust remains visible in the air, they shall also at minimum wear an N-95 disposable HEPA respirator to reduce dust exposure to acceptable levels.
- 4.2 **Program Training.** Each affected employee shall be instructed in the elements and procedures of this respiratory program.
- 4.3 **Medical Evaluation.** Employees shall not be assigned tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. Each employee required to wear a respirator shall fill out the Respirator Medical Evaluation Questionnaire found on the following pages. The questionnaire shall be sent directly to the company's Medical Review Officer who will then evaluate the need for a physical or pulmonary function test (PFT). A copy of the PFT will be made available to the employee and will be kept on file at the project office and at the **SARGENT CORPORATION** corporate office at 378 Bennoch Road, Stillwater, ME 04489 for a period of not less than 30 years.
- 4.4 **Respirator Selection.** Respirators shall be selected on the basis of hazards to which the worker is exposed. Only NIOSH certified respirators shall be selected and used.
- 4.5 **Respirator Use Training.** Each user shall be instructed and trained in the proper use of respirators and their limitations, including general requirements of 29 CFR 1910.134. Training will provide an opportunity for the employee to become familiar with the respirator, have it properly fitted, and wear it in normal air for at least 5 minutes. Every respirator wearer shall receive instruction on donning and doffing the respirator and adjusting it for proper fit. They shall be instructed in proper maintenance requirements, and symptoms of exposure.

- 4.6 **Proper Fit Required.** Prior to using a respirator, employees shall be given a qualitative fit test to ensure the size and shape of the respirator allows for a proper seal to the user's face. Respirators shall not be worn when conditions prevent a good face seal. Such conditions may include a growth of beard, sideburns, a skull cap that projects under the face piece, or glasses. Employees who are required to wear respirators must be clean shaven where the face piece to face seal occurs. To assure proper protection, the wearer shall follow the manufacturer's face piece fitting instructions to check the face piece fit each time the wearer puts on the respirator.
- 4.7 **Individual Use.** Respirators will be assigned to individual workers for their exclusive use.
- 4.8 **Cleaning Requirements.** Respirators shall be regularly cleaned, disinfected, inspected, and properly stored at the end of each day's use or more often if necessary.
- 4.8.1 Respirators shall be cleaned and disinfected following manufacturer recommendations. At a minimum, the employee who has worn the respirator (or a designated person) shall remove and dispose of the cartridges, wash the mask with soap and water, rinse in a bleach/water bath, dry the mask, examine all valves and parts for wear and place the mask in a sealed plastic bag.
- 4.8.2 Respirators shall be cleaned and stored in a clean, dry, and sanitary location.
- 4.8.3 During cleaning, respirators shall be inspected. Worn or deteriorated parts shall be replaced. Respirators for emergency use such as self-contained devices shall be thoroughly inspected at least once a month and after each use. Inspection for SCBA breathing gas pressure shall be performed weekly.
- 4.9 **Filter Replacement Schedule.**
- 4.9.1 Employees wearing Air Purifying Respirators (APR) for protection against particulates such as dust, mists, or fumes shall leave the work area and discard their filtering face piece (dust mask) or change filters when breathing becomes difficult.
- 4.9.2 Employees wearing APRs for protection against gases or vapors must discard their cartridges or canisters at the end of each work day or more often if directed by the safety department.
- 4.10 **Daily Inspections.** Continual surveillance of work area conditions and degree of employee exposure or stress shall be maintained by the Competent Person.
- 4.11 **Program Effectiveness.** Regular inspection and evaluation shall be conducted to determine the continued effectiveness of the program. The Safety Director will make frequent inspections of all areas where respirators are used to ensure compliance with the Respiratory Protection Plan.

- 4.12 **Annual Refresher Training and Fit Testing.** Retraining and respirator fit tests shall occur annually or sooner if changes in the workplace require it, if the employee's physical condition changes, or if the employee has not retained the requisite understanding.

5.0 SILICA EXPOSURE CONTROL PLAN

- 5.1 **Purpose.** The purpose of this document is to establish and implement a written exposure control plan that identifies tasks involving silica exposure and methods used to protect employees.
- 5.2 **Applicable Standards.** The following standards are applicable for respirable crystalline silica at Sargent Corporation projects and shops:
- 1926.1153 – Respirable Crystalline Silica
- 5.3 **Scope.** The Silica Exposure Control Plan applies to all Sargent Corporation employees who are expected to be exposed to respirable crystalline silica as detailed in Table 1 below.
- 5.4 **Responsibilities.** Employees will be trained on the hazards, control methods and precautions associated with silica exposure.
- 5.4.1 Supervisors shall implement and ensure procedures are followed in accordance with this Plan. They will discuss the details of implementation, provide the equipment and methods of control (engineering controls, work practice controls and PPE) at their project where activities involve respirable crystalline silica. If any activities at the project are not covered under Table 1, the supervisor should contact the safety department for assistance to evaluate exposure levels.
- 5.4.2 Employees shall follow the training they receive regarding silica exposure, work methods and hazard control. They shall follow the plan, the procedures provided on Table 1, and utilize and maintain the dust suppression systems provided for each tool.
- 5.4.3 Housekeeping. Dry sweeping or dry brushing shall not be allowed where such activity could result in employee exposure to respirable crystalline silica. Wet sweeping or HEPA filtered vacuuming shall be used. In addition, compressed air shall not be used to clean clothing or surfaces where such activity could contribute to employee exposure to crystalline silica.

Table 1: Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
1	Stationary masonry saws	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
2a	Handheld power saws (any blade diameter) when used outdoors	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
2b	Handheld power saws (any blade diameter) when used indoors or in an enclosed area	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
3	Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less) for tasks performed outdoors only	- Use saw equipped with commercially available dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	None	None
4a	Walk-behind saws when used outdoors	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
4b	Walk-behind saws when used indoors or in an enclosed area	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
5	Drivable saws for tasks performed outdoors only	- Use saw equipped with integrated water delivery system that continuously feeds water to the blade. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
6	Rig-mounted core saws or drills	Use tool equipped with integrated water delivery system that supplies water to cutting surface.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.		
7	Handheld and stand-mounted drills (including impact and rotary hammer drills)	- Use drill equipped with commercially available shroud or cowling with dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. - Use a HEPA-filtered vacuum when cleaning holes.	None	None
8	Dowel drilling rigs for concrete for tasks performed outdoors only	- Use shroud around drill bit with a dust collection system. - Dust collector must have a filter with 99% or greater efficiency and a filter cleaning mechanism. - Use a HEPA-filtered vacuum when cleaning holes.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
9a	Vehicle-mounted drilling rigs for rock and concrete	Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector.	None	None
9b	Vehicle-mounted drilling rigs for rock and concrete	Operate from within an enclosed cab and use water for dust suppression on drill bit.	None	None
10a	Jackhammers and handheld powered chipping tools when used outdoors	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10b	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
10c	Jackhammers and handheld powered chipping tools when used outdoors	- Use tool equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the tool manufacturer, or	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.		
10d	Jackhammers and handheld powered chipping tools when used indoors or in an enclosed area	- Use tool equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask
11	Handheld grinders for mortar removal (i.e., tuckpointing)	- Use grinder equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask	Powered Air-Purifying Respirator (PAPR) with P100 Filters
12a	Handheld grinders for uses other than mortar removal for tasks performed outdoors only	- Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
12b	Handheld grinders for uses other than mortar removal when used outdoors	- Use grinder equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	None	None
12c	Handheld grinders for uses other than mortar removal when used indoors or in an enclosed area	- Use grinder equipped with commercially available shroud and dust collection system. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism.	None	N95 (or Greater Efficiency) Filtering Facepiece or Half Mask

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
13a	Walk-behind milling machines and floor grinders	- Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None
13b	Walk-behind milling machines and floor grinders	- Use machine equipped with dust collection system recommended by the manufacturer. - Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. - Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism. - When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes.	None	None
14	Small drivable milling machines (less than half-lane)	- Use a machine equipped with supplemental water sprays designed to suppress dust. - Water must be combined with a surfactant. - Operate and maintain machine to minimize dust emissions.	None	None
15a	Large drivable milling machines (half-lane and larger) for cuts of any depth on asphalt only	- Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. - Operate and maintain machine to minimize dust emissions.	None	None
15b	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	- Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust. - Operate and maintain machine to minimize dust emissions.	None	None
15c	Large drivable milling machines (half-lane and larger) for cuts of four inches in depth or less on any substrate	- Use a machine equipped with supplemental water spray designed to suppress dust. - Water must be combined with a surfactant. - Operate and maintain machine to minimize dust emissions.	None	None
16	Crushing machines	- Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points). - Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions.	None	None

Construction Task or Equipment Operation		Engineering and Work Practice Control Methods	Required Respiratory Protection	
			≤ 4 hours/shift	>4 hours/shift
		Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station.		
17a	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	Operate equipment from within an enclosed cab.	None	None
17b	Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None
18a	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	Apply water and/or dust suppressants as necessary to minimize dust emissions.	None	None
18b	Heavy equipment and utility vehicles for tasks such as grading and excavating but not including demolishing, abrading, or fracturing silica-containing materials	When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab.	None	None

5.5 The following shall be implementing when utilizing the control measures specified in Table 1:

- 5.5.1 For tasks performed indoors or in enclosed areas, provide a means of exhaust as needed to minimize the accumulation of visible airborne dust;
- 5.5.2 For tasks performed using wet methods, apply water at flow rates sufficient to minimize release of visible dust;
- 5.5.3 For measures implemented that include an enclosed cab or booth, ensure that the enclosed cab or booth:
 - 5.5.3.1 Is maintained as free as practicable from settled dust;
 - 5.5.3.2 Has door seals and closing mechanisms that work properly;
 - 5.5.3.3 Has gaskets and seals that are in good condition and working properly;
 - 5.5.3.4 Is under positive pressure maintained through continuous delivery of fresh air;
 - 5.5.3.5 Has intake air that is filtered through a filter that is 95% efficient in the 0.3-10.0 μm range (e.g., MERV-16 or better); and
 - 5.5.3.6 Has heating and cooling capabilities.
- 5.5.4 Where an employee performs more than one task included on OSHA's Construction Standard Table 1 during the course of a shift, and the total duration of all tasks combined is more than four hours, the required respiratory protection for each task is the respiratory protection specified for more than four hours per shift. If the total duration of all tasks on Table 1 combined is less than four hours, the required respiratory protection for each task is the respiratory protection specified for less than four hours per shift.
- 5.6 Alternative Exposure Control Methods apply for tasks not listed in OSHA's Construction Standard Table 1, or where engineering controls, work practices, and respiratory protection described in Table 1 cannot not fully and properly implemented. The exposure of each employee who is or may reasonably be expected to be exposed to Respirable Crystalline Silica at or above the Action Level will be assessed in accordance with the Performance Option.
 - 5.6.1 **Performance Option.** Assess the 8-hour TWA exposure for each employee on the basis of any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures to Respirable Crystalline Silica.

6.0 **VOLUNTARY RESPIRATOR USE**

- 6.1 **Medical Evaluation.** Employees are required to undergo a medical evaluation prior to voluntary use of a half-face or full-face respirator. A medical evaluation is not required for voluntary use of a filtering facepiece (dust mask).
- 6.3 **Appendix D.** Employees voluntarily using respirators when not required shall be provided with a copy of 29 CFR 1910.134 Appendix D: “Information for Employees Using Respirators When Not Required under the Standard,” which follows:

APPENDIX D

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substances does not exceed the exposure limits set by OSHA. If **SARGENT CORPORATION** provides respirators for your voluntary use, or you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

1. Read and follow all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator’s limitations.
2. Choose respirators certified for use to protect against the contaminants of concern. NIOSH, the National Institute for Occupational Safety and Health, certifies respirators. A label or statement of certification should appear on the respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke. Cartridge type respirators do not provide protection in an oxygen deficient environment.
4. Keep track of your respirator so that you do not mistakenly use someone else’s respirator.

Mandatory OSHA Respirator Medical Evaluation Questionnaire

SARGENT CORPORATION
P.O. Box 435, 378 Bennoch Road
Stillwater, ME 04489
Phone: 207-827-4435 Fax: 207-827-2945

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee: Can you read (circle one): Yes/No

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Please fax to: _____

(Note: To review this questionnaire with a healthcare professional, you may contact the HR Department at Stillwater who will schedule an appointment for you.

Part A. Section 1. (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date: _____
2. Your name: _____
3. Your date of birth: _____
4. Sex (circle one): Male/Female
5. Your height: _____ ft. _____ in.
6. Your weight: _____ lbs.
7. Your job title: _____
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____
9. The best time to phone you at this number: _____

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No

11. Check the type of respirator you will use (you can check more than one category):

- a. _____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
- b. _____ Other type (for example, half- or full-face type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you ever worn a respirator (circle one): Yes/No

If "yes," what type(s): _____

Part A. Section 2. (Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you **currently** smoke tobacco, or have you smoked tobacco in the last month: Yes/No

2. Have you **ever had** any of the following conditions?

- a. Seizures (fits): Yes/No
- b. Diabetes (sugar disease): Yes/No
- c. Allergic reactions that interfere with your breathing: Yes/No
- d. Claustrophobia (fear of closed-in places): Yes/No
- e. Trouble smelling odors: Yes/No

3. Have you **ever had** any of the following pulmonary or lung problems?

- a. Asbestosis: Yes/No
- b. Asthma: Yes/No
- c. Chronic bronchitis: Yes/No
- d. Emphysema: Yes/No
- e. Pneumonia: Yes/No
- f. Tuberculosis: Yes/No
- g. Silicosis: Yes/No
- h. Pneumothorax (collapsed lung): Yes/No
- i. Lung cancer: Yes/No
- j. Broken ribs: Yes/No
- k. Any chest injuries or surgeries: Yes/No
- l. Any other lung problem that you've been told about: Yes/No

4. Do you **currently** have any of the following symptoms of pulmonary or lung illness?

- a. Shortness of breath: Yes/No
- b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes/No

- c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes/No
- d. Have to stop for breath when walking at your own pace on level ground: Yes/No
- e. Shortness of breath when washing or dressing yourself: Yes/No
- f. Shortness of breath that interferes with your job: Yes/No
- g. Coughing that produces phlegm (thick sputum): Yes/No
- h. Coughing that wakes you early in the morning: Yes/No
- i. Coughing that occurs mostly when you are lying down: Yes/No
- j. Coughing up blood in the last month: Yes/No
- k. Wheezing: Yes/No
- l. Wheezing that interferes with your job: Yes/No
- m. Chest pain when you breathe deeply: Yes/No
- n. Any other symptoms that you think may be related to lung problems: Yes/No

5. Have you **ever had** any of the following cardiovascular or heart problems?

- a. Heart attack: Yes/No
- b. Stroke: Yes/No
- c. Angina: Yes/No
- d. Heart failure: Yes/No
- e. Swelling in your legs or feet (not caused by walking): Yes/No
- f. Heart arrhythmia (heart beating irregularly): Yes/No
- g. High blood pressure: Yes/No
- h. Any other heart problem that you've been told about: Yes/No

6. Have you **ever had** any of the following cardiovascular or heart symptoms?

- a. Frequent pain or tightness in your chest: Yes/No
- b. Pain or tightness in your chest during physical activity: Yes/No
- c. Pain or tightness in your chest that interferes with your job: Yes/No
- d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
- e. Heartburn or indigestion that is not related to eating: Yes/ No
- f. Any other symptoms that you think may be related to heart or circulation problems: Yes/No

7. Do you **currently** take medication for any of the following problems?

- a. Breathing or lung problems: Yes/No
- b. Heart trouble: Yes/No
- c. Blood pressure: Yes/No
- d. Seizures (fits): Yes/No

8. If you've used a respirator, have you **ever had** any of the following problems? (If you've never used a respirator, check the following space and go to question 9) _____

- a. Eye irritation: Yes/No

- b. Skin allergies or rashes: Yes/No
- c. Anxiety: Yes/No
- d. General weakness or fatigue: Yes/No
- e. Any other problem that interferes with your use of a respirator: Yes/No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full-face piece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is not required.

10. Have you **ever lost** vision in either eye (temporarily or permanently): Yes/No

11. Do you **currently** have any of the following vision problems?

- a. Wear contact lenses: Yes/No
- b. Wear glasses: Yes/No
- c. Color blind: Yes/No
- d. Any other eye or vision problem: Yes/No

12. Have you **ever had** an injury to your ears, including a broken ear drum: Yes/No

13. Do you **currently** have any of the following hearing problems?

- a. Difficulty hearing: Yes/No
- b. Wear a hearing aid: Yes/No
- c. Any other hearing or ear problem: Yes/No

14. Have you **ever had** a back injury: Yes/No

15. Do you **currently** have any of the following musculoskeletal problems?

- a. Weakness in any of your arms, hands, legs, or feet: Yes/No
- b. Back pain: Yes/No
- c. Difficulty fully moving your arms and legs: Yes/No
- d. Pain or stiffness when you lean forward or backward at the waist: Yes/No
- e. Difficulty fully moving your head up or down: Yes/No
- f. Difficulty fully moving your head side to side: Yes/No
- g. Difficulty bending at your knees: Yes/No
- h. Difficulty squatting to the ground: Yes/No
- i. Difficulty climbing a flight of stairs or a ladder carrying more than 25 lbs.: Yes/No
- j. Any other muscle or skeletal problem that interferes with using a respirator: Yes/No

SARGENT CORPORATION

Request for Respiratory Medical Evaluation and Clearance
(to be completed by employer)

Fax to: _____

Employer _____

Date Provided _____

Employer Representative _____ Title _____ Phone _____

Employee Name(s) _____ Job Title(s): _____

Type(s) of Respirator to be used: _____

Air-Purifying Respirator: _____

_____ Atmosphere-supplying Respirator: _____

_____ Disposable Filter Mask, Non-Cartridge Type

_____ SCBA

_____ Half Mask or Full-Face Cartridge Type

_____ Supplied Air

_____ PAPR

Exposures Anticipated: (Please be specific)

_____ Particulate: _____

_____ Other Particulates: _____

_____ Vapor/Gases: _____

_____ Other: _____

Level of Work Effort:

_____ Light

_____ Moderate

_____ Heavy

_____ Strenuous

Sitting

Driving truck

Heavy lifting

Heavy Construction

Light Typing

Walking on level at 2

(<50 lbs.)

Assembly work

mph

Shoveling

Push wheelbarrow

Laying Brick

with 100 lbs.

Frequent stairs

Extent of Usage:

_____ Over 4 hrs./day

_____ 2-4 hrs./day

_____ Less than 2 hrs./day

_____ Less than 5 hrs./wk.

_____ Emergency Rescue Only

_____ Escape Use Only (no rescue)

Other Special Considerations:

_____ Confined Space

_____ Temp Extremes

_____ Hazardous Materials

_____ Other Pro. Equip.

_____ >80-90 Degrees

_____ <30 Degrees

Do No Write Below This Line**Medical Evaluation & Frequency Recommendations:**

_____ Annual

_____ Bi-Annual

_____ Tri-Annual

_____ Other _____

_____ Review Questionnaire

_____ Vital Signs

_____ Clinician Exam

_____ PFT

Reviewing Clinician Signature

Date

Set-up Complete

Date

XI. HEARING CONSERVATION PROGRAM

(Adopted 2/20/08; Revised 2/11/09; Updated 11/30/17)

1.0 PURPOSE

- 1.1 Identify work areas and activities that expose employees to noise levels that exceed Permissible Noise Exposure Limits as defined in the table below:

Duration per day, hours	Sound level dBA slow response
12	87
10½	88
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

- 1.2 Implement engineering controls wherever practical in noisy work areas to reduce employee exposure levels to within Permissible Noise Exposure Limits.
- 1.3 Provide hearing personal protective equipment (PPE) in all work areas, and require employees to use hearing protection where engineering controls do not reduce noise exposure to acceptable levels.
- 1.4 Sargent Corporation intends to protect all employees from significant noise exposure that could cause hearing impairment.

2.0 SCOPE AND APPLICATION

- 2.1 Whenever employee noise exposure is equal to or exceeds an 8-hour time-weighted average sound level (TWA) of 85 dBA, the affected employee shall be enrolled in a **Hearing Conservation Program**.

3.0 PROGRAM ELEMENTS

- 3.1 **Noise Monitoring.**
- 3.1.1 Employee noise exposure levels shall be monitored for a variety of work activities. This sampling of noise exposure levels will help identify which employees must be included in the Hearing Conservation Program.

- 3.1.2 Noise level monitoring will be utilized to determine where appropriate engineering controls need to be implemented and/or hearing protection required.
- 3.1.3 Representative personal noise sampling will be performed rather than area monitoring in most cases since most employees are mobile and are not assigned to individual work stations.
- 3.2 **Employee Notification.** Each employee exposed at or above an 8-hour TWA of 85 dBA shall be notified of such exposure.
- 3.3 **Audiometric Testing Program.** Audiometric testing shall be conducted for all employees whose exposures equal or exceed an 8-hour TWA of 85 dBA. Such testing shall be provided at no cost to the employee.
 - 3.3.1 **Baseline Audiogram** – Must be performed within 6 months of the employee’s first exposure at or above an 8-hour TWA of 85 dBA. Prior to completing the baseline audiogram, the employee shall not be exposed to workplace noise for at least 14 hours. This shall provide a comparison point for all future audiograms.
 - 3.3.2 **Annual Audiogram** – After obtaining the baseline audiogram, a new audiogram shall be performed at least annually for each employee exposed at or above an 8-hour TWA of 85 dBA.
 - 3.3.3 A **Standard Threshold Shift** is a change in hearing threshold relative to the baseline audiogram of an average of 10 dBA or more at 2000, 3000, and 4000 HZ in either ear.
 - 3.3.3.1 If an annual audiogram indicates a standard threshold shift, Sargent Corporation may obtain a retest within 30 days and consider the results of the retest as the annual audiogram.
 - 3.3.3.2 An employee whose annual audiogram indicates a standard threshold shift shall be informed of this fact in writing, within 21 days of determination.
 - 3.3.3.3 Unless a physician indicates that the standard threshold shift is not work related or aggravated by noise exposure in the workplace, Sargent Corporation shall take all necessary corrective and preventative steps as listed in OSHA 1910.95 (g)(8)(ii).
 - 3.3.4 **Evaluation of Audiogram** – Shall be performed by an audiologist.
- 3.4 **Training Requirements.** Hearing Conservation Training shall be included in safety orientations for newly hired employees. In addition, training shall be provided annually to any employees enrolled in the hearing conservation program. The training shall include the following topics:

- 3.4.1 The rules and procedures of this Hearing Conservation Program.
- 3.4.2 Requirements for employee use of hearing protection when noise levels exceed the limits listed in section 1.1 above.
- 3.4.3 Proper methods for selection, use, and care for hearing protection.
- 3.4.4 Effects of noise on hearing and hearing loss.

4.0 RESPONSIBILITIES

4.1 Management Responsibilities.

- 4.1.1 Conduct noise surveys whenever new equipment, new activities, or work conditions create noise levels that could potentially exceed 85 dBA. Accurate records of employee exposure monitoring shall be maintained.
- 4.1.2 Carefully check and calibrate instruments used to monitor noise levels.
- 4.1.3 Provide hearing conservation training for all employees that are or could be exposed to noise levels that exceed 90 dBA.
- 4.1.4 Implement engineering and administrative controls to limit or reduce employee noise exposure.
- 4.1.5 Develop and provide a list of work activities and the typical noise exposure levels associated with each activity. Post warning signs at locations that regularly have high noise levels.
- 4.1.6 Provide adequate hearing protection for employees at all jobsites. At least two types of earplugs shall be made available and shall be individually fitted for each affected employee. Hearing protectors shall be provided free of charge to employees.
- 4.1.7 Conduct annual hearing tests for all employees who are exposed at or above the 8-hour TWA of 85 dBA.

4.2 Employee Responsibilities.

- 4.2.1 Use company provided and approved hearing protection whenever informed that noise exposure in their work area exceeds OSHA permissible exposure limits as shown in Table D-2.
- 4.2.2 Request and use hearing protection whenever working with or near loud equipment such as a plate tamp, chain saw, pipe saw, impact tool, metal grinder,

or sheet pile driver. If you need to shout to be heard above background noise, you should use hearing protection.

- 4.2.3 Once a person suffers some level of hearing loss, it can never be restored.

5.0 HEARING CONSERVATION CONTROLS

- 5.1 **Engineering Controls.** If noise exposure levels are determined to be above 85 dBA, engineering controls shall be considered prior to implementing administrative controls. Examples of engineering controls include:

5.1.1 Replacing and/or upgrading exhaust mufflers.

5.1.2 Insulating noise producing components or operations.

5.1.3 Installing cabs or shields.

- 5.2 **Administrative Controls.** If engineering controls alone are not sufficient to reduce noise exposure to permissible levels, administrative controls shall be implemented to limit noise exposure. Examples of administrative controls include:

5.2.1 Restricting the time of exposure by rotating job duties.

5.2.2 Posting signs to warn employees of the noise hazard.

5.2.3 Providing hearing personal protective equipment such as ear muffs or ear plugs.

- 5.3 **PPE** for hearing protection shall be provided on all jobsites.

5.3.1 Hearing protection shall be provided for optional use by employees when exposure levels are below 90 dBA.

5.3.2 Use of hearing protection shall be mandatory for employees exposed to noise levels at or above 90 dBA.

XII. BLOODBORNE PATHOGEN EXPOSURE CONTROL PLAN

(Adopted 6/1/1993, Revised 2/19/11, Updated 11/29/17)

1.0 EXPOSURE CONTROL

1.1 Statement of Purpose.

In order to comply with Title 29 CFR 1910.1030, Bloodborne Pathogens, hereafter referred to as the rule, **SARGENT CORPORATION** has implemented a Bloodborne Pathogen Exposure Control Plan. All employees who may be reasonably anticipated to come into contact with human blood and other potentially infectious materials in order to perform their jobs shall be identified as having occupational exposure to blood. Employees in these positions shall be made aware of the potential for exposure and afforded the protection outlined by the referenced rule.

1.2 The Bloodborne Pathogen Exposure Control Plan includes:

1.2.1 Written standard operating procedures

1.2.2 Employee training requirements

1.2.3 Engineering controls and work practice controls designed to prevent exposure

1.2.4 Personal protective equipment

1.2.5 Decontamination procedures for clothing and equipment

1.2.6 A vaccination program at no cost to the employees

1.2.7 The maintenance of confidential medical records of vaccinations; the tracking, reporting and investigation of exposures; and provision for post exposure medical follow up and counseling

1.2.8 A system to monitor compliance with established procedures

1.3 Exposure to bloodborne pathogens shall be considered an occupational health hazard. Any communicable disease contracted as a result of a documented work place bloodborne pathogen exposure shall be an occupationally related incident.

1.4 It is intent of this Plan to provide procedures which, when followed, will prevent employee exposure to bloodborne infectious diseases. To that purpose, strict adherence to this policy is mandatory.

2.0 PLAN MAINTENANCE

- 2.1 **SARGENT CORPORATION** has appointed the Safety Director as administrator for the Plan and is responsible for the Plan's maintenance.
- 2.2 The Plan Administrator shall review the Plan at least annually, or more frequently if necessary to reflect new or modified tasks and procedures that affect occupational exposure and to reflect new or revised employee positions with occupational exposure. All updates shall be made at that time.

3.0 DEFINITIONS

- 3.1 **Blood:** human blood, human blood components and products made from human blood.
- 3.2 **Bloodborne Pathogens:** pathogenic microorganisms that are present in human blood and can cause disease to humans. Included but not limited to hepatitis B virus (HBV) and human immunodeficiency virus (HIV).
- 3.3 **Contaminated:** the presence or reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.
- 3.4 **Contaminated Laundry:** laundry that has been soiled with blood or other potentially infectious materials or may contain contaminated sharps.
- 3.5 **Decontamination:** the use of physical or chemical means to remove, inactivate or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is remedied safe for handling, use or disposal.
- 3.6 **Employee:** includes both paid full time and part time company personnel and those working per diem.
- 3.7 **Engineering Controls:** controls (e.g. sharps disposal containers, self-sheathing needles, etc.) that isolate or remove the bloodborne pathogen hazard from the workplace.
- 3.8 **Exposure Incident:** a specific eye, mouth, or other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials which result from the performance of employee's duties.
- 3.9 **Hand Washing Facilities:** a facility providing an adequate supply of running potable water, soap, and single use towels or hot air drying machines.
- 3.10 **HBV:** Hepatitis B Virus.

- 3.11 **Healthcare Professional:** a person whose legally permitted scope of practice allows him or her to independently perform activities required for Hepatitis B vaccination and post exposure evaluation and follow-up.
- 3.12 **HIV:** Human Immunodeficiency Virus.
- 3.13 **Occupational Exposure:** reasonably anticipated skin, eye, mucous membrane or parenteral contact with blood or other potentially infectious material that may result from the performance of an employee's duties.
- 3.14 **Other Potentially Infectious Material:** the following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, and other body fluids in situations where it is difficult or impossible to differentiate between body fluids, any unfixed tissue or organ (other than intact skin) from a human (living or dead).
- 3.15 **Parenteral:** piercing mucous membranes or the skin barrier through such events as needle sticks, cuts and abrasions.
- 3.16 **Pathogens:** microorganisms capable of producing disease.
- 3.17 **Personal Protective Equipment:** specialized clothing or equipment worn by an employee for protection against a hazard (general work clothes are not intended to function as protection against a hazard). Here on referred to as PPE.
- 3.18 **Plan Administrator:** individual appointed by **SARGENT CORPORATION** to administer the company's "Bloodborne Pathogen Exposure Control Plan."
- 3.19 **Regulated Waste:** liquid or semi-liquid blood or other potentially infectious materials: contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.
- 3.20 **Source Individual:** any individual living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee.
- 3.21 **Sterilize:** the use of a physical or chemical procedure to destroy all microbial life including highly resistance bacterial endospore.
- 3.22 **Universal Precautions:** an approach to infection control, according to the concept that all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV and other bloodborne pathogens.

- 3.23 **Workplace Practice Controls:** controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g. prohibiting recapping of needles by a two handed technique).

4.0 OCCUPATIONAL EXPOSURE

- 4.1 At present, no personnel at **SARGENT CORPORATION** have been identified as having occupational exposure as defined in 29 CFR 1910.1030.
- 4.2 Personnel in job classifications such as medical doctors, nurses, medical emergency first responders, and medical facility workers who clean up and dispose of medical wastes are identified as having occupational exposure. Should **SARGENT CORPORATION** employ personnel in these or other classifications having occupational exposure, the personnel shall be covered by the requirements of this Plan. They shall receive appropriate training as outlined in this Plan at least annually and prior to starting in one of these classifications.
- 4.3 Should an employee, not identified as having occupational exposure, have an exposure incident, it is anticipated to be an isolated and unique incident. The employee will receive appropriate training related to the occupational exposure, and will receive the same treatment following an exposure incident. The employee shall be offered the Hepatitis B vaccinations at no cost as a post-exposure precaution.
- 4.4 Each employee identified as having occupational exposure shall be offered the Hepatitis B vaccinations at no cost. Employees may waive the vaccination but must do so in written format. The declination form is attached to this plan. Employees who decline may change their mind at any time and request to be vaccinated. New employees in positions identified as having occupational exposure shall be offered the vaccination within ten days of employment.

5.0 LIST OF TASKS

- 5.1 This paragraph is reserved for future Plan updates as appropriate.

6.0 UNIVERSAL PRECAUTIONS

- 6.1 It is the policy of **SARGENT CORPORATION** that all human blood and other potentially infectious materials as defined in 29 CFR 1910.1030 shall be treated as if known to be infectious for HIV, HBV and other bloodborne pathogens.
- 6.2 All proper exposure controls shall be observed whenever dealing with any of these materials.

- 6.3 An exposure incident that results from the willful disregard of the proper use of personal protective equipment as stated in this Plan will be considered a willfully reckless and negligent act.
- 6.4 Any known exposure incident resulting from lack of use of proper protective equipment will be fully investigated and documented by the Plan Administrator to determine if changes can be made to prevent such occurrences in the future.

7.0 ENGINEERING CONTROLS

- 7.1 Engineering controls shall be practiced as a defense against occupational exposure. Equipment that may be contaminated with blood or other potentially infectious materials shall be examined prior to servicing and shall be decontaminated. The Plan Administrator will ensure that the information is available to all affected personnel. All appropriated precautions shall be taken to reduce exposure.

8.0 WORK PRACTICE CONTROLS

- 8.1 All personnel shall wash all potentially exposed skin with soap and warm water or flush mucous membranes with warm water immediately or as soon as feasible following contact of such body areas with blood or other potentially infectious materials. If hand-washing facilities are not immediately available, personnel are to wipe exposed skin with antiseptic hand cleaner and wipes/towelettes. Hand washing with soap and warm water shall occur at the earliest opportunity.
- 8.2 Eating, drinking, smoking, applying cosmetics, and handling contact lenses shall not be allowed in any area of contamination or possible contamination.
- 8.3 All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.
- 8.4 All contact with blood or other infectious materials that is not necessary for appropriate health care or sanitization shall be avoided.

9.0 PERSONAL PROTECTIVE EQUIPMENT

- 9.1 Where potential occupational exposure to bloodborne pathogens exists, Personal Protective Equipment (PPE) shall be used and provided at no cost to the employee.
- 9.2 PPE shall be considered “appropriate” only if it does not permit blood or other potentially infectious materials to pass through it to reach the employee’s work clothes, skin, eyes,

mouth or other mucous membranes under normal conditions of use and for the duration of time which the PPE shall be used.

- 9.3 Personnel shall use the appropriate PPE.
- 9.4 Contaminated PPE will be disposed of according to this Plan.
- 9.5 Defective PPE shall be discarded and replaced.
- 9.6 If blood or other potentially infectious materials penetrate a garment, the garment shall be removed and stored for cleaning or disposal in accordance with CFR 1910.1030(d) immediately or as soon as feasible.
- 9.7 Used PPE shall be placed in appropriately designated containers (red bags) for disposal or decontamination.
- 9.8 Disposable latex gloves shall be worn when:
 - 9.8.1 It can be reasonably anticipated that the personnel may have hand contact with blood or other potentially infectious materials, mucous membranes, non-intact skin.
 - 9.8.2 Handling or touching potentially contaminated items or surfaces.
- 9.9 Disposable latex gloves shall:
 - 9.9.1 Be replaced as soon as practical when contaminated, torn, punctured, or when their ability to function as a barrier is compromised.
 - 9.9.2 Not be washed or decontaminated for reuse.
- 9.10 Masks in combination with eye protection devices shall be worn whenever splashes, spray, spatter or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can reasonably be anticipated.
- 9.11 Tyvek suits and other protective body clothing shall be worn in occupational exposure situations to the degree determined by the task and the degree of exposure anticipated.

10.0 HOUSEKEEPING

- 10.1 Each project Supervisor shall ensure that all storage areas for PPE's are clean and sanitary.
- 10.2 Superintendents are responsible to ensure workplace conditions are clean and sanitary.
- 10.3 Good Housekeeping Work Practices:

- 10.3.1 Contaminated work surfaces shall be immediately decontaminated with an appropriate disinfectant.
- 10.3.2 The specific type of decontamination solution may vary based on the various products on the market. The solution must meet the requirements for decontamination as defined in 29 CFR 1910.1030.
- 10.3.3 Bins, pail, wastebaskets and similar receptacles intended for reuse which have a reasonable likelihood for becoming contaminated with blood or other potentially infectious materials shall be inspected and decontaminated on a regularly scheduled basis as determined by the cleaning schedule previously described, or as soon as feasible upon visible contamination.
- 10.3.4 Broken glassware which may be contaminated shall not be picked up directly with the hands. It will be cleaned up using mechanical means, such as a brush and dustpan.
- 10.3.5 Contaminated laundry shall be handled as little as possible with minimal agitation.
- 10.3.6 Spills of blood or other potentially infectious materials are to be considered, for the purpose of clean up, a hazardous materials incident. Handling and decontamination will be done in accordance with this Plan.

11.0 VACCINATIONS

- 11.1 **SARGENT CORPORATION** shall make available the hepatitis B vaccination series to all personnel in job classifications identified as having occupational exposure. Any employee who is subjected to an isolated and unique exposure incident shall be offered the HBV vaccination series as a post-exposure precautionary measure. The vaccination series shall be provided at no cost to the employee and at a reasonable time and place.
- 11.2 The vaccination series, evaluation and immunity profile shall be administered according to accepted medical protocol. An accredited laboratory shall conduct all laboratory tests at no cost to the employee.
- 11.3 The hepatitis B vaccine shall be made available to all identified personnel after the person has received the training outlined in this Plan and within 10 working days of initial assignment to a job classification identified as having an occupational exposure unless the person has previously received the complete hepatitis B vaccination series or an antibody test reveals that the person is immune, or the vaccine is inadvisable for medical reasons, or the person signs a waiver declining the vaccine.
 - 11.3.1 The vaccination shall be made available as outlined above if the person initially declines hepatitis B vaccinations, but at a later date, while still covered by this Plan decides to accept the vaccination.

- 11.3.2 If the U. S. Public Health Service recommends a routine booster dose(s) of hepatitis B vaccination at a future date, such booster dose(s) shall be made available to employees.
- 11.3.3 Personnel who decline the vaccination, refuse to sign the declination statement, and do not provide documentation of immunity will be removed from the job classification identified as occupationally exposed until such time as he/she complies with the requirements of this Plan.
- 11.3.4 All records relative to the series of vaccinations, follow up, and immunity profile are to be stored in the employee's medical personnel file.

12.0 EXPOSURE INCIDENT

- 12.1 An **Exposure Incident** is defined as a specific eye, mouth or other mucous membrane, non-intact skin or parenteral contact with blood or other potentially infectious materials that result from the performance of person's duties.
- 12.2 It is imperative that all personnel report any exposure incident to the Safety Director. The report shall be made without regard to the actual or perceived risk or the source individual for bloodborne pathogens. Following a report of an exposure incident:
 - 12.2.1 The designated physician shall evaluate the exposed employee(s) at the earliest opportunity. This confidential medical evaluation and follow up shall be documented in the employee's medical record.
 - 12.2.2 The incident shall be investigated by the Plan Administrator and/or other designated person to determine any appropriate corrective action.
 - 12.2.2.1 In accordance with 29 CFR 1910.1030 the following elements shall be covered in the post exposure investigation:
 - a. Documentation of the route(s) of exposure, and the circumstances under which the exposure incident occurred.
 - b. Identification and documentation of the source individual, unless that identification is not feasible or prohibited by State or Local Law.
 - c. The degree to which engineering, work practice, and PPE controls were utilized.
 - 12.2.2.2 The source individual's blood shall be tested as soon as feasible and after consent is obtained to determine HBV and HIV infection. In the event consent is not obtained, the Plan Administrator will establish and

document that legal consent could not be obtained. Even when the source individual's consent is not received, the source individual's blood, if available, shall be tested and the result documented.

- a. When the source individual is already known to be infected with HBV or HIV, testing need not be repeated.
- b. Results of the source individual's testing shall be made available to the exposed employee and the employee shall be informed of applicable State Law.

12.2.2.3 The exposed employee's blood shall be collected and tested as soon as feasible after consent is obtained.

- a. If the employee consents to baseline blood collection, but does not give consent at the time for HIV serologic testing, the samples shall be preserved for at least 90 days. If within 90 days of the exposure incident, the person elects to have the baseline sample test, such testing shall be done.
- b. Post exposure counseling and evaluation of reported illness shall be made available as medically indicated.
- c. Post exposure disease prevention, when medically indicated and as recommended by the U. S. Public Health Service, shall be provided at no cost to the exposed employee.

13.0 PROVIDE INFORMATION FOR HEALTHCARE

13.1 The Plan Administrator shall ensure that the post exposure evaluating healthcare professional is provided with:

13.1.1 A copy of 29 CFR 1910.1030.

13.1.2 A description of the exposed employee's duties as they relate to the exposure incident.

13.1.3 Documentation of the route(s) of exposure and circumstances under which the exposure occurred.

13.1.4 Results of the source individual's blood testing if available.

13.1.5 All medical records relevant to the appropriate treatment of the employee including vaccination status.

14.0 HEALTHCARE PROFESSIONAL'S WRITTEN OPINION

- 14.1 The evaluating physician shall obtain and provide the exposed employee and the Plan Administrator, with a copy of the evaluating healthcare professional's written opinion within 15 days of the completion of the evaluation.
- 14.2 The healthcare professional's written opinion for the hepatitis B vaccination shall be limited to whether hepatitis B vaccination is appropriate for the employee and if the person has received such vaccination.
- 14.3 The healthcare professional's written opinion for post exposure evaluation and follow up shall be limited to the following information:
 - 14.3.1 That the employee has been informed of the result of the evaluation.
 - 14.3.2 That the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials which require further evaluation or treatment.
- 14.4 All other findings or diagnoses shall remain confidential and shall not be included in this written report.

15.0 TRAINING

- 15.1 All personnel identified with occupational exposure shall receive training as follows:
 - 15.1.1 At the time of initial assignment to an identified job classification.
 - 15.1.2 At least annually thereafter.
 - 15.1.3 When changes such as modification of tasks or procedures, or institution of new tasks or procedures affect the person's occupational exposure. The additional training may be limited to addressing the new exposures created.
 - 15.1.4 An accessible copy of this Bloodborne Pathogen Exposure Control Plan and 29 CFR 1910.1030.
 - 15.1.5 General epidemiology and systems of bloodborne pathogens.
 - 15.1.6 The modes of transmission for bloodborne pathogens.
 - 15.1.7 An explanation of **SARGENT CORPORATION** Bloodborne Pathogen Exposure Control Plan and the means by which and employee can obtain a copy of the written plan.

- 15.1.8 The appropriate methods of recognizing tasks and other activities that may involve exposure to blood or other potentially infectious materials.
- 15.1.9 The use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices and personal protective equipment.
- 15.1.10 The types, proper use, location, removal, handling, decontamination and disposal for personal protective equipment.
- 15.1.11 The basis for selection of personal protective equipment.
- 15.1.12 The hepatitis B vaccinations, including information on its ability to prevent disease, safety, method of administration, the benefit of being vaccinated and that the vaccine and vaccination will be offer free of charge.
- 15.1.13 The appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials.
- 15.1.14 The procedures to follow if an exposure incident occurs including the method of reporting the incident and the medical follow up that will be made.
- 15.1.15 The post exposure evaluation and follow up that the evaluating physician will provide to the employee following an exposure incident.
- 15.1.16 The labeling requirements for medical waste.
- 15.1.17 An opportunity for interactive questions and answers with the person conducting the session.
- 15.2 The person conducting the training shall be knowledgeable in the subject matter covered by the elements contained in the training program as it relates to the workplace.

16.0 RECORD KEEPING

- 16.1 **Medical Records.** The Plan Administrator shall maintain an accurate record for each employee with occupational exposure, in accordance with 29 CFR 1910.1020. This record shall include:
 - 16.1.1 The name and employee number of the employee.
 - 16.1.2 A copy of the employee's hepatitis B vaccination status including the dates of all the hepatitis B vaccinations and any medical records relative to the person's ability to receive this vaccination.

- 16.1.3 A copy of all results of examinations, medical testing, and follow up procedures as required following an exposure incident.
- 16.1.4 A copy of the employee's healthcare professional's written opinion as required by description in this Plan.
- 16.1.5 A copy of the information provided to the healthcare professional as described in this Plan.
- 16.1.6 The Plan Administrator shall ensure that employee medical records required in the Plan are kept confidential and are not discussed or reported without the employee's express written consent to any person within or outside of the workplace except as required by law.
- 16.1.7 **SARGENT CORPORATION**, in conjunction with the company designated physician, will maintain these records for at least the duration of employment, plus 30 years in accordance with 29 CFR 1910.1020.
- 16.2 **Training Records.** Training records required by this Plan shall include:
 - 16.2.1 The dates of the training sessions.
 - 16.2.2 The contents or a summary of the training sessions.
 - 16.2.3 The names and qualifications of persons conducting the training sessions.
 - 16.2.4 The names and job titles of all persons attending the training sessions.
 - 16.2.5 The Plan Administrator shall maintain training records for 3 years from the date on which the training occurred.

17.0 AVAILABILITY AND TRANSFER OF RECORDS

- 17.1 All records required to be maintained by this Plan shall be made available, upon request, to the Assistant Secretary and the Director of the National Institute for Occupational Health and Safety or the U. S. Department of Health and Human Services, or their designated representative.
- 17.2 All employee medical records required to be maintained by this Plan shall be provided upon request for examination and copying to:
 - 17.2.1 The Plan Administrator;
 - 17.2.2 The Employee;
 - 17.2.3 Anyone having written consent of the employee.

- 17.3 **SARGENT CORPORATION** shall comply with requirements involving the transfer of records as set forth in 29 CFR 1910.1020
- 17.4 If the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, the employer shall notify the Director of the National Institute for Occupational Health and Safety at least three months prior to their disposal and transmit them to the Director if required by the Director to do so, within that three-month period.

18.0 ADMINISTRATION OF PLAN

- 18.1 The Plan Administrator shall work with Superintendents to ensure that the Plan is adhered to.
- 18.2 The Plan Administrator shall be available to assist Superintendents with this Plan.
- 18.3 Each jobsite having employees in the designated categories shall develop a separate addendum to cover department specifics.

SARGENT CORPORATION**BLOODBORNE PATHOGEN EXPOSURE CONTROL PLAN****Hepatitis B Virus Declination**

I understand that due to my occupational exposure to blood or other potentially infectious materials, as defined in 29 CFR 1910.1030, I may be at risk if acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Current Job Classification

Name (Last, First, M.I.)

Signature

Date

Signature of Parent of Guardian and
Relationship (if under 18 years of age)

Date

Plan Administrator or Superintendent

Signature

Date

19.0 IF AN EXPOSURE OCCURS

- 19.1 **Purpose.** Despite dedicated use of engineering and work practice controls, and proper use of personal protective equipment, exposure CAN occur. The purpose of this attachment is to outline the procedure to follow if an employee has been or may have been exposed to a bloodborne pathogen.
- 19.2 **Policy.** The following procedures will occur immediately following an exposure:
- 19.2.1 Wound Care:
- 19.2.1.1 Clean wound with soap and warm water (when not immediately possible use appropriate wipes that are provided).
 - 19.2.1.2 Flush mucous membranes for at least 15 minutes with water/saline.
 - 19.2.1.3 Other wound care dictated by severity of wound, (i.e. stop bleeding).
- 19.2.2 Contact:
- 19.2.2.1 Superintendent or Operations Manager
 - 19.2.2.2 Plan Administrator
 - 19.2.2.3 Hospital (Infection Control or Emergency Room)
- 19.3 In order to provide the most effective medical care, all exposure or suspected exposure incidents must be reported immediately. Some forms of post exposure disease preventatives are best instituted within one hour of exposure. This time frame should be kept in mind when reporting an exposure or suspected exposure. All exposure incidents shall be evaluated to determine the exposure management course. Not all exposures carry the same risk or require the same post exposure management options. The Healthcare Professional will determine these options.

SARGENT CORPORATION

BLOODBORNE PATHOGEN EXPOSURE REPORT

Incident was evaluated by: _____ Date: _____
(print name)

Following recommendation(s) was/were made to avoid future exposure:

Action Taken:

Employee Comments:

Evaluator Signature: _____

Date: _____

XIII. TRANSITE PIPE HANDLING PLAN

(Last Revised 02/04/2016)

1.0 SCOPE AND APPLICATION

- 1.1 This Plan covers projects located in the State of Maine only. Requirements in other states may vary.
- 1.2 This Plan covers the requirements and procedures for the safe handling and disposal of non-friable asbestos / cement piping (transite pipe) used in water distribution systems and wastewater collection systems. It is the policy of **SARGENT CORPORATION** that its employees shall not handle any other asbestos materials.
- 1.3 Transite pipe shall be handled in accordance with the regulations and procedures required by OSHA 29 CFR 1926.1101 *Asbestos in Construction*, and DEP CMR 405.4 *Storage, Transport and Disposal of Asbestos Containing Materials*.

2.0 DEFINITIONS

- 2.1 **Amended Water:** water to which surfactant (wetting agent) has been added to increase its ability to penetrate the ACM pipe.
- 2.2 **Asbestos Containing Material (ACM):** any material containing more than one percent asbestos.
- 2.3 **Authorized Person:** means any person authorized by the employer to be present in regulated areas.
- 2.4 **Class II Asbestos Work and Training Requirements:** activities involving the handling and disposal of substantially intact asbestos transite cement pipe. Employees performing these activities must first successfully complete an 8-hour OSHA Class II awareness course.
- 2.5 **Asbestos Competent Person:** one who has successfully passed an asbestos supervisor / competent person 40-hour training course and has been given corporate authority to define and alter ACM handling procedures. All transite pipe handling and removal operations shall be conducted under the supervision of an Asbestos Competent Person.
- 2.6 **HEPA Filter:** a high efficiency particulate air filter capable of filtering at least 99.97 percent of all particles 0.3 micrometers in diameter.
- 2.7 **Negative Initial Exposure Assessment:** a demonstration by the employer that employee exposures are below OSHA limits.

2.8 **OSHA Limits:**

2.8.1 **Permissible Exposure Limit (PEL):** 0.1 fibers per cubic centimeter of air (f/cc), averaged over an 8-hour period.

2.8.2 **Excursion Limit:** 1.0 fiber per cc of air, averaged over a 30-minute period.

2.8.3 A respirator with HEPA filters is required for exposures above these limits.

2.9 **Prohibited Activities:** cutting, grinding, crushing or purposely breaking transite pipe.

2.10 **Regulated Area:** an area marked by barrier tape and signs within which transite pipe handling occurs.

3.0 **NOTIFICATION OF OTHERS**

3.1 The nature of the work and its potential hazards shall be communicated to owner representatives, subcontractors and others at the site by means of a jobsite memo.

3.2 Sample Jobsite Memo:

SARGENT CORPORATION is performing OSHA Class II asbestos transite pipe handling operations at this project site. These activities are being conducted in regulated areas marked by red "Danger Asbestos" barrier tape and OSHA "Danger Asbestos" signs. Only Authorized Personnel who are properly trained and equipped are allowed in the regulated areas. We thank you for your cooperation and attention to this matter. If you have any questions, please see the jobsite superintendent.

4.0 **REGULATED AREAS**

4.1 All transite pipe removal and disposal activities shall be conducted within regulated areas.

4.2 Regulated areas shall be marked by means of signs and barrier tape.

4.3 Access to regulated areas shall be limited to authorized persons.

4.4 **Respirators.** All persons entering regulated areas are required to wear half face or full-face respirators equipped with HEPA filters unless/until the competent person determines by means of personal air monitoring that employee exposures to airborne asbestos are below OSHA limits.

- 4.5 **Additional PPE.** Each person performing work in a regulated area is required to wear safety glasses, hardhat, rubber or disposable gloves, steel toe boots and a disposable Tyvek suit.
- 4.6 **Prohibited Activities.** Employees shall not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated area.
- 4.7 Employees who work in regulated areas shall remove Tyvek suits and wash their hands and face prior to leaving the work area and before performing hand-to-mouth activities similar to those listed in paragraph 4.6 above.

5.0 EXPOSURE ASSESSMENTS AND MONITORING

- 5.1 Personal exposure assessments shall be performed under the direction of the competent person.
- 5.2 While work is being performed in a regulated area, personal air monitoring shall be conducted in the breathing zone of the employee who is in closest contact with the transite pipe.
- 5.3 Initially, personal air monitoring shall be conducted on a daily basis during transite pipe handling operations. Based on consistent results below the OSHA limits, the competent person may elect to sample less frequently.
- 5.4 Results of laboratory tests conducted on personal air samples shall be posted in the superintendent's office for employee viewing.

6.0 WORK PRACTICES FOR TRANSITE PIPE

- 6.1 Transite pipe handling projects shall be performed as directed by a trained Asbestos Supervisor. The Asbestos Supervisor shall inspect these projects on a regular basis.
- 6.2 Employees shall complete an asbestos awareness training program within 12 months prior to performing work that requires contact with transite pipe.
- 6.3 Transite pipe shall be thoroughly wetted prior to and during its removal.
- 6.4 Care shall be taken to remove the pipe in an intact state. Cutting, abrading, crushing or purposely breaking the pipe is not allowed under this plan.
- 6.5 Dry sweeping of ACM is not allowed. Vacuums used to clean up ACM must be equipped with HEPA filters.

7.0 RESPIRATORY PROTECTION

- 7.1 **SARGENT CORPORATION** shall provide half face respirators equipped with HEPA (N, R, or P-100) filters to employees who are required to enter asbestos regulated areas.
- 7.2 Medical evaluations shall be performed for employees required to wear negative pressure respirators.
- 7.3 Employees shall be fit tested prior to respirator use and every 6 months during transite pipe handling operations.
- 7.4 As determined by the competent person, employees may be allowed to perform work in regulated areas without respiratory protection if personal exposure monitoring consistently shows that levels of airborne asbestos are below OSHA limits. In all cases employees shall be allowed to wear a respirator if they choose.

8.0 DISPOSAL OF TRANSITE PIPE

- 8.1 Transite pipe shall not be intentionally broken or crushed prior to or during disposal.
- 8.2 Transite pipe may be accepted by any landfill licensed by the State of Maine; or
- 8.3 Transite pipe may remain buried in its original trench; or
- 8.4 The piping may be reburied in whole sections on site, at its original trench depth or deeper immediately upon abandonment (Note: The site burial location shall be recorded on an as-built site plan or similar document for the property owner's records); or
- 8.5 The piping may be removed to a site other than a licensed demolition debris landfill for immediate burial with 18 inches of soil and 6 inches of seeded topsoil. Record burial location as follows:
 - 8.5.1 A map indicating the location of the transite pipe burial site shall be forwarded to the Maine Department of Environmental Protection, Attn: Asbestos Control Division, State House Station 17, Augusta, ME 04333-0017.
 - 8.5.2 A permanent on site surveying benchmark shall be established and maintained on all asbestos waste disposal areas. This benchmark shall be shown on all record drawings for the disposal area.

8.5.3 All asbestos waste disposal areas shall be described on a survey plan and recorded in the Registry of Deeds as follows:

8.5.3.1 The type of facility located on the lot and the dates of its operation and closure;

8.5.3.2 The coordination of the disposal areas; and

8.5.3.3 The location and the composition, extent and depth of the asbestos waste material deposited.

8.6 Transportation.

8.6.1 **SARGENT CORPORATION** shall not transport asbestos containing materials.

8.6.2 Off-site transport of transite pipe will be subcontracted to a licensed hauler.

9.0 RECORD KEEPING

9.1 Personal exposure air monitoring results shall be kept for a period of 30 years.

9.2 Employee medical records shall be kept for 30 years beyond the employee's term of employment.

9.3 Employee training records shall be kept at least 1 year beyond the employee's term of employment.

XIV. FLEET SAFETY PLAN

(Adopted 4/02/07. Revised 2/10/09, 1/5/10)

1.0 INTRODUCTION

- 1.1 The information contained in this Plan is for quick reference for **SARGENT CORPORATION** employees who operate company owned motor vehicles on public highways.
- 1.2 For a better understanding of safety rules and regulations regarding the operation of a commercial motor vehicle, please refer to the **Federal Motor Carrier Safety Regulations Handbook (FMCSR)** and/or **Emergency Response Guidebook**. Company drivers may obtain the above publications by contacting the Equipment Dispatcher or Safety Director.
- 1.3 Only a few of the very important issues pertaining to company drivers are summarized within. In addition to the procedures summarized in this Section, company truck drivers are also subject to the applicable requirements of Federal and State Departments of Transportation (DOT) and Environmental Protection Agencies (EPA, DEP, etc.), the Occupational Safety and Health Administration (OSHA), Mine Safety and Health Administration (MSHA), and all sections of this company Health and Safety Plan.

2.0 MOTOR VEHICLE SAFETY POLICY

- 2.1 It is the policy of **SARGENT CORPORATION** to provide and maintain company owned or leased motor vehicles in good shape and safe operating condition.
- 2.2 Employees are expected to operate vehicles safely to prevent accidents which could result in injuries and property loss.
- 2.3 We will work as a team to uphold high standards of vehicle maintenance and safe vehicle operation. We will be considerate of the traveling public at all times.

3.0 VEHICLE USE

- 3.1 **Passenger Vehicles.** An employee who has a valid driver's license and has been authorized by his/her supervisor will be permitted to operate a company owned passenger car or pickup.
- 3.2 **Commercial Motor Vehicles.** An employee who has been authorized by his/her supervisor, has the appropriate driver's license (and any necessary endorsements) as required by state and federal DOT, and meets all other state and federal qualifications will be permitted to operate a commercial vehicle.

- 3.2.1 **Definition. A Commercial Motor Vehicle (CMV)** means any self-propelled or towed motor vehicle used in commerce on a highway when the vehicle (including attached trailers if any):
 - 3.2.1.1 Has a gross vehicle weight rating (or combination gross weight rating) of more than 10,000 pounds (or weighs more than 10,000 pounds); or
 - 3.2.1.2 Is designed to transport more than 8 passengers (including the driver) for compensation; or
 - 3.2.1.3 Is designed to transport more than 15 passengers (including the driver), but is not used to transport passengers for compensation; or
 - 3.2.1.4 Is any weight and is used to transport hazardous materials in a quantity requiring placarding.
- 3.2.2 A Commercial Driver's License (CDL) is required for drivers of some but not all Commercial Vehicles. License classes and endorsement requirements for drivers of commercial vehicles are covered in Paragraph 4.
- 3.3 **Personal Vehicle on Company Business.** Employees who are authorized by their supervisor to use their personal vehicles for company business are subject to the requirements of this Fleet Safety Plan, including:
 - 3.3.1 Maintaining the appropriate driver's license (and any necessary endorsements).
 - 3.3.2 Maintaining current auto liability insurance.
 - 3.3.3 Maintaining current state vehicle registrations and inspections.
 - 3.3.4 Maintaining the personal vehicle in safe operating condition.
- 3.4 **Unauthorized Use of Vehicles.** Authorized drivers will not allow an unauthorized person to operate a company vehicle. No exceptions!
- 3.5 **No Passengers Policy.** No passengers shall be allowed to ride in company owned commercial motor vehicles except as authorized by a supervisor.

4.0 TRUCK DRIVER SELECTION

- 4.1 **Driver Evaluation.** The selection of commercial truck drivers is based on their driving ability. In evaluating employees and job applicants as commercial drivers, management will:
- 4.1.1 Review past driving performance and work experience by evaluating an employment application, conducting a formal interview, and completing previous employer reference checks.
 - 4.1.2 Review the employee's Motor Vehicle Record (MVR) annually and more frequently if reasons warrant.
 - 4.1.3 Ensure the employee has a valid Commercial Driver's License (CDL) with appropriate endorsements as necessary and is qualified to operate the type of vehicle he/she will drive.
 - 4.1.4 Review the results of pre-employment and subsequent physical examinations. Full time employees classified as Truck Drivers and other CDL holders who may be asked to drive a truck on public roadways must at minimum undergo and pass a biannual DOT physical, and carry a current DOT card.
 - 4.1.5 Confirm negative results of pre-employment drug tests. A prospective employee who fails to pass the pre-employment drug test shall not be hired.
- 4.2 **License Classes.**
- 4.2.1 **Class A:** Any combination of vehicles (truck and one or more trailers) when the gross weight ratings or registered weights of the truck and trailer(s) combined is 26,001 or more pounds, and when the gross weight or gross weight rating of the trailer(s) is in excess of 10,000 pounds. A Class A license is a Commercial Driver's License (CDL). Holders of a Class A license may, with any appropriate endorsements, operate all vehicles in Class B and Class C.
 - 4.2.2 **Class B:** Any single vehicle with a gross vehicle weight rating or registered weight of 26,001 or more pounds or any such vehicle towing a vehicle not in excess of 10,000 pounds gross vehicle weight rating or gross weight. A Class B license is a CDL. Holders of a Class B license may, with any appropriate endorsements, operate all vehicles in Class C.
 - 4.2.3 **Class C:** Any single vehicle or combination of vehicles that does not meet the definitions of Class A or Class B. Holders of a Class C license may operate a vehicle with a gross vehicle weight less than 26,001 pounds (13 tons).
 - 4.2.3.1 Holders of a Class C license may operate passenger vehicles, pickup trucks, mechanic and welder service trucks, and small rack trucks.

- 4.2.3.2 Holders of a Class C license may tow a vehicle so long as the total gross vehicle weight rating or gross weight of the combination of vehicles is not in excess of 26,000 pounds.
- 4.2.3.3 A Class C license is a CDL only if it carries one of the endorsements listed in Section 4.3 below.

Note: A person who drives or tows a vehicle that is either designed to transport 16 or more passengers, including the driver, or is placarded for hazardous materials must hold a CDL with the proper endorsement(s).

- 4.3 **License Endorsements:** To operate specialized vehicles with specific loads, one or more endorsements may be required. The following 6 endorsements can only be added to a Commercial Driver's License:

- 4.3.1 - **N** - **Tank Vehicle.** This endorsement is for drivers of vehicles which carry non-hazardous gases or liquids in bulk only. A bulk tank is a tank that has a capacity greater than 119 gallons. **Water truck drivers need an "N" (or "X") endorsement to haul on a public road.**
- 4.3.2 - **H** - **Hazardous Materials.** This endorsement is for drivers of vehicles carrying solid hazardous material in bulk when required to be placarded by Federal DOT regulation only. A bulk container is one that has a maximum capacity greater than 119 gallons as a receptacle for a solid.
- 4.3.3 - **X** - **Tank Vehicle with Hazardous Materials.** This endorsement is for drivers of vehicles with bulk tanks designed or used to carry hazardous materials. This combines the endorsements "N" and "H" into one.

A vehicle with a bulk tank for carrying hazardous materials must be placarded. A bulk tank is one with a capacity larger than 119 gallons.

The requirements of this paragraph apply regardless of the gross weight of the vehicle or the actual quantity of hazardous material in the bulk tank. **Fuel truck drivers need an "X" endorsement (or both "N" and "H" endorsements) to haul on a public road.**

- 4.3.4 - **T** - For the operation of double/triple trailers where allowed by law. (Triple trailers are not allowed in Maine.)
- 4.3.5 - **P** - For the operation of passenger vehicles designed to transport over 15 passengers including the driver.
- 4.3.6 - **Y** - For the operation of school buses designed to transport over 15 passengers including the driver.

5.0 FLEET MOTOR CARRIER REQUIREMENTS

- 5.1 **Commercial Motor Vehicle (CMV) Registration.** (Note: This paragraph lists some registration requirements in Maine. The requirements may vary from state to state.)
- 5.1.1 A truck used on public roadways, including an eligible pickup truck, must be registered as a **CMV** for the actual gross weight of the truck and load, including the weight of any trailer and its load.
 - 5.1.2 **Booster.** Once a CMV is registered in Maine, the gross weight may be increased for a period of one to eight months by paying an additional fee.
 - 5.1.3 A pickup truck that is registered as a **passenger vehicle** may not exceed 6000 pounds gross vehicle weight of the pickup and its load, even though the vehicle specifications may list a larger gross vehicle weight.
 - 5.1.4 A pickup truck registered as a passenger vehicle may tow:
 - 5.1.4.1 A camper trailer of any weight; or
 - 5.1.4.2 A utility trailer that does not exceed 2000 pounds gross vehicle weight, so long as the combined gross vehicle weight of the truck and the utility trailer does not exceed 8000 pounds.
 - 5.1.4.3 Otherwise, a pickup truck towing a trailer where the combined gross vehicle weight exceeds 6000 pounds must be registered as a CMV.
- 5.2 **Annual Review of Driving Record.**
- 5.2.1 In accordance with Section 391.25 of the Federal Motor Carrier Safety Regulations, the Human Resource Department shall conduct an annual review of the driving record of each employee who drives a commercial vehicle in excess of 10,000 pounds gross vehicle weight.
 - 5.2.2 Each driver will receive a form summarizing the results of the annual review of his/her driving record. Employees will be asked to review this information, make any necessary corrections and/or additions to the record, attest to its accuracy, and return it to the Human Resource Department. The list of violations shall be included in the qualifications section of the driver's personnel file.
 - 5.2.3 The person reviewing a driving record shall use the criteria in Sec. 391.25 to determine whether the driver meets minimum requirements for safe driving or is disqualified to drive a motor vehicle pursuant to Sec. 391.15.
 - 5.2.4 Recommendations to disqualify a driver pursuant to an unsatisfactory driving record shall be made to the company President and/or Vice President of Operations.

- 5.2.5 A note, setting forth the date upon which the review was performed and the name of the person who reviewed the driving record shall be included in the qualifications section of the driver's personnel file.

5.3 **Notification of Violations.**

- 5.3.1 Each CDL driver who operates a commercial vehicle with gross vehicle weight of 26,001 pounds or more (or one that is placarded for hazardous materials), and who is convicted of violating, in any type of motor vehicle, a State or local law relating to motor vehicle traffic control (other than a parking violation), shall notify the Human Resource Department in writing within 30 days of such conviction.
- 5.3.2 Such notification shall contain the following information:
- 5.3.2.1 Driver's full name and driver's license number;
 - 5.3.2.2 Location where motor vehicle violation occurred;
 - 5.3.2.3 The specific motor vehicle violation for which the person was convicted and any suspension, revocation, or cancellation of driving privileges which resulted from the conviction (**notification of any suspension of driving privileges is required within 24 hours of the suspension**);
 - 5.3.2.4 Date of conviction; and
 - 5.3.2.5 Driver's signature.
- 5.3.3 Additionally, if such violation and conviction occur in a State or jurisdiction other than the one which issued the driver's license, the driver shall also send a written copy of the above information to an official designated by the State which issued the license. This notification to the state official must also be made within 30 days of the conviction.

- 5.4 **Medical Examiner Certification.** Each employee who drives a commercial vehicle in excess of 10,000 pounds gross vehicle weight (or any placarded vehicle) on public roads must undergo and pass a biannual DOT physical and carry a current DOT card. Employee DOT physicals will be scheduled by the Human Resource Department. The company will pay for the cost of routine DOT physicals, and employees will be paid for their time during company scheduled physicals.

- 5.5 **Driving Rules.** Each employee who at any time drives a commercial vehicle in excess of 10,000 pounds gross vehicle weight is subject to all applicable driving rules listed in **Part 392 – Driving of Commercial Motor Vehicles** of the Federal Motor Carrier Safety Regulations. All CMV drivers shall receive training in and a copy of Part 392.

- 5.6 **Accessory Parts and Equipment.** The installation and maintenance of accessory parts and equipment on company owned, leased, or rented commercial vehicles shall be done only as approved by the manufacturer and shall be performed by qualified personnel.
- 5.7 **Exemptions.** The requirements of §5.2 through §5.4 do not apply to an employee who:
 - 5.7.1 Does not drive a CMV as a normal and routine part of his/her employment; and
 - 5.7.2 Does not drive a CMV that requires placards for hazardous materials; and
 - 5.7.3 Does not drive a CMV more than 100 air-miles from his/her normal work reporting location; and
 - 5.7.4 Does not drive a CMV outside the state of Maine.

6.0 FLEET SAFETY REQUIREMENTS

- 6.1 **Safe Operation.** The driver of a commercial vehicle is responsible and shall be held accountable for the safe operation of the vehicle.
 - 6.1.1 Drivers shall not drive a defective or substandard vehicle which he/she believes could reasonably result in personal injury or property damage.
 - 6.1.2 Drivers shall not drive a vehicle during severe weather conditions or in potentially dangerous situations when he/she believes to do so could reasonably result in personal injury or property damage.
 - 6.1.3 Drivers shall not exceed the posted speed limit.
 - 6.1.4 All drivers shall have had at least one 30-minute rest break within the previous 8 hours on duty.
 - 6.1.5 Supervisors of company drivers shall respect each driver's responsibility to understand his/her own and the vehicle's limitations. No one shall permit or require a driver to operate a vehicle in a manner or situation the driver believes to be unsafe.
 - 6.1.6 The use of handheld cellular/mobile phones while driving commercial vehicle is prohibited. Other distracting activities such as eating or drinking are not permitted while driving a company owned vehicle. Pull off to a safe location before reading a map or calling for directions. Any activity that creates a distraction while driving leads to an increased risk of having an accident.
- 6.2 **Daily Vehicle Inspections.** Each employee who drives a commercial vehicle in excess of 10,000 pounds gross vehicle weight shall complete a **documented** inspection of their truck(s) on a daily basis.

- 6.2.1 Each daily vehicle inspection shall be recorded on an “Official Driver’s Vehicle Inspection Report” as prescribed by the Federal Motor Carrier Safety Administration.
- 6.2.2 Inspection booklets shall be located in all commercial vehicles. Replacement inspection booklets are available from the Equipment Dispatcher.
- 6.2.3 If a defect is found that could cause an unsafe situation or if the vehicle does not have working back-up alarm, the vehicle shall be immediately tagged out of service until the problem is corrected.
- 6.2.4 For less serious deficiencies that are unlikely to cause an unsafe situation, repairs shall be made and defective items replaced as soon as possible.
- 6.2.5 The daily inspection record is made in duplicate. One copy remains in the booklet which shall be kept in the truck. The other copy shall be delivered to the project superintendent or the driver’s supervisor together with the driver’s timecard and a copy of his/her daily log. After any necessary repairs have been made, the superintendent’s copy shall be forwarded to Eric Gifford at Stillwater for final review and filing.
- 6.3 **Seatbelts.** Seatbelts are provided in all company vehicles. Drivers and passengers shall use seatbelts at all times while riding in company vehicles. At no time shall the number of people in a vehicle exceed the number of functioning seat belts.
- 6.4 **Backup Alarm.** Each commercial motor vehicle shall be equipped with a functioning backup alarm which is audible above surrounding background noises. A truck that does not meet this standard shall not be allowed on a **SARGENT CORPORATION** jobsite until the problem has been corrected.
- 6.5 **Secure Loads.** Drivers of commercial vehicles hauling cargo are responsible to ensure that all cargo is secure from any unplanned movement.
 - 6.5.1 Any pieces of gravel, rocks, debris, or other loose objects that could fall from the truck during transit must be removed before leaving the loading area.
 - 6.5.2 Gravel truck covers shall be used when provided.
 - 6.5.3 The vehicle’s cargo must be distributed and properly secured. Requirements for securing specific types of cargo (such as heavy equipment, concrete pipe, etc.) are covered in FMCSR §393.100 through §393.142.
 - 6.5.4 The vehicle’s tailgate, doors, tarpaulins, spare tire, cargo fastening devices, and other equipment must be secured.
 - 6.5.5 The cargo or any other object may not be placed where it will obscure the driver’s view or interfere with his/her free movements or exit from the vehicle.

6.5.6 Drivers shall inspect the cargo and all devices used to secure the cargo and make any necessary adjustments after the first 50 miles and every 150 miles thereafter.

6.6 **Emergency Equipment.** Each commercial motor vehicle shall be equipped as follows:

6.6.1 **Fire Extinguisher.** The fire extinguisher shall be securely mounted in a readily available location. It must be inspected monthly to ensure it is filled and ready for use.

6.6.2 **Spare Fuses.** There must be at least one spare fuse for each type/size of fuse needed to operate any of the vehicle's required parts and accessories.

6.6.3 **Warning Devices for Stopped Vehicles.** Three bidirectional emergency reflective triangles that conform to the requirements of the Federal Motor Vehicle Safety Standard must be stored in the vehicle.

7.0 HOURS OF SERVICE & LOG BOOKS

7.1 **Hours of Service Requirements.** No person shall drive a commercial vehicle with a gross vehicle weight of more than 10,000 pounds (or a placarded vehicle of any weight):

7.1.1 More than 11 total driving hours following 10 consecutive hours off duty; or

7.1.2 After the 14th hour since starting work following 10 consecutive hours off duty; or

7.1.3 After having been on duty 60 hours in any 7 day period. (Note: The 7 day period may re-start after 34 successive hours off duty. For drivers who operate within a 50 air miles of a jobsite, the 7 day period may re-start after 24 hours off duty.)

7.2 **Exemption from Hours of Service Requirements.** A driver who works exclusively within a 100 air mile radius of his/her work reporting location in the state of Maine is exempt from the hours of service requirements listed in §7.1 above. If at any time the driver crosses a state line or makes a trip more than 100 air miles in a CMV, all hours of service requirements are in effect. The 100 mile exemption does not apply to the driver of any vehicle that requires a placard for hazardous materials.

7.3 **Log Books (Driver's Record of Duty Status).** Every driver who operates a commercial motor vehicle with a gross vehicle weight of more than 10,000 pounds (or a placarded vehicle of any weight) shall record his/her duty status for each 24 hour period.

7.3.1 Duty status shall be recorded in duplicate on a specified grid in a log book provided by the Equipment Dispatcher.

7.3.2 The duty status shall be recorded the grid as: "off duty" (OFF), "driving" (D), or "on-duty not driving" (ON).

- 7.3.3 The driver shall note his/her location (including city and state) in the “Remarks” section of the grid for each non-driving period throughout the day.
- 7.3.4 The driver is the only person allowed to make daily log entries relating to the driver’s duty status. Drivers shall keep their entries current to the last change in duty status.
- 7.3.5 The following information must be included on the daily log in addition to the grid:
- 7.3.5.1 **Date:** Enter today’s date at top of log.
 - 7.3.5.2 **Name and Address of Carrier:** **SARGENT CORPORATION**
378 Bennoch Road
Stillwater, ME 04489
 - 7.3.5.3 **Home Terminal Address:** Enter the address of the project or terminal where truck is assigned.
 - 7.3.5.4 **Total Miles Driving Today:** Enter total miles driven today from midnight to 11:59 PM.
 - 7.3.5.5 **Truck (and trailer) Numbers:** Enter the unit number(s).
 - 7.3.5.6 **Driver’s Signature.** Driver certifies that all entries are true and correct.
 - 7.3.5.7 **Time Base Used.** All company drivers shall use the 60 hour / 7 day time base (see Sec. 5.8.3). Each 24 hour period begins at 12:00 midnight.
 - 7.3.5.8 **Recording days off duty.** Two or more consecutive 24-hour periods may be recorded on one duty status record.
 - 7.3.5.9 **Total hours.** The total hours for each duty status shall be entered at the right of the grid. The total of these entries shall equal 24 hours.
- 7.3.6 **Completed Logs.** Daily log entries are made in duplicate. Originals shall be turned in each day with the driver’s timecard. They will be delivered to the Equipment Dispatcher who will keep them on file in Stillwater. The duplicate copy remains in the driver’s log book which stays with the driver. The driver’s log book must include a record of the previous 7 day time period.
- 7.3.7 **Exemption from Log Book Requirement.** An employee who is not classified as a truck driver, but who occasionally drives a commercial motor vehicle on public highways does not need to keep daily logs on a full time basis. However if the employee at any time drives a CMV more than 100 air miles from his/her work reporting location, the employee must first complete daily logs for the previous seven days, including the day of the trip.

Each employee who is classified as a truck driver and/or who regularly drives a CMV for the company is expected to maintain a current daily log at all times when he/she is on duty. The log book stays with the driver if he/she changes trucks.

7.3.8 **Example of a Daily Log.**

On May 1, 2007, Charlie Gravel hauled gravel all day from Turner to Lewiston.

He started work at 6:00 AM at the Lewiston project site. Then he spent ½ hour doing morning exercises, discussing the day's STA (Safety Task Assessment) with the crew, completed a walk around inspection, and checked his truck's fluid levels. He logged this time as "On Duty – Not Driving."

He hauled all day, stopping for coffee break at the gravel pit at 8:30 and again for lunch in Auburn at 11:30. Charlie stopped driving at 6:00 PM back at the Lewiston project site, where he spent ½ hour doing a post-trip inspection of his truck.

During each time period when Charlie was not driving, he brought his daily log up to date and showed his location. He logged driving time as "Driving," coffee break and post-trip inspection as "On Duty – Not Driving," and lunch break as "Off Duty." Then at quitting time he completed his log and entered the total number of hours and total mileage.

Charlie's log entries are shown on the following page:

DRIVER'S DAILY LOG

(24 HOURS)

226

226

29160

5, 01, 07

SARGENT CORPORATION

378 Bennoch Rd, STILLWATER, ME

FANCY SITE, Cool Road, Lewiston, ME

Total Miles Driving Today Total Mileage Today

Original - File at home terminal
Duplicate - Driver retains it his/her possession for eight days

RECAP Complete at end of workday. **12**

On-duty hours today. (Total lines 3 & 4) **70 Hour/8 Day Drivers**

I certify these entries are true and correct:
Charles Gavel

Driver's Full Signature

Co-Driver's Name

Truck/Tractor and Trailer Numbers or License Plate(s) / State (show each unit)

1. OFF DUTY

2. SLEEPER BERTH

3. DRIVING

4. ON DUTY (NOT DRIVING)

MID-NIGHT		TOTAL HOURS																					
1	2	3	4	5	6	7	8	9	10	11	NOON	1	2	3	4	5	6	7	8	9	10	11	
226 226 29160 5, 01, 07 SARGENT CORPORATION 378 Bennoch Rd, STILLWATER, ME FANCY SITE, Cool Road, Lewiston, ME																							
1. OFF DUTY 2. SLEEPER BERTH 3. DRIVING 4. ON DUTY (NOT DRIVING)																							

REMARKS

TURNER, ME (Grease Truck)
 LEWISTON, ME (Post-Trip Insp.)
 AUBURN, ME
 LEWISTON, ME

SHIPPING DOCUMENTS:

B/L or Manifest No. or **SC-Gravel**

Shipper & Commodity

FROM: **Hauling gravel from Turner Pct to Lewiston Fancy Site**

USE TIME STANDARD AT HOME TERMINAL

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8.0 **ALCOHOL & CONTROLLED SUBSTANCES**

8.1 **General.**

- 8.1.1 A qualified member of the Human Resource Department shall present and discuss the information in this section with each employee who is expected to operate a CMV with a gross vehicle weight of 26,001 pounds or more, or one that is placarded for hazardous materials. Any questions regarding this section may be addressed to Heather Hutchinson in the HR Department at 1-800-533-1812.
- 8.1.2 Each CDL driver will be provided with information on testing requirements and consequences for the misuse of alcohol and/or use of controlled substances
- 8.1.3 Drivers will be provided with information concerning the effects of alcohol and controlled substances use on an individual's health, work and personal life.
- 8.1.4 Certificate of receipt. Each driver shall be provided with a copy of this Section of the HASP, and shall be required to sign a statement certifying that he/she has received these materials. The original signed statement will be kept in the driver's personnel file in Stillwater.

8.2 **Prohibitions.**

- 8.2.1 No driver shall use alcohol while on duty, or while off duty and driving a company vehicle, or within four hours of reporting for duty or driving a company vehicle. No driver shall report for duty or remain on duty while under the influence of alcohol.
- 8.2.2 No driver shall use a controlled substance at any time, except when the use is pursuant to the instructions of a licensed medical practitioner who has advised the driver that the substance will not adversely affect his/her ability to operate a commercial motor vehicle.
- 8.2.3 No company driver shall transport alcoholic beverages in any form or in any location in a CMV.

8.3 **Substance Abuse Testing.** This paragraph summarizes the FMCSR requirements for substance abuse testing. These rules apply to each employee who holds a Commercial Driver's License and who at any time drives on public roadways, a commercial motor vehicle that either:

- has a gross vehicle weight of 26,001 pounds or more; or
- is designed to transport 15 or more passengers including the driver; or
- is of any size and is placarded to transport hazardous materials.

- 8.3.1 **Pre-employment Testing.** In accordance with the Sargent Corporation Pre-employment Substance Abuse Testing Program, each applicant for employment

shall undergo mandatory drug testing for controlled substances. A verified negative test result is required as a condition of employment.

8.3.2 Random Testing. Each driver shall be enrolled in the company's random drug and alcohol testing program.

8.3.2.1 Our random testing program is administered by LexisNexis who randomly selects candidates for testing on a quarterly basis.

8.3.2.2 Selected drivers are informed when and where they are to appear at a qualified collection facility for testing. Urine specimens are collected under DOT guidelines and sent to a certified toxicology laboratory for test results. A chain of custody form including both the driver's social security number and the specimen number accompanies each specimen to ensure the results are attributed to the correct driver.

8.3.2.3 Test results are kept strictly confidential. Corporate officials are made aware of test results solely on a "need to know" basis for operational purposes.

8.3.2.4 Refusal to submit to a scheduled random substance abuse test shall be counted as a positive test. Failure to appear for a scheduled test without an acceptable excuse and/or failure to cooperate with testing personnel during the test procedure shall be considered a refusal to submit to the test.

8.3.3 Post Accident Testing. Both alcohol and controlled substance tests will be administered to CDL drivers as soon as practical following an accident when:

8.3.3.1 The accident involves a human fatality (regardless of fault); or

8.3.3.2 A citation has been issued to the CDL driver for a moving traffic violation arising from the accident, and the accident resulted in bodily injury with immediate medical treatment away from the accident site; or

8.3.3.3 A citation has been issued to the CDL driver for a moving traffic violation arising from the accident, and the accident resulted in disabling damage to a motor vehicle requiring it to be towed or transported away from the accident site.

8.3.3.4 **Post-accident testing has been amended to include non-CDL personnel driving company vehicles and personnel operating privately-owned vehicles conducting company business (See 6.0 Drug and Alcohol-Free Workplace Policy).**

8.3.3.5 If a required alcohol test cannot be administered within 2-hours following an accident, the Human Resource Department shall prepare

and maintain a record stating the reasons the test was not promptly administered.

- 8.3.3.6 If a required alcohol test cannot be administered within 8-hours and/or the controlled substance test cannot be administered within 32-hours following an accident, efforts to administer such test(s) will cease and the Human Resource Department shall prepare and maintain a record stating the reasons the test(s) could not be administered.

8.3.4 **Reasonable Suspicion Testing.**

- 8.3.4.1 A supervisor who has participated in a **Supervisory Drug & Alcohol Training** program shall require a driver to submit to alcohol and controlled substance testing when the supervisor has reasonable suspicion that the driver is under the influence of or is impaired by one or more of these substances.

- 8.3.4.2 The trained supervisor's determination that reasonable suspicion exists to require the driver to undergo an alcohol or controlled substance test must be based on specific direct observations made by the supervisor concerning the appearance, behavior, speech, or body odors of the driver.

8.4 **Consequences of Prohibited Substance Use.**

- 8.4.1 Any employee who is seen using alcohol or illegal drugs during working hours shall be terminated from employment.
- 8.4.2 A driver who has been tested with a blood alcohol concentration between 0.02 and 0.04 shall not be allowed to operate a CMV for a period not less than 24 hours following the test.
- 8.4.3 A driver who has tested positive for illegal drugs or has an alcohol concentration greater than 0.04 shall not be allowed to drive a commercial vehicle until the driver has:
 - 8.4.3.1 Been evaluated by a Substance Abuse Professional (SAP);
 - 8.4.3.2 Complied with any recommended treatment; and
 - 8.4.3.3 Received a negative result on a return-to-duty test for the prohibited substance of concern.
- 8.4.4 Unannounced follow-up tests for the prohibited substance are also required. The number of required follow-up tests and their scheduling shall be determined by the SAP.



CMV DRIVER REQUIREMENTS

BASED ON GROSS VEHICLE WEIGHT AND DISTANCE TRAVELED

		Driving Within 100 Air-miles of the Normal Work Reporting Location, and Not Outside Maine		Drivers Traveling More Than 100 Air Miles from a Maine Jobsite, or Driving in any other State	
	All Placarded Vehicles (any distance, any weight)	GVW Between 10,000 - 26,000 lbs.	GVW >26,000 lbs.	GVW Between 10,000 - 26,000 lbs.	GVW >26,000 lbs.
CDL Required; Endorsements as Needed	X		X		X
Current DOT Physical Required	X	X**	X**	X	X
Random Substance Abuse Testing Pool	X		X		X
Drivers are Subject to Driving Rules (Part 392)	X	X	X	X	X
Requirement to Keep a Logbook	X	X**	X**	X	X
Hours of Service Requirements Apply	X			X	X
Post Trip Inspection Report Required	X	X	X	X	X

** Employees who do not regularly drive a CMV, but who occasionally drive a CMV **only in the state of Maine and always within 100 miles of their jobsite** do not need to have a physical examination or medical card, and do not need to keep a logbook.

Financial Capability

Please see the Cover letter and CSO Report.

Technical Capability

Please see the cover letter and CSO report.

Transportation Analysis – Traffic Impact (14-526 (a) 1)

Not Applicable. The proposed project does not involve any improvements that will impact existing or require additional vehicular or pedestrian circulation.

Access and Circulation (14-526 (a) 2 a)

- (i) Not Applicable. Vehicular circulation will not be impacted by the proposed improvements.
- (ii) Not Applicable. There are no additional points of access proposed with the improvements.
- (iii) Not applicable. There are no drive-up features associated with this project.

Loading and Servicing (14-526 (a) 2 b)

- (i) Not applicable. The proposed project does not involve the need for delivery and/or other service vehicles.

Environmental and Landscape Features

Preservation of significant Natural Features (14-526 (b) 1)

The proposed project site is a previously developed soccer field. The proposed project involves the installation of an underground storage facility to abate combined sewer overflows in the area. The soccer field will be restored as part of the project.



CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE
TRANSPORTATION ENGINEERING • ENVIRONMENTAL SERVICES

WETLAND REPORT

Back Cove South CSO

**Prepared for
City of Portland Department
of Public Works
250 Canco Road
Portland, ME 04103**

**Prepared by
Sebago Technics
75 John Roberts Rd.
South Portland, ME 04106**

March 28, 2019

WETLAND REPORT

Back Cove South CSO

Table of Contents

1.0 INTRODUCTION	1
1.1 Scope of Work.....	1
2.0 PROTECTED NATURAL RESOURCE REGULATIONS AND PERMITTING INFORMATION	1
2.1 Stream Regulations and Permitting.....	1
2.2 Wetland Classification, Regulations, and Permitting	1
2.3 Municipal Regulations and Permitting	2
3.0 AGENCY RESOURCES	2
3.1 Published Mapping	2
4.0 PROTECTED NATURAL RESOURCE CLASSIFICATION AND DESCRIPTION	3
4.1 Streams	3
4.2 Wetlands.....	3
4.3 Vernal Pools	3
4.4 Mapping.....	3
5.0 FINDINGS AND RECOMMENDATIONS	4
6.0 CLOSING	4
APPENDIX A – PHOTOGRAPHS	
APPENDIX B – DOCUMENTS	

1.0 INTRODUCTION

1.1 Scope of Work

We are pleased to present this Wetland Report for the Back Cove South CSO project in Portland for the Department of Public Works. The purpose of our services as contracted was to investigate and document wetlands within the project area. The conclusions and recommendations presented in this report are based upon the data obtained from the areas explored.

These findings may be used to supplement other information that may be required to obtain land development permits from the Maine Department of Environmental Protection (MDEP), U.S. Army Corps of Engineers (Corps), and/or the City of Portland. Included in this report is information about wetland-related regulations and permitting requirements as they pertain to proposed development on the property.

2.0 PROTECTED NATURAL RESOURCE REGULATIONS AND PERMITTING INFORMATION

2.1 Stream Regulations and Permitting

Streams are Protected Natural Resources under the MDEP Natural Resources Protection Act (NRPA). Stream alteration, or soil or vegetation disturbance within 25 feet of a stream, generally requires an Individual permit from the MDEP. Soil or vegetation disturbance between 25 feet and 75 feet from a stream or a stream crossing generally requires filing of a MDEP Permit-by-Rule (PBR) Notification. Streams are also protected by the Corps. Any direct alteration of a stream requires a permit from the Corps.

2.2 Wetland Classification, Regulations, and Permitting

MDEP

The MDEP uses two categories to classify wetlands for permitting purposes; “Wetlands of Special Significance” (*WOSS*) and “Wetlands Not of Special Significance”. A *WOSS* is defined in the NRPA, Chapter 310 – Wetlands and Waterbodies Protection, Section 4. The following eight criteria are used in determination of a *WOSS*:

1. **Critically imperiled or imperiled community.** The freshwater wetland contains a natural community that is critically imperiled (S1) or imperiled (S2) as defined by the Natural Areas Program.
2. **Significant wildlife habitat.** The freshwater wetland contains significant wildlife habitat as defined by 38 MRSA § 480-B(10).
3. **Location near coastal wetland.** The freshwater wetland area is located within 250 feet of a coastal wetland.
4. **Location near GPA great pond.** The freshwater wetland area is located within 250 feet of the normal high water line, and within the same watershed, of any lake or pond classified as GPA under 38 MRSA § 465-A.

5. **Aquatic vegetation, emergent marsh vegetation or open water.** The freshwater wetland contains, under normal circumstances, at least 20,000 square feet of aquatic vegetation, emergent marsh vegetation, or open water, unless the 20,000 or more square foot area is the result of an artificial pond or impoundment.
6. **Wetlands subject to flooding.** The freshwater wetland area is inundated with floodwater during a 100-year flood event based on flood insurance maps produced by the Federal Emergency Management Agency (FEMA) or other site-specific information.
7. **Peatlands.** The freshwater wetland is or contains peatlands, except that the department may determine that a previously mined peatland, or portion thereof, is not a wetland of special significance.
8. **River, stream, or brook.** The freshwater wetland area is located within 25 feet of a river, stream or brook.

Activities that alter “Wetlands of Special Significance” require an individual permit. Activities that alter greater than 4,300 ft² of wetlands classified as “Wetlands Not of Special Significance” generally require a permit, as follows:

1. Alterations of between 4,300 ft² and 15,000 ft² require a Tier 1 NRPA permit.
2. Alterations of between 15,000 ft² and 43,560 ft² require a Tier 2 NRPA permit.
3. Alterations of greater than 43,560 ft² require a Tier 3 NRPA permit.

Tier 2 and 3 NRPA permit applications generally require further submissions, such as wetland data forms, a wetland functional assessment, and a wetland mitigation plan. Data for these submissions must be collected during the growing season, between about May 01 to October 15 in Maine.

Corps

Corps jurisdiction on a project is triggered by, among other criteria, alteration of a wetland that is connected by “significant nexus” to a stream or navigable water. Most projects that involved wetland fill are permitted by the Corps through their General Permit process. Activities that alter between 1 ft² and 15,000 ft² of wetland on this property will likely require filing of a Category 1 Notification Form with the Corps. The Corps will generally accept the MDEP Tier application for alterations between 4,300 ft² and 3 acres. Alterations over 3 acres require a Corps Individual Permit.

2.3 Municipal Regulations and Permitting

We did not review the City of Portland ordinances for regulations or permitting guidance pertaining to natural resource alteration. We suggest that you review City of Portland statutes to assess zoning and potential building restrictions specific to the property/proposed project.

3.0 AGENCY RESOURCES

3.1 Published Mapping

We reviewed the USGS Topographic Maps, accessed from the USGS website on March 28, 2019. The USGS map identifies Back Cove as the only water feature.

We reviewed the USDI U.S. Fish and Wildlife Services (USFWS) National Wetland Inventory (NWI) Map, accessed March 28, 2019. The NWI Map identifies an E2EM1P wetland which is an irregularly flooded estuarine, intertidal, persistent emergent wetland as well as a E2US3N wetland which is a regularly flooded estuarine, intertidal, unconsolidated shore wetland with mud substrate.

Copies of published mapping are included in Appendix B.

4.0 PROTECTED NATURAL RESOURCE CLASSIFICATION AND DESCRIPTION

A site visit was conducted on May 16, 2018.

4.1 Streams

No streams were identified within the project area.

4.2 Wetlands

The wetlands on this site were delineated by Gary M. Fullerton, CSS of Sebago Technics, Inc. on May 16, 2018. This delineation was conducted, compiled, and reported in general accordance with guidelines described in the 1987 Corps of Engineers Wetland Delineation Manual and its 2012 Regional Supplement (Version 2), The MDEP NRPA Statute, NRPA Chapter 310, NRPA Chapter 335, and the Corps General Permit.

The wetlands were marked in the field with alpha numeric pink “wetland delineation” flagging. We identified one area of wetland on this site.

1. This wetland is a wetland of special significance as it is part of a coastal wetland. It is classified as an irregularly flooded estuarine, intertidal, persistent emergent wetland (E2EM1P). It is dominated by saltmeadow cordgrass (*Spartina patens*) and smooth cordgrass (*Spartina alterniflora*). The saltmeadow cordgrass is found in the upper portions of the wetland whereas the smooth cordgrass is found in the lower elevations where it is inundated for a longer duration. Soils within the wetland are classified as Pemaquid, Todds Point, and Damariscotta soils which are tidal marsh organic soils.
Areas below the tidal marsh are classified as E2US3N which is a regularly flooded estuarine, intertidal, unconsolidated shore wetland with mud substrate. This wetland generally contains rockweed as its dominant vegetation.

4.3 Vernal Pools

No vernal pools exist within this coastal wetland.

4.4 Mapping

Wetlands were located using a Trimble GPS backpack unit capable of decimeter accuracy. These locations are limited to within the project boundary and may continue outside the project boundary onto adjacent land.

5.0 FINDINGS AND RECOMMENDATIONS

On May 16, 2018, a coastal wetland was mapped on this project site which is a wetland of special significance. This wetland is part of the intertidal zone and includes salt-tolerant grasses as the dominant vegetation. This tidal marsh is the upper extents of Back Cove.

6.0 CLOSING

It has been a pleasure to be of assistance to you with this phase of your project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,

Sebago Technics, Inc.

A handwritten signature in black ink, appearing to read 'Gary M. Fullerton', with a long horizontal flourish extending to the right.

Gary M. Fullerton, CSS, LSE

Director of Natural Resource

Appendix A

PHOTOGRAPHS



Photograph 1. View looking northeasterly at rip rap bank and Back Cove. 05/16/18.



Photograph 2. View looking northeasterly at coastal wetland. 05/16/18.



Photograph 3. View looking southwesterly at coastal wetland. 05/16/18.



Photograph 4. View looking northeasterly at coastal wetland. 05/16/18.

Appendix B

DOCUMENTS

Landscaping and Landscape Preservation (14-526 (b) 2 a)

- (i) There is limited tree cover on the proposed project site. The proposed addition will not impact tree cover on the site.
- (ii) No trees with a 10-inch DBH or greater within the setback are to be impacted. Please see the site plan.
- (iii) Vegetation will be protected during construction in accordance with tree preservation standards listed in Section 4 of the Technical Manual.
- (iv) No waivers for vegetation are sought.
- (v) The proposed project meets all the requirements outlined in Division 26, Shoreland Regulations. Please see the Evaluation Report included as attachment 1 and the plan set.

Site Landscaping (14-526 (b) 2 b)

There is no proposed landscaping for this project. The existing soccer field will be restored as part of this project.

Parking Lot Landscaping (14-526 (b) 2 b ii)

Not applicable. There is no parking proposed as part of this project. This project is Public Works project designed to rectified combined sewer overflows in the area.

Street Trees (14-526 (b) 2 b iii)

Not applicable. The proposed project will not impact any existing street trees.

Environmental and Stormwater

Water Quality, Stormwater Management and Erosion Control (14-526 (b) 3 a)

The proposed site has been designed in accordance to City and Chapter 500 requirements to minimize the amount of stormwater leaving the site. Please see the plan set included in this submittal for stormwater information.

Consistency with City Master Plans (14-526 (c) 1)

The proposed project is a Public Works project and is consistent with the City Master Plan. The proposed development involves the installation of an underground storage system to abate combined sewer overflows. The project will not result in any additional burdens to the City's resources, nor the unnecessary decrease of undeveloped parcels. The proposed use is consistent with the surrounding area.

Public Safety and Fire Prevention (14-526 (c) 2)

- a. Crime Prevention – The proposed project involves the placement of an underground system in the area of an existing soccer field. The soccer field will be replaced as part of this project. There will be no impact to the site’s ability to cultivate or deter crime.
- b. There is adequate access to the site for emergency vehicles. Please see the plan set.
- c. The site has been designed to be consistent with the standards of the City of Portland Technical Manual. Please see the plan set.

Availability and Adequacy of Public Utilities (14-526 (c) 3) (Technical Manual, Sections 2 & 9)

- a. The development will not overburden sanitary sewers and storm drains, water lines, or other public infrastructure and utilities.
- b. There is no proposed additional electrical service with this project.
- c. All proposed sanitary sewers, storm drains, water lines or other utilities meet the provisions of the City Technical manual.
- d. The proposed development will connect to an existing sewer line.
- e. All proposed sanitary sewer and stormwater utilities are designed to City standards.
- f. Not applicable. There is no solid waste plan associated with this project.

Massing, Ventilations and Wind Impact (14-526 (d) 1)

- a. All proposed structures are to be installed underground and will not result in health or safety problems from a reduction in ventilation to abutting structures. Please see the site plan.
- b. All proposed structures are to be installed underground and will not minimize the value or utility of the neighboring buildings. Please see the plan set.
- c. There are no HVAC systems proposed as part of this project.

Shadows (14-526 (d) 2)

Not applicable. All proposed structures are to be installed underground.

Snow and Ice Loading (14-526 (d) 3)

Not applicable. No buildings are proposed as part of this project.

View Corridors (14-526 (d) 4)

Not applicable. All proposed structures are to be installed underground and the existing soccer field is to be replaced in kind.

Historic Resources (14-526 (d) 5)

The proposed development will not impact nor is it in close proximity of any historic resources.

Exterior Lighting (14-526 (d) 6)

Not applicable. No lighting is proposed as part of this CSO project.

Noise and Vibration (14-526 (d) 7)

Not Applicable. There is no equipment associated with the proposed use that would result in the generation of noise or vibrations other than the temporary noise associated with construction during the installation of the storage chamber.

Signage and Wayfinding (14-526 (d) 8)

Not applicable. There is no additional signage proposed for this CSO project.

Zone Related Design Standards (14-526 (d) 5)

Not Applicable. There are no specific design standards associated with the zone of the subject site.



CITY OF PORTLAND
Department of Public Works
Christopher C. Branch, P.E., Director

Jerry Dostie, Project Manager
Maine Department of Transportation
Bureau of Project Development, Multimodal Program
16 State House Station
Augusta, ME 04333-0016

June 29, 2020

Subject: Public Process Certification, Large Culvert Replacement Project
WIN 024369.00

Dear Mr. Dostie:

The Municipality of Portland certifies with this letter that a public process was carried out for the subject project, satisfying a pre-construction requirement in the executed project agreement with MaineDOT.

Opportunities for public comment included:

- June 2011 COP Council authorization of the Tier III Combined Sewer Overflow Plan
- Various COP Council updates to the CSO storage project that began in 2013.
- May 7, 2018 Press Release for geotechnical work
- January 7, 2019 Press Release for geotechnical work
- February 20, 2019 COP Council CIP authorization
- April 29, 2019 COP Council authorization of MDOT agreement
- September 6, 2019 Press Release for geotechnical work
- November 4, 2019 Notice for public meeting mailed – press release
- November 7, 2019 Parks Commission public meeting presentation
- November 15, 2019 Press Release for geotechnical work
- December 4, 2019 Neighborhood meeting presentation
- The project continues to work with the Portland Planning Department for presentation to the Planning Board. A presentation is currently scheduled for Jul 14th.

There has been no public opposition to the project at this time.

I have attached, for your information, the notification that was sent to abutters by mail or email, the public notice, the meeting minutes and sign-in sheet. If you need any additional information, please contact me at all 874-8840 or brad@portlandmaine.gov
Sincerely,

Bradley A. Roland, P.E., Senior Project Engineer



CITY OF PORTLAND
Department of Public Works
Christopher C. Branch, P.E., Director

November 7, 2019

Re: Back Cove South Storage Facility (BCSSF)

Dear Resident:

The Portland Department of Public Works would like to invite you to a neighborhood meeting to discuss the construction of the above referenced project. The attached map will assist in defining the project boundaries.

This project continues the City's efforts to reduce combined sewer overflows (CSOs) to Back Cove and Casco Bay with the installation of a 3.5-million-gallon storage facility to be located under the Preble Street playing fields. The project involves the following components:

- Using pipe and structures to bring three individual CSO overflows from their current discharge locations to the storage facility.
- Excavation within the playing fields to install the facility.
- Installation of associated utility building to house the controls for the facility.
- Installation of new storm drain within I-295 and Franklin Street on/off ramps.
- Installation of back flow prevention to assist with the flooding of the Franklin Street corridor.
- Installation of a force main to the intersection of Marginal Way and Diamond Streets.
- Raising the current elevation of the soccer fields to address tidal inundation which limits use of the field.
- Restoration of the soccer fields.

The City and their contractor are aware of the active use of the area and will ensure pedestrian access to the Back Cove Trail remains for the duration of the project.

The meeting is scheduled to be held in **Room 24** of City Hall (lower floor near the ATM), on **Wednesday, December 4th, 2019 at 5:30 P.M.** The meeting should last about an hour. Please join us to receive a verbal description of what the project intends to achieve.

Note from the Planning Department:

Under Section 14-32(C) and 14-524(a)d of the City Code of Ordinances, an applicant for a Level III development, subdivision of over five lots/units, or zone change is required to hold a neighborhood meeting within 30 days of submitting a preliminary application or 21 days of submitting a final site plan application, if a preliminary plan was not submitted. The neighborhood meeting must be held at least seven days prior to the Planning Board public hearing on the proposal. Should you wish to offer additional comments on this proposed development, you may contact the Planning Division at 874-8721 or send written

212 Canco Road, Ste B • Portland, ME 04103 • 207-874-8801

cbranch@portlandmaine.gov • www.portlandmaine.gov

correspondence to the Planning and Urban Development Department, Planning Division,
4th Floor, 389 Congress Street Portland, ME 04101 or by email: to
jrather@portlandmaine.gov

We look forward to meeting with you to discuss this project. If you are unable to attend
the meeting, please feel free to send written comments with a neighbor or mail them to
myself. I can be reached at 212 Canco Road, Suite B, Portland 04103 or 874-8840.

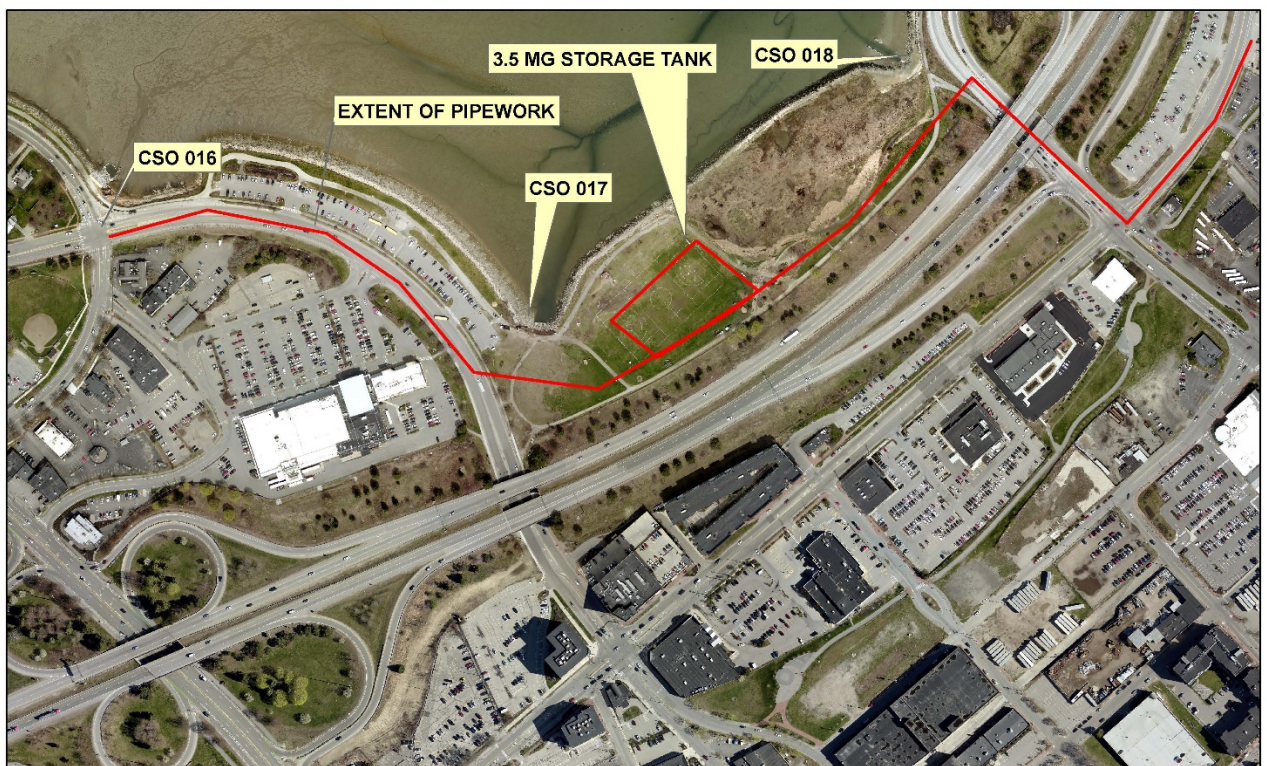
Sincerely,

CITY OF PORTLAND



Bradley A. Roland, P.E.
Senior Project Engineer

BACK COVE SOUTH STORAGE FACILITY



BACK COVE SOUTH STORAGE FACILITY
PROJECT LOCATION MAP
NEIGHBORHOOD MEETING

0 125 250 500 750 1,000 Feet



Back Cove South Storage Facility
Interested Parties List

First Name	Last Name	Company Name	Street Number	Street Name	City	State	Zip
Anthony	Donovan		27	Riverview Street	Portland	ME	04102
Barbara	Wood		125	Emery Street	Portland	ME	04102
Chris	Castelsky	Fairpoint Communicati	521	East Morehead Stret	Charlotte	NC	28202
David	Nowlin		215	Oxford Street	Portland	ME	04102
Deb	Keenan		28	Dorothy Street	Portland	ME	04103
Devon	Platte		26	North Street, #3	Portland	ME	04101
Edward	Suslovic	District 3	46	Kenwood Street	Portland	ME	04103
		Greater Portland Coun	970	Baxter Blvd., 2nd Fl	Portland	ME	04103
Janice	Carpenter		9	W. Commonwealth	Portland	ME	04103
Jennifer	Munson	City of Portland	389	Congress Street	Portland	ME	04101
Jesse	Thompson	Kaplan Thompson Arch	100	Exchange Street	Portland	ME	04103
Len	Anderson		543	Allen Avenue	Portland	ME	04103
Lynn	Clarkson		145	Marlborough Road	Portland	ME	04103
Mary	Griffity		6	E. Prom, Unit #2	Portland	ME	04103
Vahan	Tufankijan	Seaside Healthcare	850	Baxter Boulevard	Portland	ME	04103
Nancy	Bartlett			PO Box 7965	Portland	ME	04112
Pam	Burnside		64	Lester Drive	Portland	ME	04103
Paul	Dubois		1915	Congress Street	Portland	ME	04102
Peggy	Morin		66	Farnham Street	Portland	ME	04101
Philip	Haughey		1660	Soldiers Field Road	Boston	MA	02135
James	Sterling	Portland Society of Architects		PO Box 7305	Portland	ME	04112
Priscilla	LaVallee		190	US Route 1, Unit 2	Falmouth	ME	04105
Rebecca	Halla	Waste Management of	2000	Forest Avenue	Portland	ME	04103
REP Benjamin	Dudley III	District 30	9	Ponce Street	Portland	ME	04101
REP Glenn	Cummings	District 37	24	Nevens Street	Portland	ME	04103
Robert	Hains		250	Holm Avenue	Portland	ME	04102-1208

Local business list

Attached Map Key	name	property	email	phone
1	Jim Hanley	Ted West's partner--Prebble St intersection	jhanley@capservicing.com	(207) 553 2000 x 208
2	Joel Trantum	Planet Dog; AT &T	jtrantum@aol.com	(617) 873-0850
3	Peter Quesada	Fore River Co; 87-161 Marginal Way	pquesada@forerivercompany.com	(207) 772 8286 x203
4	Peter Noyes	Noyes Moving & Storage; AAA service center	pnoyes@noyesmoving.com	(207) 347-3581
5	Brent Noyes	Noyes Moving & Storage; AAA service center	bnoyes@noyesmoving.com	(207) 838-9788
5	Josh Benthien	Northland; former Century Tire	josh@northlandus.com	(207) 780.0223
6	Michael Cianchette	309-323 Marginal Way	MCianchette@theregency.com	(207) 774-1000
7	Alan Levenson	several properties east of Franklin	Ajsaddlebrooke@aol.com	

Adjacent property owner list

161 Marginal Way Llc	Box 7525	Portland ME 04112
87 Marginal Way Llc	Po Box 7525	Portland ME 04112
Atlantic Bayside Holdings Li Llc	50 Portland Pier Ste 400	Portland ME 04101
Atlantic Bayside Square Llc	340 Fore St	Portland ME 04101
Atlantic Bayside Trust Llc	50 Portland Pier Ste 400	Portland ME 04101
Back Cove Company	Po Box 7525, 5 Milk St	Portland ME 04112
Blue Atlantic Portland Llc	13155 Noel Rd Ste 100 Lb 73	Dallas TX 75240
Five Liver Company	5 Milk St	Portland ME 04101
Hannaford Bros Co	Po Box 1000	Portland ME 04104
Hannaford Bros Co #351C	Po Box 1000	Portland ME 04104
Marginal Way Properties Inc	984 Memorial Dr # 504	Cambridge MA 02138
Noyes Earl W & Sons	Po Box 938	Portland ME 04104
State Of Maine	Null	Augusta ME 04333
Tomaks Real Estate Llc	49 Eastman Rd	Cape Elizabeth ME 04107

NEIGHBORHOOD MEETING SIGN-IN

17025

Back Cove South Storage Facility (BCSSF) New Drainage System from Back Cove to Marginal Way

Date/Time of Meeting: December 4, 2019 at 5:30 P.M.

Location: Room 24, Portland City Hall
389 Congress Street, Portland

Members of the Public in Attendance	
Printed Name	E-mail
1. Owens McCullough	omccullough@subgytechnics.com
2. Brad Fries	brad@northlandus.com
3. Bruce Kistner	bkistner@forevercompany.com
4. Ed Suslovic	esuslovic@gmail.com
5. Jaime Parker	jaime@trails
6. George Rheault	george.rheault@gmail.com
7. Chris	
8.	
9.	
10.	
11.	
12.	
Applicant and Consultant Team in Attendance:	
1. Owens McCullough	omccullough@subgytechnics.com
2. Bradley Boland	brad@portlandmaine.gov
3. Brad Fries	brad@northlandus.com
4. Chris Branch	chbranch@portlandmaine.gov
5.	
6.	
7.	



**Neighborhood Meeting Minutes
December 4, 2019**

A neighborhood meeting was held at 5:30 PM on Wednesday, December 4, 2019 in Room 24 at Portland City Hall, 389 Congress Street, to discuss the proposed Back Cove South Storage Facility (BCSSF) proposed under the Preble Street playing fields and a new drainage system from Back Cove to Marginal Way.

Minutes:

1. Approximately 9 people attended the meeting including representatives from the City of Portland.
2. A sign-in sheet was circulated.
3. Owens McCullough from Sebago Technics and Brad Roland from City of Portland provided an overview of the project using a PowerPoint Presentation.
4. Public had some general questions regarding timing of construction, impacts to trail system and cost impacts to the City and Tax Payers.

The meeting adjourned at approximately 7:00 p.m.

Sincerely,

Owens A. McCullough, P.E.
Sebago Technics Inc

IMPORTANT NOTICE FROM CITY OF PORTLAND PLANNING DIVISION

IN THE VICINITY OF 244 PREBLE ST

To residents and property owners: Portland's Public Works Department has submitted a Level 3 site plan application for a proposed Back Cove South Storage Facility located at 244 Preble Street. The proposal is to construct an off-line combined sewer overflow (CSO) storage tank with a capacity of 3.5 million gallons in the Back Cove Park (known as Preble Street soccer field). The site is in Recreation and Open Space Zone (ROS) and within the Shoreland Overlay zone. The proposal is subject to Portland's site plan and shoreland zoning standards.

In accordance with the Portland Land Use Ordinance, notices of receipt of a Level III Site Plan application must be sent to property owners within 500 ft. of the subject property (or 1,000 ft. if the project is a subdivision or map amendment for a site located within an Industrial Zone). You will be notified of future Planning Board meetings by receiving notices from the Planning Division prior to any workshops or public hearings.

A project and plan summary is available for viewing on the Citizen Self Service Portal (<https://egweb.portlandmaine.gov/energovprod/selfservice>), by referencing Plan Number PL-000592-2019. Written comments should be submitted to planningboard@portlandmaine.gov. If you have any questions regarding the proposal, please contact Christian Roadman, Planner, by phone at 207-874-8984 or e-mail at croadman@portlandmaine.gov.

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Back Cove South Storage Facility

Preble Street Playing Fields and Franklin Street

PURPOSE & PROJECT GOALS

In 2013, the City continued their efforts with reduction of combined sewer overflows (CSOs) to Casco Bay with the development of the Tier III Long Term Control Plan (LTCP). In addition to the continued efforts of sewer separation and green infrastructure installation, the plan identified 5 storage tanks located throughout the City initially focusing on Back Cove. The BCSSF is the second storage tank project that will focus on the following items:

- Capture first flush (first 1-inch of rainfall);
- Provide sewer system flexibility of flow management;
- Reduce volume of CSO #16, #17 and #18 overflow volumes from 150 MG to 18 MG.

PROJECT INCLUDES:

- 3.5 MG underground storage tank
- Facility control building
- Upon completion, the Preble Street playing fields will be restored at a higher elevation to assist with tidal inundation which limits the use of the fields.
- In raising the fields, additional riprap will be installed to address the erosion at the shoreline.
- All of the trails will be raised.
- The project will install a new drainage system from Back Cove to Marginal Way providing additional storm capacity to the Franklin Street corridor. Backflow prevention will be installed on the system preventing high tides from inundating the Bayside area.

TRAIL ACCESS

The walking trails will remain open during construction. However, please respect the onsite pedestrian direction arrows as to which trail is currently open. It will change throughout the project.



DID YOU KNOW?

- A “combined” sewer system transports wastewater from our homes, industries and businesses as well as the storm water collected from streets, parking lots, roofs, and yards to the East End Wastewater Treatment Plant.
- During heavy rain events, the combined sewer capacity is overwhelmed and a mix of sewer and storm water is discharged into Back Cove. This is called a Combined Sewer Overflow (CSO).

PROJECT SCHEDULE:

- The contractor, Sargent Corp, will be mobilizing to the site the week of March 30th.
- The initial phases will see the following:
 - *installation of fencing to separate the public from the construction site,*
 - *preparing the site for the excavation portion of the project.*
 - *Placement of new riprap along the shoreline.*
 - *And a variety of other activities.*
- The installation of sheet piles for shoring will start in May.
- Excavation will happen throughout the summer.
- The construction of the concrete tanks will begin in late summer.
- The entire project completion is in 2021.
- For more information please visit the Public Works website under Water Resources – Current Projects



COMBINED SEWER OVERFLOW FACT SHEET

Back Cove South Storage Facility 2020-05-04 Update

Project:	Back Cove South Storage Facility
Project Owner:	City of Portland
Project Location:	Preble Street Playing Fields
Sewershed:	Back Cove
CSO's Impacted:	Bedford Street #16, Preble St #17, Franklin St #18
Year Contracted:	2020
Bid Amount:	\$39,965,000
Owners representative:	Sebago Technics / AECOM
Prime Consultant:	Woodard & Curran
Prime Contractor:	Sargent Corporation

Project Description: The project involves the underground installation of a 3.5 MG storage tank, facility control building and upon completion, the Preble Street playing fields will be restored at a higher elevation to assist with tidal inundation which limits the use of the fields.

Schedule: The month of May will see the following activities on the site:

1. Completion of site mobilization by the Contractor (Sargent Corporation) to include the jobsite construction trailer, installation of an access drive from Preble Street and installation of construction security fencing.
2. Striping and grubbing of the existing turf surface.
3. Site excavation and raising the surface grade and trail along the shoreline for flood protection.
4. Installation of erosion control protection together with shoreline riprap stabilization.
5. Installation of sheet piling for the excavation stabilization for the tank installation. The installation of sheet piling will require several months to install and is a critical path item to accommodate excavation for the tank installation.
6. Removal of excavated material from the site and stockpiling of materials on the project site.
7. Surface grading of the land within the area shown on the attached graphic.

For Addition Information: visit <http://www.portlandmaine.gov/2540/Back-Cove-South-Storage-Facility>



CSO tank project question

Christian MilNeil <c.neal.milneil@gmail.com>

Sun, Jun 23, 2019 at 11:31 AM

To: croadman@portlandmaine.gov

Cc: Jamie Parker <jaime@trails.org>

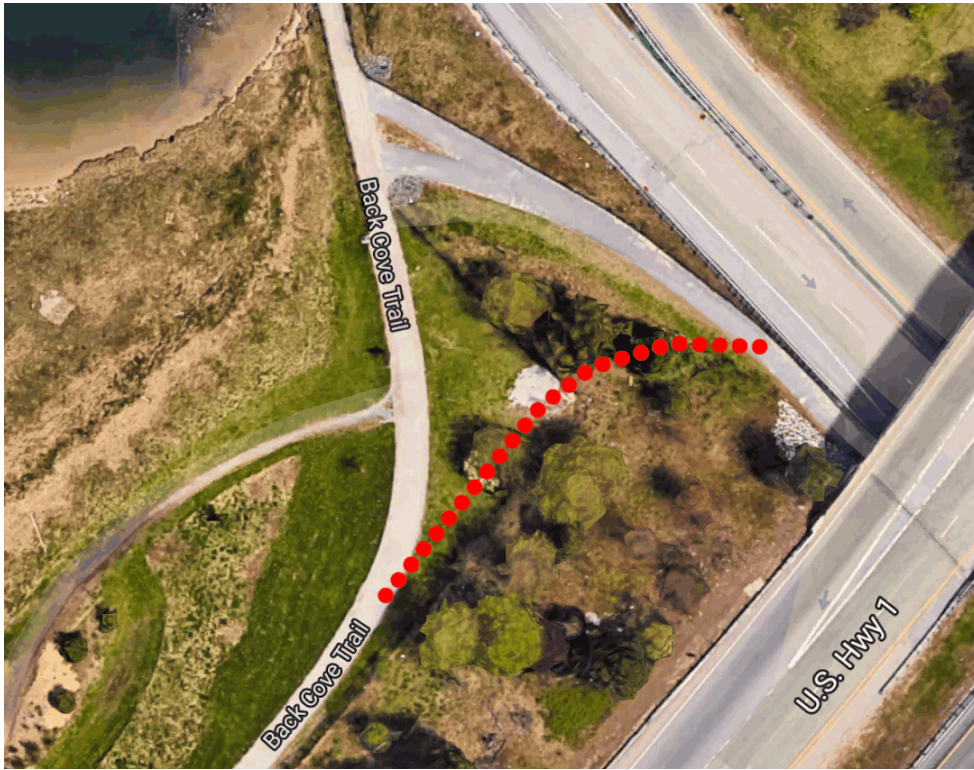
Hi Christian,

I've got a question about the city's proposed site plan for the new CSO tank on Back Cove (PL-000592-2019, <https://egweb.portlandmaine.gov/EnerGovProd/SelfService/#!/plan/ca63bb6f-2189-4c2c-8778-94f7250d610a?tab=attachments>).

It's hard for me to tell from the current PDF documents on there what the final site layout and landscaping plan will be. Does a landscaping plan exist, and if so, could you please post it on the website?

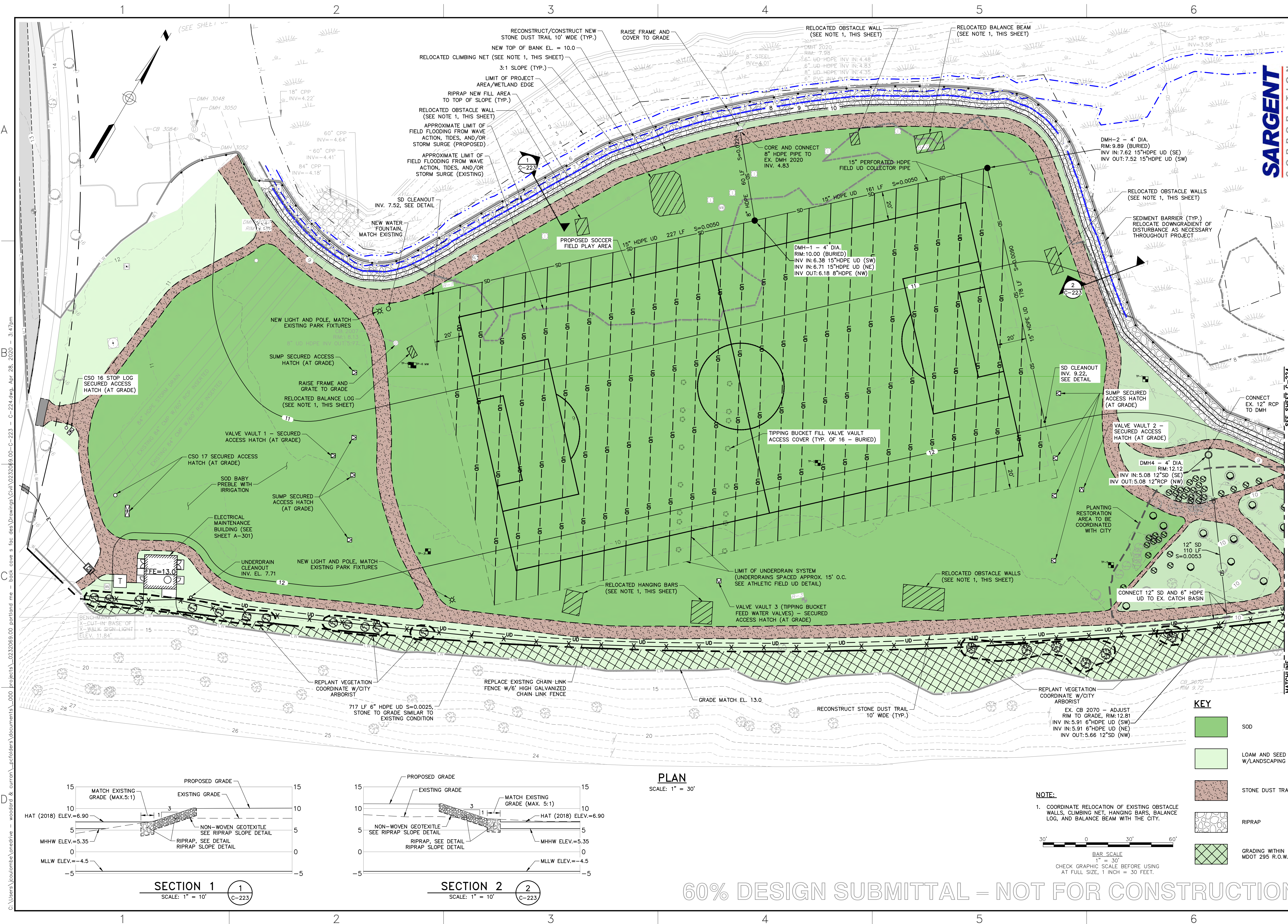
This project should be an opportunity to widen a high-traffic trail to reduce conflicts, perhaps even separating a paved path for cyclists and a stone dust path for pedestrians (as is done on the Eastern Prom trail), and improve connections.

I'm especially eager for the city to improve and correct the tight turn from the Back Cove Trail to the Exit 7/Franklin Street connector, which, when it was built with state/federal funds, was limited to staying within the state highway ROW. We should take this opportunity to improve the connection for bikes and pedestrians headed to and from Hannaford by installing a new trail link roughly along the red dotted line in this image (this is roughly the same path where the city is proposing new storm drain pipes):

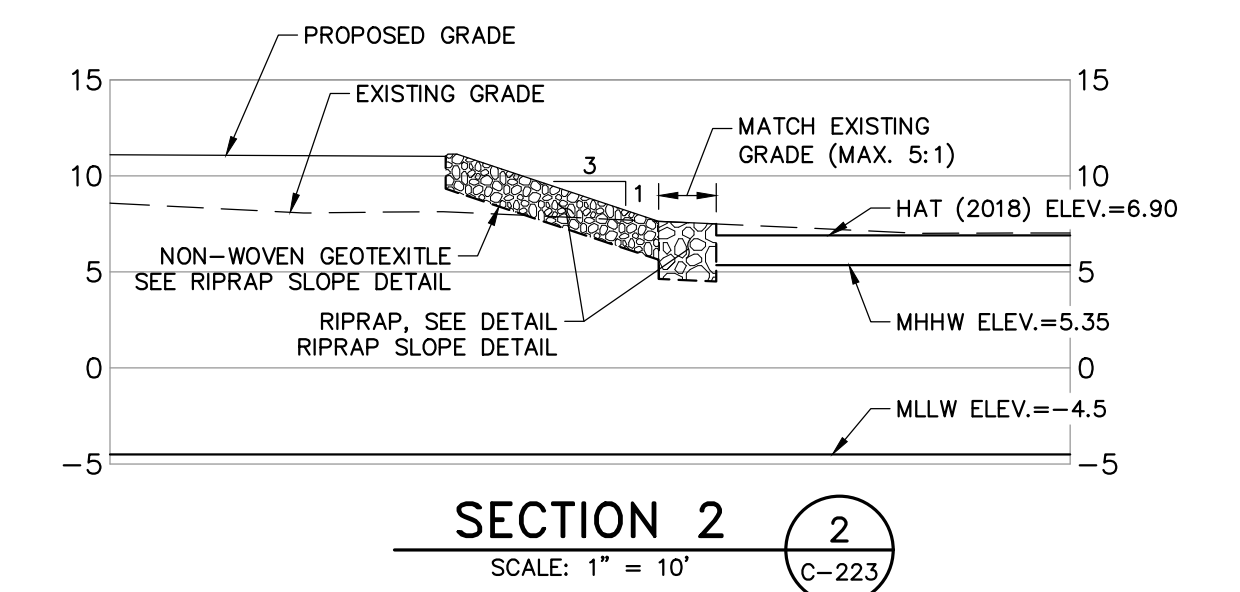
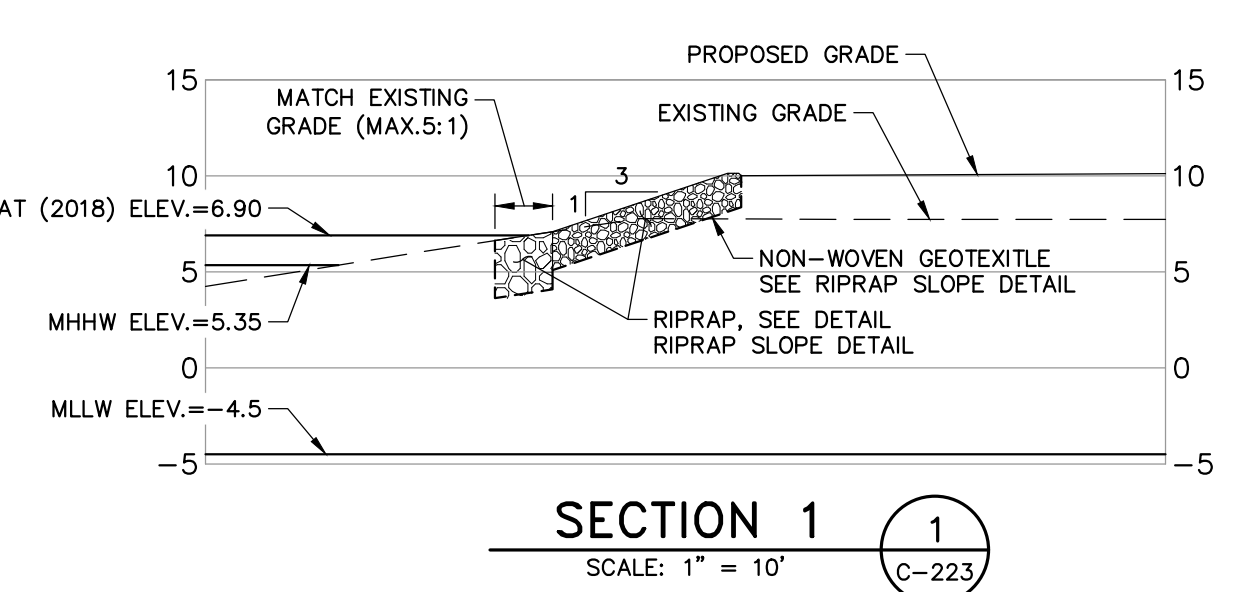


Christian MilNeil

double u double u double u dot christianmilneil dot com



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PLAN
SCALE: 1" = 30'

NOTE:
1. COORDINATE RELOCATION OF EXISTING OBSTACLE WALLS, CLIMBING NET, HANGING BARS, BALANCE LOG, AND BALANCE BEAM WITH THE CITY.

KEY	
	SOD
	LOAM AND SEED W/LANDSCAPING
	STONE DUST TRAIL
	RIPRAP
	GRADING WITHIN MDOT 295 R.O.W.

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Portland, Maine 04102
800.426.4262 | www.woodardcurran.com

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REV.	DESCRIPTION	DATE

CHECKED BY: MOLM
DESIGNED BY: JBC
DRAWN BY: JBC

0232069.00-C-223 - C-224.DWG

FINAL GRADING AND SITE RESTORATION PLAN - 1

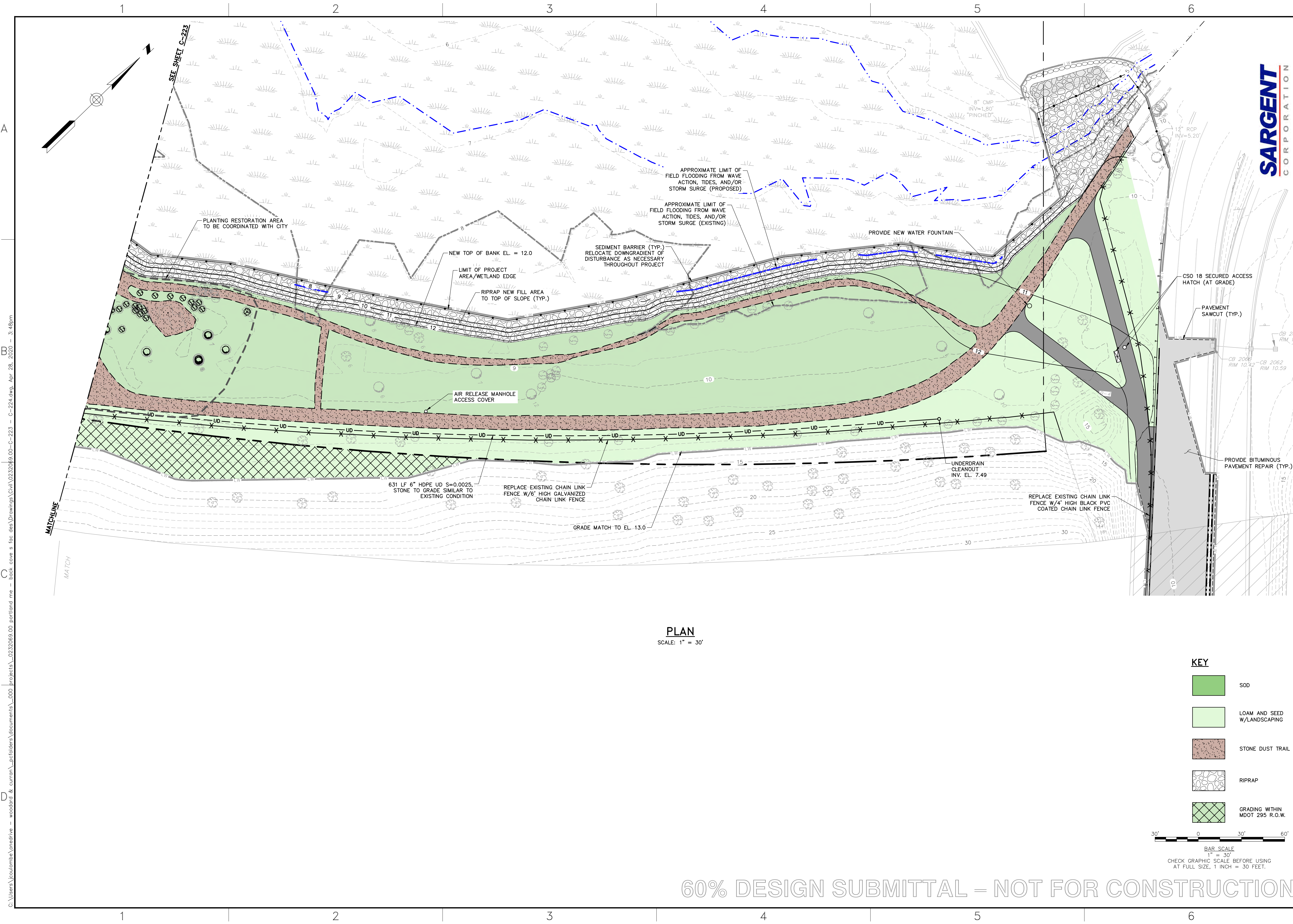
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 25 OF 104

C-223

60% DESIGN SUBMITTAL - NOT FOR CONSTRUCTION



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COMMITMENT & INTEGRITY DRIVE RESULTS

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DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 26 OF 104

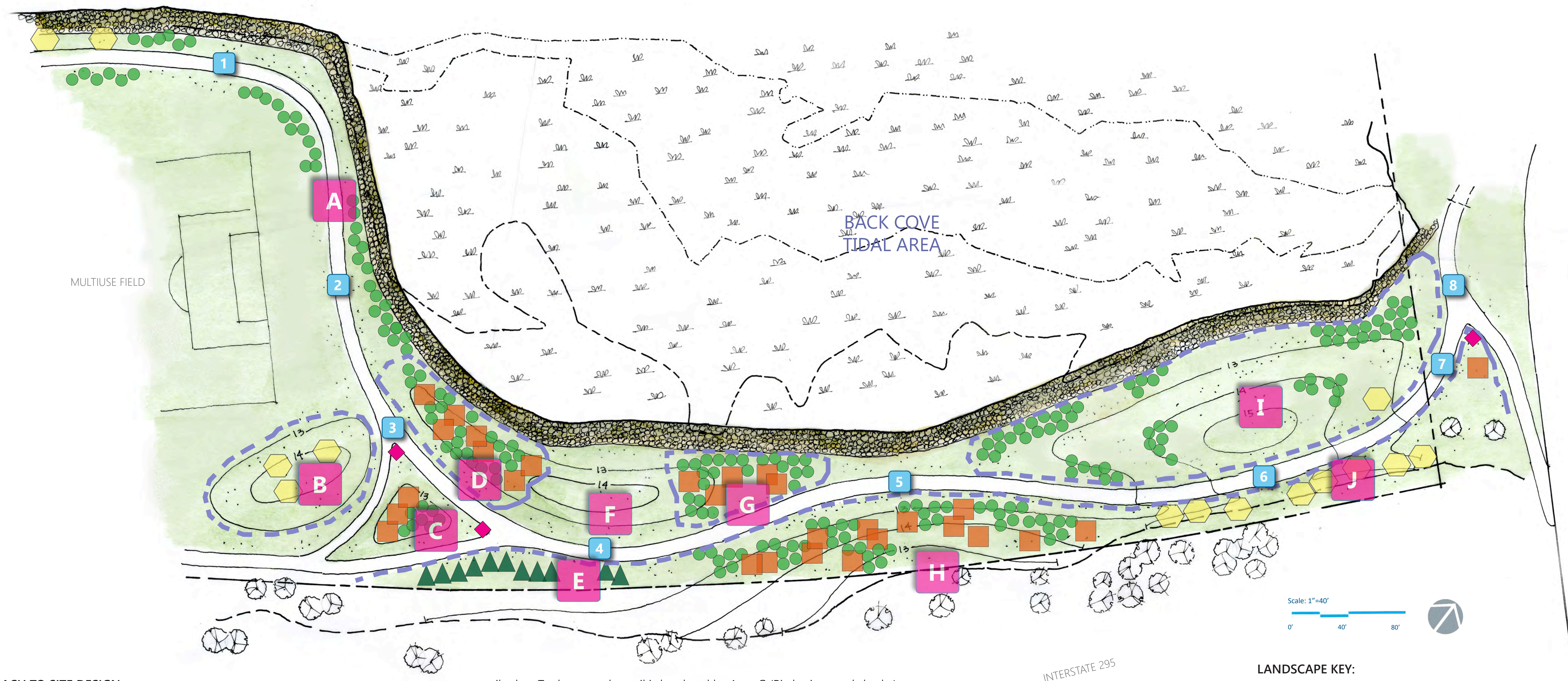
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

FINAL GRADING AND SITE
RESTORATION PLAN - 2

C-224

DRAFT – FOR REVIEW



APPROACH TO SITE DESIGN:

1. Retain open views of Back Cove as the trail approaches from the south. Trail is set back from the edge of the stone revetment to allow for a green buffer (lawn area and plantings) and to reduce potential erosion of trail from occasional wave action or flooding.
2. Trail shifts slightly inland to create opportunities for landscaping and landform.
3. The trail intersects at Area C planted with Red Pines. A secondary trail shifts southwesterly. The trail at the approach to Areas B-D is set within subtle increase in elevations to anchor the trail into the setting.
4. Section 4 of the trail is bordered to the east by Area E and hillside and to the west by Areas D-G. The landscaped area is elevated slightly and provides a maintained lawn opening to Back Cove (Area F). In this section, the trail moves away from Back Cove to reduce wave action and flooding impacts.
5. Trail curves back to the west, shifting closer to the edge of Back Cove. This section of trail is buffered from the highway to the east with the landscaped hillside extending to the

- trail edge. To the west, the trail is bordered by Area G (Pitch pines and shrubs), a mown clearing, and views across the open landscape of Area I (Rose Maritime inspired).
6. As the trail moves northerly, it is bracketed by a hillside of Red Oaks (Area J) to the east and the open meadow landscape inter-planted with groups of maritime shrubs (Area I). The area is raised slightly with a small lawn area at its high point.
 7. The trail approach to the highway offramp at Franklin Arterial is reoriented to expand the landscape of Area I and to enhance views across the landscape from southbound vehicles. The realignment simplifies and better coordinates movement through the trail intersection.
 8. (Throughout) Back Cove East landscape offers an excellent opportunity for education about the project, improvements to the health of Casco Bay, wildlife and habitat, and climate change / sea level rise. To this end, the City should consider teaming with Friends of Casco Bay, Maine Audubon, and others to develop an approach to signage and interpretation.

LANDSCAPE KEY:

- A** Landscape treatment area (reference planting approach descriptions).
- 1** Trail and site section (reference approach to site design descriptions).
- Evergreen tree(s) and/or grouping
- Deciduous tree(s) and/or grouping
- Shrub grouping / density
- Wetland shrub grouping / density
- Directional signage (suggested)
- Seeded area boundary

PLANTING APPROACH:

AREA A.
Northern Bayberry incorporated to mitigate and soften views of the athletic field from Back Cove. Groupings are located along the edge of the field to the extent possible to allow views of Back Cove from the trail. The buffer is required as part of permitting approved by the Department of Environmental Protection.

AREA B.
Grouping of Red Oak with coastal native grasses intermixed with select native wildflowers. Area is slightly raised and mown annually (early spring).

AREA C.
Red Pine under planted with low shrub grouping of Blueberry.

AREA D.
Area with species similar to Pitch Pine Woodland natural community. Clusters of Pitch Pines under-planted with groupings of Black Huckleberry, Northern Bayberry, Blueberry, and Rhodora. Seeded with native coastal grasses.

AREA E.
Wet drainage area with native shrubs indicative of Rose Maritime Shrubland, including Meadowsweet and Winterberry Holly.

AREA F.
Maintained small lawn area bookended by Pitch Pine planting areas. Mown lawn allows open view of Back Cove from the trail and opportunities for recreation and picnics.

AREA G.
Treatment consistent with Area D (similar to Pitch Pine Woodland natural community).

AREA H.
Similar treatment to Areas D and G, but denser and with Red Spruce in lieu of Pitch Pine. This area is intended to buffer the interstate and to provide a backdrop to the trail, orienting the user experience toward Back Cove. Seeded with native coastal grass mix.

AREA I.
Area with species similar to Rose Maritime Shrubland natural community. Groupings of shrubs including Bush Honeysuckle, Beach Plum, Northern Bayberry, and Virginia Rose. Seeded with native coastal grasses intermixed with select native wildflowers.

AREA J.
Hillside planted with clusters of Red Oak. Seeded with native coastal grasses intermixed with select native wildflowers.

Date: July 8, 2020

Consultant Team:



BACK COVE EAST LANDSCAPE
PLANTING STRATEGY

Prepared for:



BACK COVE EAST – PROPOSED PLANT PALETTE

TREES (1 OF 1)



Red Oak
Quercus rubra



Red Pine
Pinus resinosa



Pitch Pine
Pinus rigida

BACK COVE EAST – PROPOSED PLANT PALETTE

SHRUBS (1 OF 3)



Beach Plum
Prunus maritima



Black Huckleberry
Gaylussacia baccata



Bush Honeysuckle
Diervilla lonicera

BACK COVE EAST – PROPOSED PLANT PALETTE

SHRUBS (2 OF 3)



Lowbush Blueberry
Vaccinium angustifolium



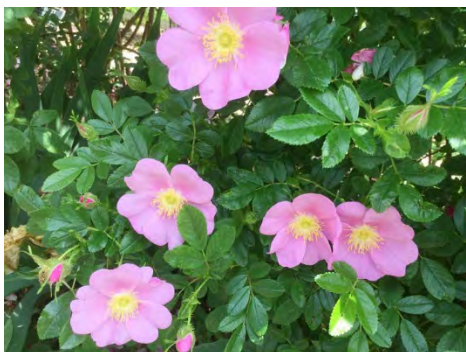
Northern Bayberry
Myrica pensylvanica



Rhodora
Rhododendron canadense

BACK COVE EAST – PROPOSED PLANT PALETTE

SHRUBS (3 OF 3)



Virginia Rose
Rosa virginiana



Meadowsweet
Spiraea latifolia



Winterberry
Ilex verticillata

BACK COVE EAST – PROPOSED PLANT PALETTE

GRASSES (1 OF 1)



Atlantic Panic Grass
Panicum amarum



Big Bluestem
Andropogon gerardii



Canada Wild Rye
Elymus canadensis



Indian Grass
Sorghastrum nutans



Path Rush
Juncus tenuis



Red Fescue
Festuca rubra



Switch Grass
Panicum virgatum

BACK COVE EAST – PROPOSED PLANT PALETTE

HERBACEOUS (1 OF 1)



Common Milkweed
Asclepias syriaca



New England Aster
Symphytotricon novae-angliae



Pale Purple Coneflower
Echinacea pallida



Purple Coneflower
Echinacea purpurea



Showy Goldenrod
Solidago speciosa



Smooth Blue Aster
Symphytotricon laeve



Stiff Goldenrod
Oligoneuron rigidum

PLANTING PALETTE

Back Cove South Project
Monday, July 6, 2020

DECIDUOUS TREES

<i>Common name</i>	<i>Botanical name</i>	<i>Natural Community</i>
Red Oak	Quercus rubra	Pitch Pine Woodland (PPW)

EVERGREEN TREES

<i>Common name</i>	<i>Botanical name</i>	<i>Natural Community</i>
Pitch Pine	Pinus rigida	PPW
Red Pine	Pinus resinosa	PPW

SHRUBS, GROUP A

<i>Common name</i>	<i>Botanical name</i>	<i>Natural Community</i>
Beach Plum	Prunus maritima	Rose Maritime Shrubland (RMS)
Black Huckleberry	Gaylussacia baccata	PPW
Bush Honeysuckle	Diervilla lonicera	RMS
Lowbush Blueberry	Vaccinium angustifolium	PPW / RMS
Northern Bayberry	Myrica (Morella) pensylvanica	PPW / RMS
Rhodora	Rhododendron canadense	PPW
Virginia Rose	Rosa virginiana	RMS

SHRUBS, GROUP B

Meadowsweet	Spiraea latifolia	RMS
Winterberry Holly	Ilex verticillata	RMS

SEED MIXES

NEW ENGLAND COASTAL GRASS MIX

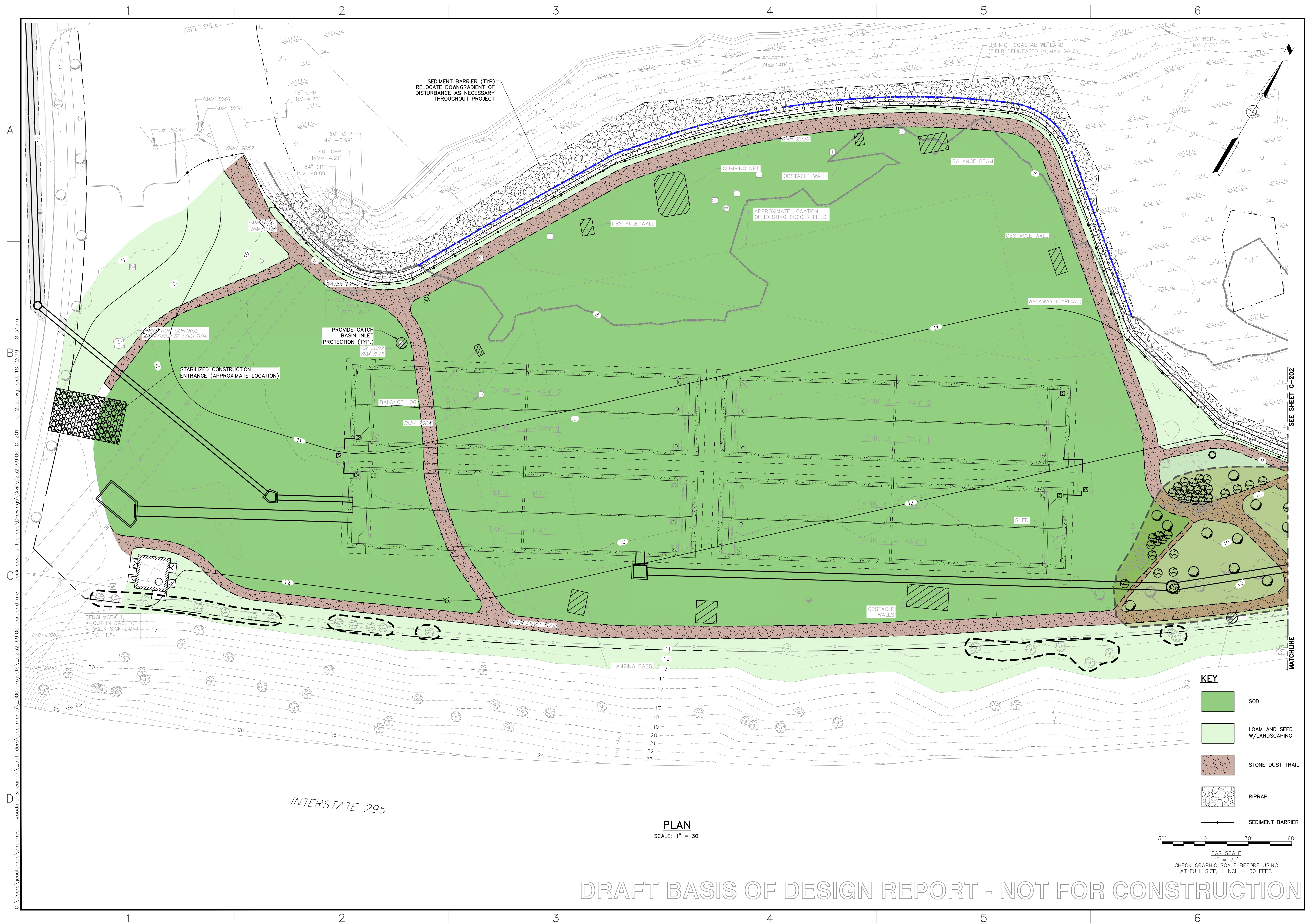
Source: New England Wetland Plants

Atlantic Coast Panic Grass	Panicum amarum
Big Bluestem	Andropogon gerardii
Canada Wild Rye	Elymus canadensis
Indian Grass	Sorghastrum nutans
Path Rush	Juncus tenuis
Red Fescue	Festuca rubra
Switch Grass	Panicum virgatum

SELECT HERBACEOUS PLANTS

Source: University of NH

Common Milkweed	Asclepias syriaca
New England Aster	Symphyotrichon novae-angliae
Pale Purple Coneflower	Echinacea pallida
Purple Coneflower	Echinacea purpurea
Showy Goldenrod	Solidago speciosa
Smooth Blue Aster	Symphyotrichon laeve
Stiff Goldenrod	Oligoneuron rigidum



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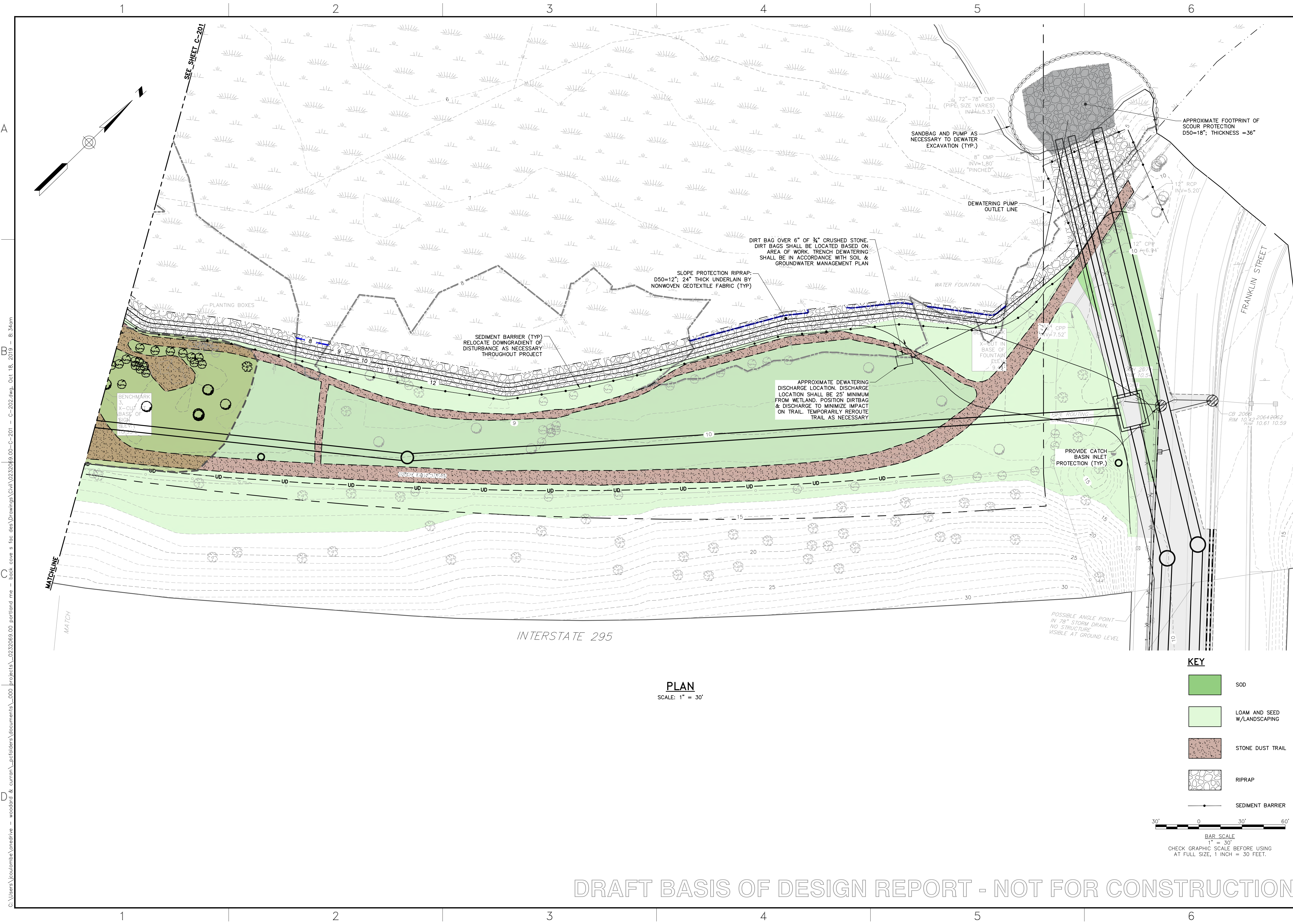
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PORTLAND, MAINE

STORAGE FACILITY

NO.:0232069.00
NOVEMBER 2019
E: AS NOTED
F: 3 OF XX

C-201



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DRAFT BASIS OF DESIGN REPORT - NOT FOR CONSTRUCTION

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REV	DESCRIPTION	DATE

CHECKED BY: MCLM
DESIGNED BY: KJT
DRAWN BY: JBC
0232069.00-C-201 - C-202.DWG

EROSION CONTROL PLAN (TRAIL)

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: NOVEMBER 2019
SCALE: AS NOTED
SHEET: 4 OF XX

C-202

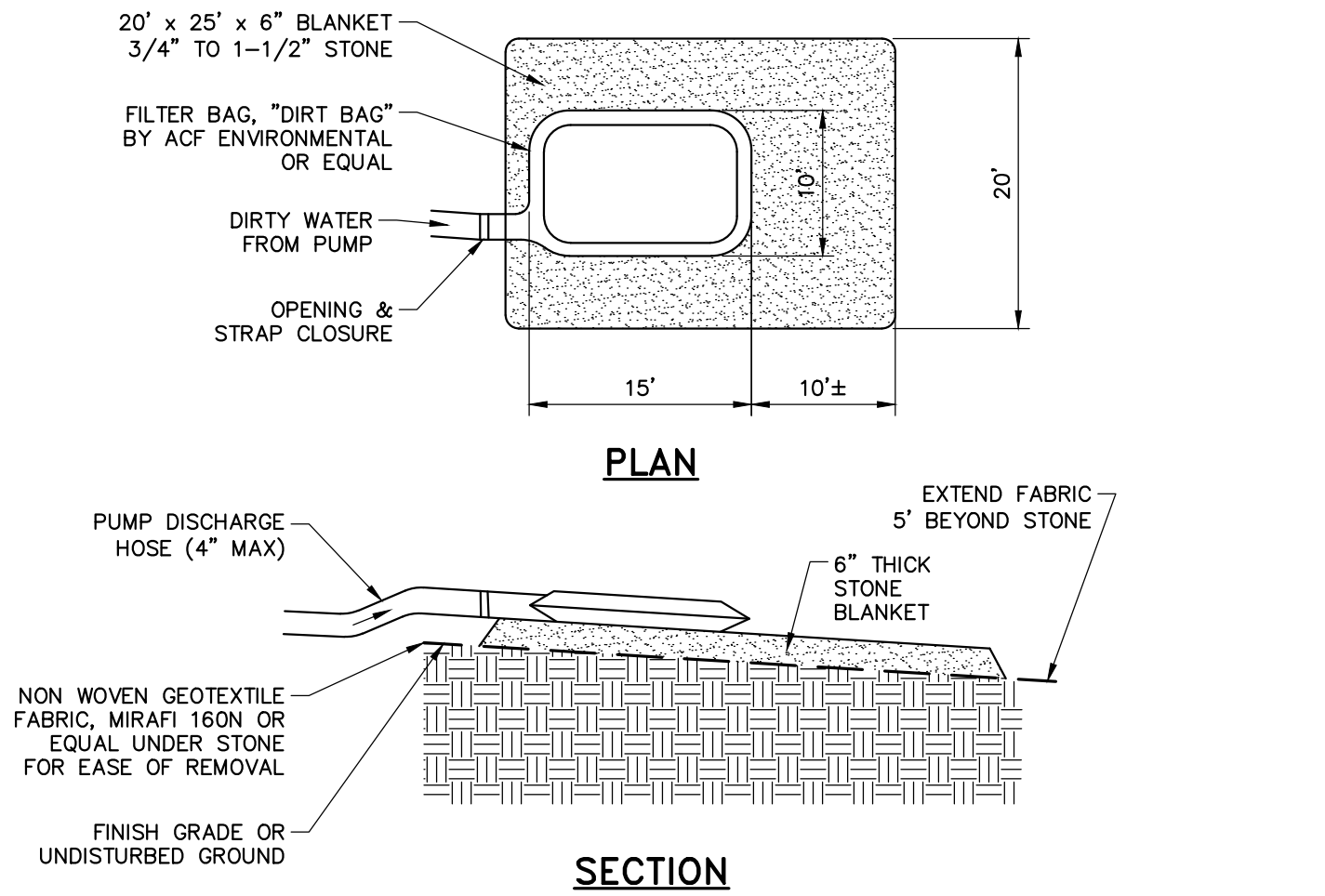
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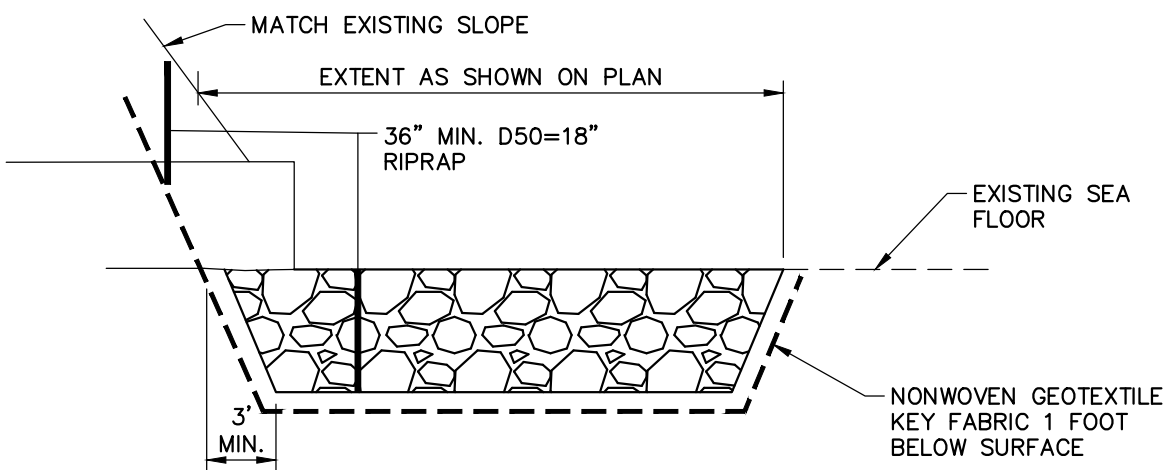
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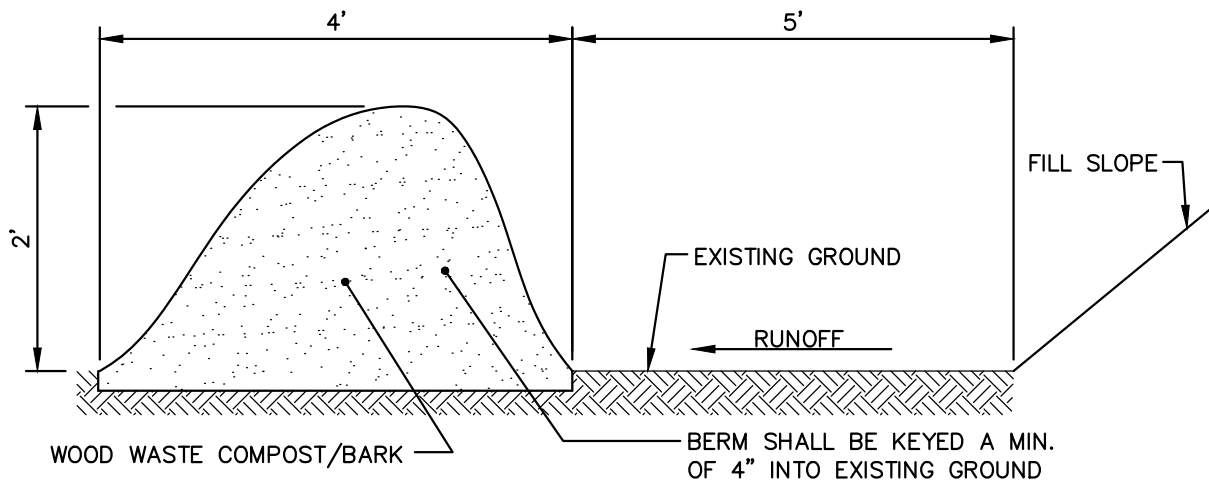
DEWATERING DISCHARGE
SEDIMENT CONTROL DEVICE
N.T.S.



SCOUR PROTECTION
N.T.S.

NOTES:

1. THE WOOD WASTE COMPOST/BARK MIX SHALL CONFORM TO THE FOLLOWING STANDARDS:
 - A. MOISTURE CONTENT - 30-60%.
 - B. pH - 5.0 - 8.0.
 - C. SCREEN SIZE - 100% LESS THAN 3", MAX. 70% LESS THAN 1".
 - D. NO LESS THAN 40% ORGANIC MATERIAL (DRY WEIGHT) BY LOSS OF IGNITION.
 - E. NO STONES LARGER THAN 2" IN DIAMETER.
 - F. SILTS, CLAYS OR SUGAR SANDS ARE NOT ACCEPTABLE IN THE MIX.
2. THE COMPOST BERM SHALL BE PLACED, UNCOMPACTED, ALONG A RELATIVELY LEVEL CONTOUR.
3. THE WOOD WASTE COMPOST/BARK FILTER BERM MAY BE USED IN LIEU OF SILTATION FENCE, AT THE TOE OF SHALLOW SLOPES, ON FROZEN GROUND, LEDGE OUT CROPS, VERY ROOTED FORESTED AREA OR AT THE EDGE OF GRAVEL PARKING AREAS.
4. BERMS SHALL REMAIN IN PLACE UNTIL UPSTREAM AREA IS COMPLETED OR 70% CATCH OF VEGETATION IS ATTAINED. BERMS SHALL BE REMOVED BY SPREADING SUCH THAT NATIVE EARTH CAN BE SEEN BELOW.
5. WOODWASTE COMPOST BARK FILTER SHALL NOT BE USED IN WETLAND AREAS.



WOOD WASTE COMPOST/BARK
FILTER BERM DETAIL
N.T.S.

EROSION AND SEDIMENTATION CONTROL NOTES

1. THE PROJECT SHALL CONFORM WITH THE STANDARDS OF THE MAINE CONSTRUCTION GENERAL PERMIT, IF APPLICABLE.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE MAINE EROSION AND SEDIMENT CONTROL BMP'S HANDBOOK PUBLISHED BY THE MAINE DEP UNLESS OTHERWISE NOTED IN THESE PLANS. [HTTP://MAINE.GOV/DEP/BLWQ/DOCSTAND/ESCBMPS/](http://MAINE.GOV/DEP/BLWQ/DOCSTAND/ESCBMPS/)

Temporary Erosion Control Measures

Measure	Dates For Use	Timing, Activity, and Location
Sedimentation Barrier	ALL	Before soil disturbance, install downhill of areas to be disturbed and around material stockpiles.
Up-slope Diversion	ALL	Before soil disturbance, install uphill of areas to be disturbed and material stockpiles.
Catch Basin Protection	ALL	Before soil or pavement disturbance, install ACF Environmental, Inc. High Flow Siltsock, SiltSaver Inlet Filter, or equal, installed per manufacturer's requirements.
Dust Control	ALL	During dry weather, apply water and calcium chloride to control dust.
Temporary Seeding	April 15 to Oct. 1	Soil stockpiles that are not covered and disturbed areas that will not be disturbed again within 14 days. If grass growth provides less than 95% soil coverage by Nov. 1, apply mulch and anchor with erosion control blanket.
Mulch	April 15 to Sept. 15	On all areas of exposed soil prior to rain events or every 7 days, apply 100-150 lbs (2.5 bales) per 1,000 sq ft. by mechanical blower.
Winter Mulch	Sept. 16 to Oct. 31 Nov. 1 to April 14	On all areas of exposed soil prior to precipitation or every 7 days, apply 150 to 170 lbs. mulch (4 bales) per 1,000 sq. ft. by mechanical blower. Erosion control blanket may be used as a substitute for winter mulch. On all areas of exposed soil, apply 150 to 170 lbs. mulch (4 bales) per 1,000 sq. ft. and anchor with netting at the end of each working day. Erosion control blanket may be used as a substitute for winter mulch.
Inspections	Until site is permanently stabilized	Inspect the erosion and sedimentation control measures daily, and maintain and repair as necessary.

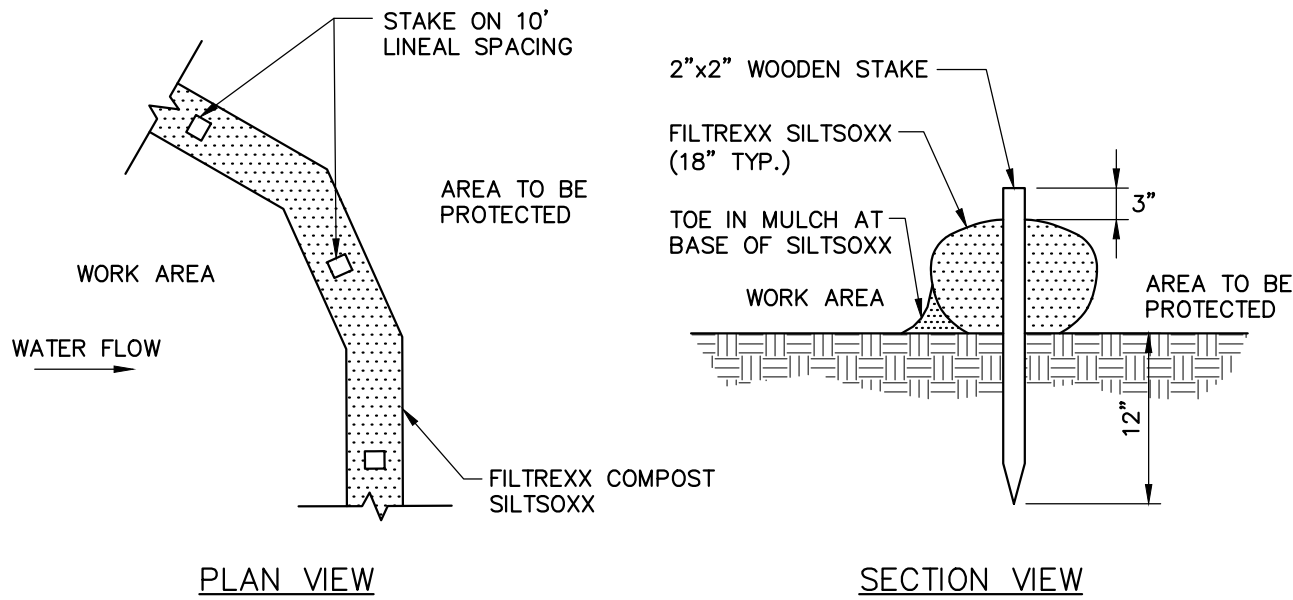
Permanent Erosion Control:

Measure	Dates For Use	Timing, Activity, and Location
Pavement - Base Course - Final Course	When no frost is in ground	Install only in areas shown on the plan, shortly after pavement base is brought to final grade. Install near completion of project.
Permanent Seeding	April 15 to Sept. 15	On final grade areas, within 7 days of grade preparation, prepare topsoil, followed by seed and mulch application.
Dormant Seeding	Sept. 16 to April 15	On final grade areas, with prepared topsoil. Apply seed at double the specified rate on bare soil, and follow with an application of winter mulch.
Ground Cover, Trees, Shrubs	April 15 to Nov. 1	Install with final landscaping.
Permanent Mulch	ALL	Install with final landscaping.

Inspections:

Regular inspections of all erosion and sedimentation controls shall be made at least weekly and prior to and following storm events. Minimum inspections shall be made as listed in the table below.

Inspected Item	Look For
Mulched Surfaces	Thin mulch or inadequate application. Wind movement.
Seeded Surfaces	Poor seed germination. Loss of mulch. Development of rivelets.
Sediment Barrier	Sediment build-up to one half the height of the barrier. Undermining of the barrier. Supporting stakes loose, toppled, or unmarked. Breaks in barrier.
Perimeter Diversion	Discharge is to stabilized area. Erosion or breaks in barrier. Supporting stakes loose, toppled or unmarked.
Catch Basin Protection	Sediment build-up and structure blockages. Slow flow/Ponding water. Breaks in fabric or voids in barrier.
Dewatering Filter	Breaks in fabric or supporting structure. Slow flow, indicating high sediment build-up.
Construction Entrance	Sedimentation of roadways. Off-site dust complaints.



PLAN VIEW

SECTION VIEW

NOTE:

1. WHEN STAKING IS NOT POSSIBLE, HEAVY CONCRETE BLOCKS SHALL BE USED BEHIND THE SEDIMENT CONTROL TO HELP STABILIZE DURING RAINFALL/RUNOFF EVENTS.

SILTATION BARRIER - SILTSOXX
N.T.S.

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EROSION CONTROL NOTES

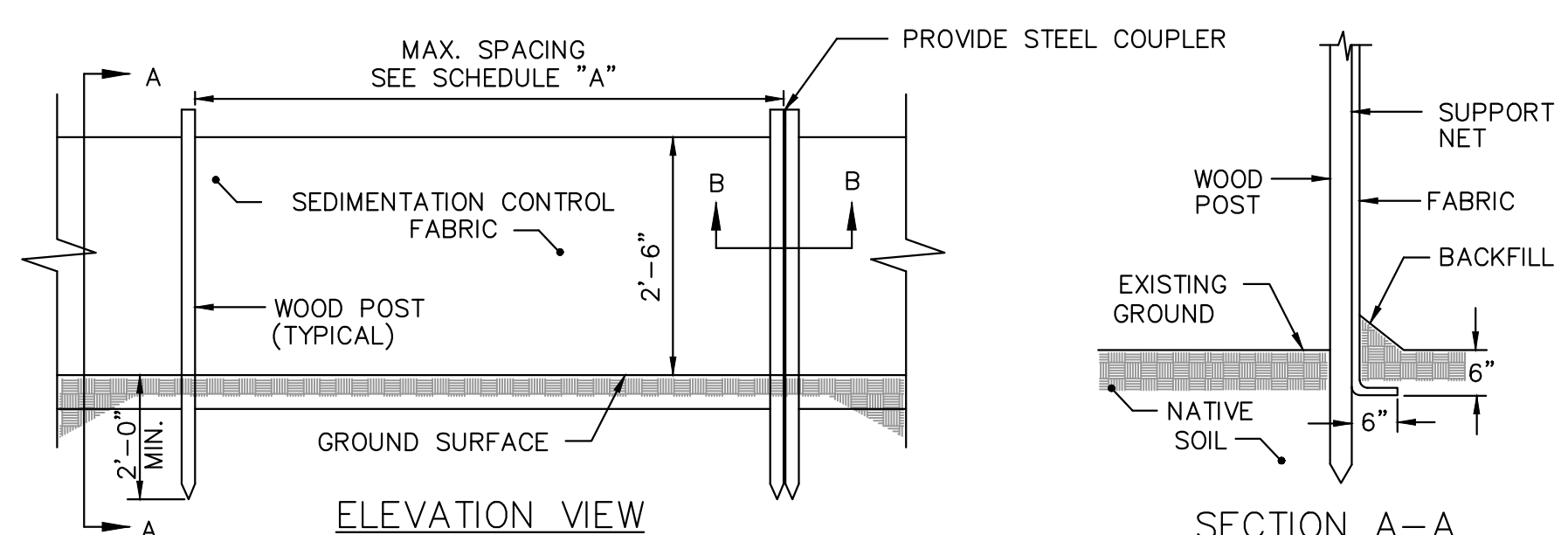
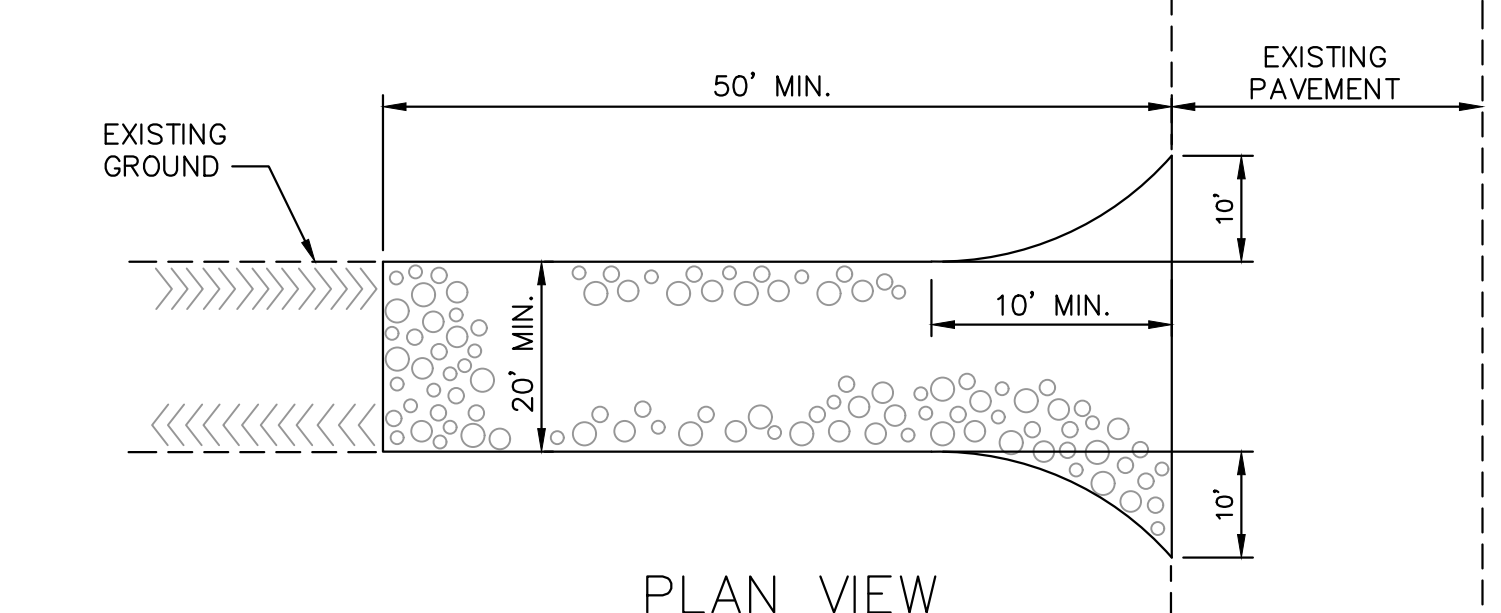
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

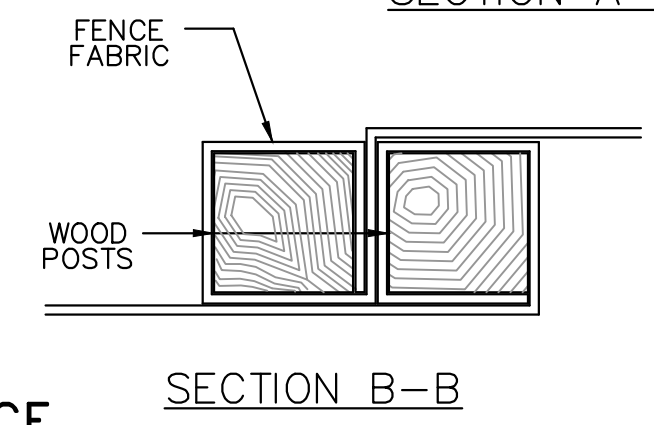
JOB NO.: 0232069.00
DATE: OCTOBER 2019
SCALE: AS NOTED
SHEET: 20 OF XX

C-300

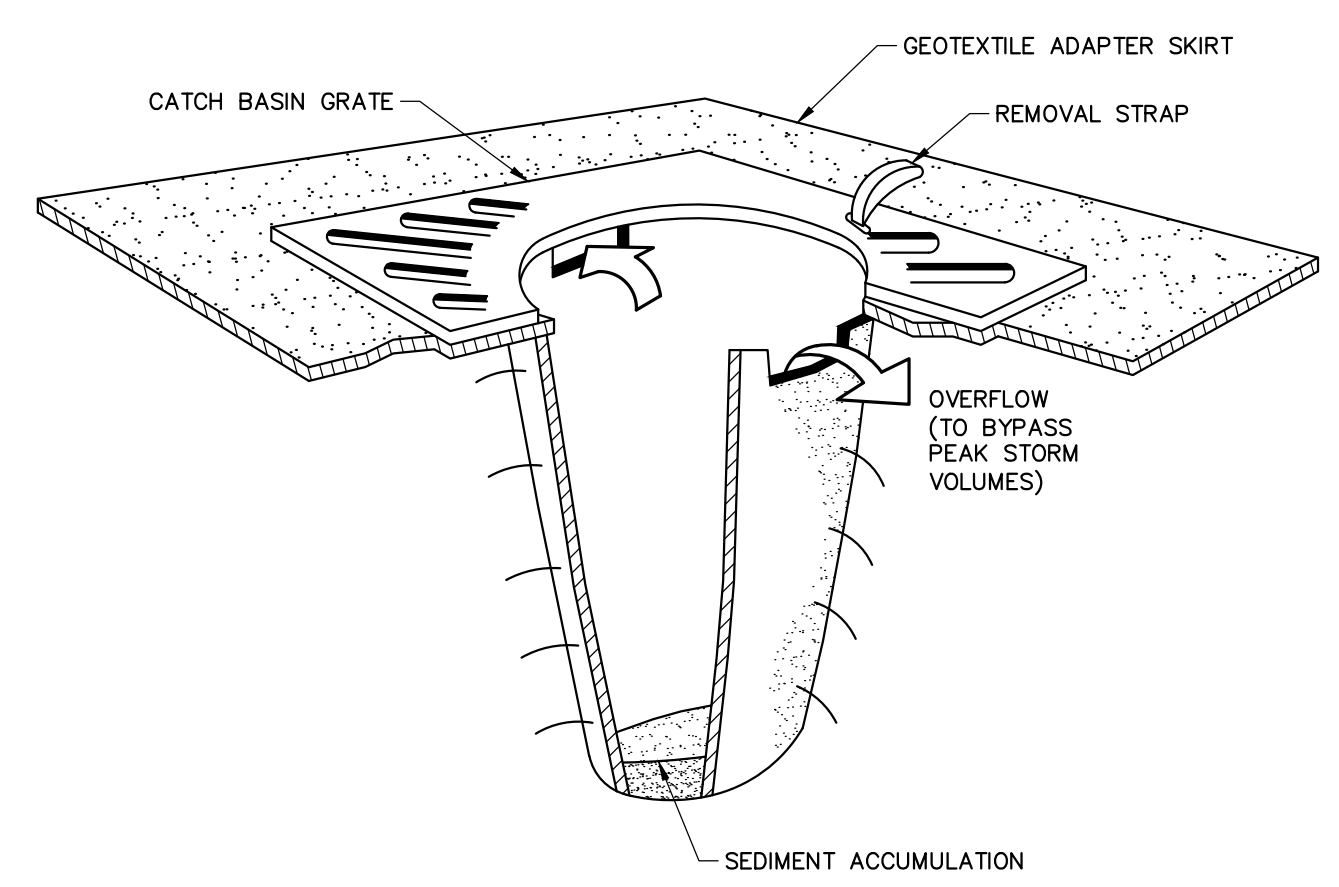
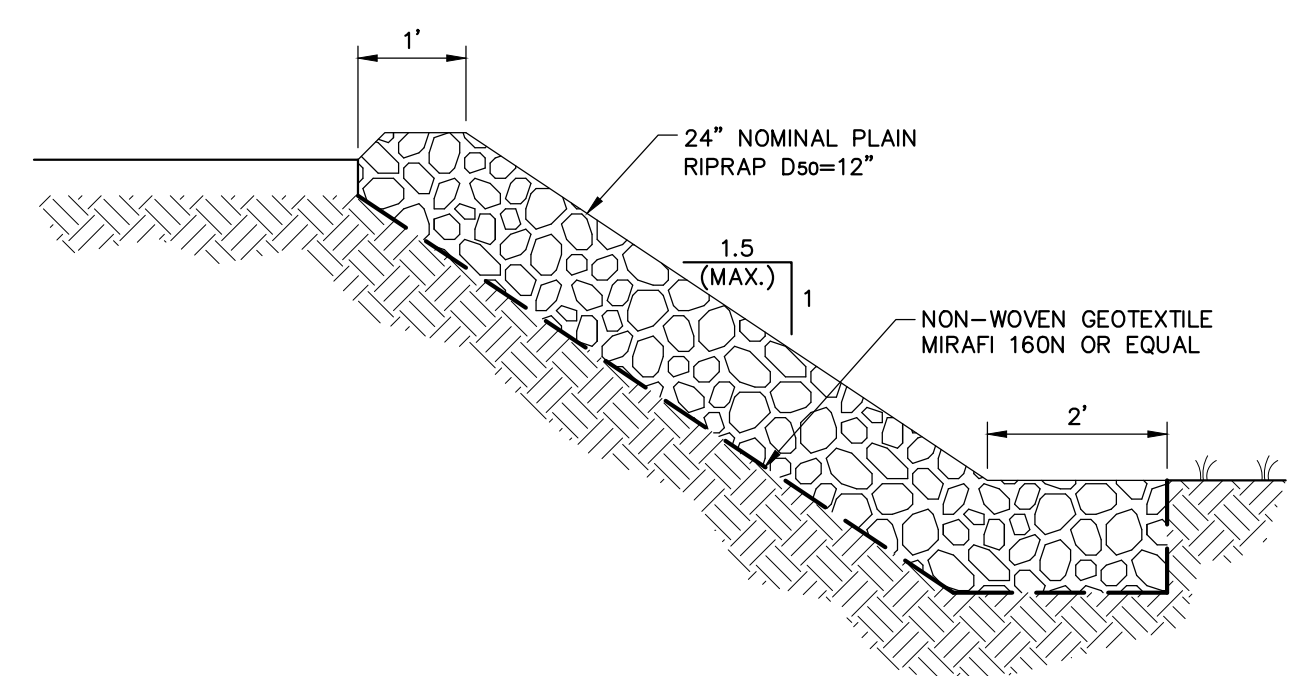
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SCHEDULE "A"	
SILT FENCE REINFORCEMENT	MAX. SPACING
NONE	6'
WIRE REINFORCEMENT 14 GAUGE, 6" MESH	10'



SILTATION FENCE
N.T.S.



NOTES:

CATCH BASIN PROTECTION TO BE "SILTSACK" (BY ACF ENVIRONMENTAL) OR "STREAM GUARD" (BY FOSS ENVIRONMENTAL SERVICES).

INSERT TO BE EMPTIED IN AN APPROVED MANNER WHEN IT IS 1/2 FULL OF SEDIMENT.

INSPECT INSERT AFTER ALL RAINFALL EVENTS, REPAIR AND MAINTAIN AS REQUIRED.

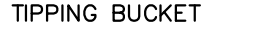
TEMPORARY INLET PROTECTION
N.T.S.

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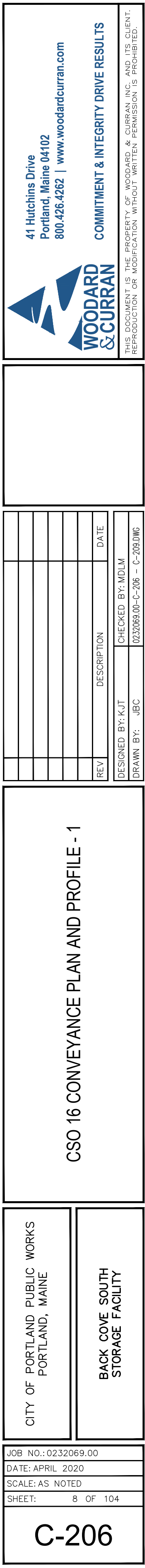
BACK COVE SOUTH
STORAGE FACILITY

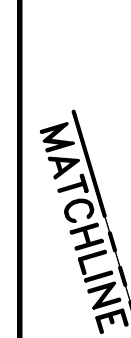
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DATE:OCTOBER 2019
SCALE:AS NOTED
SHEET: 21 OF XX

C-301



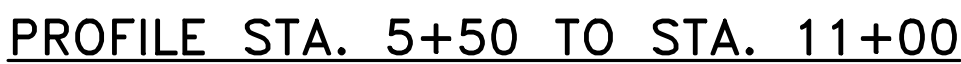
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HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

20'
60% DESIGN SUBMITTAL – NOT FOR CONSTRUCTION

CSO 16 CONVEYANCE PLAN AND PROFILE - 2

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

NO.: 0232069.00
E: APRIL 2020
LE: AS NOTED
ET: 9 OF 104

C-207

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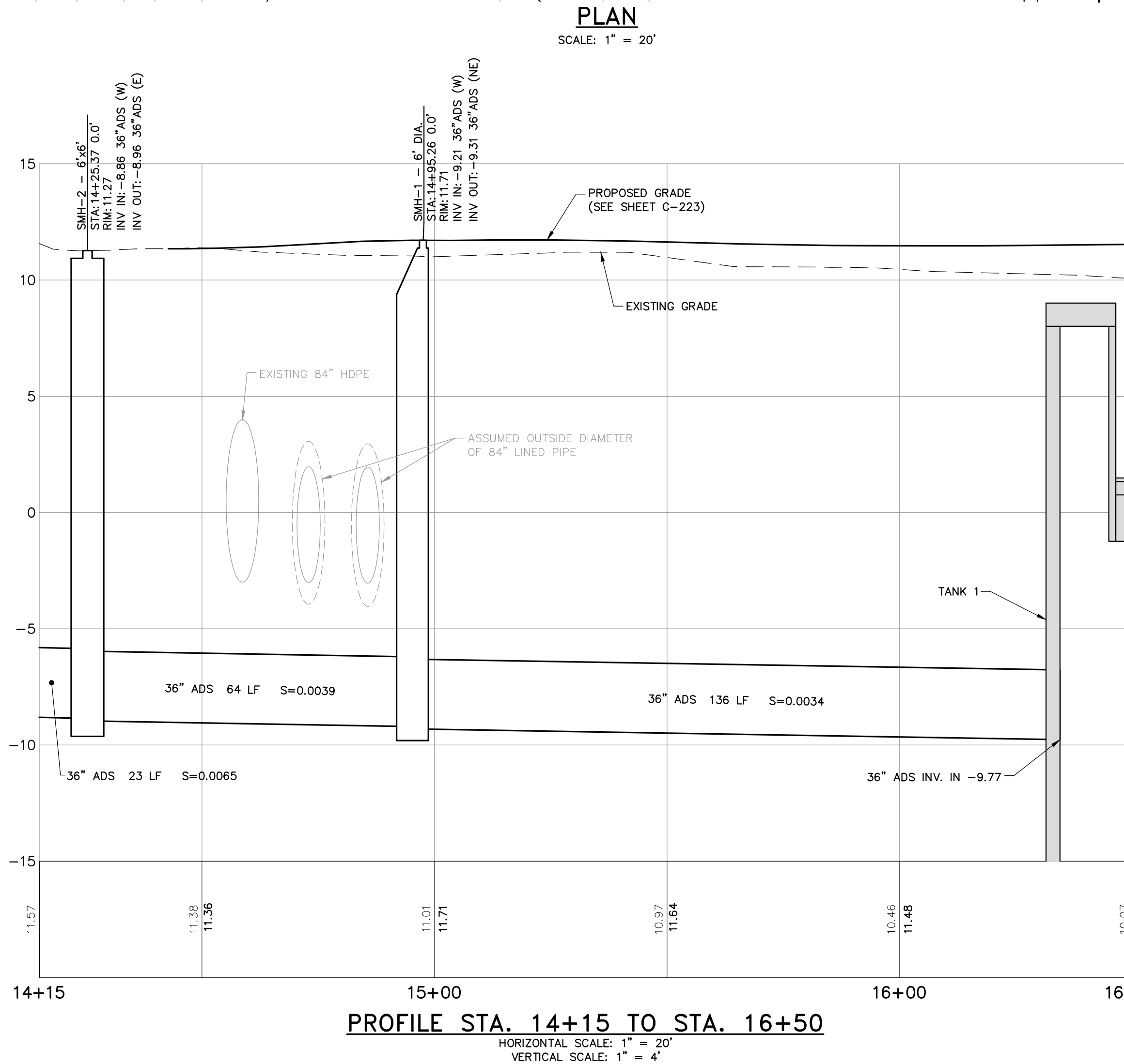
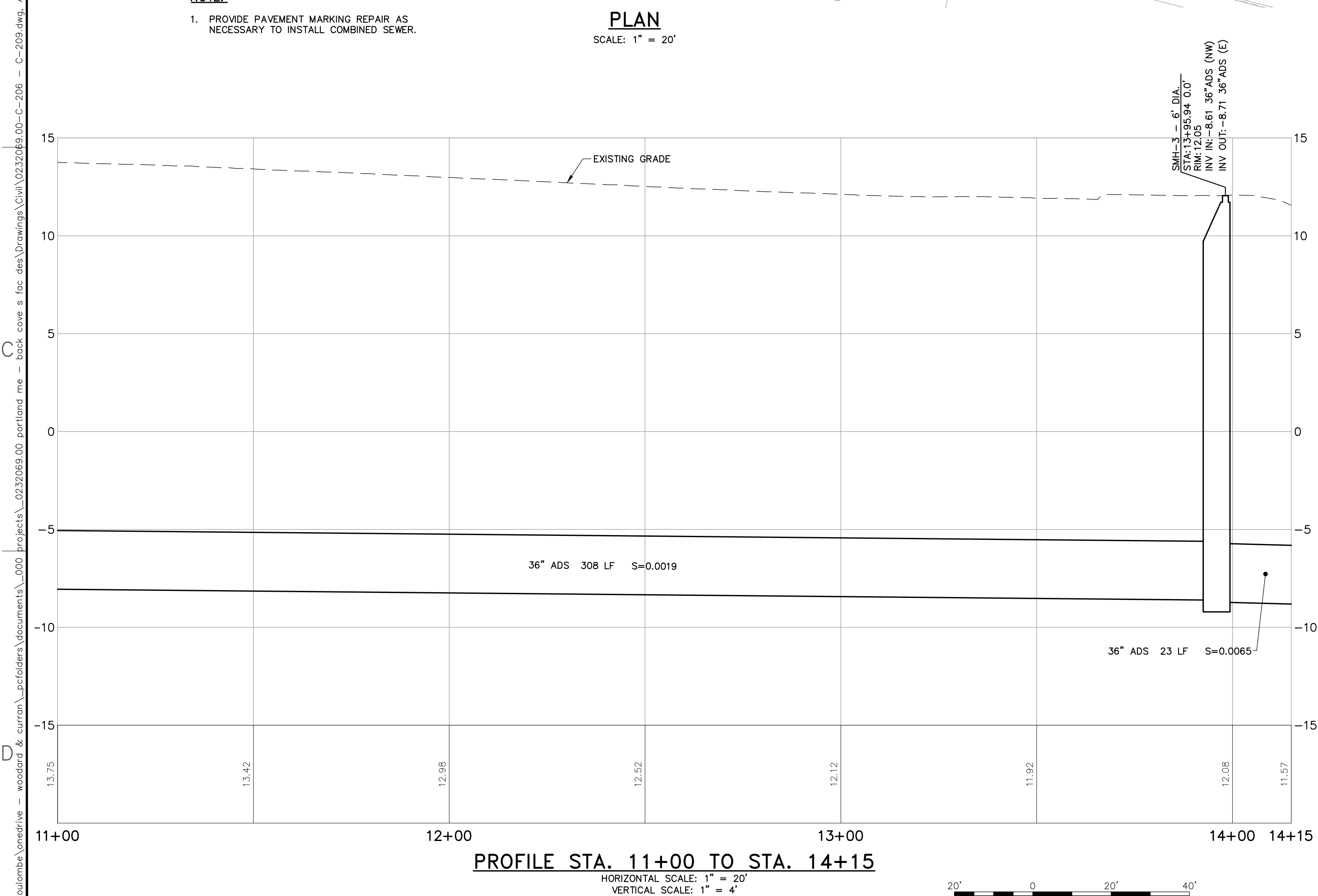
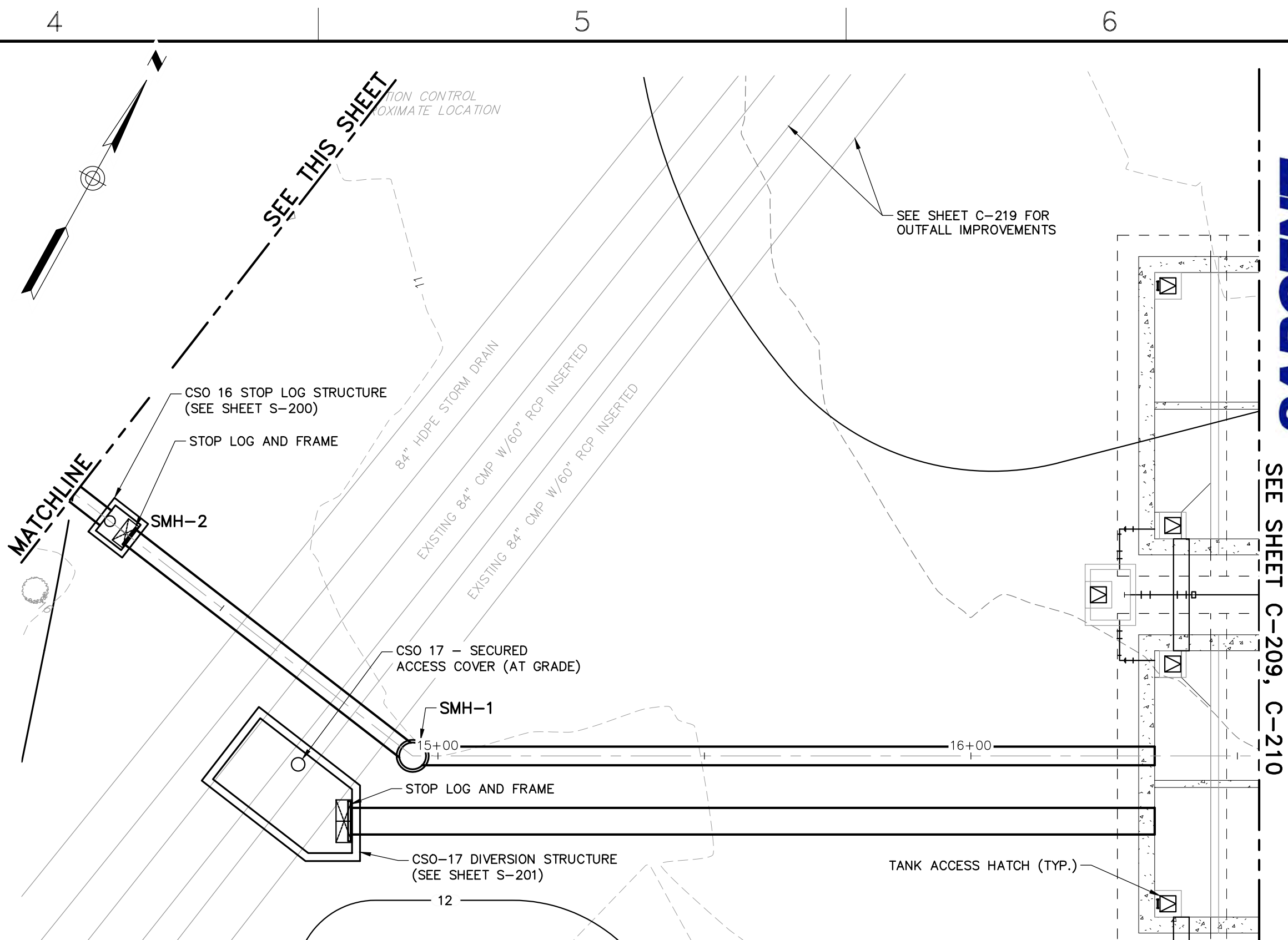
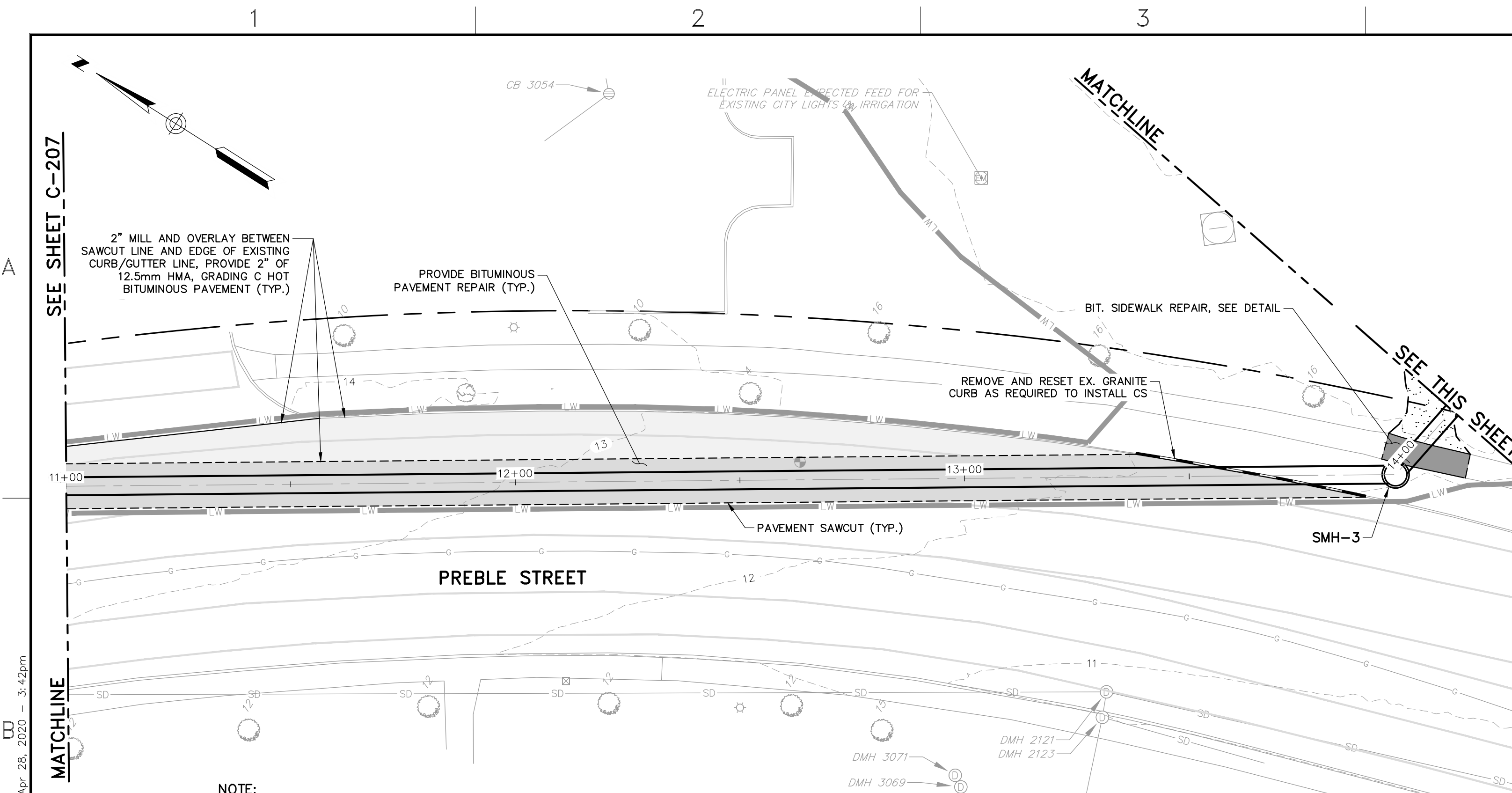
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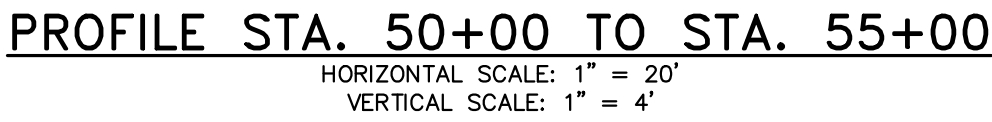
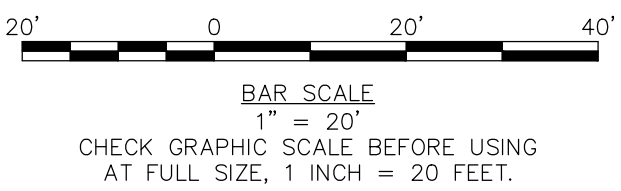
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JOB NO.: 0232069.00		DATE: APRIL 2020	
SCALE: AS NOTED		SHEET: 10 OF 104	
C-208			

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REV	DESCRIPTION	DATE
DESIGNED BY: KJT	CHECKED BY: MDLM	
DRAWN BY: JBC	1023069.00-C-215 - C-216.DWG	

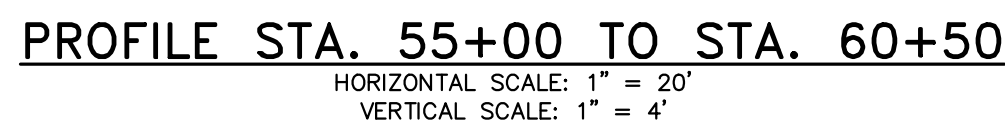
MARGINAL WATILAN & KUILE - I

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

NO.: 0232069.00
APRIL 2020
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F: 17 OF 104

C-215



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REV	DESCRIPTION	DATE
	DESIGNED BY: KJT	CHECKED BY: MDLM
	DRAWN BY: JBC	02/20/99.00-C-215 - C-216.DWG

MARGINAL WAY PLAN & PROFILE - 2

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PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 18 OF 104

C-216



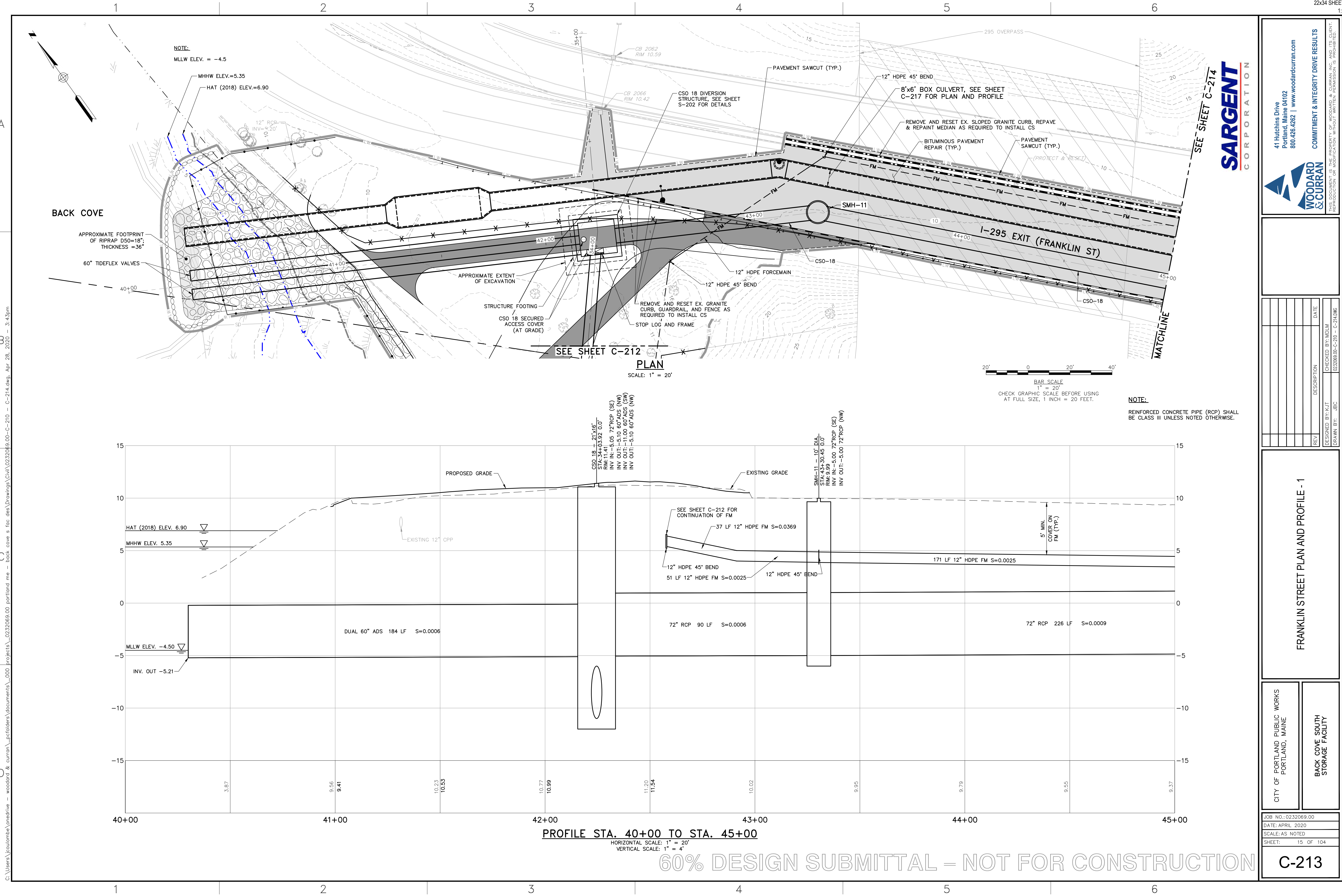
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

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FRANKLIN STREET PLAN AND PROFILE - 1

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PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 15 OF 104

C-213

22x34 SHEET
1:1

SARGENT
CORPORATION

REV.	DESCRIPTION	DATE

CHECKED BY: MDLM
DESIGNED BY: K/JT
DRAWN BY: JBC

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REINFORCED CONCRETE PIPE (RCP) SHALL BE CLASS III UNLESS NOTED OTHERWISE.

CITY OF PORTLAND PUBLIC WORKS

PORTLAND, MAINE

BACK COVE SOUTH STORAGE FACILITY

W&C PROJECT NO. 0232069.00

APRIL 2020

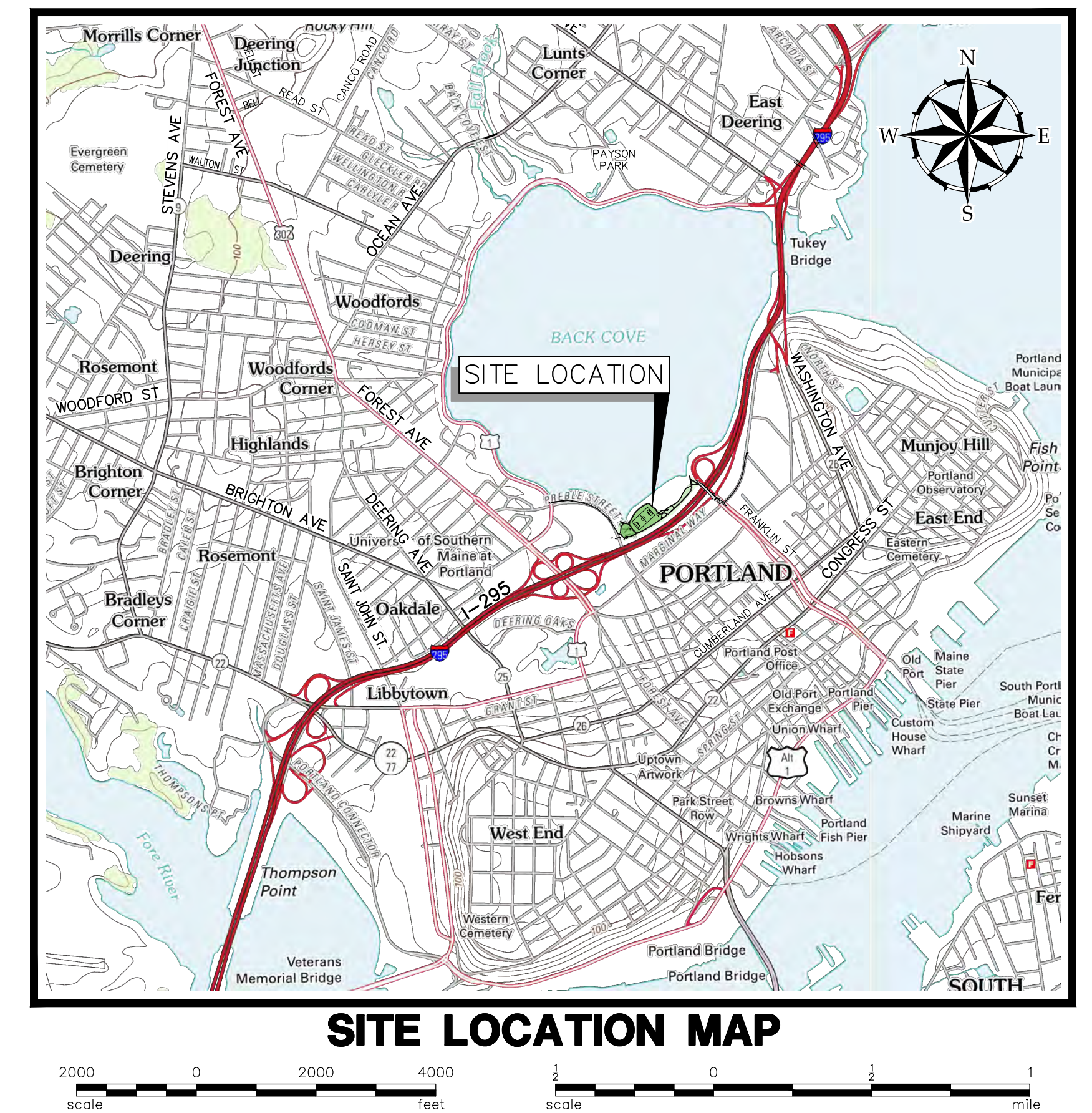
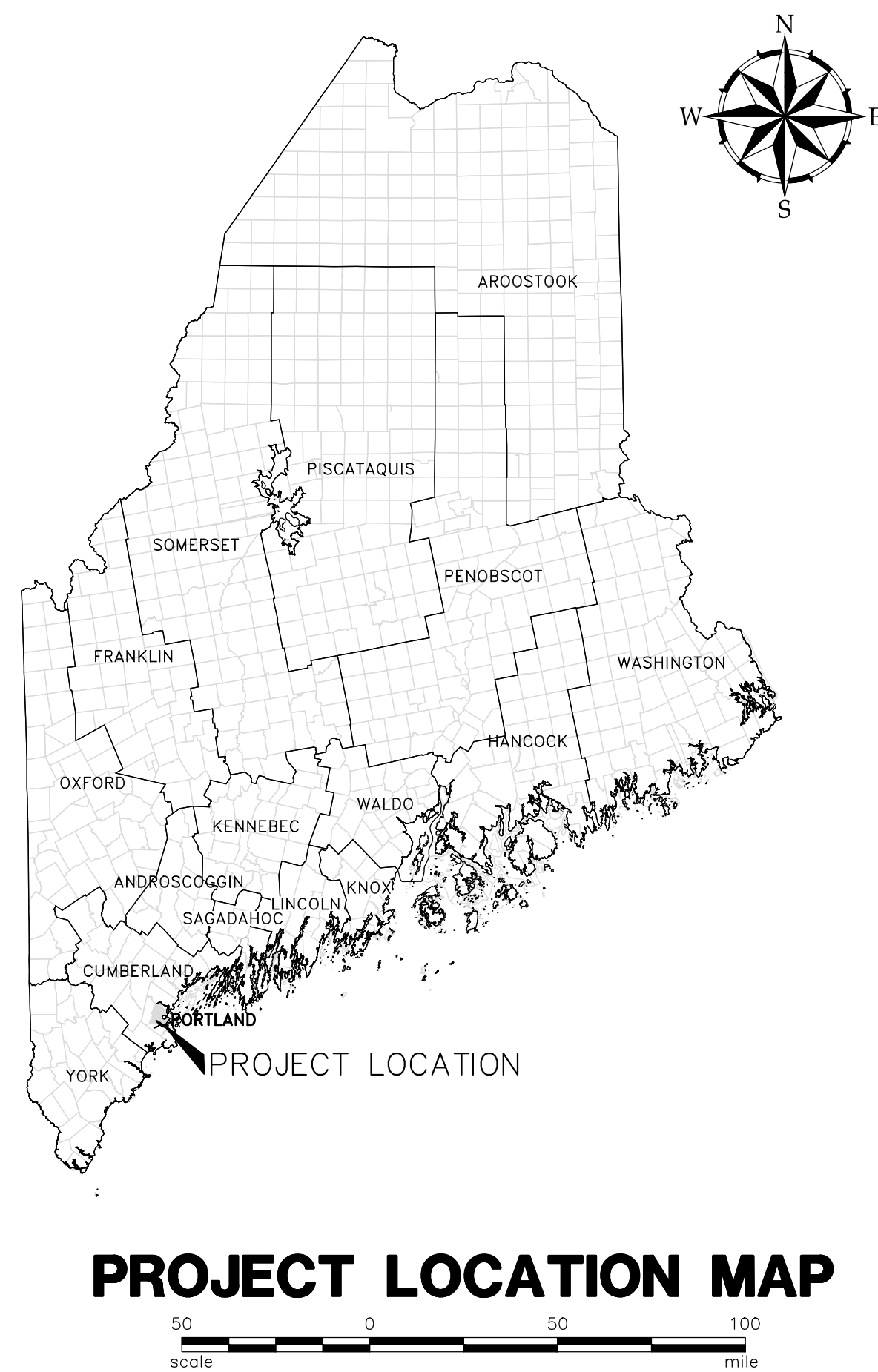
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DRAWING INDEX

GENERAL		
0	G-000	COVER SHEET
CIVIL		
1	C-001	GENERAL NOTES, LEGEND, AND ABBREVIATIONS
2	C-200	KEY PLAN
3	C-201	EXISTING SITE DEMOLITION & EROSION CONTROL PLAN - 1
4	C-202	EXISTING SITE DEMOLITION & EROSION CONTROL PLAN - 2
5	C-203	EXISTING SITE DEMOLITION & EROSION CONTROL PLAN - 3
6	C-204	EXISTING SITE DEMOLITION & EROSION CONTROL PLAN - 4
7	C-205	EXISTING SITE DEMOLITION & EROSION CONTROL PLAN - 5
8	C-206	CSO 16 CONVEYANCE PLAN AND PROFILE - 1
9	C-207	CSO 16 CONVEYANCE PLAN AND PROFILE - 2
10	C-208	CSO 16 CONVEYANCE PLAN AND PROFILE - 3
11	C-209	CSO 17 CONVEYANCE PLAN AND PROFILE
12	C-210	CSO 18 CONVEYANCE PLAN AND PROFILE - 1
13	C-211	CSO 18 CONVEYANCE PLAN AND PROFILE - 2
14	C-212	CSO 18 CONVEYANCE PLAN AND PROFILE - 3
15	C-213	FRANKLIN STREET PLAN AND PROFILE - 1
16	C-214	FRANKLIN STREET PLAN AND PROFILE - 2
17	C-215	MARGINAL WAY PLAN & PROFILE - 1
18	C-216	MARGINAL WAY PLAN & PROFILE - 2
19	C-217	8'x6" BOX CULVERT PLAN AND PROFILE - 1
20	C-218	8'x6" BOX CULVERT PLAN AND PROFILE - 2
21	C-219	YARD PIPING - OVERALL PLAN
22	C-220	YARD PIPING - TANK VENT AND FORCEMAIN PLAN & SECTION - 1
23	C-221	YARD PIPING - TANK VENT AND FORCEMAIN PLAN & SECTION - 2
24	C-222	YARD PIPING - TIPPING BUCKET WATER PLAN & ISOMETRIC
25	C-223	FINAL GRADING AND SITE RESTORATION PLAN - 1
26	C-224	FINAL GRADING AND SITE RESTORATION PLAN - 2
27	C-225	TANK ISOMETRIC
28	C-300	EROSION CONTROL NOTES AND DETAILS
29	C-301	CIVIL DETAILS - 1
30	C-302	CIVIL DETAILS - 2
31	C-303	CIVIL DETAILS - 3
32	C-304	CIVIL DETAILS - 4
33	C-305	CIVIL DETAILS - 5
ARCHITECTURAL		
34	A-001	ARCHITECTURAL LEGEND, ABBREVIATIONS, AND CODE SUMMARY
35	A-301	ELECTRICAL MAINTENANCE BUILDING FLOOR AND ROOF PLAN
36	A-302	ELECTRICAL MAINTENANCE BUILDING ELEVATIONS
37	A-303	ELECTRICAL MAINTENANCE BUILDING ISOMETRICS
38	A-304	ELECTRICAL MAINTENANCE BUILDING ARCHITECTURAL SECTIONS AND DETAILS
39	A-305	ELECTRICAL MAINTENANCE BUILDING SCHEDULES AND DETAILS
STRUCTURAL		
40	S-001	STRUCTURAL ABBREVIATIONS, NOTES, AND DESIGN LOADS
* 41	S-101	STORAGE TANKS OVERALL PLAN
* 42	S-102	UPPER LEVEL PLAN - TANK 2 (TYP. FOR TANKS 1 - 4)
* 43	S-103	LOWER LEVEL PLAN - TANK 2 (TYP. FOR TANKS 1 - 4)
* 44	S-104	STORAGE TANK 2 SECTIONS 1 (TYP. FOR TANKS 1 - 4)
* 45	S-105	STORAGE TANK 2 SECTIONS 2 (TYP. FOR TANKS 1 - 4)
46	S-200	CSO 16 DIVERSION STRUCTURE
47	S-201	CSO 17 DIVERSION STRUCTURE
48	S-202	CSO 18 DIVERSION STRUCTURE
* 49	S-301	ELECTRICAL MAINTENANCE BUILDING FOUNDATION PLAN AND SECTION
* 50	S-302	ELECTRICAL MAINTENANCE BUILDING ROOF FRAMING PLAN
* 51	S-303	ELECTRICAL MAINTENANCE BUILDING SECTIONS AND DETAILS
52	S-1300	CONCRETE TANK DETAILS
53	S-1301	CONCRETE WALL AND FLOOR PENETRATION DETAILS

DRAWING INDEX

54	S-1302	CONCRETE FLOOR SLAB & WALL FOOTING DETAILS
55	S-1400	MASONRY DETAILS
56	S-1401	MASONRY SCHEDULES AND DETAILS
57	S-1600	ROUGH CARPENTRY ROOF FRAMING, SECTIONS & DETAILS
PROCESS		
58	P-100	PROCESS FLOW DIAGRAM, PROCESS ABBREVIATIONS & SYMBOLS
59	P-101	CSO STORAGE FACILITY P&ID
60	P-102	DIVERSION STRUCTURES P&ID
61	P-201	PROCESS TANK SECTIONS
62	P-202	PROCESS VALVE VAULT 1 PLAN & SECTION
63	P-203	PROCESS VALVE VAULT 2 PLAN & SECTION
64	P-204	PROCESS VALVE VAULT 3 PLAN & SECTION
HVAC		
65	H-001	HVAC LEGEND AND GENERAL NOTES
66	H-301	ELECTRICAL MAINTENANCE BUILDING FLOOR PLAN
67	H-302	HVAC SCHEDULES
PLUMBING		
68	PL-001	PLUMBING LEGEND AND GENERAL NOTES
69	PL-301	ELECTRICAL MAINTENANCE BUILDING FLOOR PLAN
70	PL-302	PLUMBING SCHEDULES AND DETAILS
ELECTRICAL		
71	E-001	ELECTRICAL LEGEND
72	E-005	ELECTRICAL DEMOLITION PLAN
73	E-002	ELECTRICAL OVERALL SITE PLAN
74	E-003	ELECTRICAL PARTIAL SITE PLANS 1
75	E-004	ELECTRICAL PARTIAL SITE PLAN 2
76	E-050	SITE GROUNDING PLAN
77	E-010	ONE-LINE DIAGRAM
78	E-100	TANK POWER AND CONTROLS PLAN 1
* 79	E-101	TANK POWER AND CONTROLS PLAN 2
80	E-200	ELECTRICAL MAINTENANCE BUILDING POWER AND CONTROL PLAN
81	E-201	ELECTRICAL MAINTENANCE BUILDING LIGHTING AND BUILDING SYSTEMS PLAN
82	E-500	INSTRUMENT AND CONTROLS RISER DIAGRAM
83	E-600	PANEL AND LIGHT FIXTURE SCHEDULES
84	E-700	MOTOR WIRING DIAGRAMS
85	E-800	ELECTRICAL DETAILS 1
86	E-801	ELECTRICAL DETAILS 2
87	E-802	ELECTRICAL DETAILS 3
INSTRUMENTATION		
88	I-001	INSTRUMENTATION & CONTROLS NETWORK ARCHITECTURE
89	I-010	INSTRUMENTATION & CONTROLS DETAIL SHEET 1
90	I-011	INSTRUMENTATION & CONTROLS DETAIL SHEET 2
91	I-012	INSTRUMENTATION & CONTROLS DETAIL SHEET 3
92	I-101	INSTRUMENTATION & CONTROLS SCADA PANEL LEGEND & NOTES
93	I-102	INSTRUMENTATION & CONTROLS SCADA PANEL BILL OF MATERIALS
94	I-103	INSTRUMENTATION & CONTROLS SCADA PANEL EQUIPMENT LAYOUT
95	I-104	INSTRUMENTATION & CONTROLS SCADA PANEL TERMINAL BLOCK LAYOUT
96	I-105	INSTRUMENTATION & CONTROLS SCADA PANEL POWER DISTRIBUTION
97	I-106	INSTRUMENTATION & CONTROLS SCADA PANEL COMMUNICATIONS
98	I-107	INSTRUMENTATION & CONTROLS SCADA PANEL PLC ANALOG INPUTS
99	I-108	INSTRUMENTATION & CONTROLS SCADA PANEL PLC DIGITAL OUTPUTS
100	I-109	INSTRUMENTATION & CONTROLS SCADA PANEL PLC ANALOG INPUTS (1 OF 2)
101	I-110	INSTRUMENTATION & CONTROLS SCADA PANEL PLC ANALOG INPUTS (2 OF 2)
102	I-111	INSTRUMENTATION & CONTROLS SCADA PANEL PLC AC DIGITAL INPUTS
103	I-112	INSTRUMENTATION & CONTROLS INTRINSIC BARRIER PANEL EQUIPMENT LAYOUT
104	I-113	INSTRUMENTATION & CONTROLS INTRINSIC BARRIER PANEL WIRING DETAILS
*NOT INCLUDED IN SUBMISSION		



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COMMITMENT & INTEGRITY DRIVE RESULTS



LEGEND

- PROPOSED

-

& ADS A.G. ARMH	AND ADVANCED DRAINAGE SYSTEM ABOVE GROUND AIR RELEASE MANHOLE	N.I.C. NO. NR N.T.S.	NOT IN CONTRACT NUMBER NO REFUSAL NOT TO SCALE
BC BIT BW B/W	BOTTOM OF CURB BITUMINOUS BOTTOM OF WALL BETWEEN	OE OH ± LLS	OVERHEAD ELECTRIC OVERHEAD PLUS OR MINUS LICENSED LAND SURVEYOR
CB CJ CLDI CMP CMP CONC CPP CS CSO	CATCH BASIN CAST IRON CENTRAL MAINE POWER CORRUGATED METAL PIPE CONCRETE CORRUGATED PLASTIC PIPE COMBINED SEWER COMBINED SEWER OVERFLOW	PROP. PT. PVC R.O.W. RCP REINF. REQ'D	PROPOSED POINT POLYVINYL CHLORIDE RIGHT-OF-WAY REINFORCED CONCRETE PIPE REINFORCED REQUIRED
D DI DIA. DMH DTL.	DRAIN DUCTILE IRON DIAMETER DRAIN MANHOLE DETAIL	S SEWER SS SD SMH SCH STA.	SLOPE (FT./FT.) SEWER STAINLESS STEEL STORM DRAIN SEWER MANHOLE SCHEDULE STATION
E EL. E.O.P. EXIST.	UNDERGROUND ELECTRICAL ELEVATION EDGE OF PAVEMENT EXISTING	TS TW TYP.	TOP OF STAIRS TOP OF WALL TYPICAL
FCMH FF FM FT	FORCEMAIN CLEANOUT MANHOLE FINISH FLOOR FORCEMAIN FOOT/FEET	UP VC WT.	UTILITY POLE VITRIFIED CLAY VITRIFIED CLAY
G GS GALV. GRAN.	GAS MAIN GAS SERVICE GALVANIZED GRANITE	W W W/ W WS WV	WEST WATER WITH WATERMAIN WATER SERVICE WATER VALVE
HAT HDPE HYD	HIGHEST ANNUAL TIDE (2018) HIGH DENSITY POLYETHYLENE HYDRANT		
INV.	INVERT		
LF	LINEAR FEET		
MAX. MDOT	MAXIMUM MAINE DEPARTMENT OF TRANSPORTATION		
MHHW MLLW MIN. MON	MEAN HIGHER HIGH WATER MEAN LOWER LOW WATER MINIMUM MONUMENT		

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OPTIONAL NOTES, RECORDS, AND ADDITIONAL INFORMATION

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
 DATE: APRIL 2020
 SCALE: NONE
 SHEET: 1 OF 104

C-001

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CITY OF PORTLAND PUBLIC WORKS PORTLAND, MAINE BACK COVE SOUTH STORAGE FACILITY		41 Hutchins Drive Portland, Maine 04102 800.426.4262 www.woodardcurran.com WOODARD & CURRAN COMMITMENT & INTEGRITY DRIVE RESULTS		THIS DOCUMENT IS THE PROPERTY OF WOODARD & CURRAN, INC. AND ITS CLIENT. REPRODUCTION OR MODIFICATION WITHOUT WRITTEN PERMISSION IS PROHIBITED.		
KEY PLAN				REV	DESCRIPTION	DATE
DESIGNED BY: KJT		CHECKED BY: MOLM				
DRAWN BY: JBC		02/26/69.00-C-200.DWG				
JOB NO.: 0232069.00						
DATE: APRIL 2020						
SCALE: AS NOTED						
SHEET: 2 OF 104						
C-200						



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	DESIGNED BY: KJT	CHECKED BY: MDLM
	DRAWN BY: JBC	0232089.00-DEMOLITION.DWG

EXISTING SITE DEMOLITION
& EROSION CONTROL PLAN - 1

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

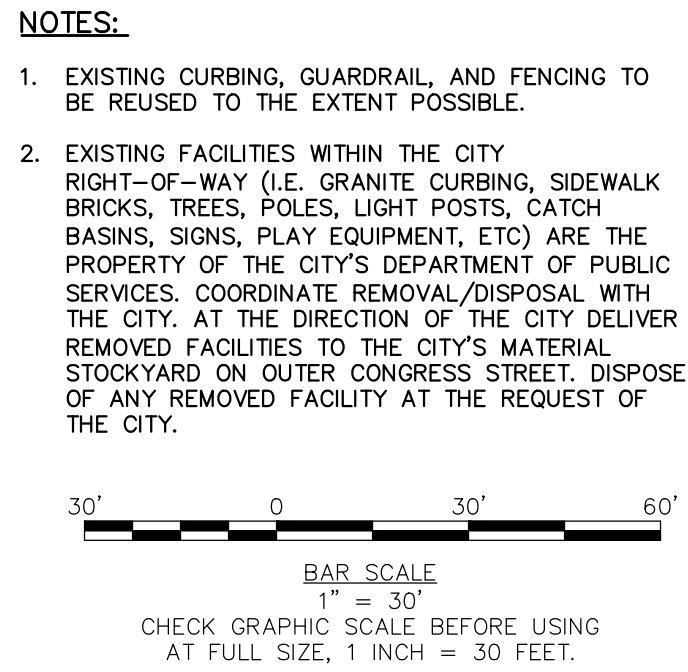
JOB NO : 0232069.00

DATE: APRIL 2020

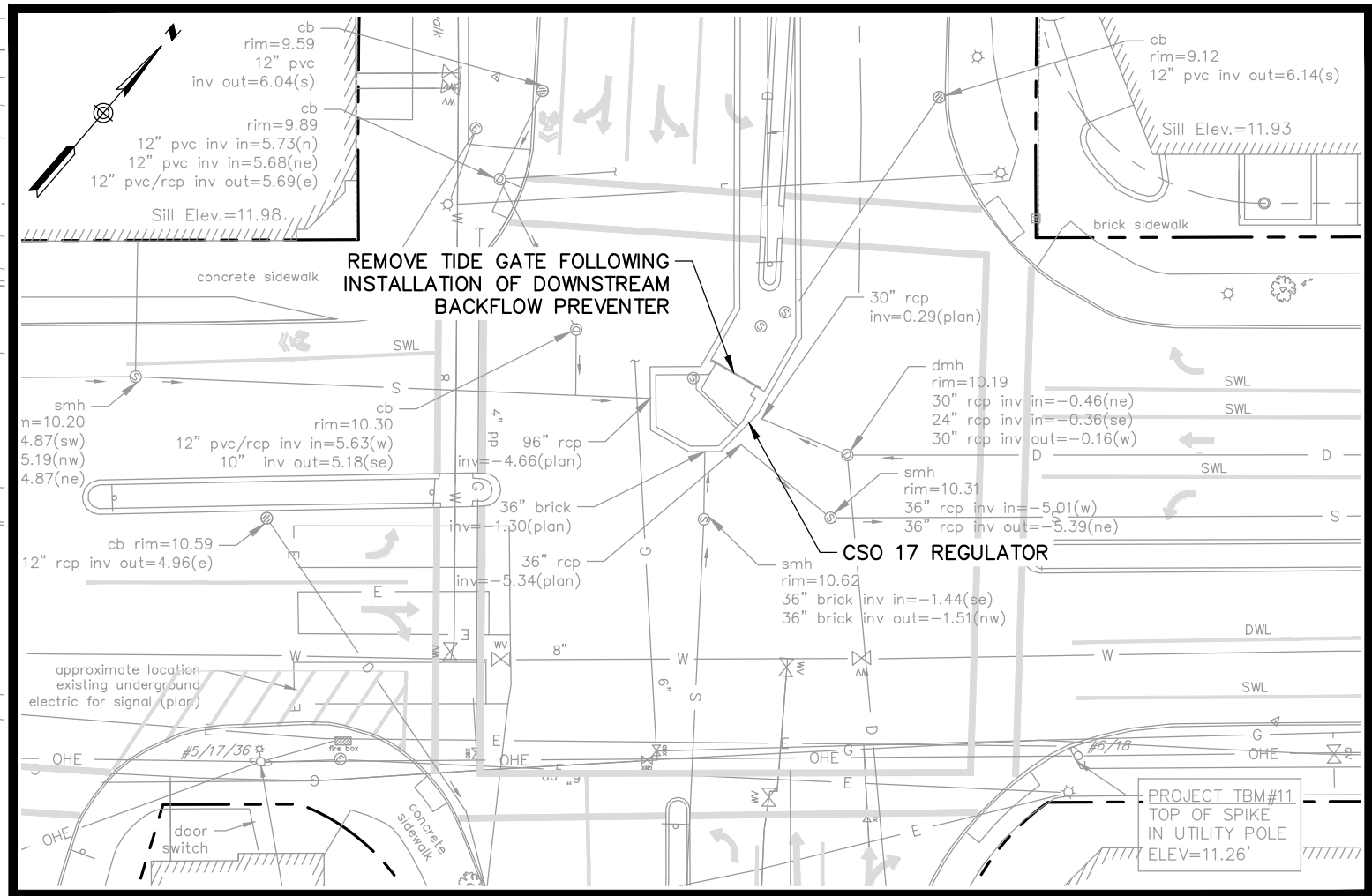
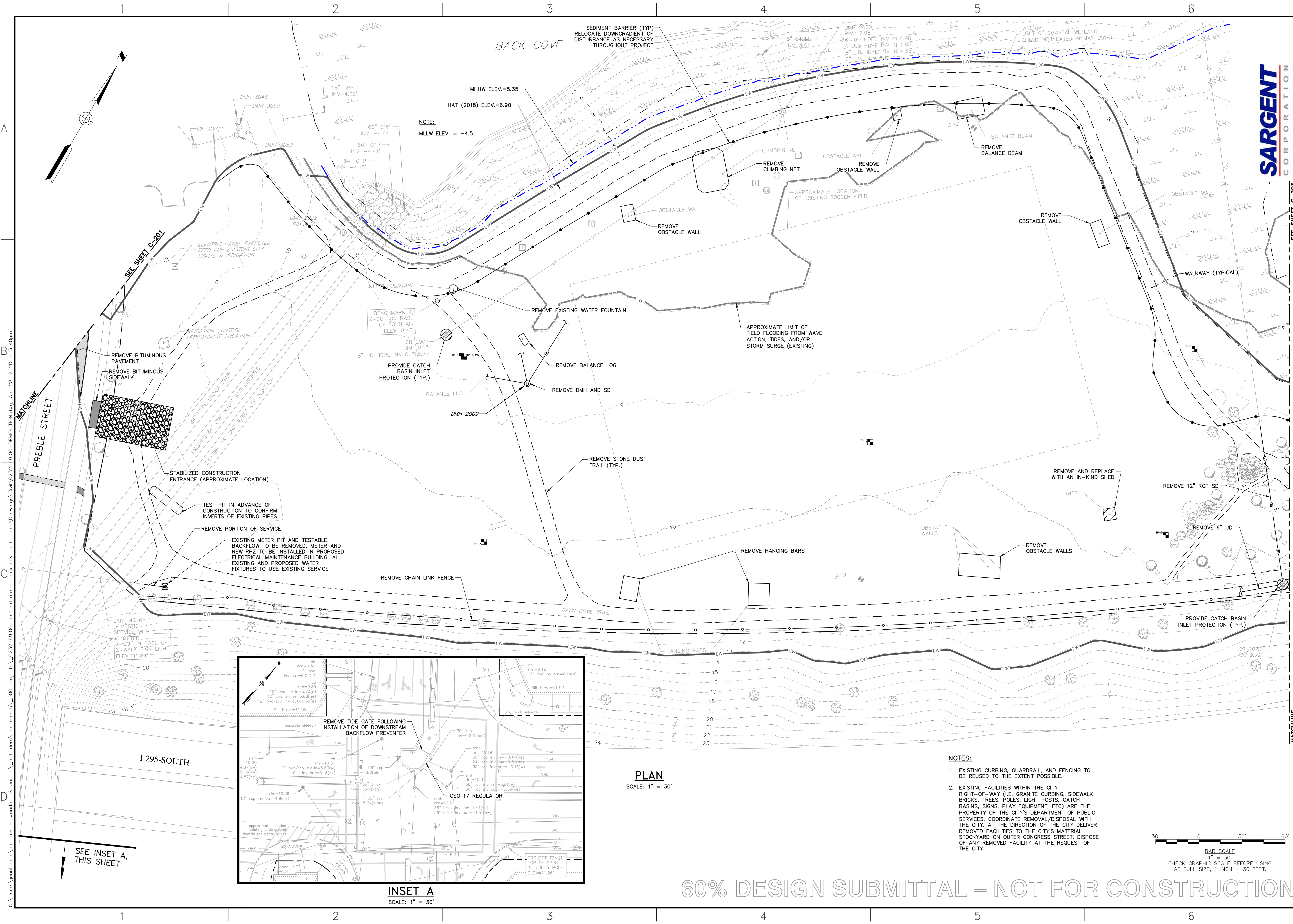
SCALE: AS NOTED

SHEET: 3 OF 104

C-201



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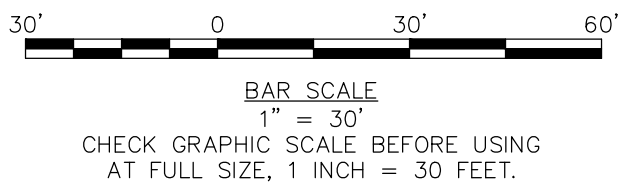


PLAN
SCALE: 1" = 30'

INSET A
SCALE: 1" = 30'

NOTES:

1. EXISTING CURBING, GUARDRAIL, AND FENCING TO BE REUSED TO THE EXTENT POSSIBLE.
2. EXISTING FACILITIES WITHIN THE CITY RIGHT-OF-WAY (IE. GRANITE CURBING, SIDEWALK BRICKS, TREES, POLES, LIGHT POSTS, CATCH BASINS, SIGNS, PLAY EQUIPMENT, ETC) ARE THE PROPERTY OF THE CITY'S DEPARTMENT OF PUBLIC SERVICES. COORDINATE REMOVAL/DISPOSAL WITH THE CITY. AT THE DIRECTION OF THE CITY DELIVER REMOVED FACILITIES TO THE CITY'S MATERIAL STOCKYARD ON OUTER CONGRESS STREET. DISPOSE OF ANY REMOVED FACILITY AT THE REQUEST OF THE CITY.



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COMMITMENT & INTEGRITY DRIVE RESULTS

SEE SHEET C-203

EXISTING SITE DEMOLITION
& EROSION CONTROL PLAN - 2

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

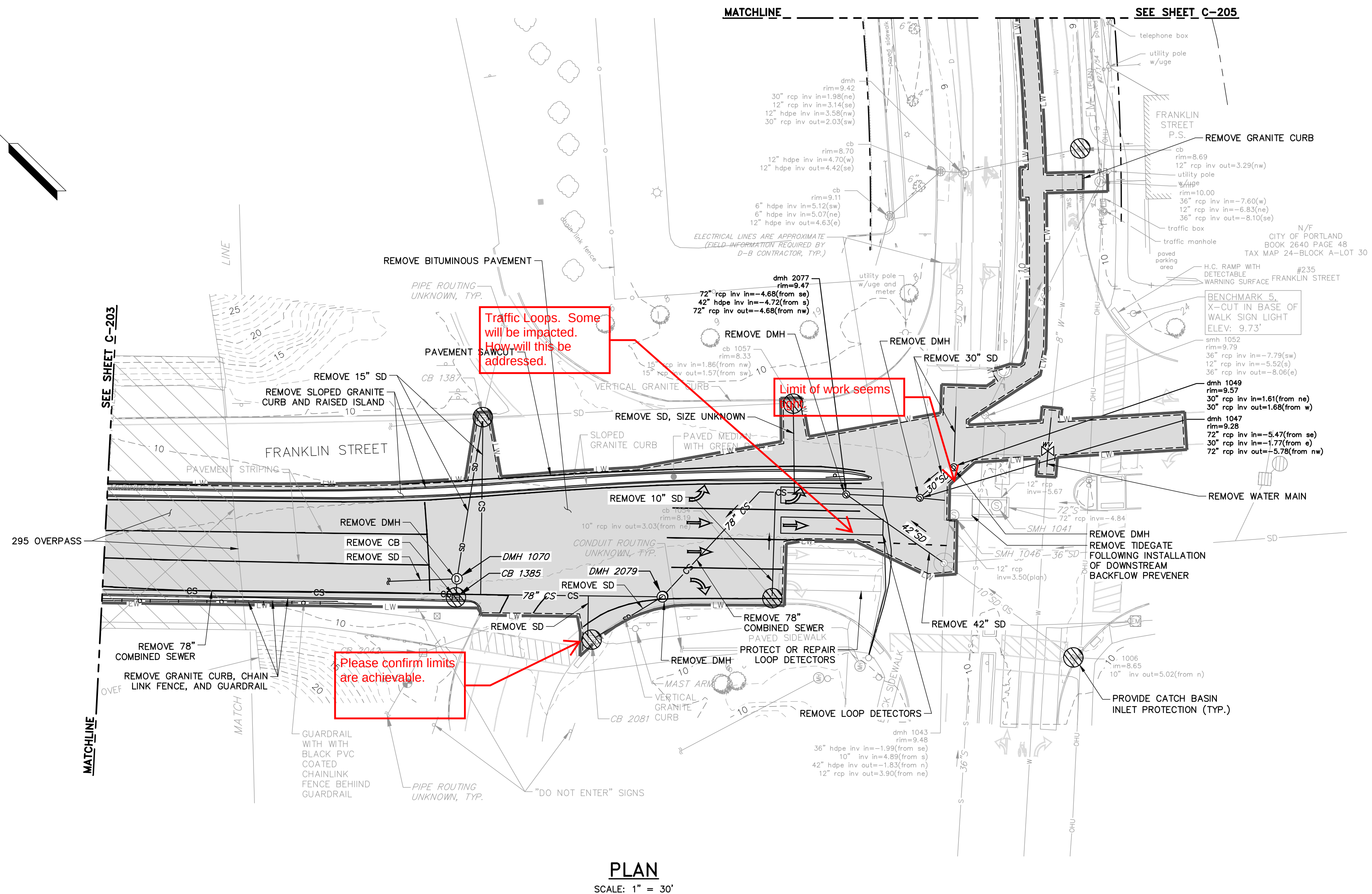
BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 4 OF 104

C-202

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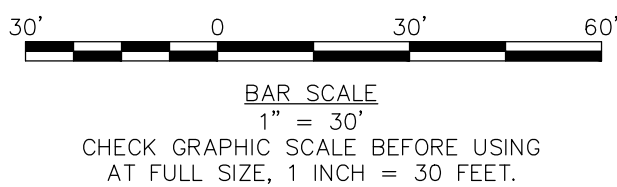




PLAN
SCALE: 1" = 30'

NOTES:

1. EXISTING CURBING, GUARDRAIL, AND FENCING TO BE REUSED TO THE EXTENT POSSIBLE.
2. EXISTING FACILITIES WITHIN THE CITY RIGHT-OF-WAY (I.E. GRANITE CURBING, SIDEWALK BRICKS, TREES, POLES, LIGHT POSTS, CATCH BASINS, SIGNS, PLAY EQUIPMENT, ETC) ARE THE PROPERTY OF THE CITY'S DEPARTMENT OF PUBLIC SERVICES. COORDINATE REMOVAL/DISPOSAL WITH THE CITY. AT THE DIRECTION OF THE CITY DELIVER REMOVED FACILITIES TO THE CITY'S MATERIAL STOCKYARD ON OUTER CONGRESS STREET. DISPOSE OF ANY REMOVED FACILITY AT THE REQUEST OF THE CITY.



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		DRAWN BY: JBC	023069.00-DEMOLITION.DWG

EXISTING SITE DEMOLITION
& EROSION CONTROL PLAN - 4

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

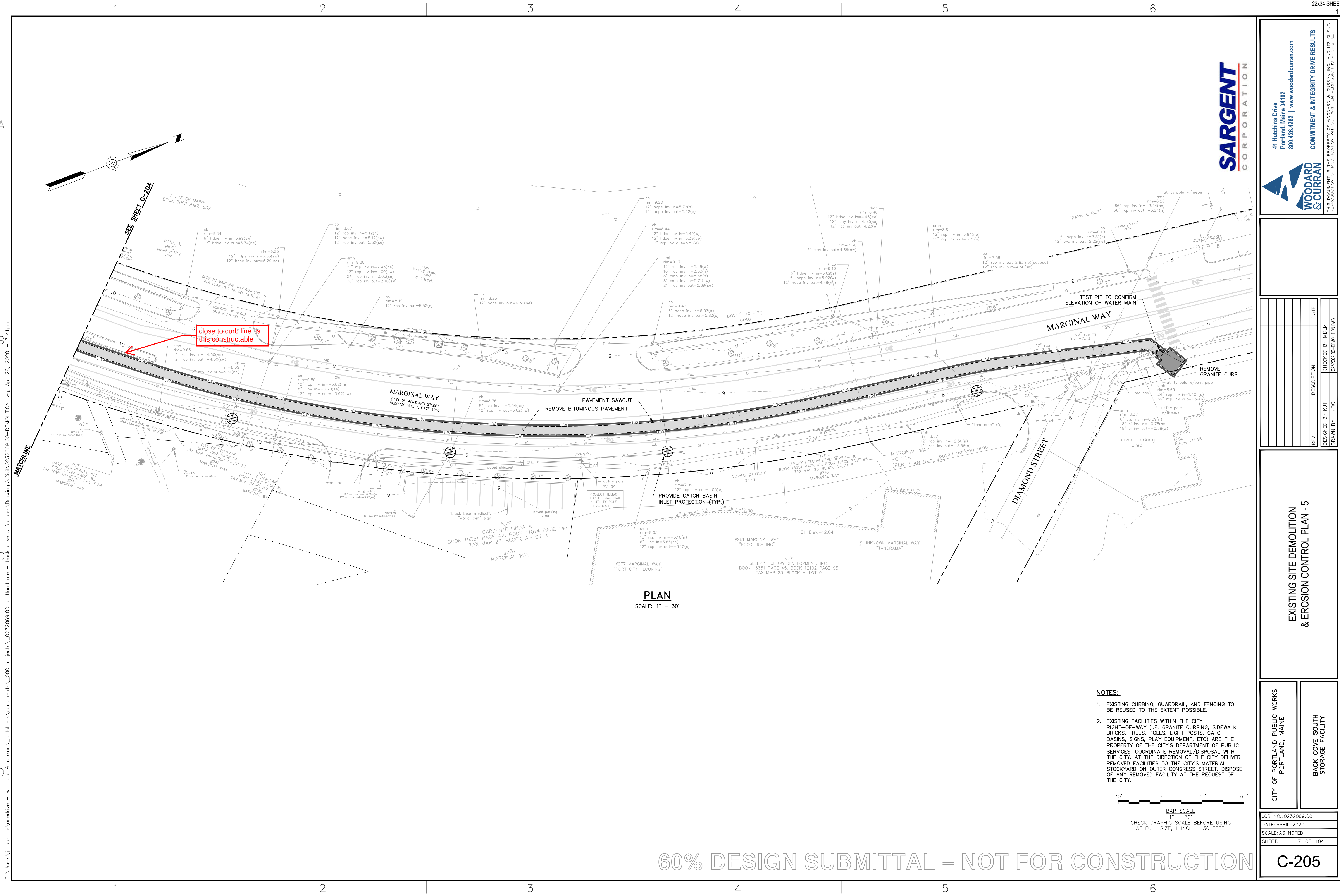
JOB NO.: 0232069.00

DATE: APRIL 2020

SCALE: AS NOTED

SHEET: 6 OF 104

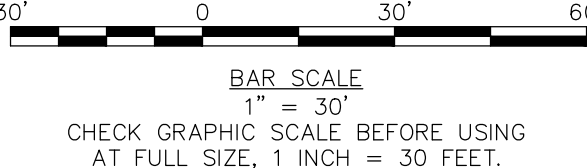
C-204



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- NOTES:**
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REV	DESCRIPTION	DATE

EXISTING SITE DEMOLITION
& EROSION CONTROL PLAN - 5

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

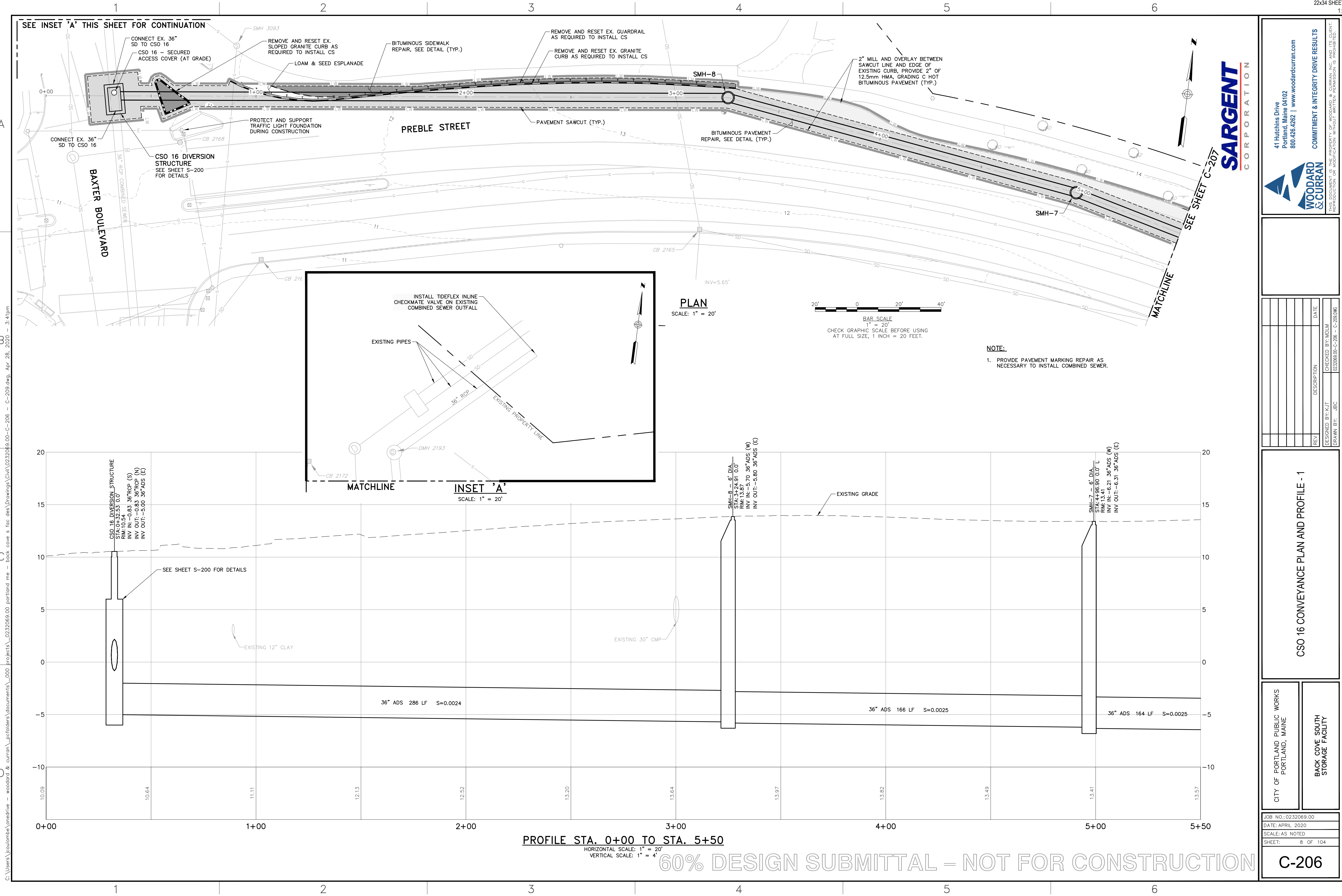
JOB NO.: 0232069.00

DATE: APRIL 2020

SCALE: AS NOTED

SHEET: 7 OF 104

C-205



22x34 SHEET
1:1

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SCALE: AS NOTED
SHEET: 8 OF 104

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00

DATE: APRIL 2020

SCALE: AS NOTED

SHEET: 8 OF 104

C-206

SEE INSET 'A' THIS SHEET FOR CONTINUATION

CONNECT EX. 36" SD TO CSO 16

CSO 16 - SECURED ACCESS COVER (AT GRADE)

REMOVE AND RESET EX. SLOPED GRANITE CURB AS REQUIRED TO INSTALL CS

LOAM & SEED ESPLANADE

BITUMINOUS SIDEWALK REPAIR, SEE DETAIL (TYP.)

REMOVE AND RESET EX. GUARDRAIL AS REQUIRED TO INSTALL CS

REMOVE AND RESET EX. GRANITE CURB AS REQUIRED TO INSTALL CS

SMH-8

2" MILL AND OVERLAY BETWEEN SAWCUT LINE AND EDGE OF EXISTING CURB, PROVIDE 2" OF 12.5mm HMA, GRADING C HOT BITUMINOUS PAVEMENT (TYP.)

PREBLE STREET

PAVEMENT SAWCUT (TYP.)

BITUMINOUS PAVEMENT REPAIR, SEE DETAIL (TYP.)

SMH-7

CONNECT EX. 36" SD TO CSO 16

CSO 16 DIVERSION STRUCTURE SEE SHEET S-200 FOR DETAILS

BAXTER BOULEVARD

PROTECT AND SUPPORT TRAFFIC LIGHT FOUNDATION DURING CONSTRUCTION

CB 216B

CB 216

CB 2172

DMH 2193

EXISTING PROPERTY LINE

EXISTING PIPES

INSTALL TIDEFLEX INLINE CHECKMATE VALVE ON EXISTING COMBINED SEWER OUTFALL

SMH-8 - 6' DIA.
STA: 44+96.90 0.0' L
INV IN: -5.70 36" ADS (W)
INV OUT: -5.80 36" ADS (E)

SMH-7 - 6' DIA.
STA: 44+96.90 0.0' L
INV IN: -6.21 36" ADS (W)
INV OUT: -6.31 36" ADS (E)

EXISTING GRADE

EXISTING 30" CMP

EXISTING 12" CLAY

36" ADS 286 LF S=0.0024

36" ADS 166 LF S=0.0025

36" ADS 164 LF S=0.0025

PROFILE STA. 0+00 TO STA. 5+50

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

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SEE SHEET C-207

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING AT FULL SIZE, 1 INCH = 20 FEET.

NOTE:
1. PROVIDE PAVEMENT MARKING REPAIR AS NECESSARY TO INSTALL COMBINED SEWER.

PLAN
SCALE: 1" = 20'

INSET 'A'
SCALE: 1" = 20'

SMH-8

SMH-7

CB 216B

CB 216

CB 2172

DMH 2193

EXISTING PROPERTY LINE

EXISTING PIPES

INSTALL TIDEFLEX INLINE CHECKMATE VALVE ON EXISTING COMBINED SEWER OUTFALL

SMH-8 - 6' DIA.
STA: 44+96.90 0.0' L
INV IN: -5.70 36" ADS (W)
INV OUT: -5.80 36" ADS (E)

SMH-7 - 6' DIA.
STA: 44+96.90 0.0' L
INV IN: -6.21 36" ADS (W)
INV OUT: -6.31 36" ADS (E)

EXISTING GRADE

EXISTING 30" CMP

EXISTING 12" CLAY

36" ADS 286 LF S=0.0024

36" ADS 166 LF S=0.0025

36" ADS 164 LF S=0.0025

PROFILE STA. 0+00 TO STA. 5+50

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

60% DESIGN SUBMITTAL - NOT FOR CONSTRUCTION

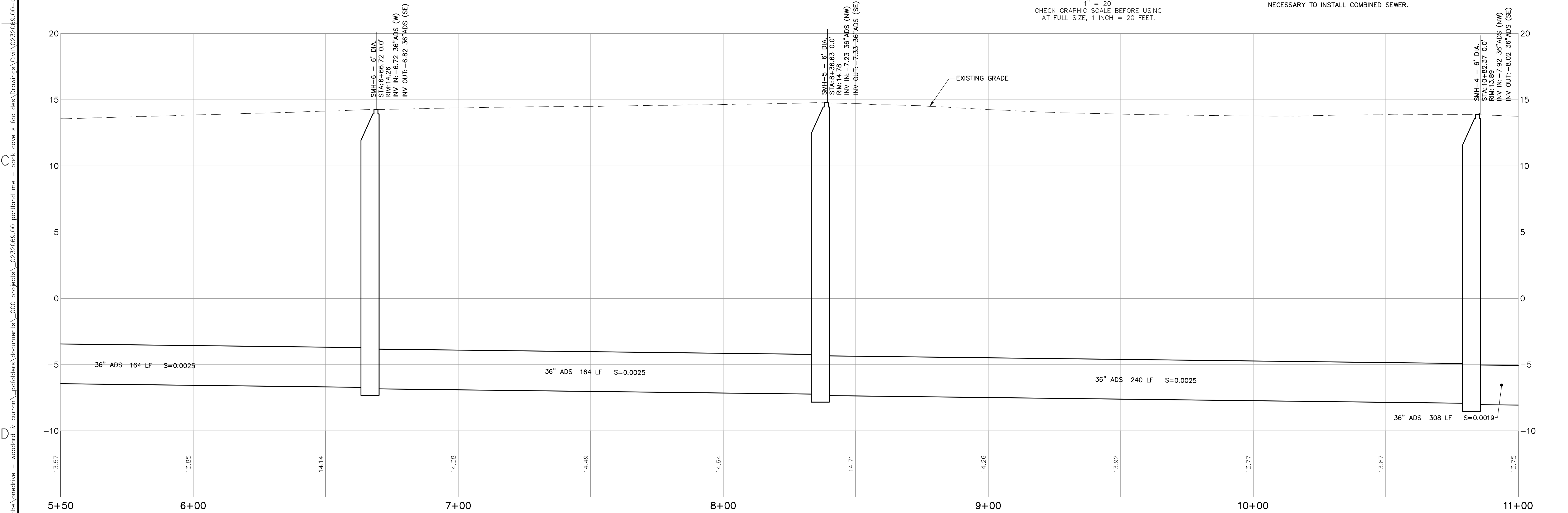
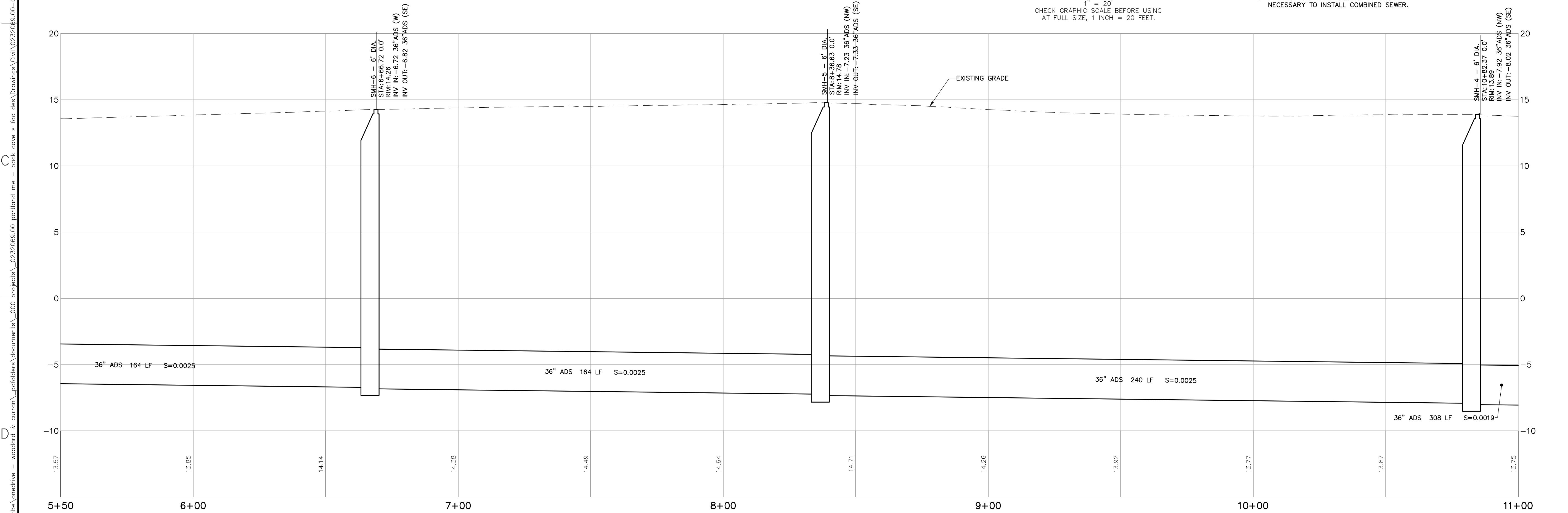
SEE SHEET C-207

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING AT FULL SIZE, 1 INCH = 20 FEET.

NOTE:
1. PROVIDE PAVEMENT MARKING REPAIR AS NECESSARY TO INSTALL COMBINED SEWER.

PLAN
SCALE: 1" = 20'

INSET 'A'
SCALE: 1" = 20'



HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

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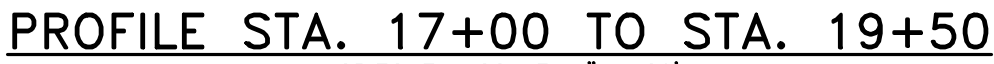
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	DESIGNED BY: KJT	CHECKED BY: MUM
	DRAWN BY: JBC	02/20/03 00-C-206 - 209 JMS

CSO 16 CONVEYANCE PLAN AND PROFILE - 2

CITY OF PORTLAND PUBLIC WORKS PORTLAND, MAINE	BACK COVE SOUTH STORAGE FACILITY
--	-------------------------------------

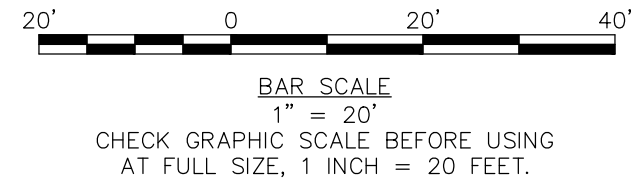
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DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 9 OF 104

C-207



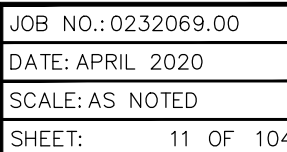
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

VERTICAL SCALE: 1 = 4

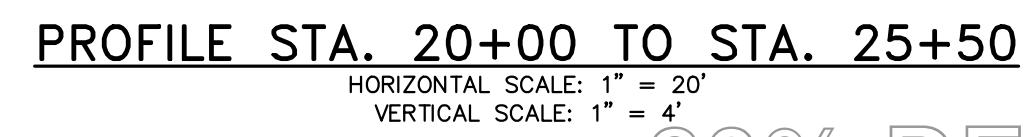


CHECK GRAPHIC SCALE BEFORE USING
AT FULL SIZE, 1 INCH = 20 FEET.

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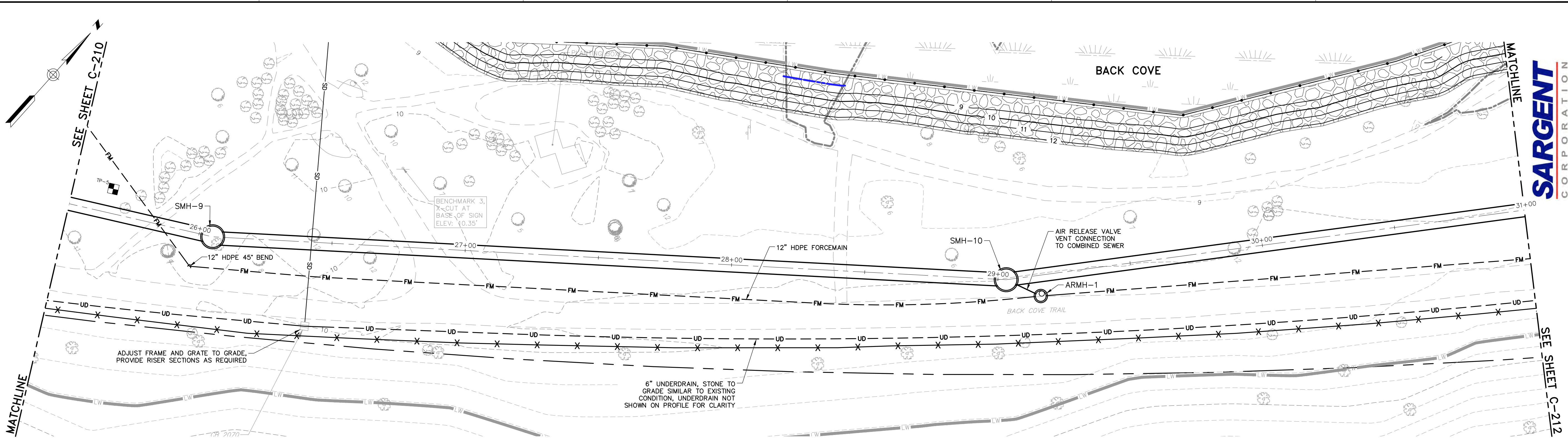


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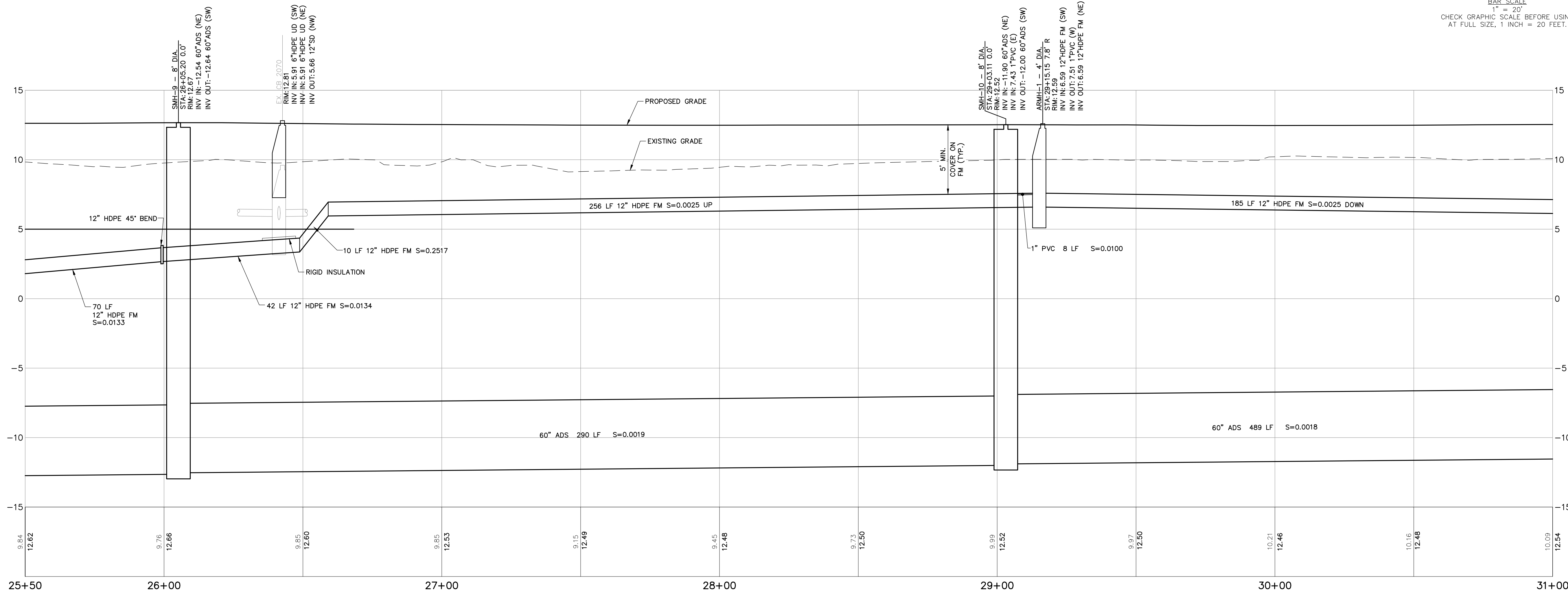
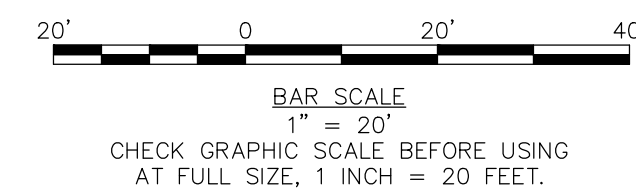


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PLAN
SCALE: 1" = 20'



PROFILE STA. 25+50 TO STA. 31+00

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

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REV	DESCRIPTION	DATE

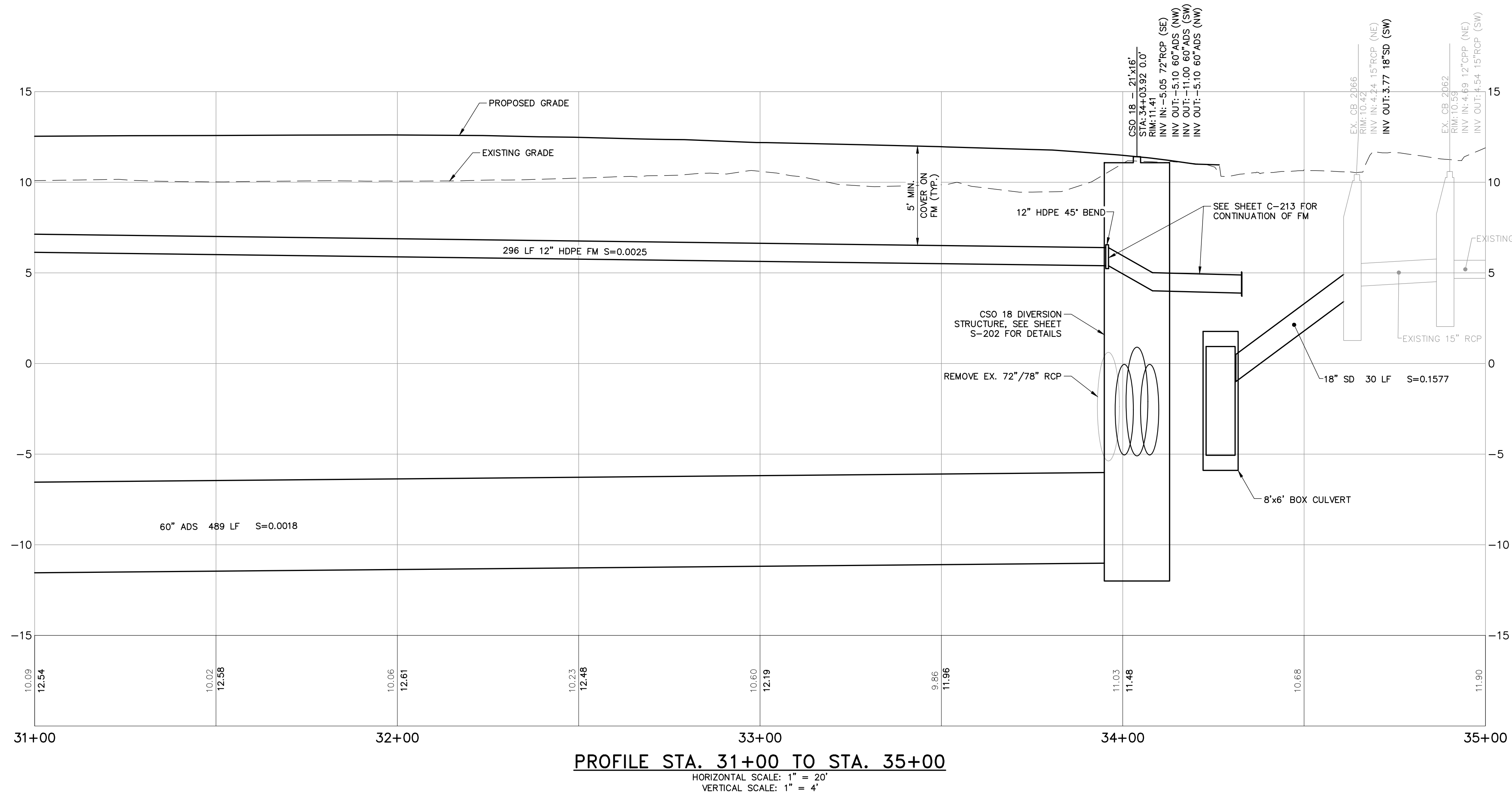
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DESIGNED BY: KJT
DRAWN BY: JBC
JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 13 OF 104

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

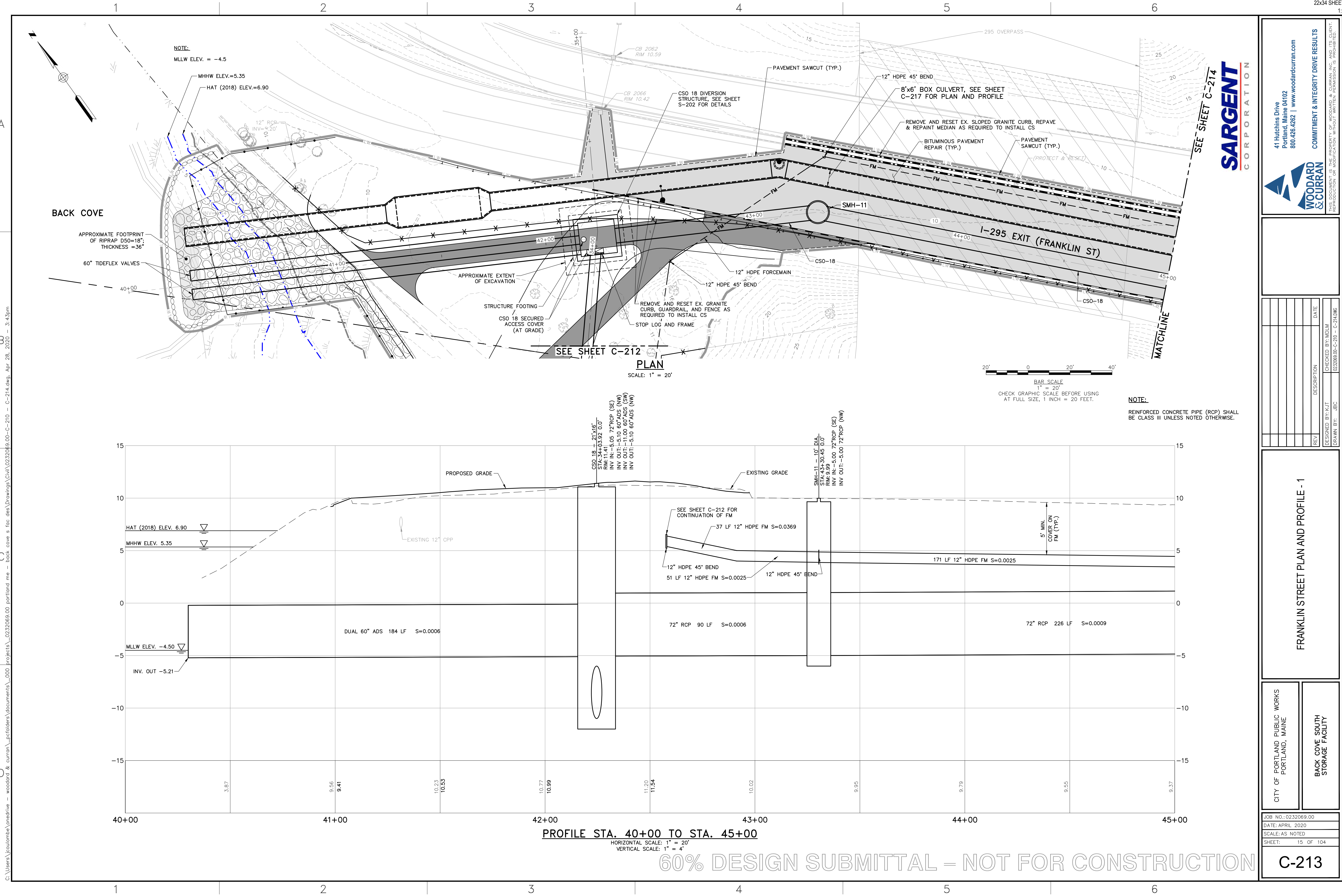
BACK COVE SOUTH
STORAGE FACILITY

C-211

CSO 18 CONVEYANCE PLAN AND PROFILE - 2



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FRANKLIN STREET PLAN AND PROFILE - 1

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 15 OF 104

C-213

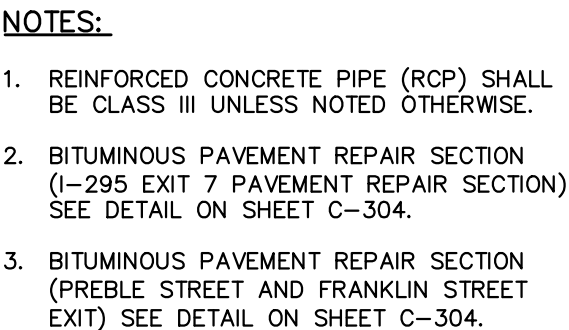
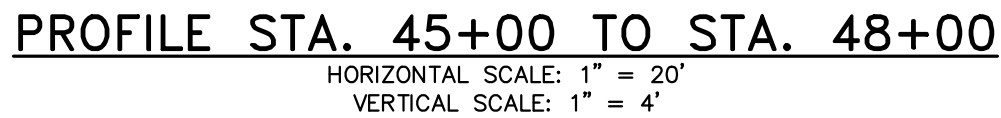
22x34 SHEET
1:1

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REV.	DESCRIPTION	DATE

CHECKED BY: MDLM
DESIGNED BY: K/JT
DRAWN BY: JBC

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REV	DESCRIPTION	DATE
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	DRAWN BY: JBC	02320693.00-C-210 - C-714.DWG

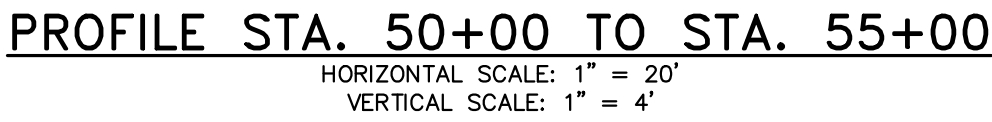
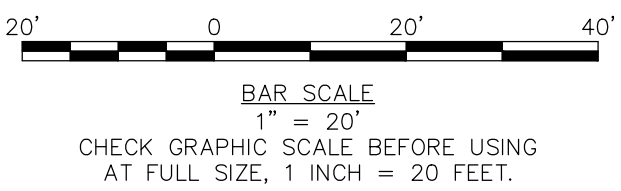
FRANKLIN STREET PLAN AND PROFILE - Z

CITY OF PORTLAND, MAINE
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

NO.: 0232069.00
APRIL 2020
E: AS NOTED
F: 16 OF 104

C-214



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REV	DESCRIPTION	DATE
DESIGNED BY: KJT		CHECKED BY: MDM
DRAWN BY: JBC		1023099.00-C-215 - C-216.DWG

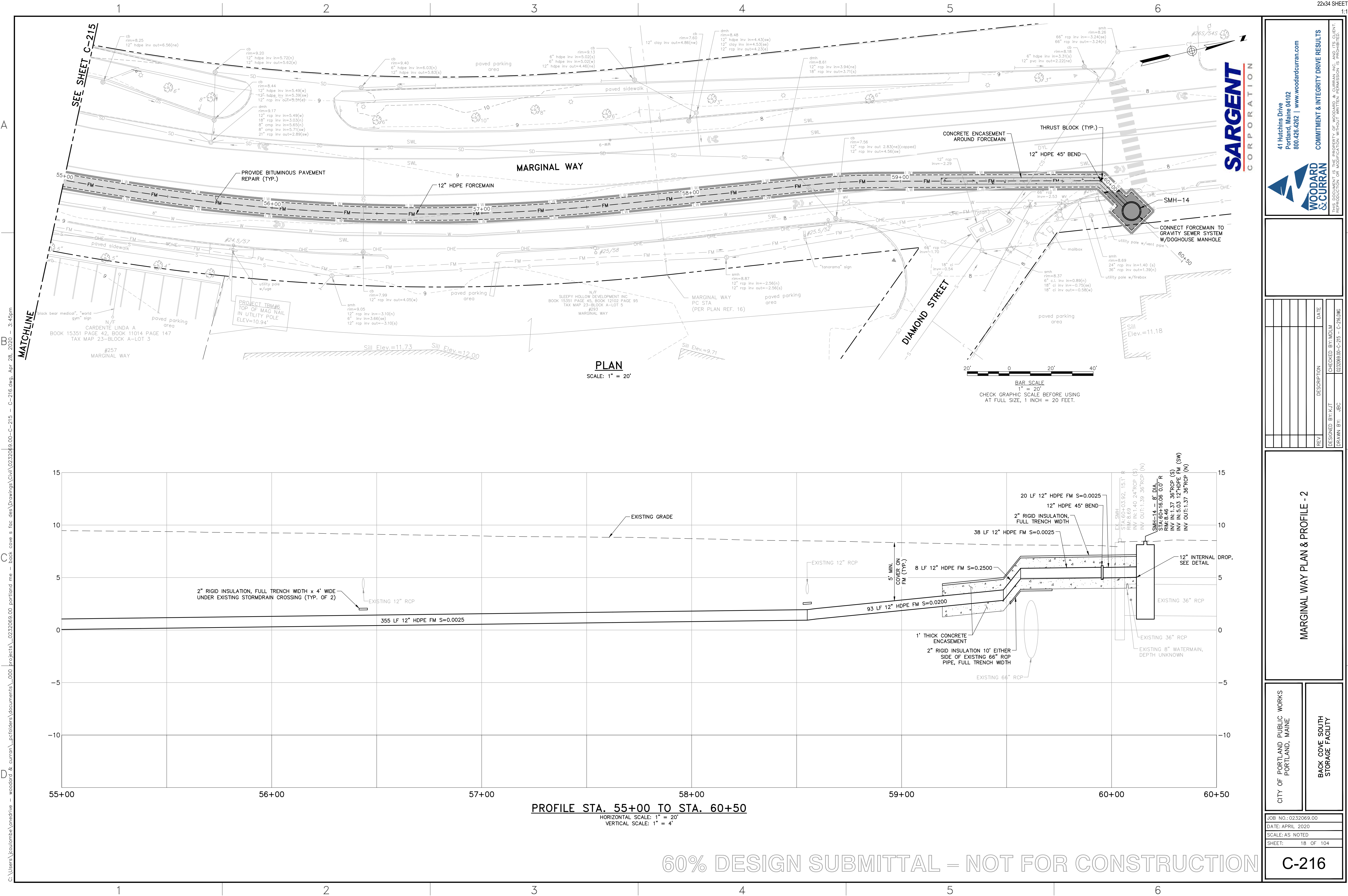
MARGINAL WATILAN & TIVILLE - I

PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

NO.: 0232069.00
APRIL 2020
E: AS NOTED
F: 17 OF 104

C-215



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REVISIONS

NO.	DESCRIPTION	DATE

DESIGNED BY: K/JT
CHECKED BY: MDLM
DRAWN BY: JBC

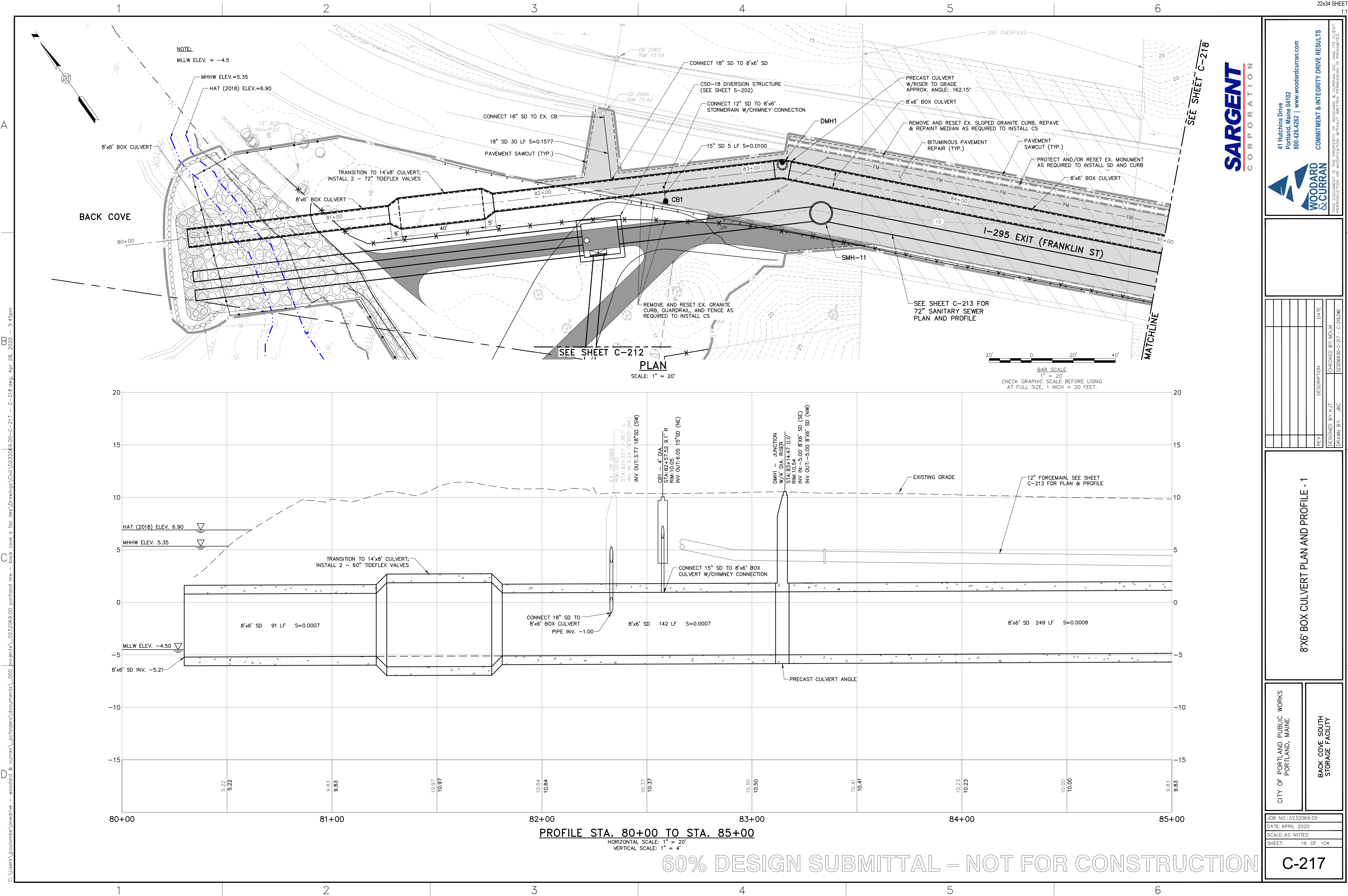
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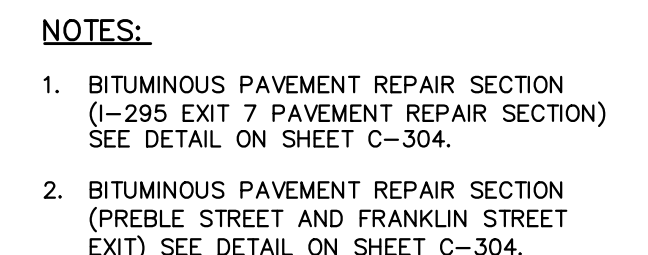
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 18 OF 104

C-216





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REV	DESCRIPTION	DATE
	DESIGNED BY: KJT	CHECKED BY: MDM
	DRAWN BY: JBC	0023099.00-C-217 - C-218.0WS

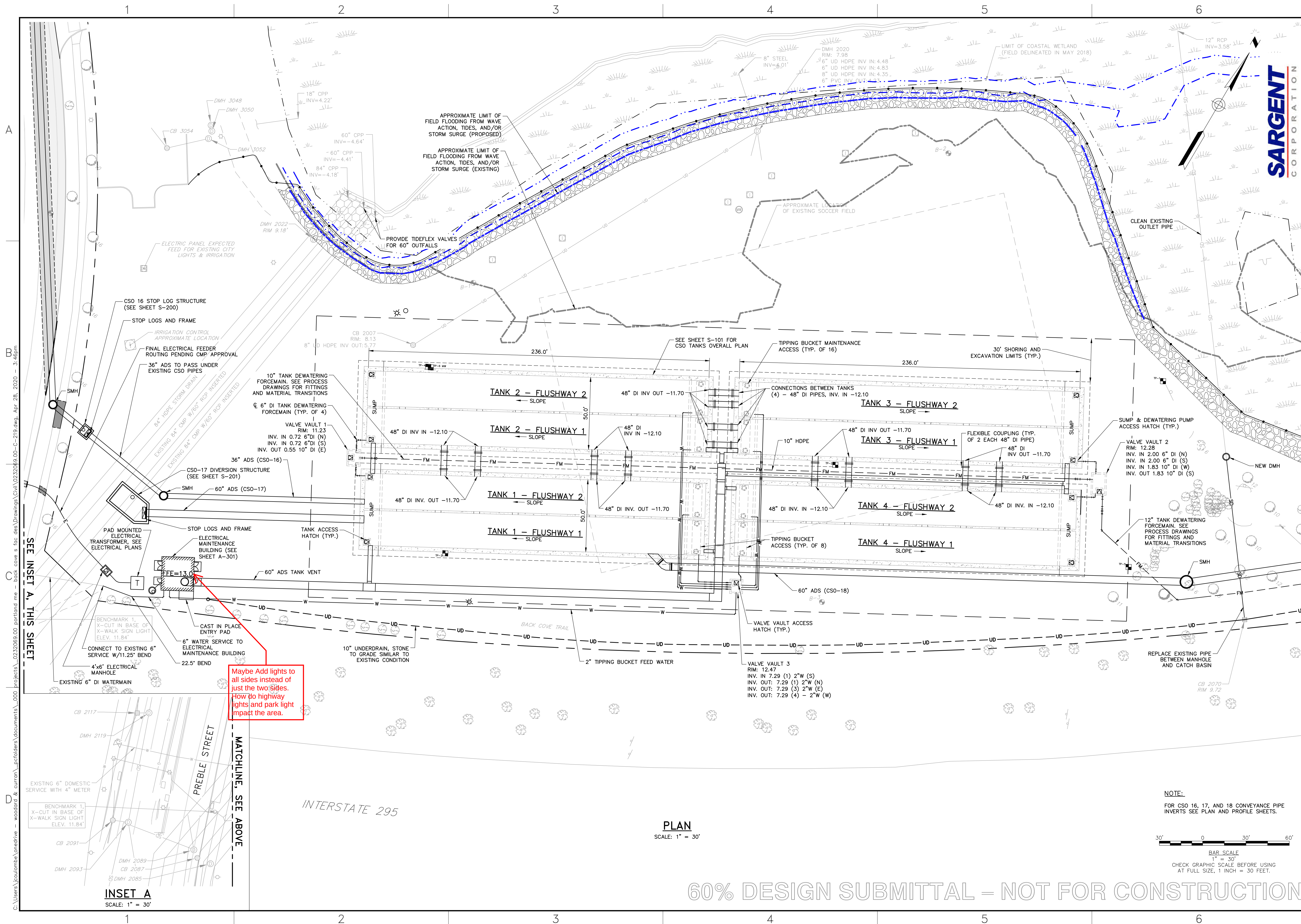
2020 BOY SCOUTS OF AMERICA

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

NO.:0232069.00
E: APRIL 2020
LE: AS NOTED
ET: 20 OF 104

C-218



Maybe Add lights to all sides instead of just the two sides. How do highway lights and park light impact the area.

INSET A
SCALE: 1" = 30'

PLAN
SCALE: 1" = 30'

NOTE:
FOR CSO 16, 17, AND 18 CONVEYANCE PIPE
INVERTS SEE PLAN AND PROFILE SHEETS.

30' 0 30' 60'

BAR SCALE
1" = 30'

CHECK GRAPHIC SCALE BEFORE USING
AT FULL SIZE, 1 INCH = 30 FEET.

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COMMITMENT & INTEGRITY DRIVE RESULTS

DATE: 02/20/2020
CHECKED BY: J.K.T.
DESIGNED BY: J.B.C.

YARD PIPING - OVERALL PLAN

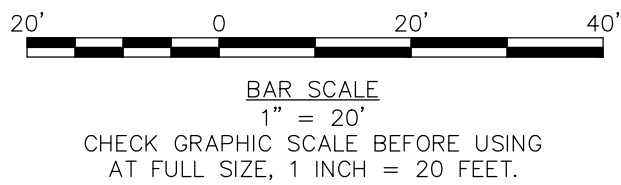
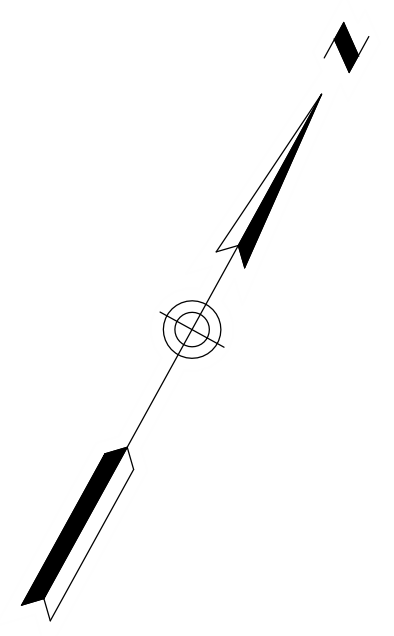
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 21 OF 104

C-219

C:\Users\jcolamba\OneDrive - woodard & curran\p_folders\documents\000_projects\0232069.00_portland me - back cove s. for des\Drawings\0232069.00-C-219.dwg, Apr 28, 2020 - 3:45pm



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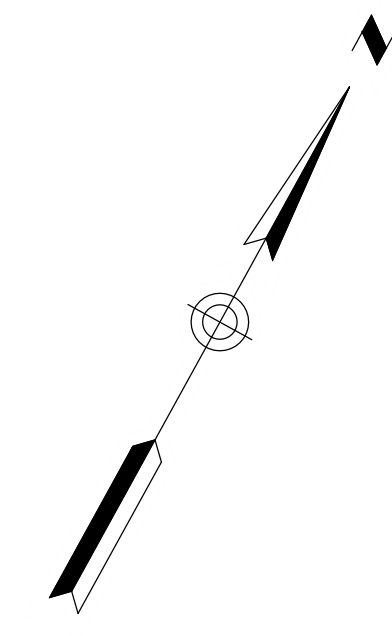
YARD PIPING - TANK VENT AND FORCEMAIN
PLAN & SECTION - 1

PORTLAND, MAINE

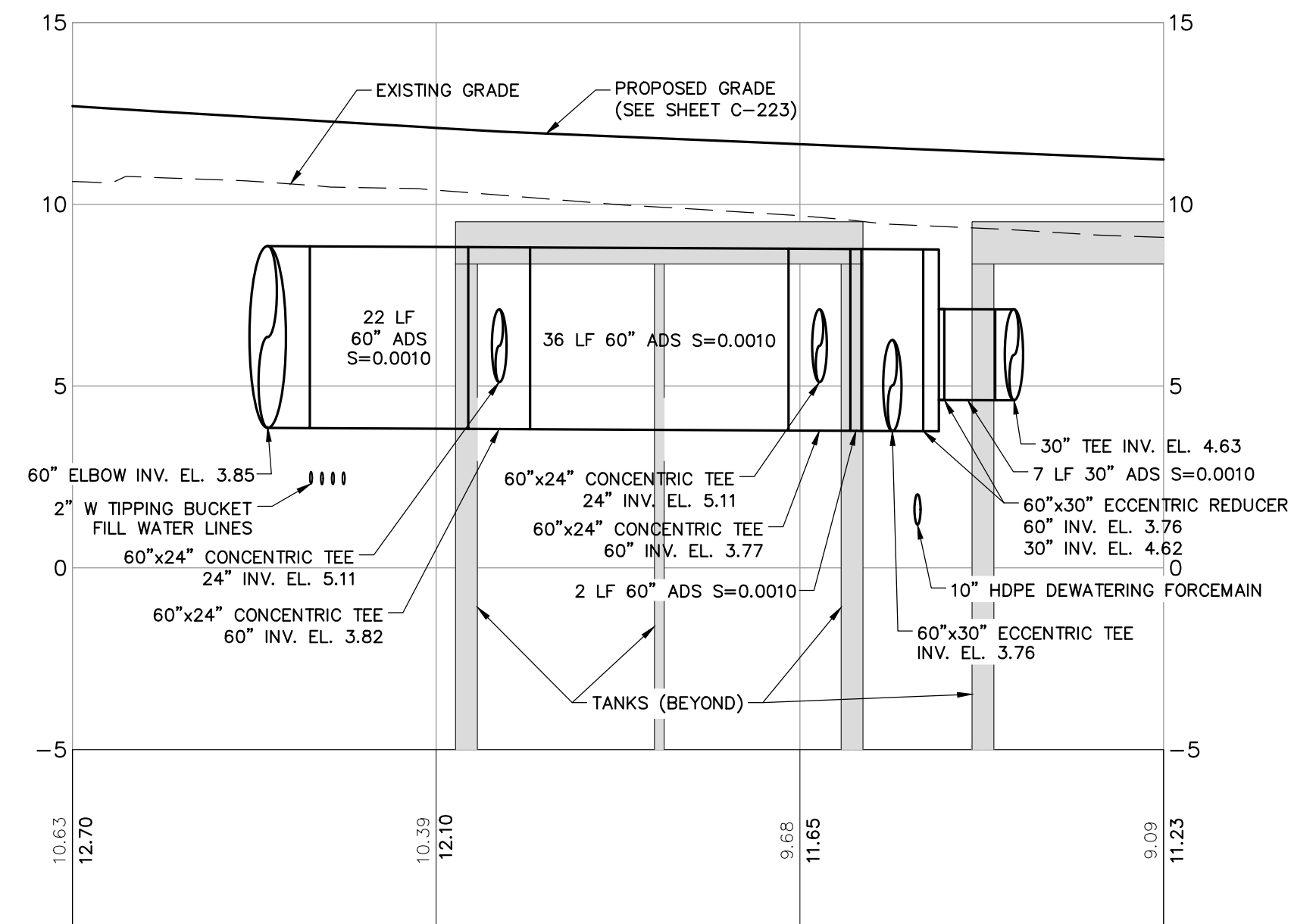
BACK COVE SOUTH
STORAGE FACILITY

NO.: 0232069.00
DATE: APRIL 2020
SALE: AS NOTED
PAGE: 22 OF 104

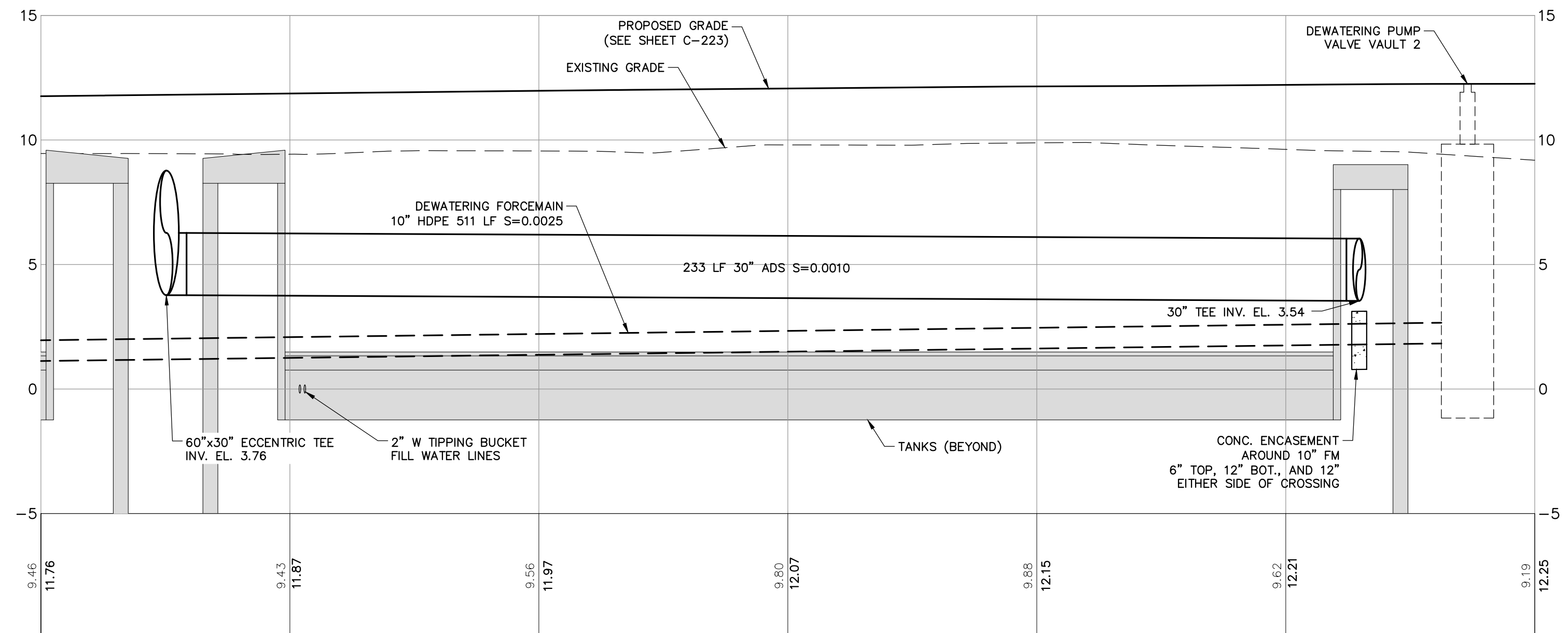
C-220



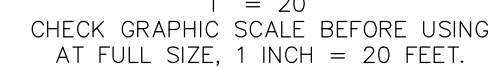
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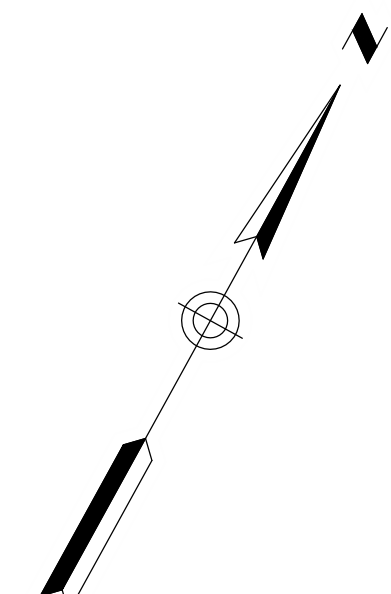
2
C-221



3
C-221



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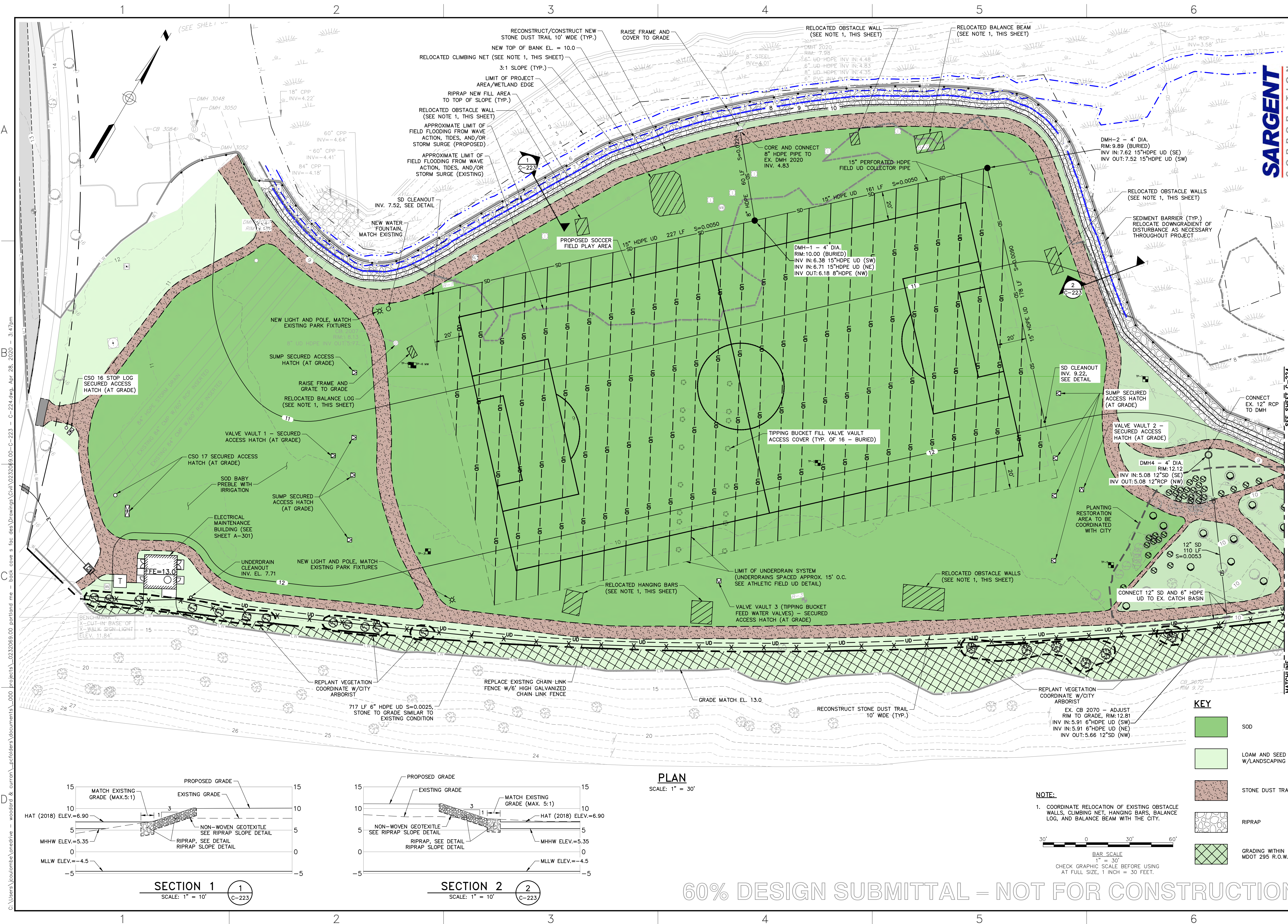


SCALE: 1" = 10'

[illegible]

DB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 24 OF 104

C-222



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SECTION 1
SCALE: 1" = 10'

SECTION 2
SCALE: 1" = 10'

PLAN
SCALE: 1" = 30'

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REV.	DESCRIPTION	DATE

CHECKED BY: MOLM
DESIGNED BY: JBC
DRAWN BY: JBC

0232069.00-C-223 - C-224.DWG

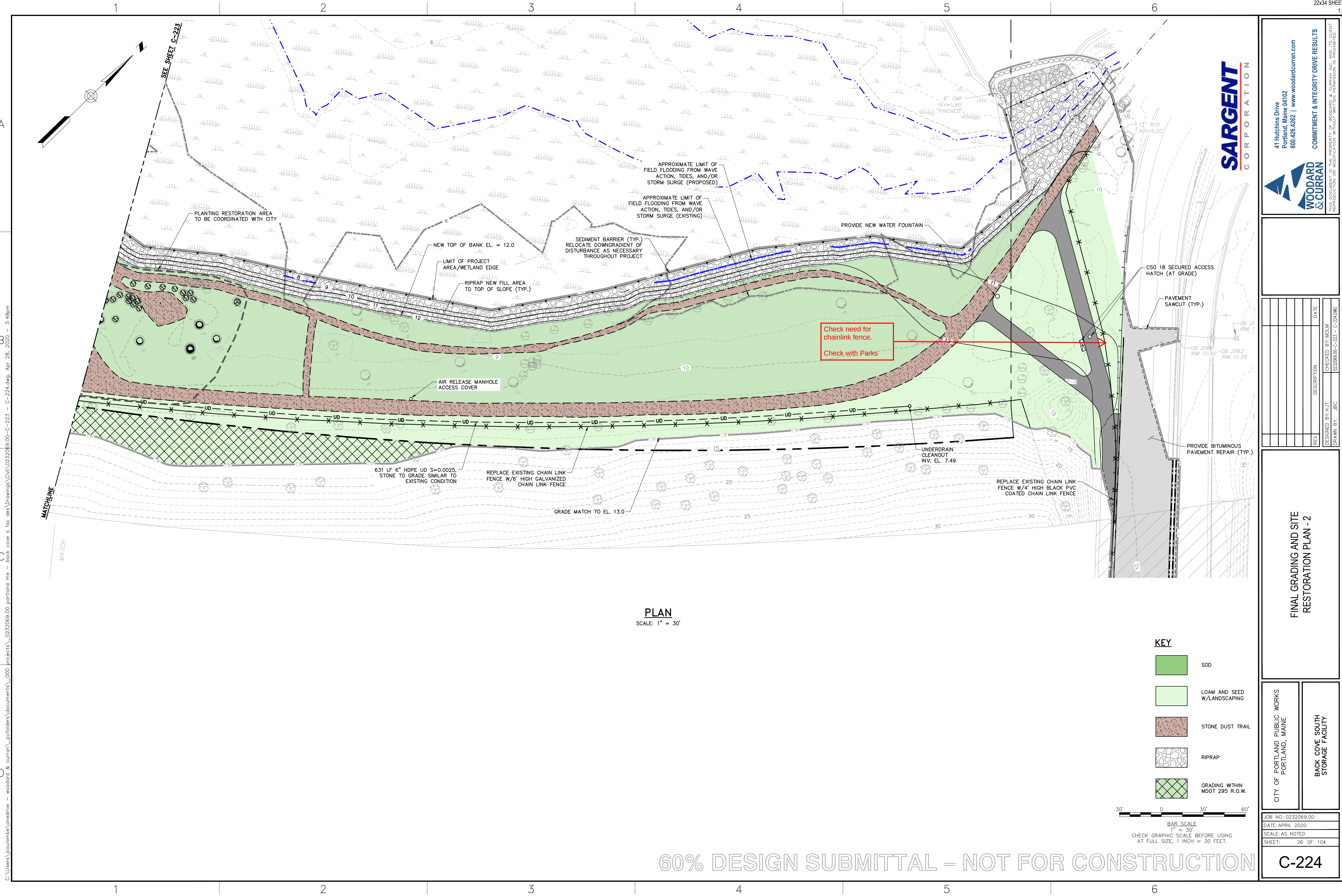
FINAL GRADING AND SITE RESTORATION PLAN - 1

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 25 OF 104

C-223



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REV. DESCRIPTION DATE

DESIGNED BY: K/JT CHECKED BY: MDLM

DRAWN BY: JBC 0232069.00-C-223 - C-224.DWG

FINAL GRADING AND SITE RESTORATION PLAN - 2

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH STORAGE FACILITY

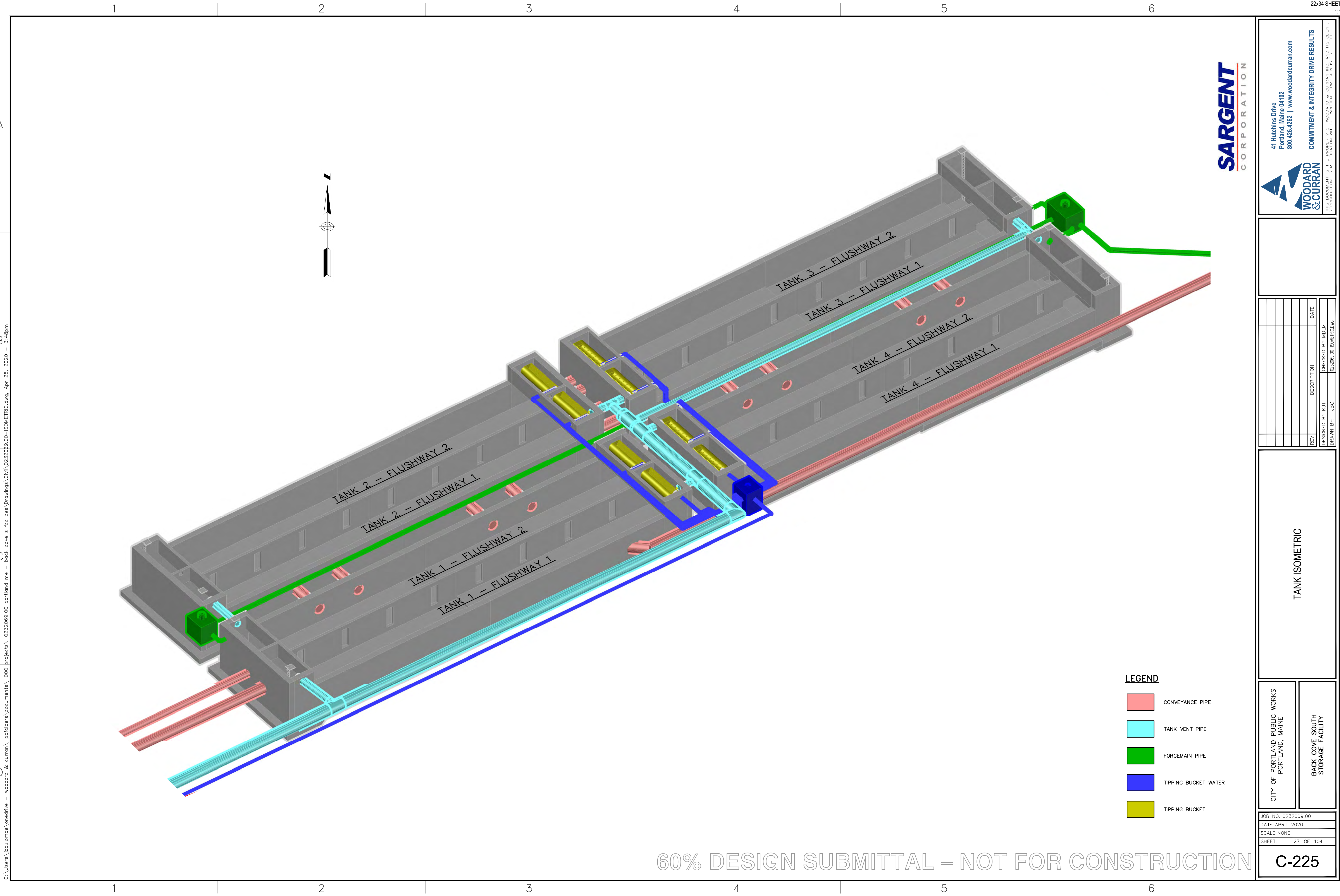
JOB NO.: 0232069.00

DATE: APRIL 2020

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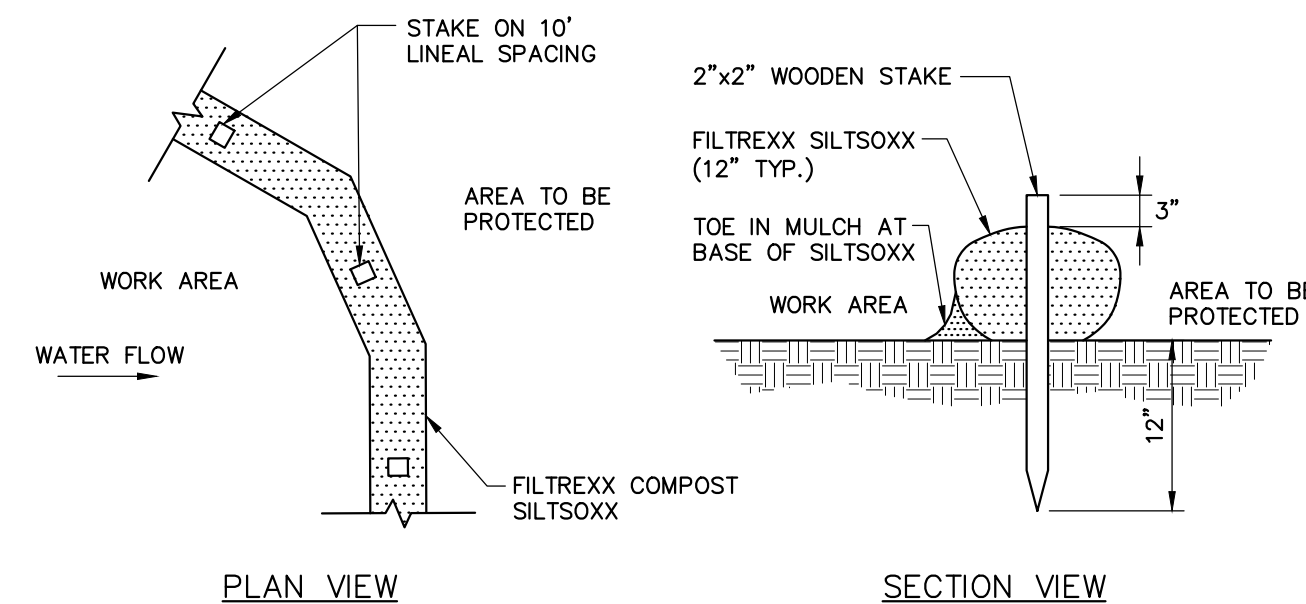
SHEET: 26 OF 104

C-224



CITY OF PORTLAND PUBLIC WORKS PORTLAND, MAINE		BACK COVE SOUTH STORAGE FACILITY	
JOB NO.: 0232069.00		DATE: APRIL 2020	
SCALE: NONE		SHEET: 27 OF 104	
C-225		TANK ISOMETRIC	
REV	DESCRIPTION	CHECKED BY: MDLM	DATE
DESIGNED BY: K/JT		DRAWN BY: JBC	
0232069.00-ISOMETRIC		COMMITMENT & INTEGRITY DRIVE RESULTS	
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GENERAL NOTES FOR MANHOLES AND CATCH BASINS

1. ALL CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4000 lbs. PER SQ. INCH AT THE END OF 28 DAYS, UNLESS OTHERWISE NOTED.
2. PRECAST REINFORCED CONE BARREL MANUFACTURED PER ASTM SPEC. C-478.
3. ALL STORM AND SEWER MANHOLE COVERS SHALL BE SOLID AND SHALL HAVE ONE 7/8" DIAMETER DRILLED PICK HOLE LOCATED 8" FROM THE CENTER OF THE COVER.
4. ALL SANITARY MANHOLE COVERS SHALL HAVE "SEWER" CAST INTO THE COVER. ALL STORMWATER/RAIN MANHOLE COVERS SHALL HAVE "RAIN" CAST INTO THE COVER.
5. ALL MANHOLE RISERS SHALL BE EAST JORDAN OR NEENAH.
6. SEWER BRICK SHALL CONFORM TO ASTM SPEC. DESIGNATE ON C-32-63, GRADE MA AND SA.
7. ALL SANITARY MANHOLES SHALL HAVE A WATERPROOFING COATING APPLIED TO THE EXTERIOR SURFACE.
8. CATCH BASIN FRAMES FOR TYPE A4 CATCH BASIN CURB INLETS SHALL BE EAST JORDAN OR NEENAH FOUNDRY.
9. CASTINGS SHALL CONFORM TO ASTM DESIGNATION A48-CLASS 35.
10. EXISTING MANHOLES, CATCH BASINS, FRAMES, AND COVERS SHALL BE SALVAGED, AND SHALL REMAIN THE PROPERTY OF THE CITY OF PORTLAND.

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CORPORATION

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CIVIL DETAILS - 1

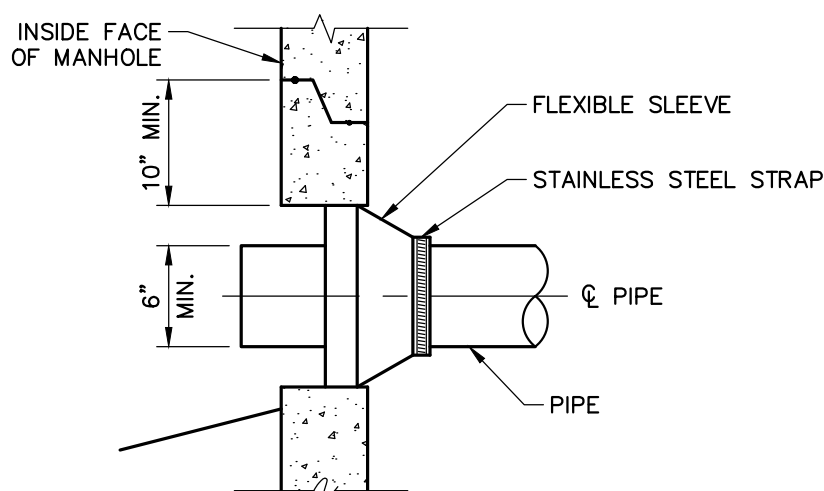
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 29 OF 104

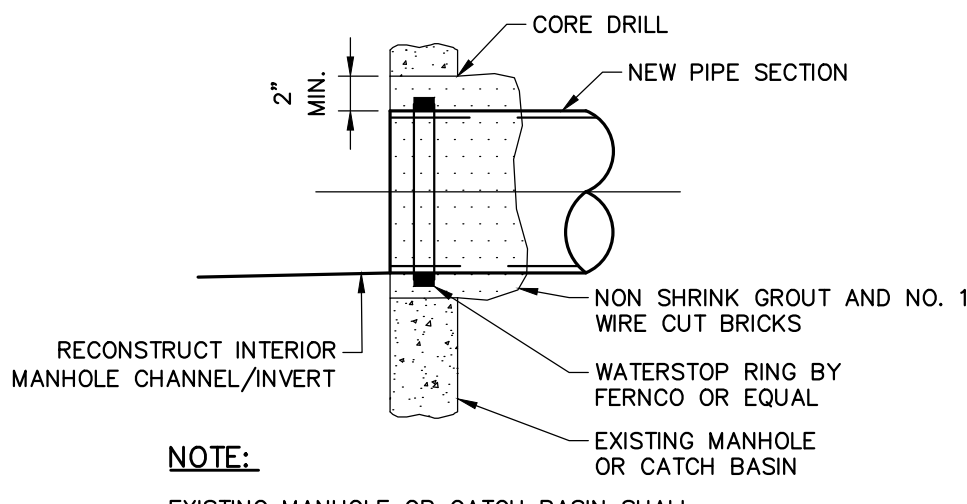
C-301

NEW PIPE TO NEW STRUCTURE
CONNECTION DETAIL



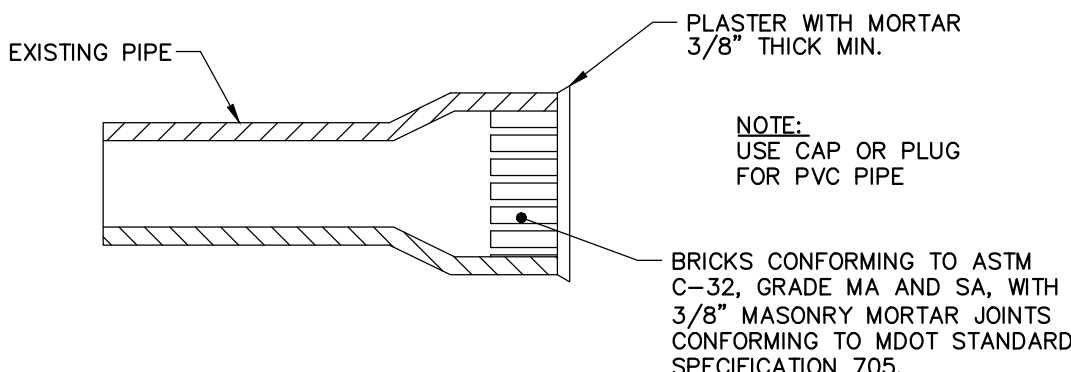
N.T.S.

NEW PIPE TO EXISTING STRUCTURE

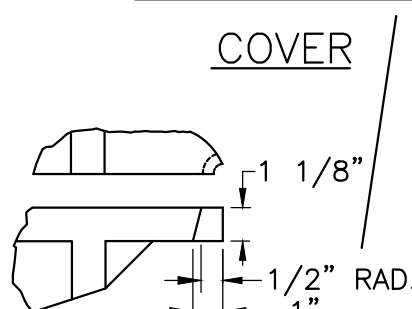
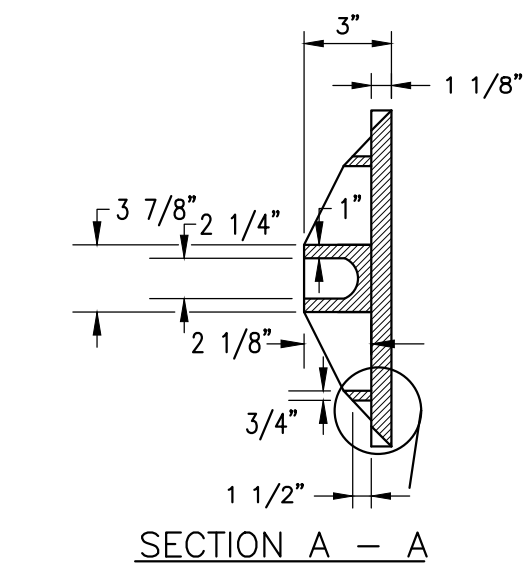


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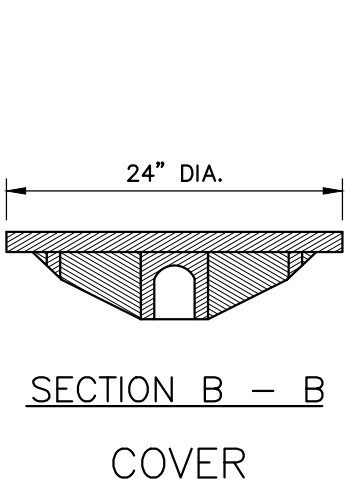
MASONRY PLUG DETAIL



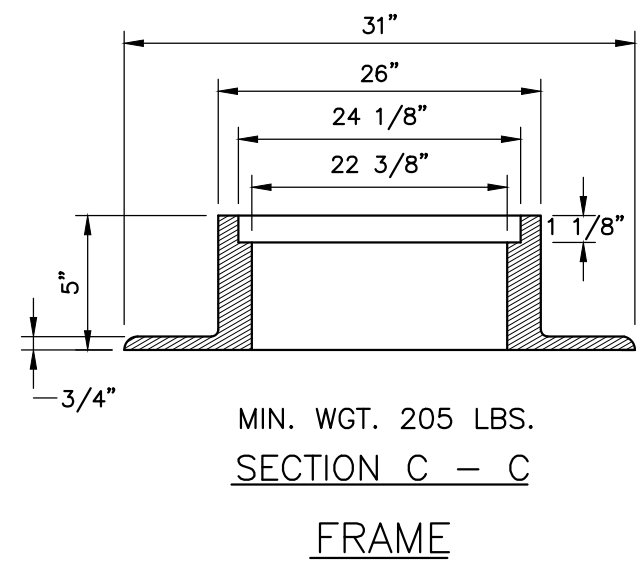
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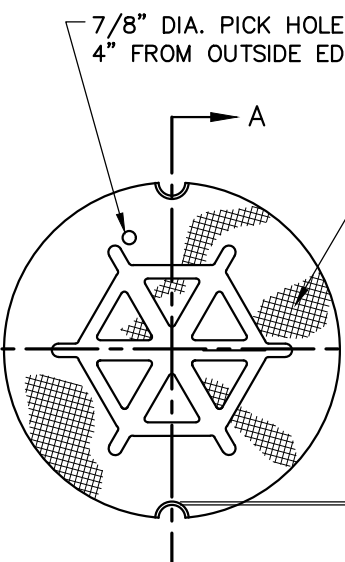
PICK HOLE DETAIL



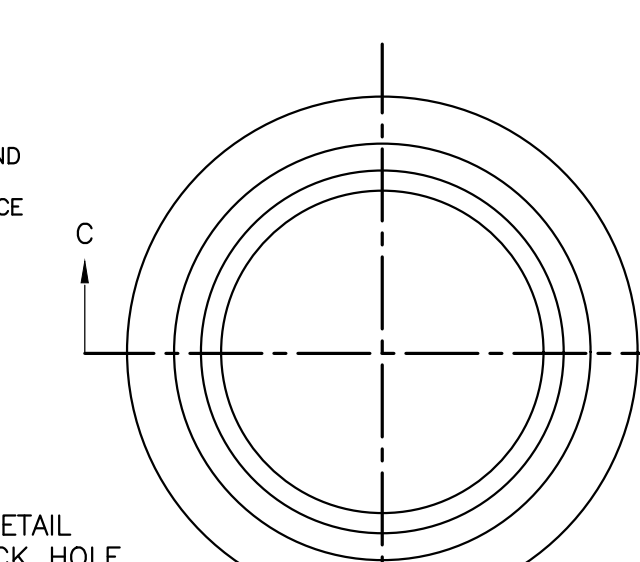
COVER



FRAME



COVER
PLAN VIEW

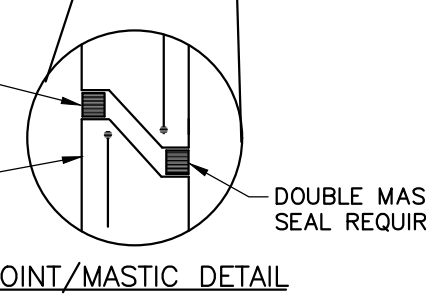
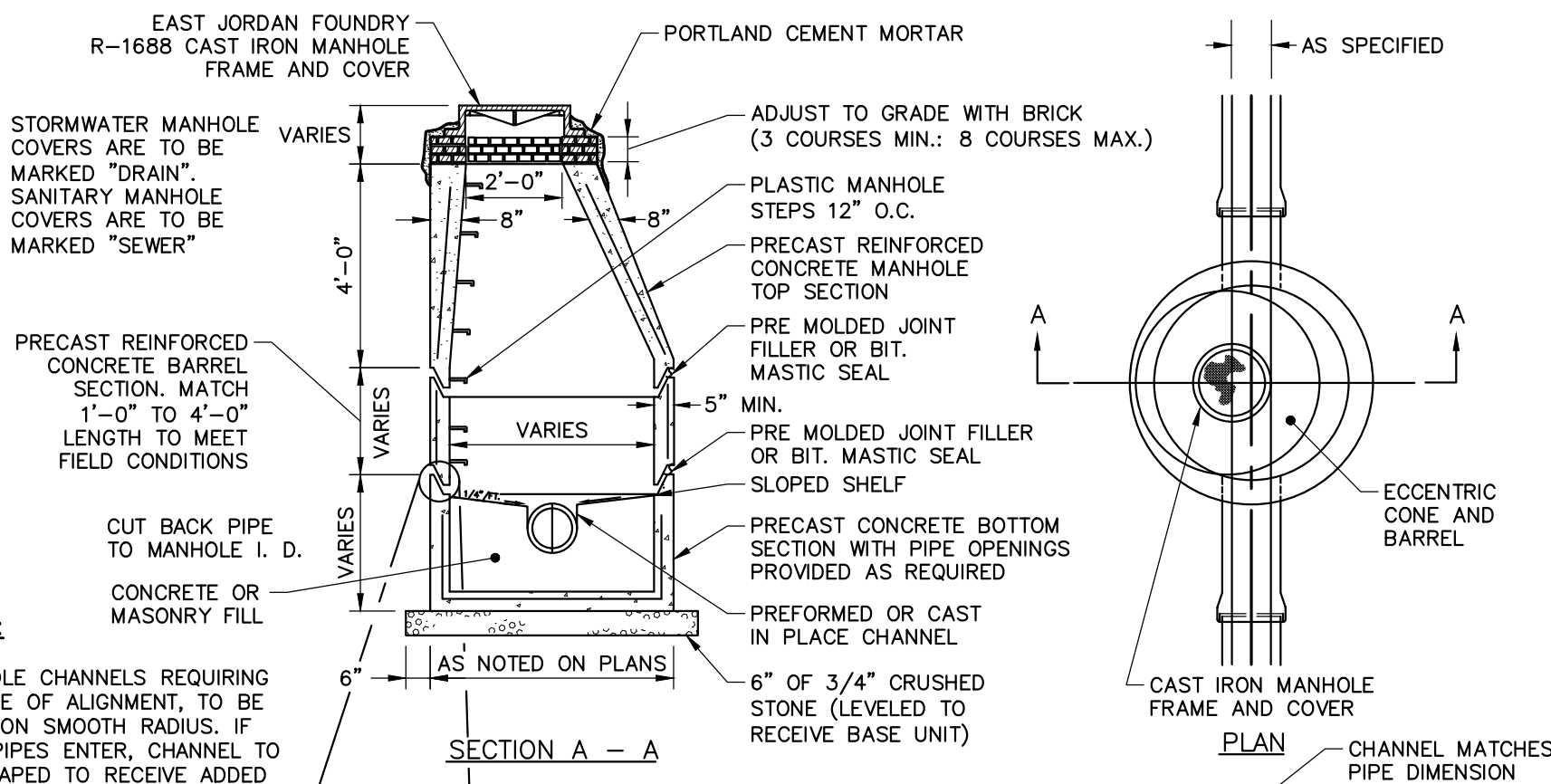


FRAME
PLAN VIEW

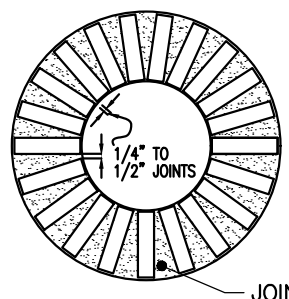
NOTE:
FOR ALL CROSS COUNTRY MANHOLES (LAWN AREAS),
USE PAM REXUS MANHOLE COVERS BY CERTAINTED.

TYPE "A" CAST IRON MANHOLE COVER AND FRAME

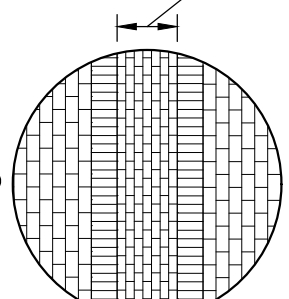
N.T.S.



JOINT/MASTIC DETAIL



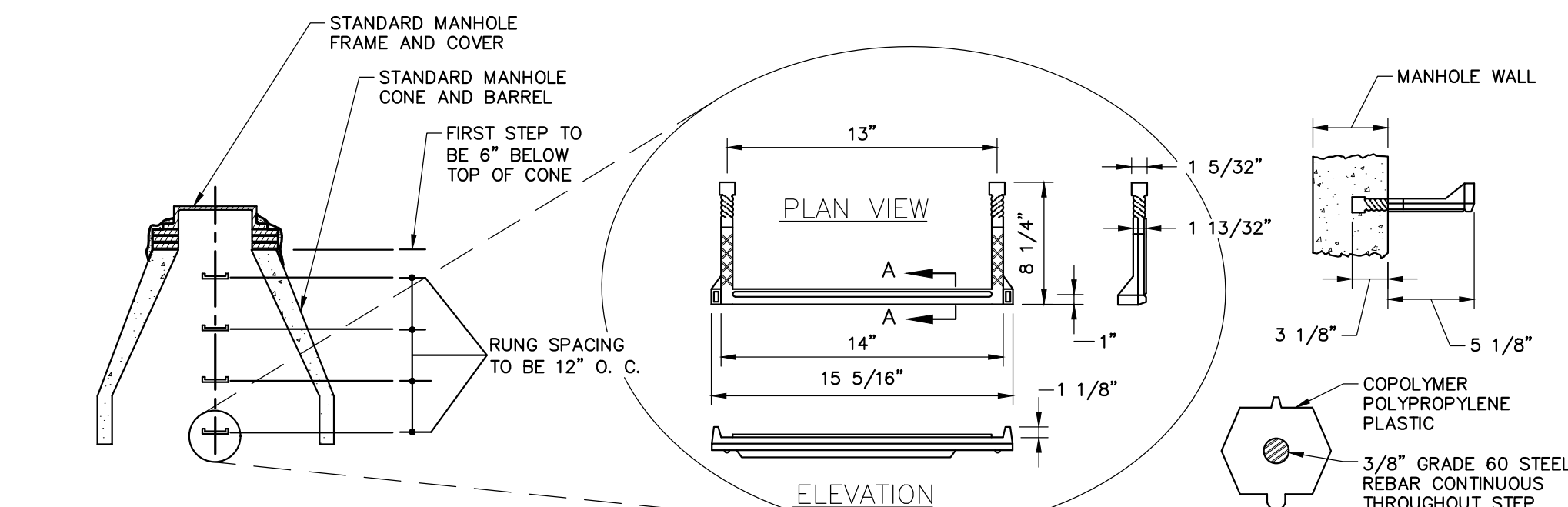
BRICK JOINT DETAIL



SHELF DETAIL

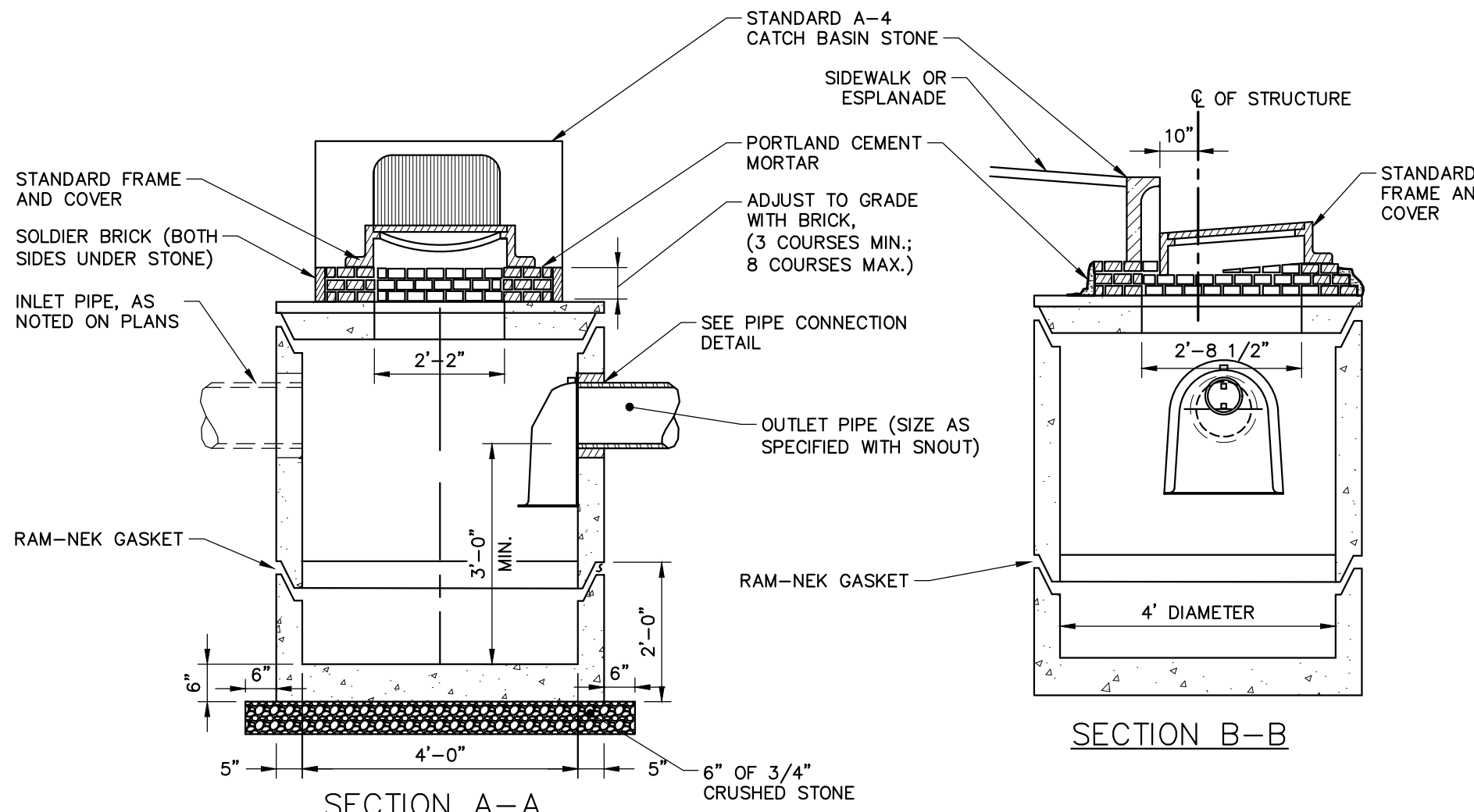
PRECAST CONCRETE MANHOLE

N.T.S.

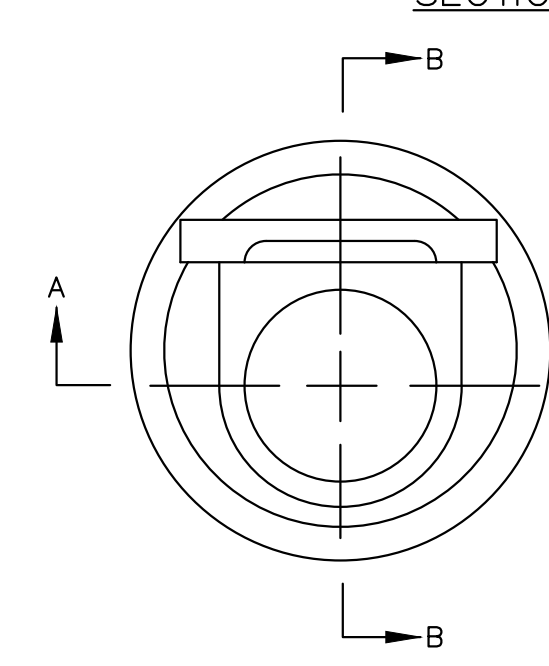


PLASTIC MANHOLE STEPS

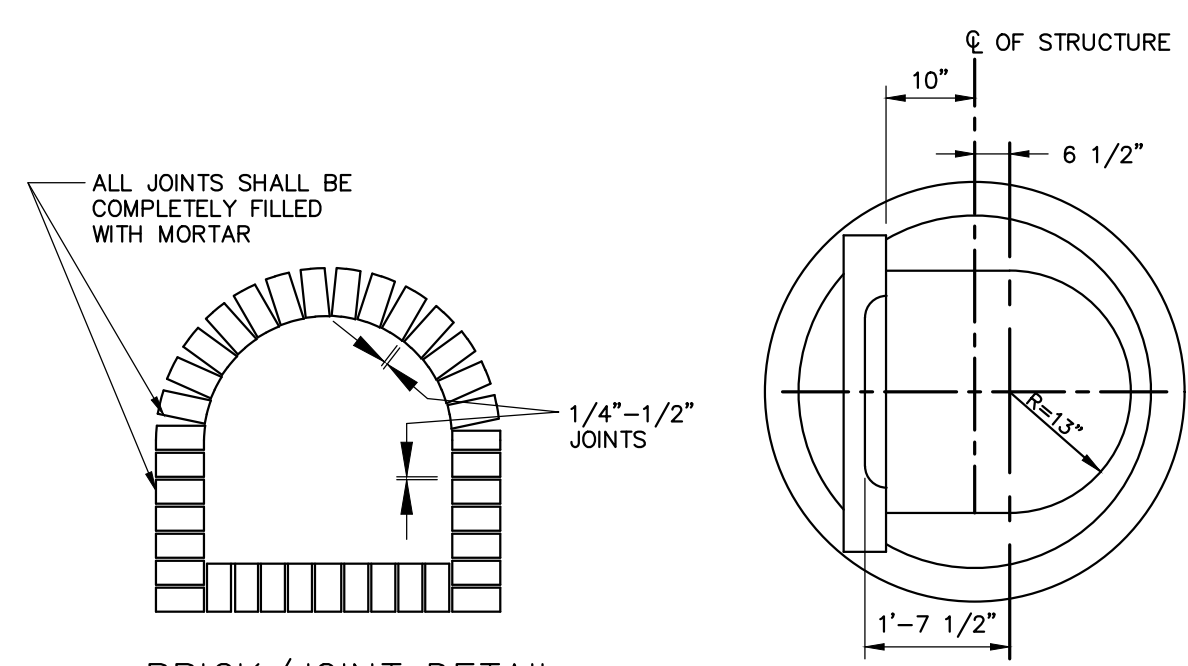
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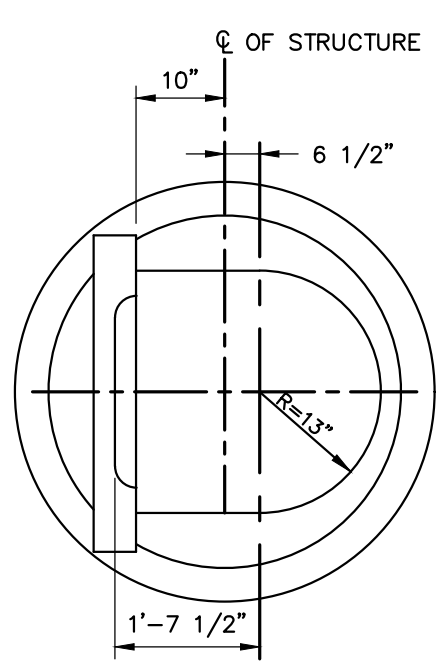
SECTION A-A



COVER, FRAME AND STONE
PLAN VIEW



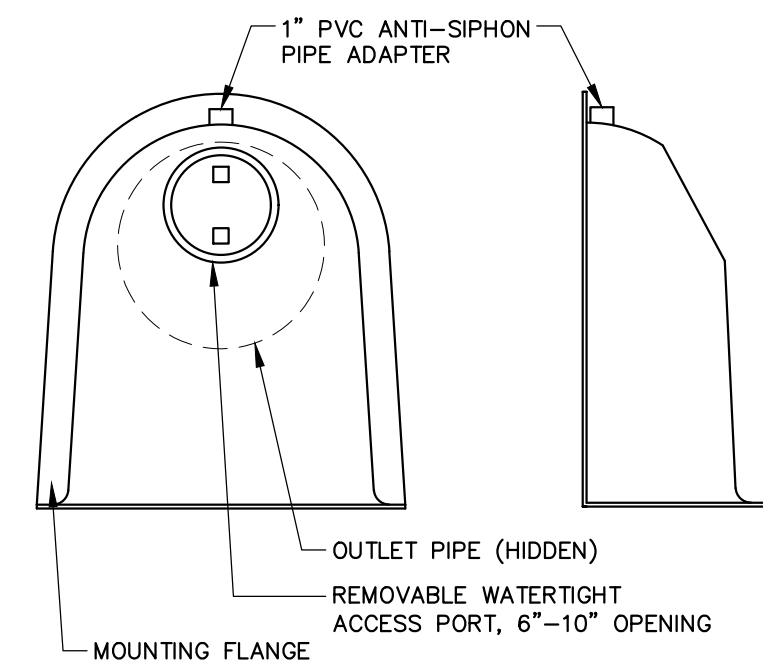
BRICK/JOINT DETAIL



PLAN VIEW
TOP SLAB

PRECAST CONCRETE CATCH BASIN

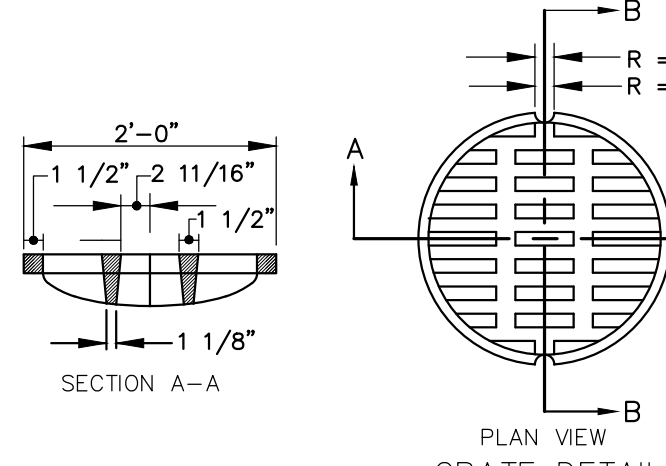
N.T.S.



FRONT VIEW
SIDE VIEW

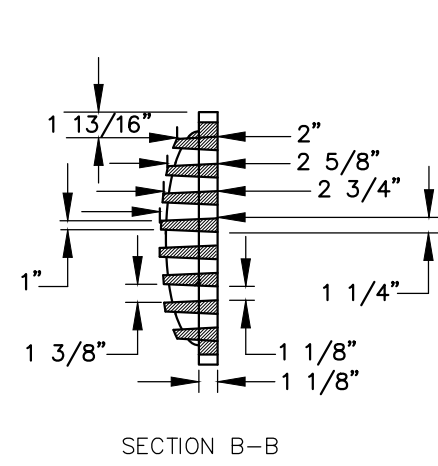
CATCH BASIN HOOD DETAIL

N.T.S.

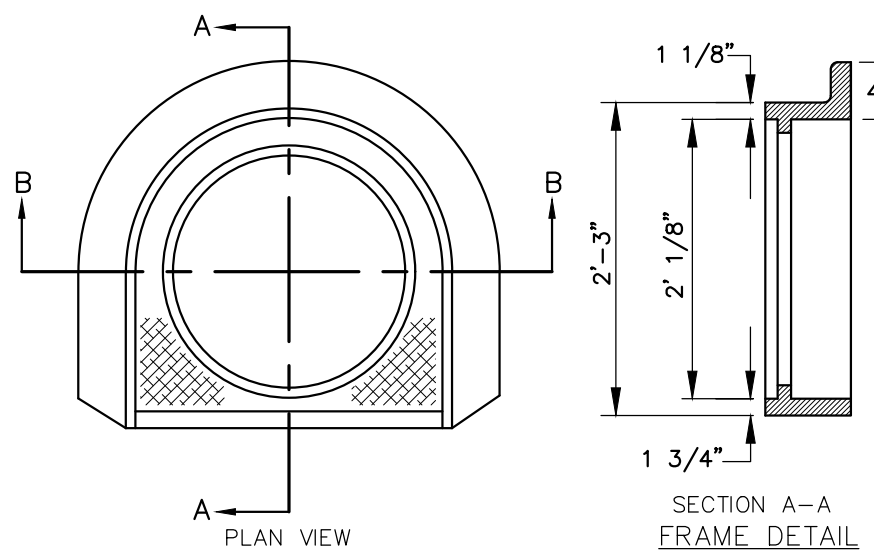


SECTION A-A
SECTION B-B

GRATE DETAIL

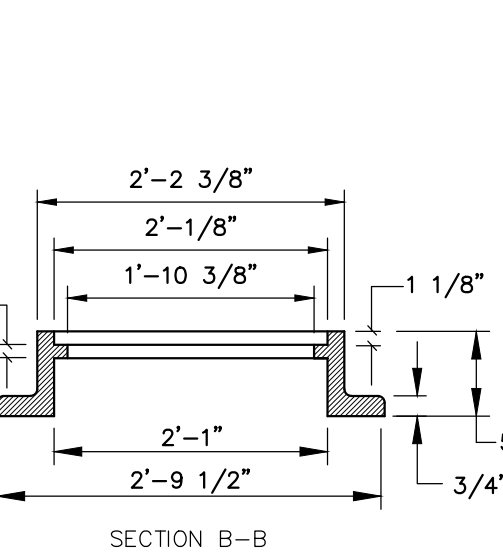


SECTION B-B



SECTION A-A
SECTION B-B

FRAME DETAIL



SECTION B-B

CATCH BASIN TYPE "D" - FRAME & COVER DETAIL

N.T.S.

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* SAND SHALL BE USED IN PLACE OF EXCAVATED MATERIAL THAT IS UNSUITABLE FOR USE AS BACKFILL

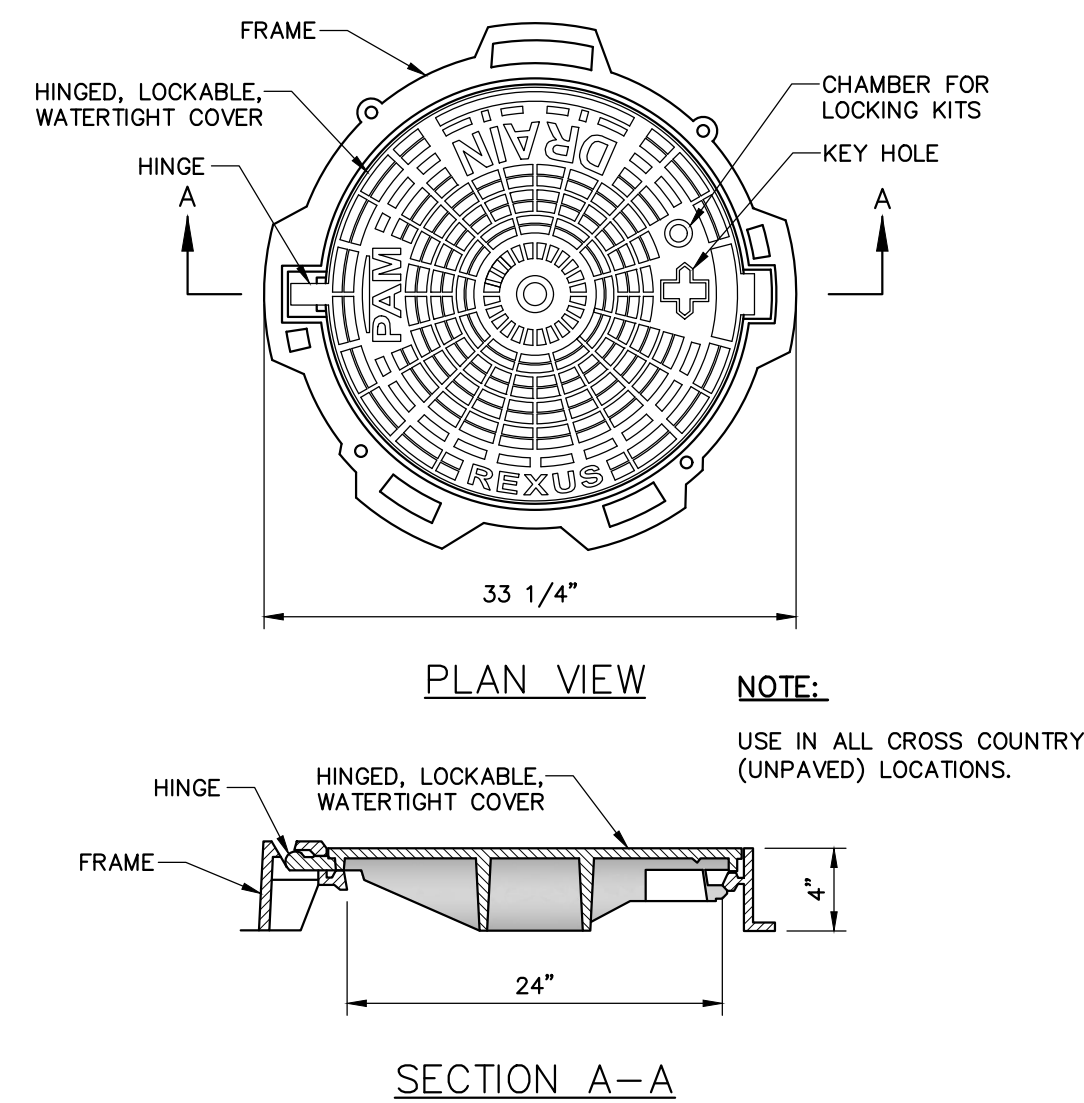
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N.T.S.

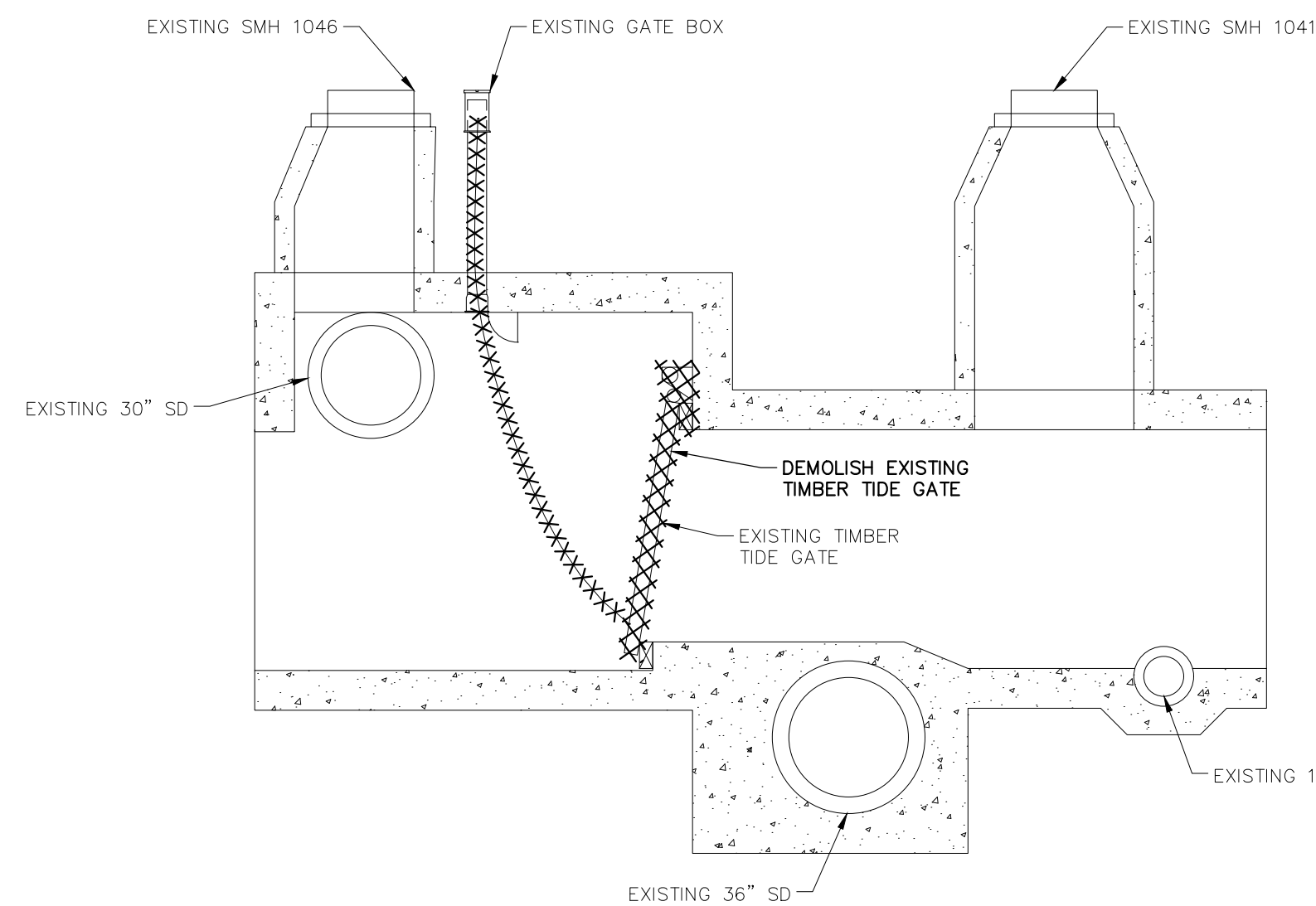
N.T.S.

C-302

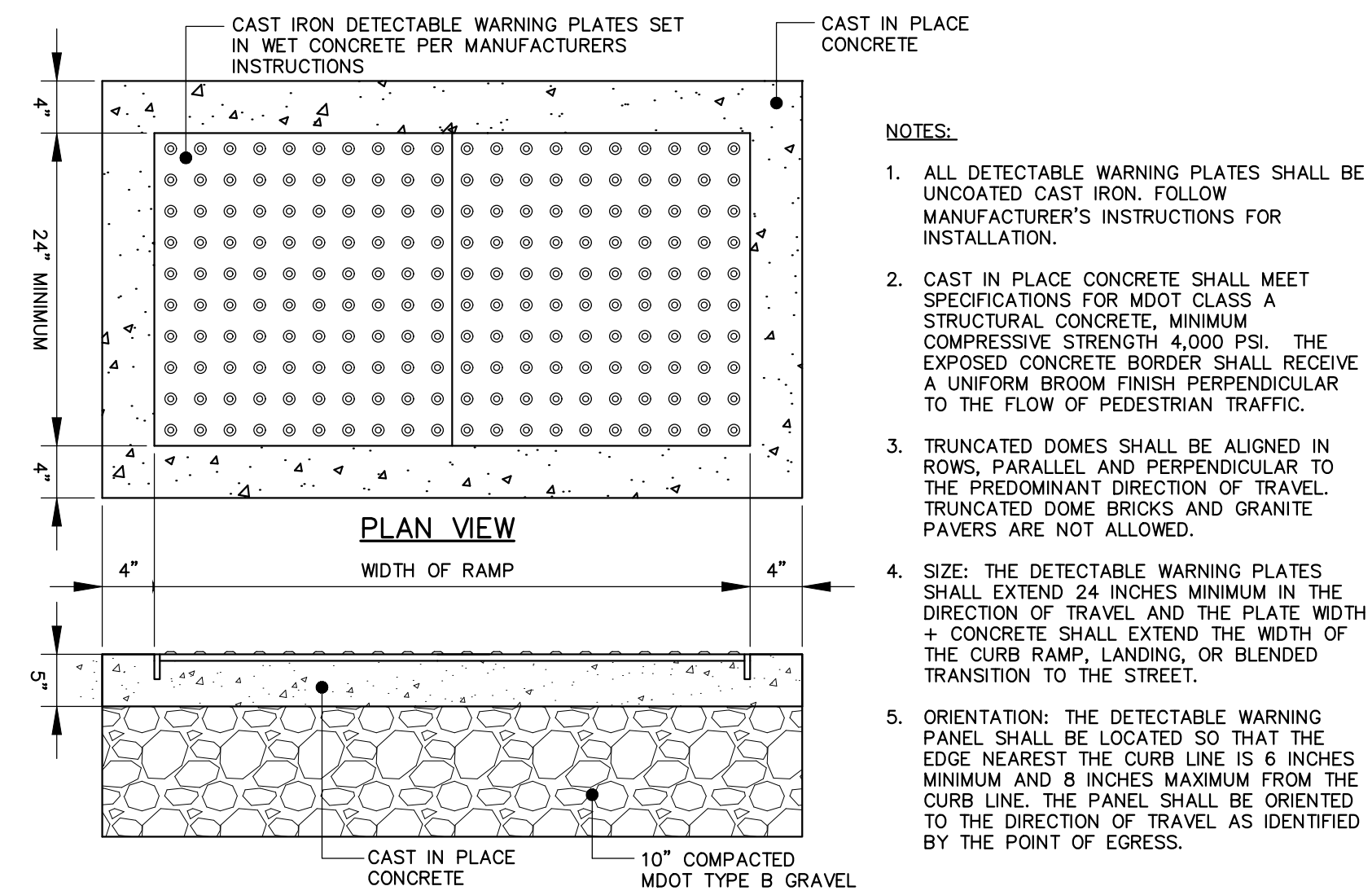
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PAM REXUS MANHOLE COVER
N.T.S.



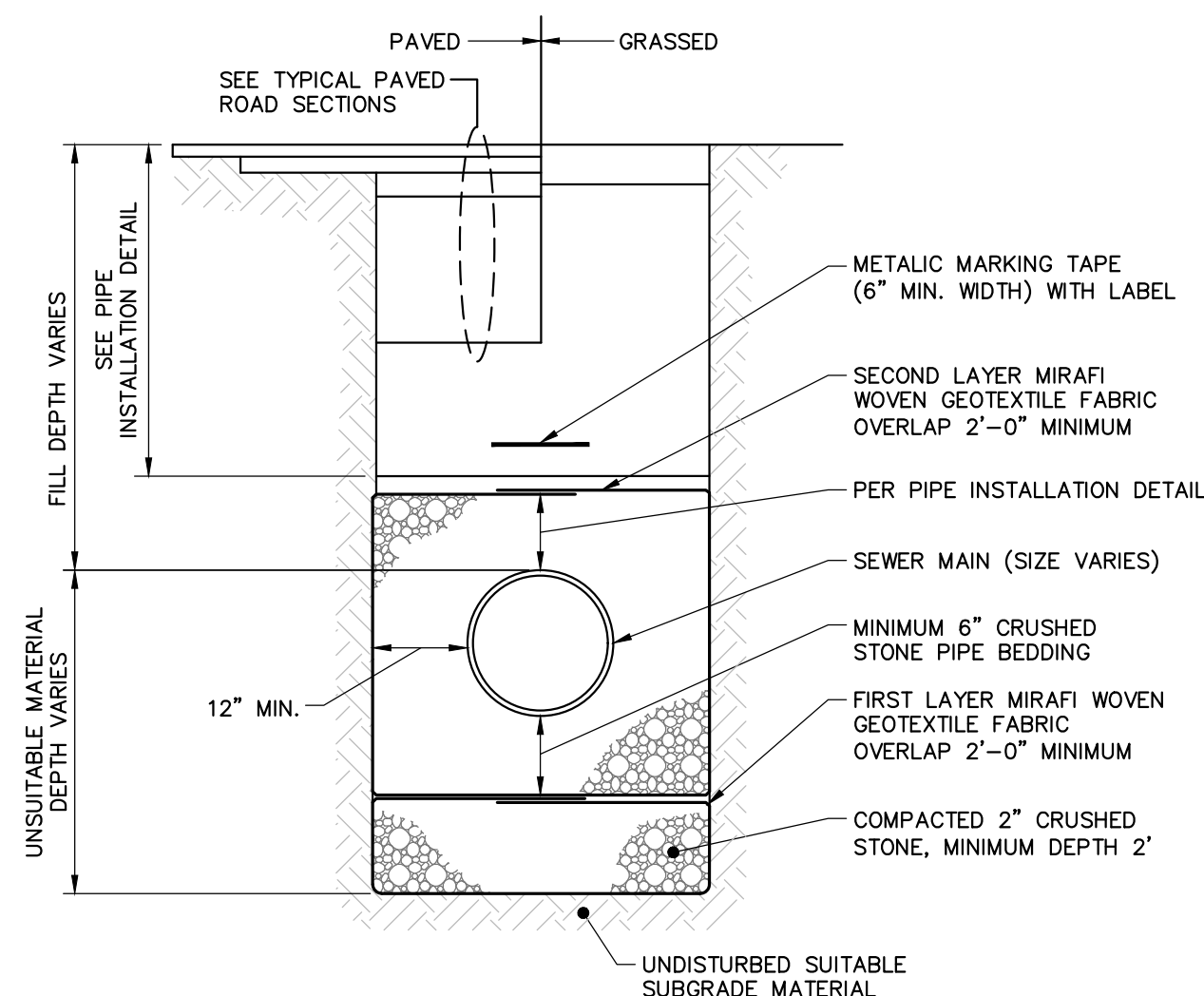
EXISTING CSO-18 REGULATOR STRUCTURE
CONNECTION DETAIL
N.T.S.



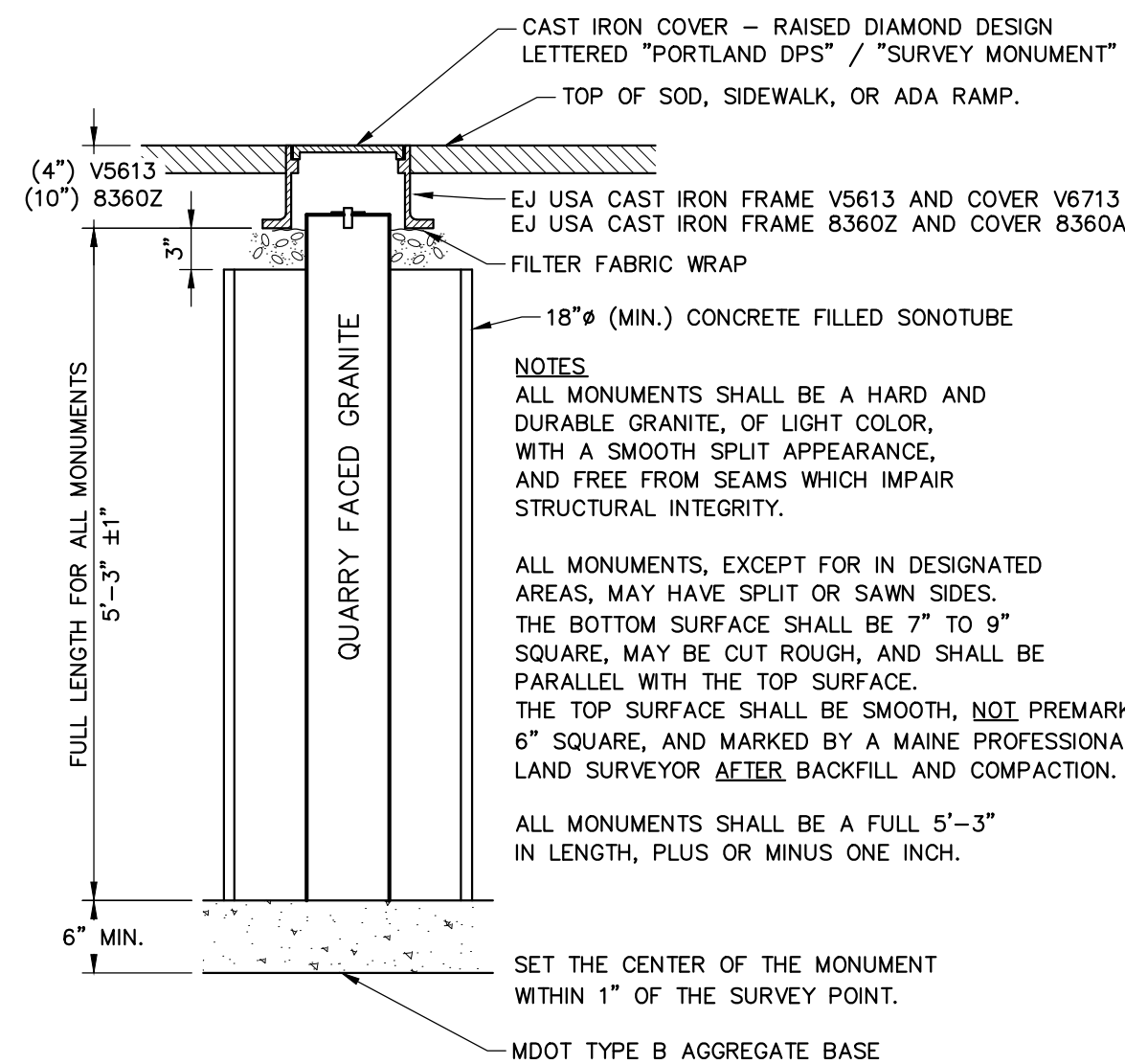
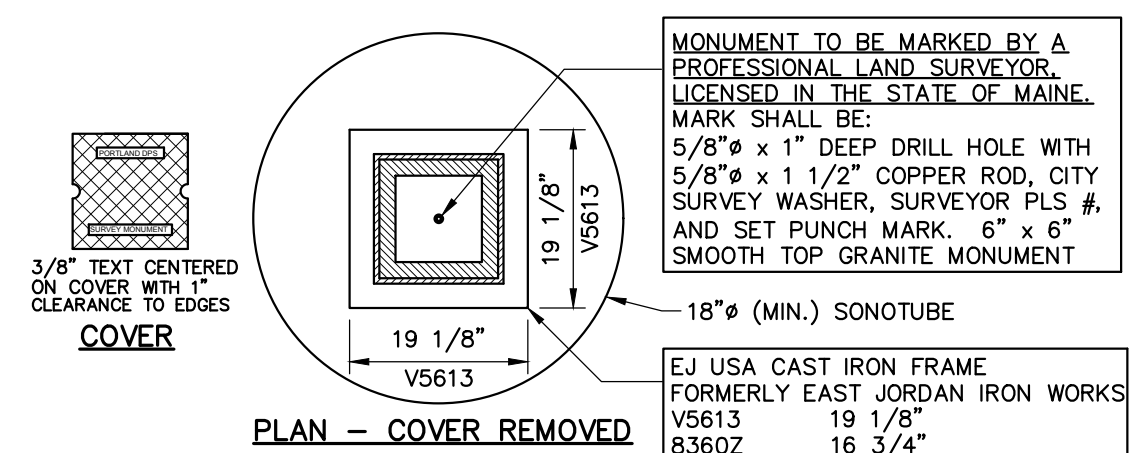
SECTION VIEW

SIDEWALK RAMP DETECTABLE WARNING

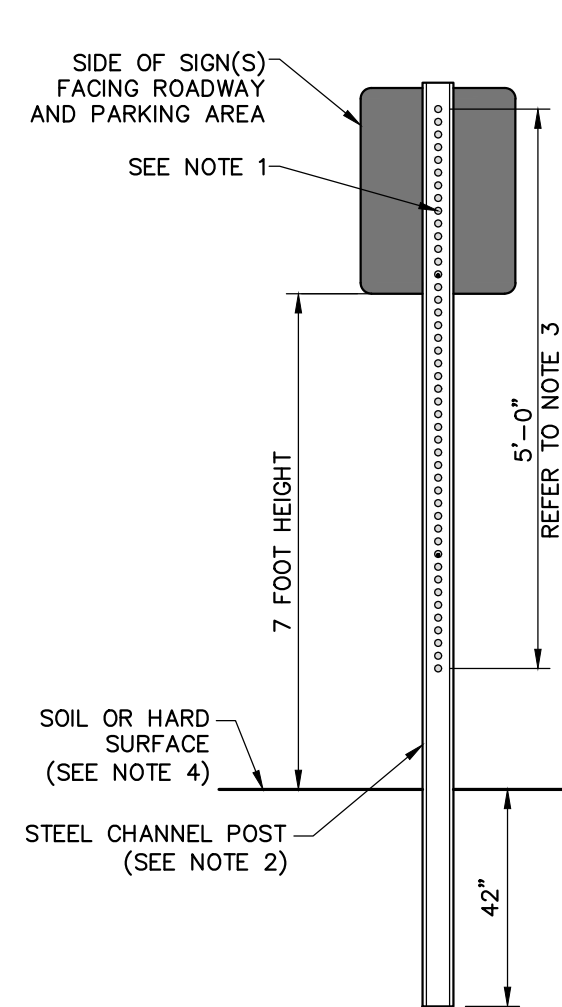
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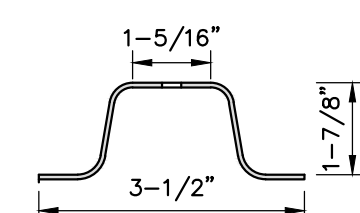
SECTION
UNSUITABLE AREA PIPE BEDDING
N.T.S.



GRANITE STREET MONUMENT
N.T.S.

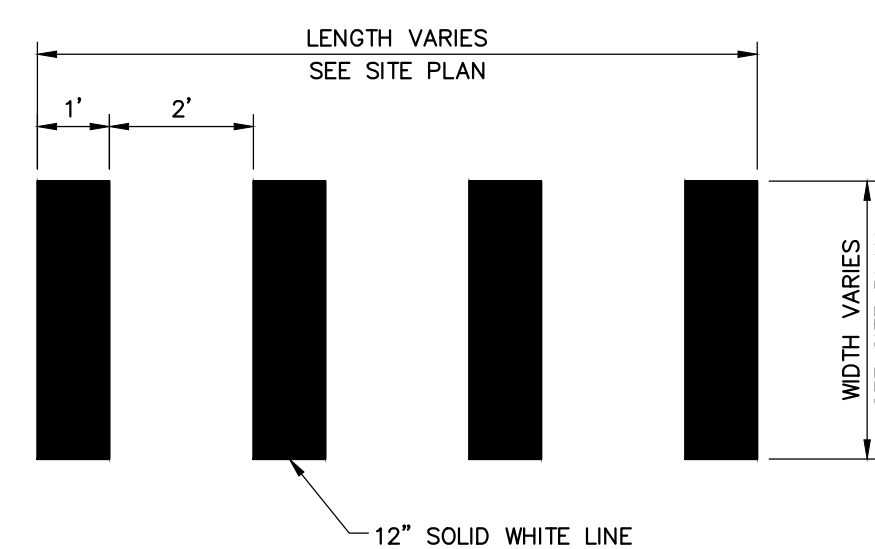


SIGN POST DETAIL
N.T.S.

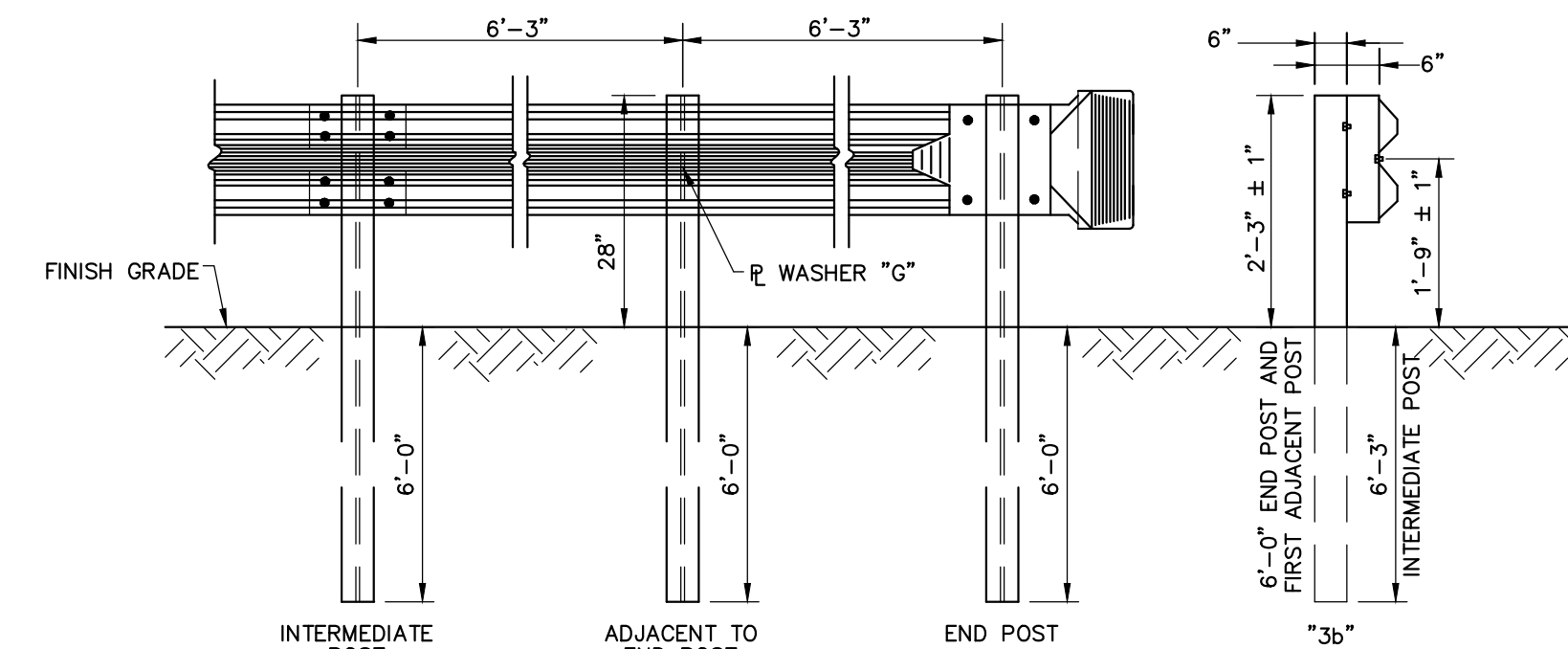


GALVANIZED STEEL CHANNEL
POST CROSS SECTION

- NOTES:**
1. SIGN BOLTS SHALL BE GALVANIZED STEEL WITH NUTS AND LOCK WASHERS WITH A DIAMETER OF 5/16 INCHES.
 2. STEEL CHANNEL POST SHALL BE GALVANIZED WITH A GROSS WEIGHT OF 3 LBS. PER LINEAR FOOT (L.F.).
 3. HOLES WITHIN STEEL CHANNEL POSTS SHALL BE 3/8 INCH DIAMETER SPACED 1 INCH ON-CENTER (O.C.).
 4. SIGN POST INSTALLATION THROUGH CONCRETE OR PAVEMENT REQUIRES CORE DRILLING 4" MINIMUM AND PATCHING WITH CEMENT MORTAR.

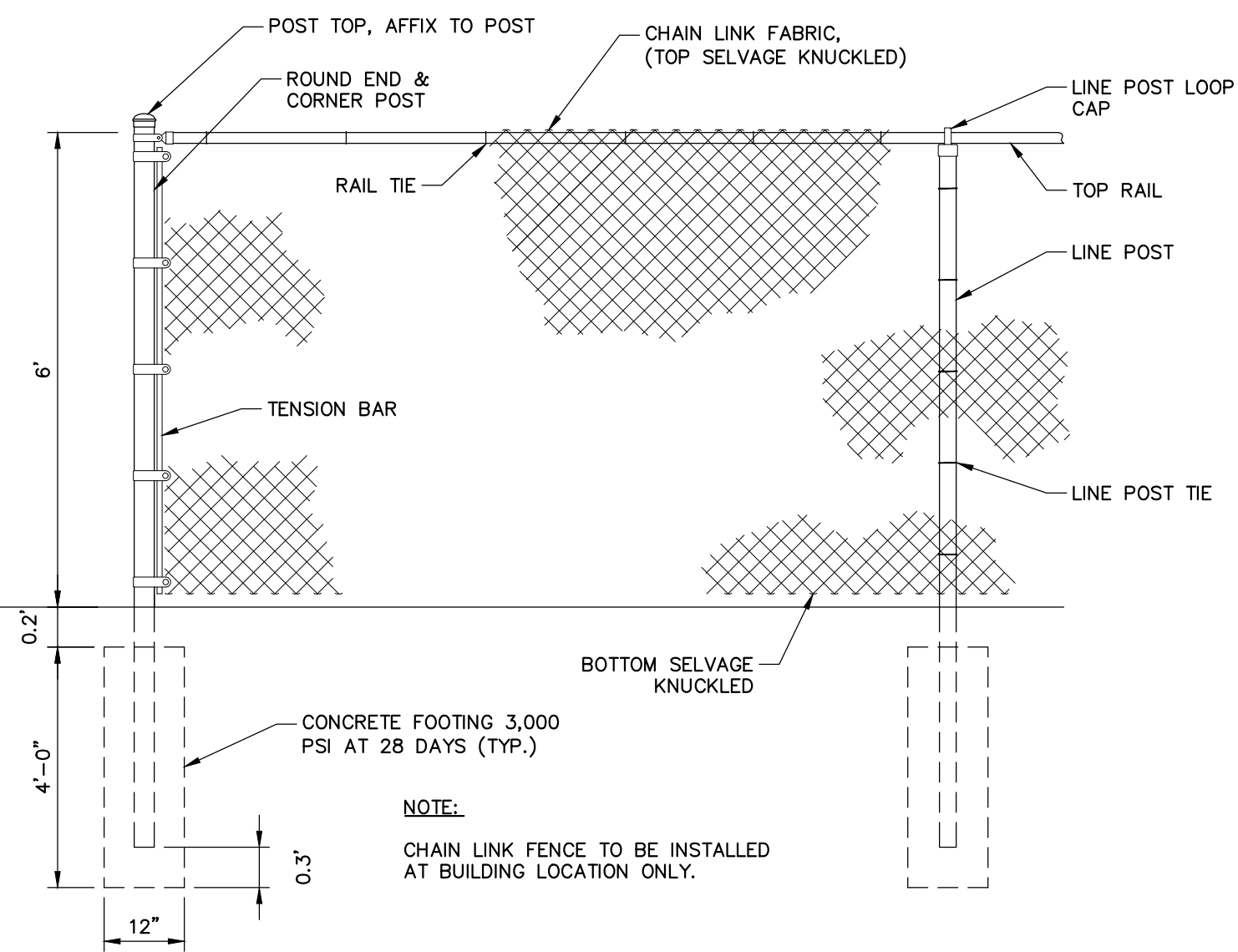


CROSS WALK STRIPING DETAIL
N.T.S.



- NOTES:**
- ALL POST SPACING SHALL BE 6'-3" UNLESS OTHERWISE DIRECTED BY ENGINEER.
 - GUARDRAIL SHALL BE MDOT SPECIFICATION TYPE "36" POSTS
 - ALL HOLES IN BEAM SHALL BE SHOP-PUNCHED BEFORE GALVANIZING.

STEEL GUARDRAIL DETAIL
N.T.S.



CHAIN LINK FENCE DETAIL
N.T.S.

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		DRAWN BY: JBC	

CIVIL DETAILS - 3

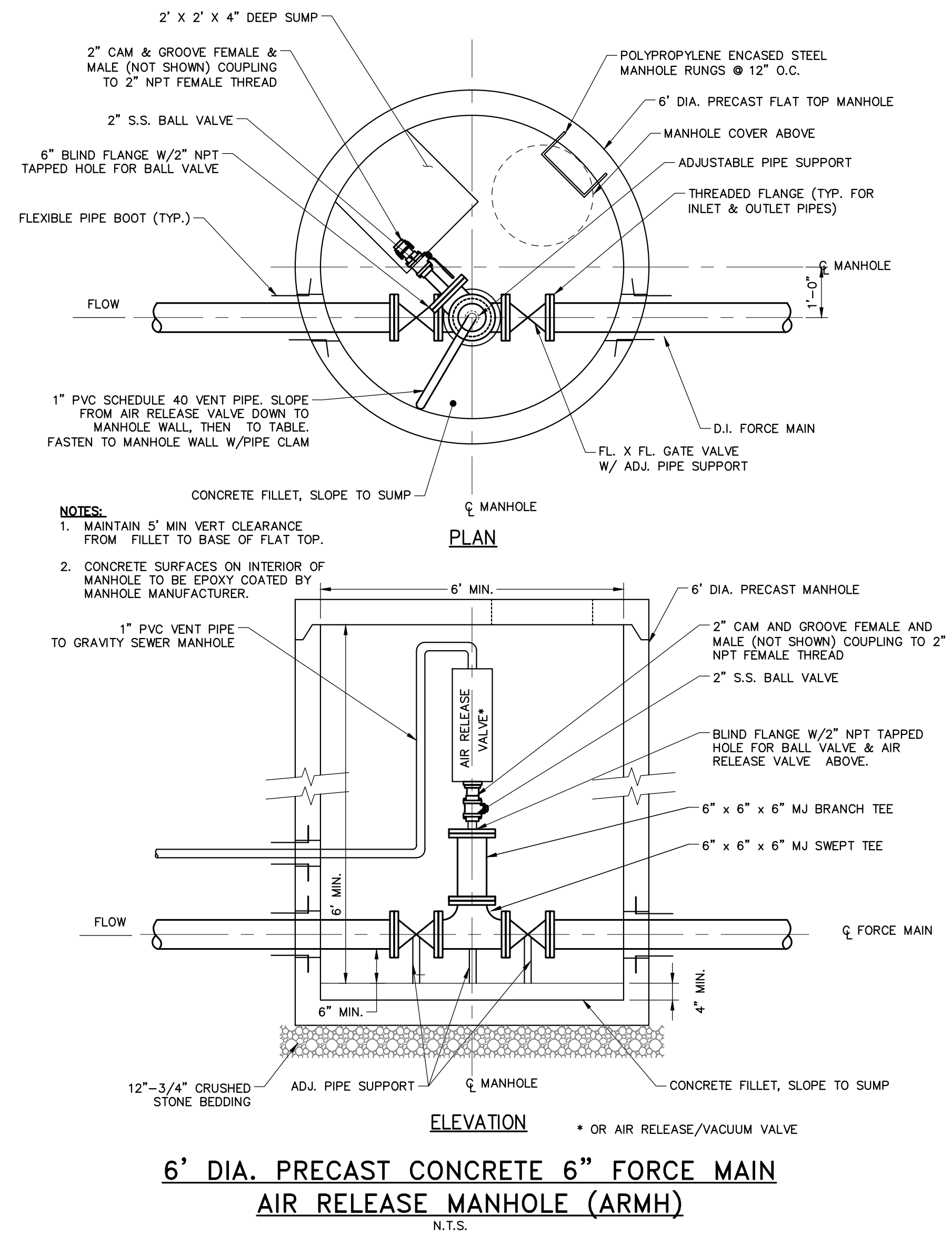
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 31 OF 104

C-303

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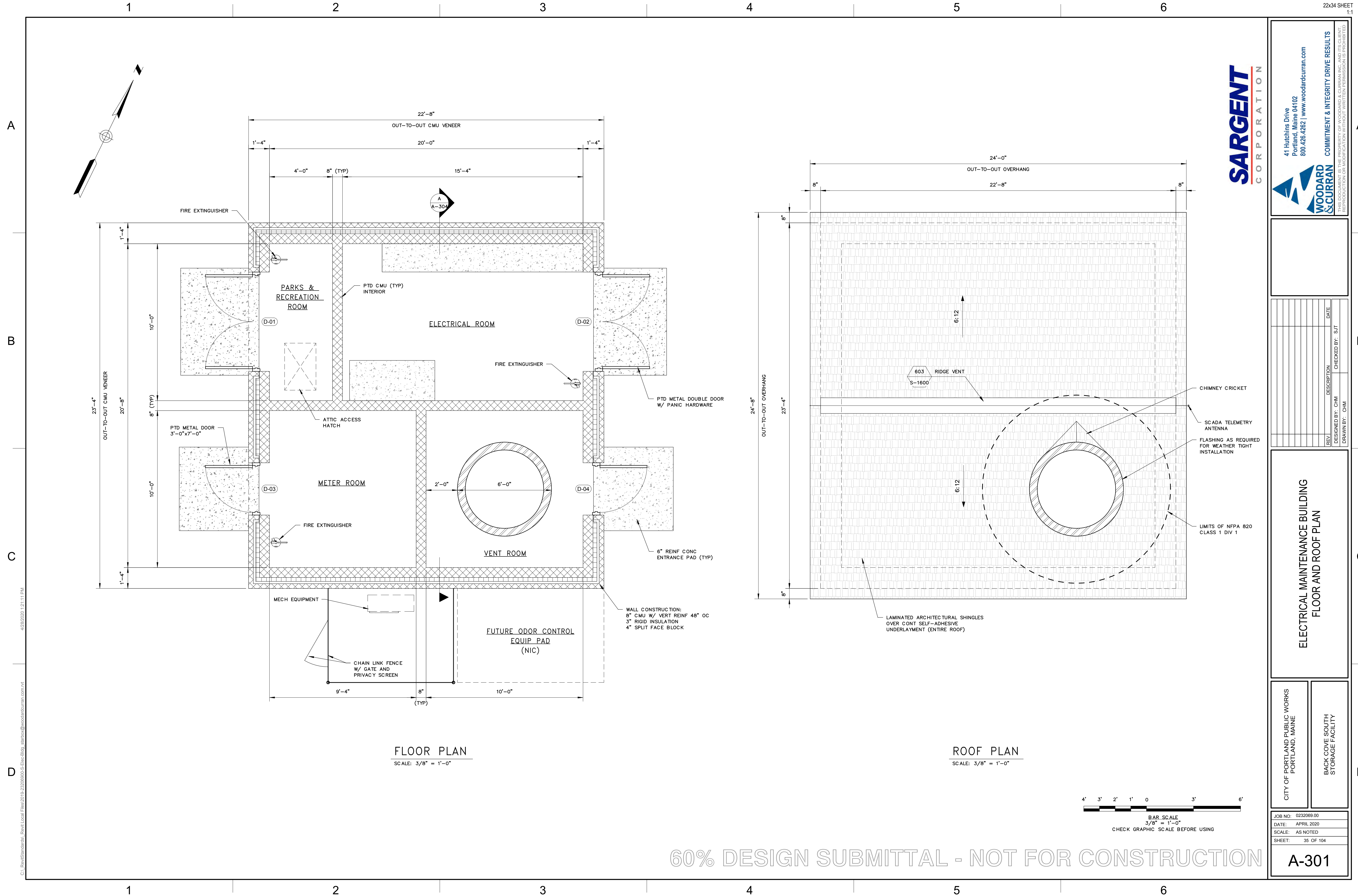
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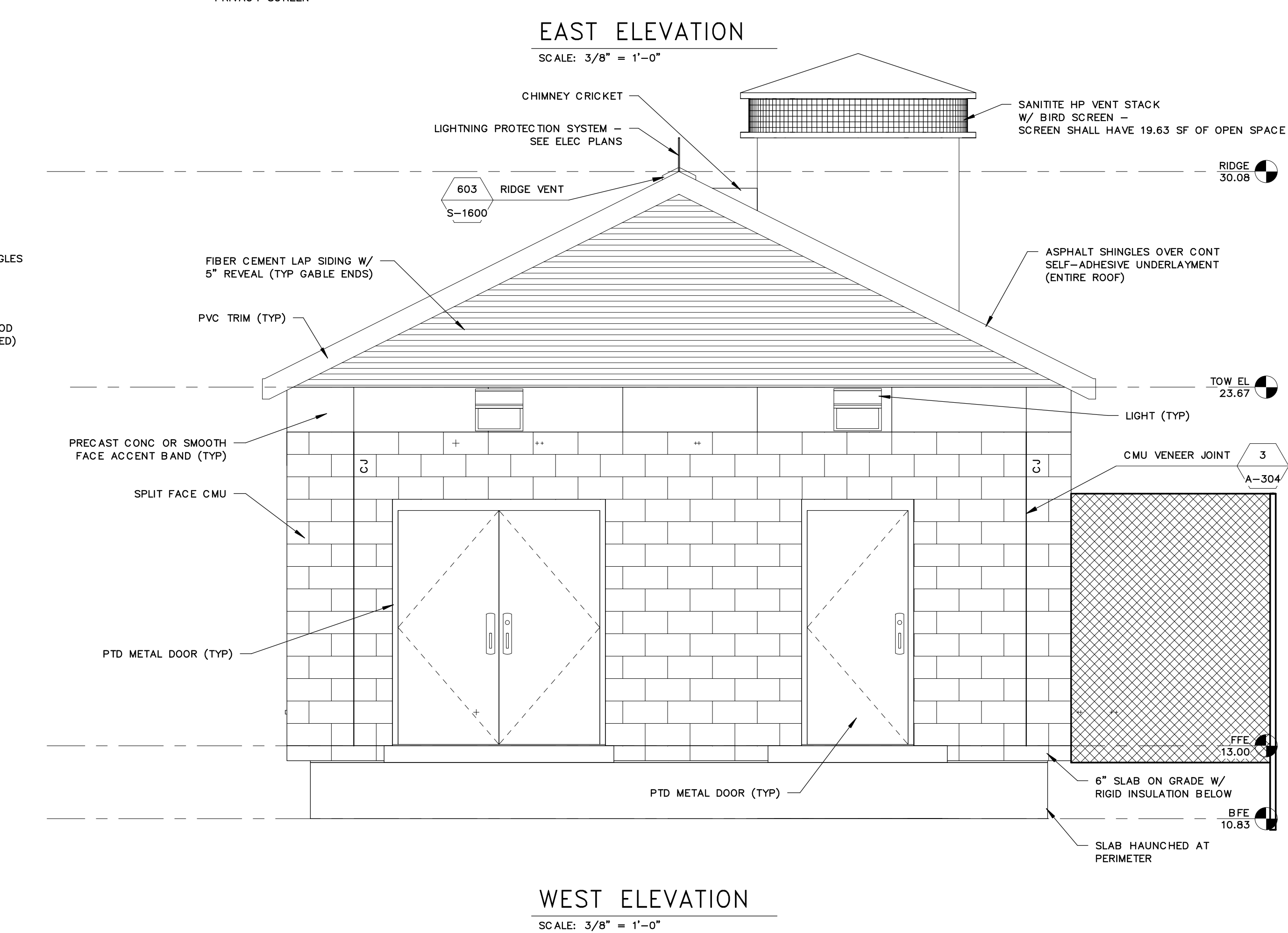
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CITY OF PORTLAND PUBLIC WORKS PORTLAND, MAINE		BACK COVE SOUTH STORAGE FACILITY		ELECTRICAL MAINTENANCE BUILDING ELEVATIONS		 41 Hutchins Drive Portland, Maine 04102 508.426.4262 www.woodardcurran.com		WOODARD & CURRAN COMMITMENT & INTEGRITY DRIVE RESULTS THIS DOCUMENT IS THE PROPERTY OF WOODARD & CURRAN INC. AND ITS CLIENT. REPRODUCTION OR MODIFICATION WITHOUT WRITTEN PERMISSION IS PROHIBITED.	
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REV		DESCRIPTION		DATE		DESIGNED BY: CHM		CHECKED BY: SJT	
						DRAWN BY: CHM			



C



3



B



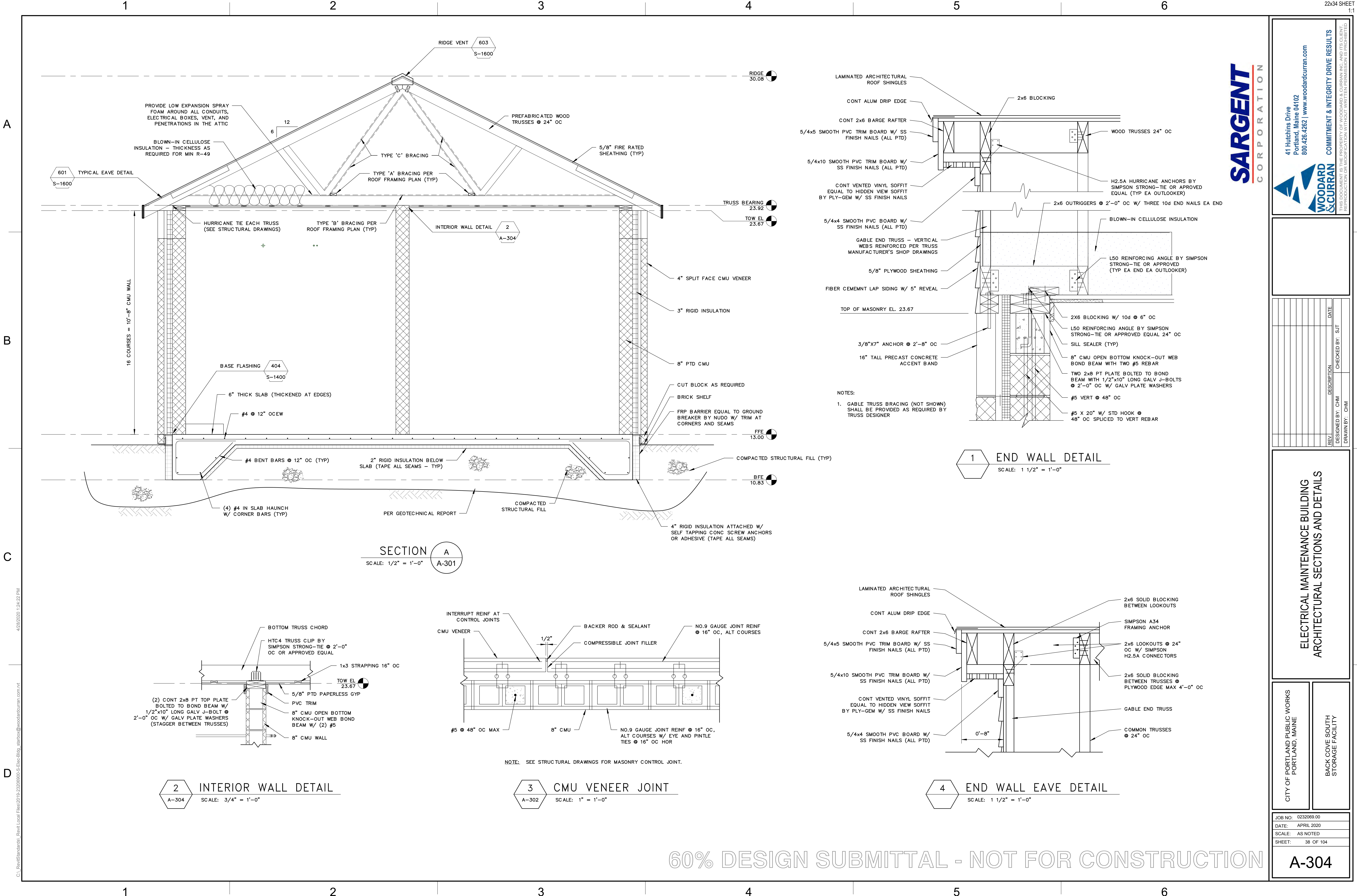
ELECTRICAL MAINTENANCE BUILDING ISOMETRICS

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINEBACK COVE SOUTH
STORAGE FACILITY

B NO:	0232069.00
DATE:	APRIL 2020
SCALE:	AS NOTED
SHEET:	37 OF 104

A-303

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WOODARD & CURRAN
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COMMITMENT & INTEGRITY DRIVE RESULTS

REVISIONS

NO.	DESCRIPTION	DATE	CHECKED BY	DATE
1	DESIGNED BY: CHM			
2	DRAWN BY: CHM			

ELECTRICAL MAINTENANCE BUILDING
ARCHITECTURAL SECTIONS AND DETAILS

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 38 OF 104

A-304

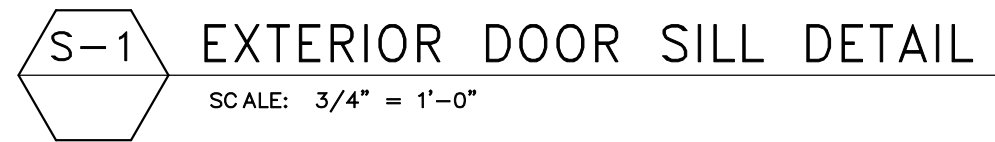
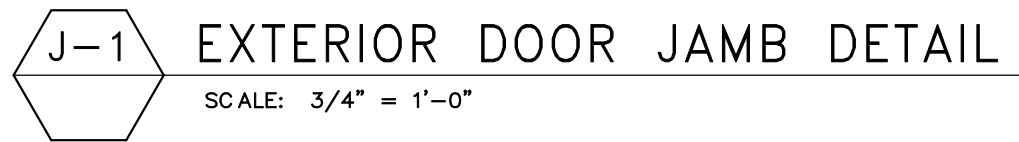
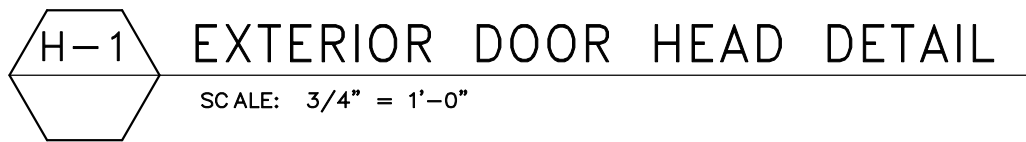
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DOOR SCHEDULE NOTES:

1. ALL DOORS AND FRAMES SHALL BE FIELD PAINTED PER SPECIFICATION 09 90 00. DOORS SHALL BE 1 3/4" THICK, FLUSH DOORS WITH STAINLESS STEEL HARDWARE.
2. ALL DOOR HARDWARE AND ACCESSORIES SHALL MEET ALL APPLICABLE CODE REQUIREMENTS FOR GIVEN FIRE/UL RATING AND FOR HANDICAP ACCESSIBILITY.
3. EXTERIOR DOORS AND PENETRATIONS SHALL HAVE FLASHING AND WEATHER STRIPPING AS PER DETAILS THIS SHEET, AS SPECIFIED, AND AS RECOMMENDED BY THE DOOR SUPPLIER. ALL EXTERIOR DOORS SHALL BE INSULATED.
4. COORDINATE AND PROVIDE KNOCKOUTS IN DOOR FRAMES FOR SECURITY DOOR INTRUSION SWITCHES FOR EXTERIOR DOORS.

DOOR HARDWARE SCHEDULE NOTES:

1. PROVIDE ALL HARDWARE DENOTED BY 'X'.
2. ALL DOOR CLOSERS SHALL HAVE INTEGRAL "HOLD-OPEN" FEATURE, EXCEPT FOR FIRE-RATED DOORS.
3. ELECTRICAL LOCKSETS ARE NOT REQUIRED.



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ABBREVIATIONS

CONC	SEALED CONCRETE
GWB	PAPERLESS GYPSUM WALL BOARD
PTD	PAINTED

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[illegible]

ELECTRICAL MAINTENANCE BUILDING SCHEDULES AND DETAILS

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO:	0232069.00
DATE:	APRIL 2020
SCALE:	AS NOTED
SHEET:	39 OF 104

A-305

STRUCTURAL GENERAL NOTES

NOTE: THIS IS A GENERAL LIST OF ABBREVIATIONS. NOT ALL ITEMS SHOWN HERE APPEAR ON THE CONTRACT DOCUMENTS

NOTE: DETAIL NUMBERS BETWEEN DRAWING SERIES ARE NOT USED

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A. GENERAL STRUCTURAL NOTES:

1. DESIGN IS IN ACCORDANCE WITH THE MAINE UNIFORM BUILDING CODE AND THE 2015 INTERNATIONAL BUILDING CODE.
2. THESE NOTES SHALL APPLY TO ALL WORK, EXCEPT AS NOTED OTHERWISE.
3. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE DRAWINGS AND SPECIFICATIONS OF ALL DISCIPLINES WHICH SHALL BE REFERRED TO FOR SIZES AND LOCATIONS OF ALL OPENINGS, PENETRATIONS, DRAINS, PADS, CONDUIT, EQUIPMENT, AND PIPE SUPPORTS, ETC.
4. GEOTECHNICAL REPORT REFERRED TO HEREIN IS TITLED "PORTLAND BACK COVE SOUTH STORAGE FACILITY" BY TERRACON, DATED APRIL 8TH, 2020.

B. SITE CONDITIONS, EXCAVATION, SHORING AND DEWATERING.

1. SEE GEOTECHNICAL REPORT AND EXCAVATION SUPPORT DRAWINGS BY HB FLEMING

C. SUBGRADE PREPARATION, BACKFILL, AND COMPACTION:

1. SEE GEOTECHNICAL REPORT.

D. GEOTECHNICAL DESIGN CRITERIA:

1. SEE GEOTECHNICAL REPORT FOR MORE DETAILS.
2. NET ALLOWABLE SOIL BEARING CAPACITY = 1,000 PSF (STORAGE TANKS AND DIVERSION STRUCTURES)
3. NET ALLOWABLE SOIL BEARING CAPACITY = 3,000 PSF (ELECTRICAL MAINTENANCE BUILDING)
4. MODULUS OF SUBGRADE REACTION = 75 PCF (STORAGE TANKS AND DIVERSION STRUCTURES)
5. MODULUS OF SUBGRADE REACTION = 125 PCF (ELECTRICAL BUILDING)
6. COEFFICIENT OF FRICTION = 0.35 (STORAGE TANKS AND DIVERSION STRUCTURES)
7. COEFFICIENT OF FRICTION = 0.45 (ELECTRICAL MAINTENANCE BUILDING)
8. SATURATED UNIT WEIGHT OF BACKFILL = 125 PCF
9. SATURATED UNIT WEIGHT OF FILL OVER BURIED STRUCTURES = 120 PCF
10. AT REST LATERAL EARTH PRESSURE COEFFICIENT, $K_0 = 0.66$
11. ACTIVE LATERAL EARTH PRESSURE COEFFICIENT, $K_a = 0.49$
12. PASSIVE LATERAL EARTH PRESSURE COEFFICIENT, $K_p = 2.04$
13. NO SOIL LIQUIFACTION POTENTIAL
14. GROUNDWATER: AT FINISH GRADE (MAX), BELOW STORAGE TANKS (MIN)
15. FLOODWATER: SEE DESIGN LOADS NOTES.
16. SOIL CORROSION: TYPE II CEMENT

E. EMBEDDED CONDUITS AND PIPES:

1. ALL ELECTRICAL AND INSTRUMENTATION CONDUIT EMBEDDED IN CONCRETE SHALL BE INSTALLED, ARRANGED, AND SPACED PER THE REQUIREMENTS OF SPECIFICATION 03 11 00 AND AS FOLLOWS:
2. OUTSIDE DIAMETER OF CONDUIT SHALL NOT EXCEED 1/3 OF CONCRETE THICKNESS.
3. CONDUITS SHALL NOT BE PLACED CLOSER THAN 3 OUTSIDE DIAMETERS ON CENTER.
4. CONDUITS SHALL NOT BE EMBEDDED IN CONCRETE SLABS LESS THAN 4 INCHES THICK.
5. ONLY 2 CONDUITS MAY CROSS AT ANY POINT AND THE SUM OF THE OUTSIDE DIAMETER OF THE CROSSING CONDUITS SHALL NOT EXCEED 1/3 OF THE CONCRETE THICKNESS.
6. PROVIDE A MINIMUM 1-1/2 INCH CONCRETE COVER OVER CONDUITS.
7. CONDUITS SHALL NOT BE LOCATED BETWEEN BOTTOM OF REINFORCING STEEL AND BOTTOM OF SLAB.
8. ALUMINUM CONDUIT SHALL NOT BE EMBEDDED IN CONCRETE AND NO CONDUIT IS PERMITTED IN BEAMS, COLUMNS, OR GIRDDERS.

F. GENERAL REINFORCED CONCRETE REQUIREMENTS:

1. COMPRESSIVE STRENGTH OF CONCRETE AT 28-DAYS = 5,000 PSI (STORAGE TANKS AND DIVERSION STRUCTURES)
2. COMPRESSIVE STRENGTH OF CONCRETE AT 28-DAYS = 4,000 PSI (ELECTRICAL MAINTENANCE BUILDING)
3. REINFORCEMENT: ASTM A615, GRADE 60
4. CONCRETE DESIGN IS PER AMERICAN CONCRETE INSTITUTE 318-14 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE".
5. REINFORCEMENT SHALL BE DETAILED, FABRICATED, AND PLACED AS PER ACI 315 DETAILING MANUAL.
6. PROVIDE 3/4-INCH, 45 DEGREE CHAMFER ON EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE.
7. CONCRETE SUBCONTRACTOR TO COORDINATE AND SCHEDULE ALL CONCRETE PLACEMENTS WITH TESTING AGENCY AS REQUIRED TO PROVIDE FIELD TESTING SERVICES FOR EVERY CONCRETE PLACEMENT AND IN FULL COMPLIANCE WITH PROJECT SPECIFICATIONS.

G. REINFORCED CONCRETE TANKS:

1. CONCRETE DESIGN IS PER AMERICAN CONCRETE INSTITUTE 350-06 "CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES."
2. WATERSTOPS SHALL BE CONTINUOUS THROUGHOUT, AND INTERSECTIONS SHALL BE FACTORY FABRICATED. WATERSTOPS AT VERTICAL JOINTS SHALL EXTEND TO WITHIN 2-INCHES OF THE TOP OF THE STRUCTURE, UNLESS NOTED OTHERWISE.
3. ACTIVELY LEAKING CRACKS WILL BE REPAIRED BY POLYURETHANE CRACK INJECTION AND/OR CRYSTALLINE WATERPROOFING SURFACE COATING SPECIFIED IN 03 63 00 AND 03 01 06 RESPECTIVELY. REPAIRS TO BE PERFORMED AFTER BACKFILLING OPERATIONS ARE COMPLETE.

H. SEQUENCE OF WORK:

1. REFER TO EXCAVATION SUPPORT DRAWINGS. LOWER LEVEL TEMPORARY STRUT FRAMING SHALL NOT BE REMOVED UNTIL CONCRETE BASE SLABS HAVE ACHIEVED 75 PERCENT OF THE SPECIFIED 28-DAY CONCRETE COMPRESSIVE STRENGTH AND NO SOONER THAN 7-DAYS AFTER THE FINAL TANK SLAB PLACEMENT.
2. ALL EXTERIOR TANK WALLS SHALL OBTAIN 4,000 PSI COMPRESSIVE STRENGTH PRIOR TO BACKFILLING.
3. WALLS AND COVER SLAB WILL BE SKIP-POURED. A MINIMUM 48 HRS SHALL BE ALLOWED BETWEEN ADJACENT PLACEMENTS.
4. DIFFERENTIAL IN BACKFILL ELEVATION ALONG OPPOSITE SIDES OF THE STORAGE TANKS SHALL NOT EXCEED 15 FT AT ANY TIME.
5. BACKFILL SHALL PROCEED TO WITHIN 2 FT OF THE TOP OF WALL PRIOR TO INSTALLING PRECAST PANEL COVER SYSTEM.

I. MASONRY:

1. ALL MASONRY MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH ACI 530-13.
2. HOLLOW CONCRETE MASONRY UNITS: NORMAL WEIGHT CONFORMING TO ASTM C90 WITH A MINIMUM NET AREA COMPRESSIVE STRENGTH OF 2,000 PSI MEASURED IN ACCORDANCE WITH ASTM C140.
3. THE MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF MASONRY, f'_m = 2,000 PSI AS MEASURED ON THE NET SECTION AT 28-DAYS.
4. MORTAR: ASTM C270, TYPE S, PROPORTION SPECIFICATION, UNLESS NOTED OTHERWISE. MORTAR FOR VENEER SHALL CONFORM TO ASTM C270, TYPE N, PROPORTION SPECIFICATION. MORTAR FOR VENEER SHALL CONTAIN PIGMENT TO ACHIEVE COLOR AS SELECTED BY OWNER.
5. CEMENT: ASTM C150, TYPE I OR TYPE II. ALTERNATIVELY, FOR MORTAR, THE CEMENT MAY BE MORTAR CEMENT PER SPECIFICATIONS.
6. GROUT: ASTM C476 FOR FINE GROUT AND MEET THE SPECIFIED COMPRESSIVE STRENGTH OR PROPORTION REQUIREMENTS.
7. REINFORCEMENT: ASTM A615, GRADE 60.
8. MORTAR SHALL NOT BE USED WHERE GROUT IS SPECIFIED.
9. MASONRY SHALL BE LAID IN RUNNING BOND AND ALL MORTAR JOINTS TOOLED CONCAVE.

J. MISCELLANEOUS METALS:

1. ALL ANCHOR BOLTS SHALL BE 316 STAINLESS STEEL AT STORAGE TANKS AND CSO DIVERSION STRUCTURES.
2. ALL POST-INSTALLED ANCHORS AT STORAGE TANKS AND CSO DIVERSION STRUCTURES SHALL BE ADHESIVE ANCHORS (DRILL AND EPOXY).

K. PRECAST CONSTRUCTION:

1. PRECAST PLANK COVERS AND APPURTENANCES ARE SPECIFIED IN SECTION 03 41 00 PRECAST CONCRETE PLANKS.
2. COMPRESSIVE STRENGTH OF CONCRETE AT 28-DAYS = 6,000 PSI
3. REINFORCEMENT: ASTM A615, GRADE 60
4. JOINTS SHALL INCLUDE BUTYL RUBBER SEALS AND HAVE EXTERIOR MEMBRANE JOINT WRAP INSTALLED. APPLIES ONLY TO PRECAST PLANKS OR AS INDICATED IN DRAWINGS.
5. PROVIDE 3/4-INCH, 45 DEGREE CHAMFER ON EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE.

L. WOOD FRAMING:

1. ROOF PLYWOOD: 5/8" FIRE RETARDANT TREATED PLYWOOD (IMPREGNATED, NOT BRUSH APPLIED)
2. FASTENING REQUIREMENTS: THE NUMBER AND SIZE OF FASTENERS CONNECTING WOOD MEMBERS SHALL BE AS SPECIFIED ON DRAWINGS, SPECIFICATIONS AND NOT LESS THAN SHOWN IN 2015 IBC TABLE 2304.10.1.
3. METAL FRAMING CONNECTORS: AS INDICATED ON DRAWINGS OR SPECIFICATIONS WITH HOT-DIPPED GALVANIZED COATING.
4. LUMBER: #2 GRADE OR BETTER WITH MOISTURE CONTENT LESS THAN 19%.
5. WHERE NAIL SIZES (PENNYWEIGHT) ARE INDICATED THE FOLLOWING MINIMUM NAIL SIZES ARE REQUIRED:
6d (0.099 x 2")
8d (0.113 x 2.5")
10d (0.128 x 3")
12d (0.128 x 3.25")
16d (0.135 x 3.5")

M. EXISTING CONDITIONS:

1. VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AS THEY RELATE TO NEW CONSTRUCTION. REPORT TO THE ENGINEER OF RECORD ALL OBSERVATIONS AND ANY DISCREPANCIES BEFORE PROCEEDING WITH WORK.
2. WHERE DETAILS FOR SPECIFIC CONDITIONS ARE NOT SHOWN ON THESE PLANS, USE DETAILS FOR THE MOST NEARLY SIMILAR CONDITIONS SHOWN ON THE STRUCTURAL DRAWINGS AS DETERMINED BY THE STRUCTURAL ENGINEER. REPORT ANY COORDINATION ISSUES IMMEDIATELY TO THE ENGINEER.

N. DESIGN LOADS AND BUILDING CODES:

1. DESIGN LOADS ARE PER THE 2015 INTERNATIONAL BUILDING CODE AS AMENDED BY THE MAINE UNIFORM BUILDING CODE.
2. RISK CATEGORY: III
TERRAIN CATEGORY: D (OCEAN EXPOSURE)
3. SNOW LOADS PER ASCE 7-10:
GROUND SNOW LOAD (P_g)= 60 PSF
SNOW IMPORTANCE FACTOR (I_s)= 1.10
EXPOSURE FACTOR (C_e)= 0.90
THERMAL FACTOR (C_t)= 1.10
ROOF SNOW LOAD (P_f)= (P_g)= 45.7 PSF
4. WIND LOADS PER ASCE 7-10:
DESIGN WIND SPEED (V)= 128 MPH
 $K_z=13$ ft= 1.03
 K_{zt} = 1.00
 K_d = 0.85
 $q_z=13$ ft= 36.7 PSF VELOCITY PRESSURE
5. SEISMIC LOAD PER ASCE 7-10:
SHORT SPECTRAL RESP ACC (S_{Sa})= 0.241
1-SEC SPECTRAL RESP ACC (S_1)= 0.078
SITE CLASS E (PER GEOTECHNICAL REPORT)
SEISMIC IMPORTANCE FACTOR (I_e)= 1.25
SPECTRAL RESP COEF (S_{ds})= 0.401
SPECTRAL RESP COEF (S_{d1})= 0.192
SEISMIC DESIGN CATEGORY (SDC)= C
SFRS= INTERMEDIATE REINFORCED MASONRY SHEAR WALLS, $R = 3.5$ (BUILDING)
SFRS= ORDINARY CONC SHEAR WALLS, $R = 3.0$ (BURIED CONC STRUCTURES)
ANALYSIS METHOD: EQUIVALENT LATERAL FORCE
6. FLOOD LOADS:
NON-COASTAL A ZONE DESIGN FLOOD ELEV= 13.0 FT
7. LIVE LOADS:
ELECTRICAL MAINTENANCE BUILDING SLAB-ON-GRADE: 300 PSF
FUTURE USES OF SOCCER FIELD: 100 PSF
VEHICULAR LOAD: AASHTO HL-93 (BURIED CONC STRUCTURES)
8. SHOP-FABRICATED WOOD TRUSS MINIMUM DESIGN LOADS:
SNOW LOAD: AS STATED ABOVE INCLUDING UNBALANCED LOAD
ROOF LIVE LOAD: 20 PSF (NON-REDUCIBLE)
TOP CHORD DL: 10 PSF
BOT CHORD DL: 10 PSF
BOT CHORD LL: 10 PSF (UNINHABITABLE ATTICS W/O STORAGE)

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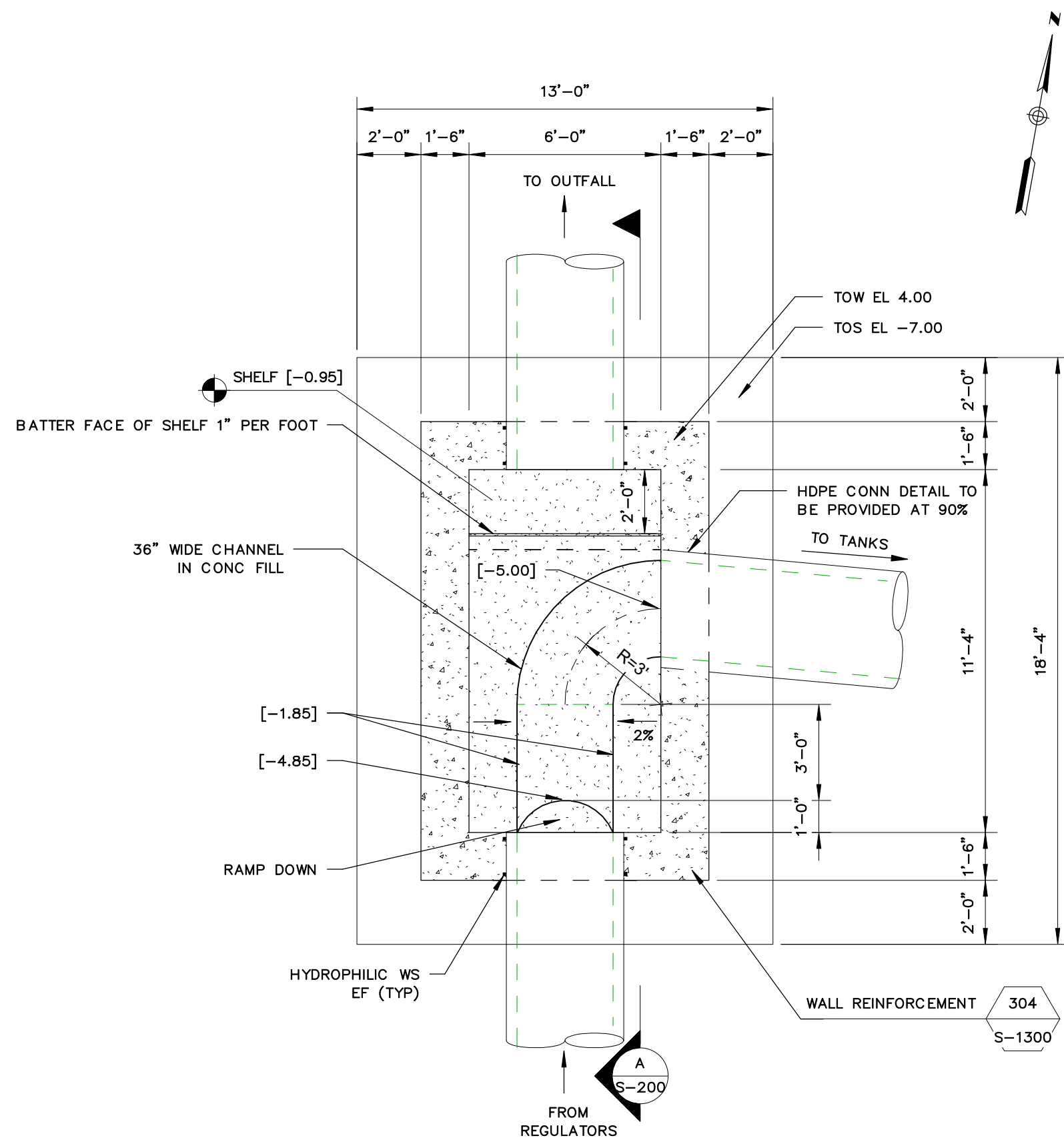
STRUCTURAL ABBREVIATIONS, NOTES, AND DESIGN LOADS

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

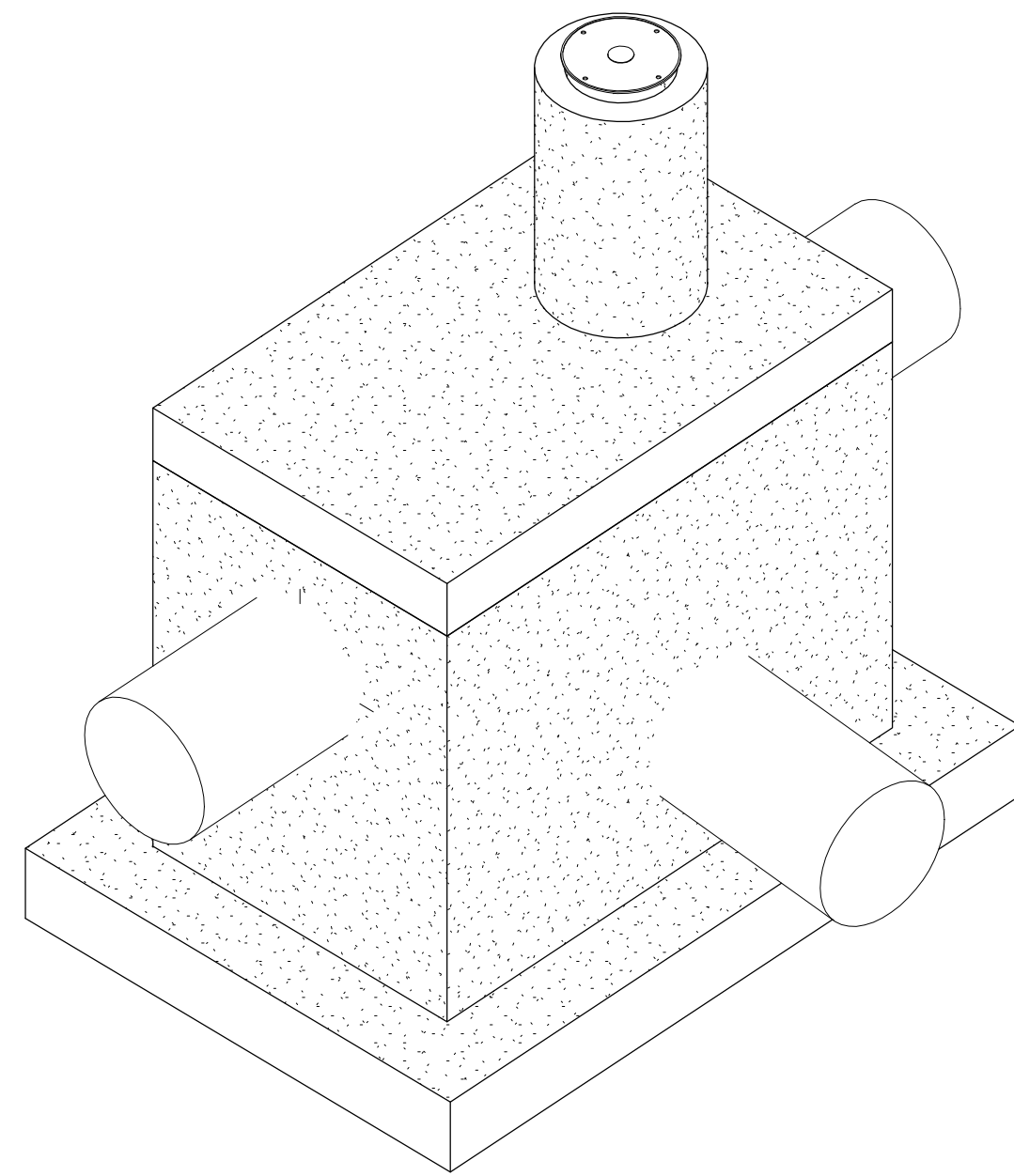
JOB NO:	0232069.00
DATE:	APRIL 2020
SCALE:	AS NOTED
SHEET:	40 OF 104

S-001



CSO 16 LOWER LEVEL PLAN

SCALE: 1/4" = 1'-0"



CSO 16 ISOMETRIC VIEW

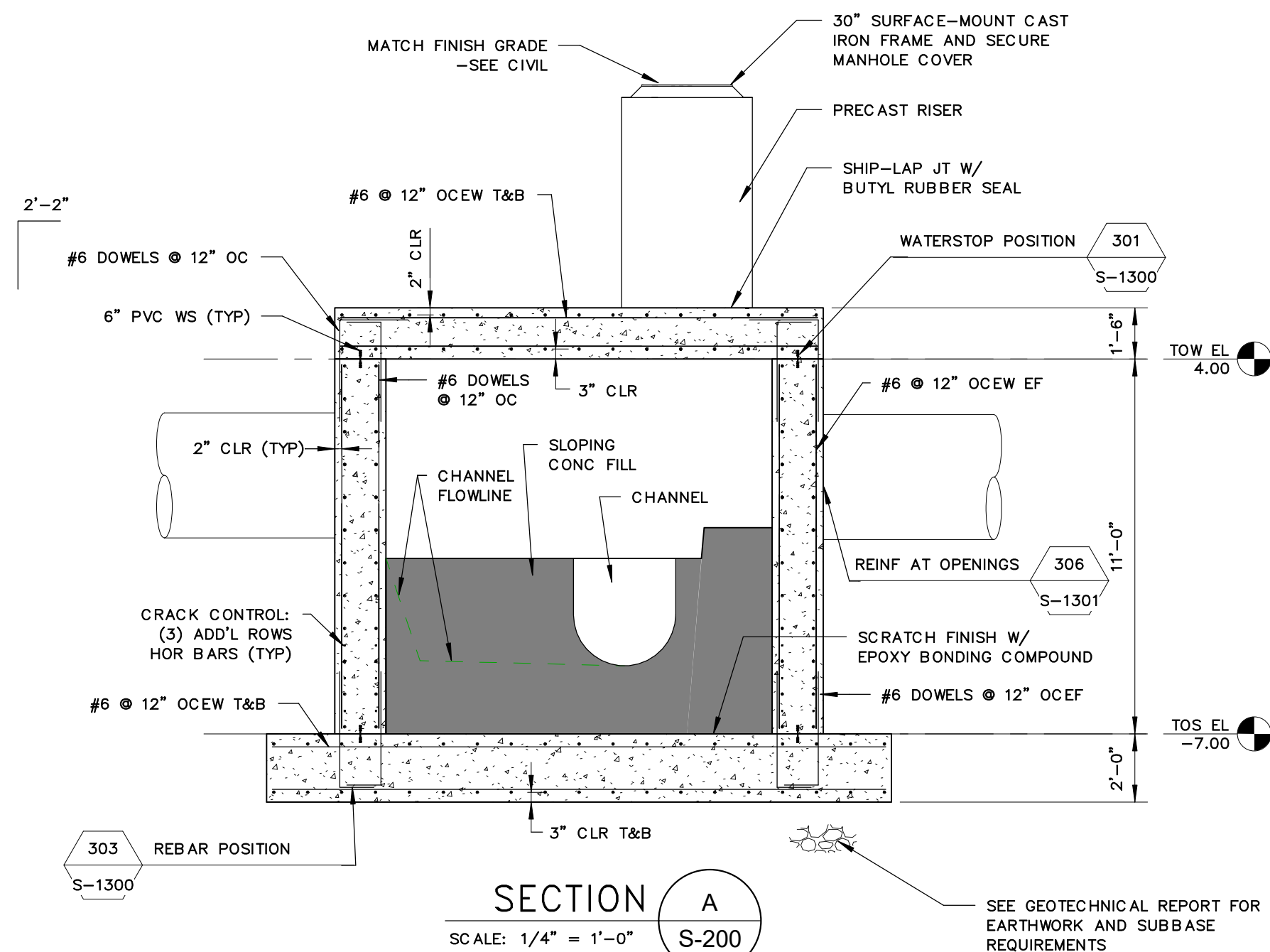
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STRUCTURAL GENERAL NOTES:

- REFER TO ELECTRICAL AND MECHANICAL DRAWINGS FOR ADDITIONAL NEW RELATED WORK.
- CONCRETE SUBCONTRACTOR SHALL COORDINATE PIPE PENETRATIONS WITH MECHANICAL SUBCONTRACTOR SUBMITTALS.

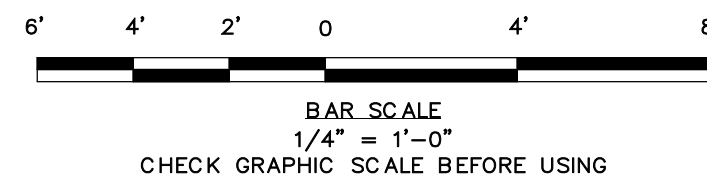
DIVERSION STRUCTURE NOTES

- REFER TO STRUCTURAL NOTES SHEET S-001, EARTHWORK SPECIFICATION 31 00 00, AND GEOTECHNICAL REPORT FOR SITE SUBGRADE PREPARATION, GROUNDWATER, DEWATERING, SHORING, AND ROCK EXCAVATION REQUIREMENTS.
- "[XXX.XX]" INDICATES ELEVATION OF CONCRETE FILL. REFER TO SPECIFICATION 03 16 00 FOR CONCRETE FILL REQUIREMENTS.
- ALL CONSTRUCTION JOINTS ARE SHOWN IN THESE DRAWINGS.
- TIGHTNESS TESTING IN ACCORDANCE WITH ACI 350.1 IS NOT REQUIRED. ACTIVELY LEAKING CRACKS WILL BE REPAIRED BY POLYURETHANE CRACK INJECTION AND/OR CRYSTALLINE WATERPROOFING SURFACE COATING SPECIFIED IN 03 63 00 AND 03 01 06 RESPECTIVELY. REPAIRS SHALL BE PERFORMED AFTER BACKFILLING WITHIN THE WARRANTY PERIOD.
- REFER TO SHEET S-1300 FOR CONCRETE TANK STANDARD DETAILS. DETAILS SHOWN ON SHEET S-1300 APPLY TO ALL WORK, UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALL TANK SUBGRADE CONDITIONS WILL BE INSPECTED AND APPROVED BY GEOTECHNICAL ENGINEER, PRIOR TO PLACING REBAR.
- REFER TO SPECIFICATION 03 30 20 FOR CONCRETE TESTING REQUIREMENTS AND TESTING FREQUENCY.



SECTION A

SCALE: 1/4" = 1'-0"



BAR SCALE
1/4" = 1'-0"

CHECK GRAPHIC SCALE BEFORE USING

CSO 16 DIVERSION STRUCTURE

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO: 0232069
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 46 OF 104

S-200

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C

D

A

B

C

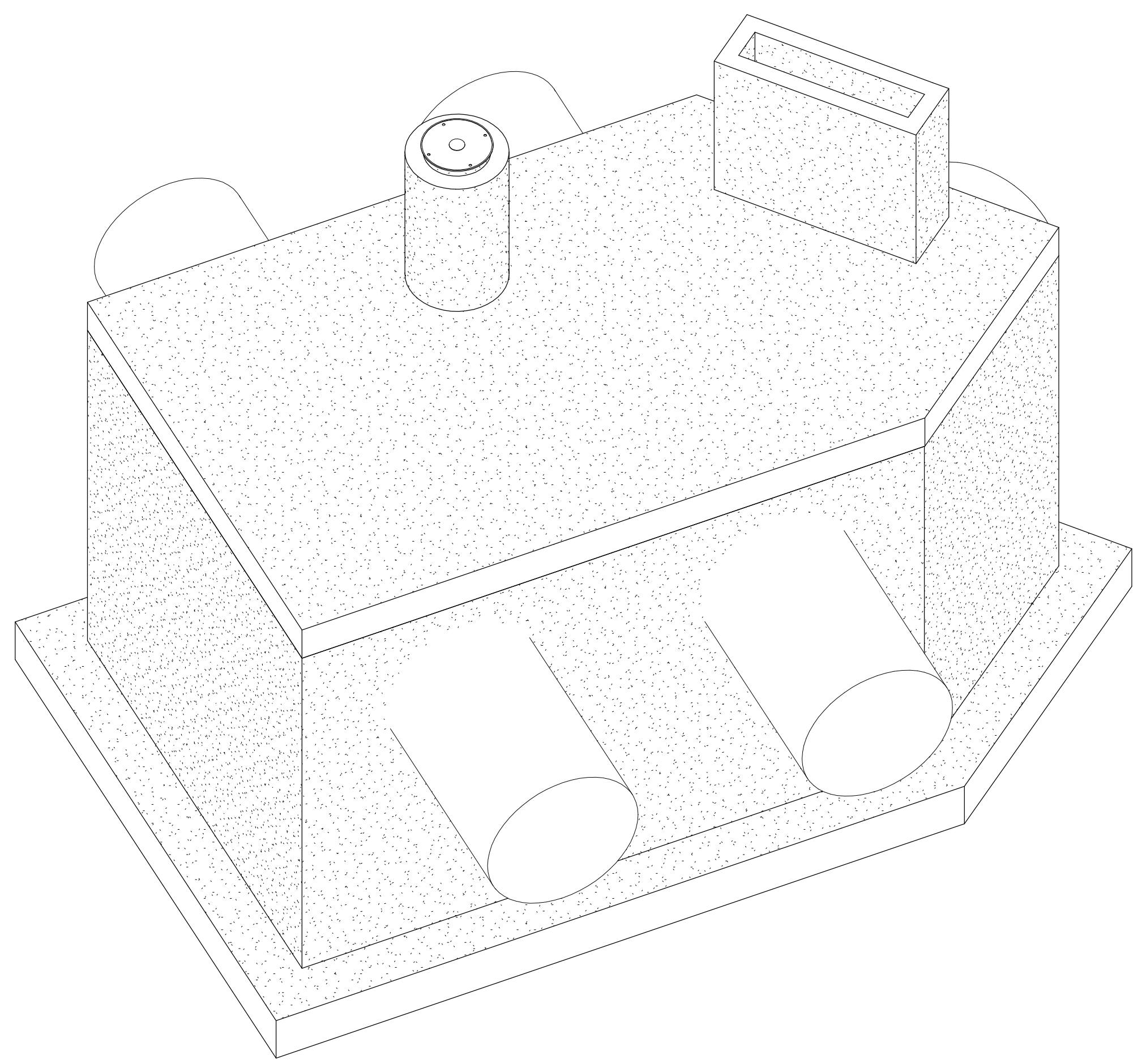
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CSO 17 ISOMETRIC VIEW

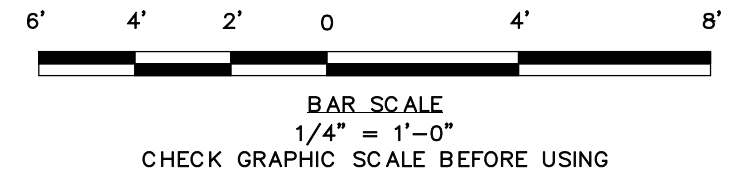
SCALE:

STRUCTURAL GENERAL NOTES:

- REFER TO ELECTRICAL AND MECHANICAL DRAWINGS FOR ADDITIONAL NEW RELATED WORK.
- CONCRETE SUBCONTRACTOR SHALL COORDINATE PIPE PENETRATIONS WITH MECHANICAL SUBCONTRACTOR SUBMITTALS.

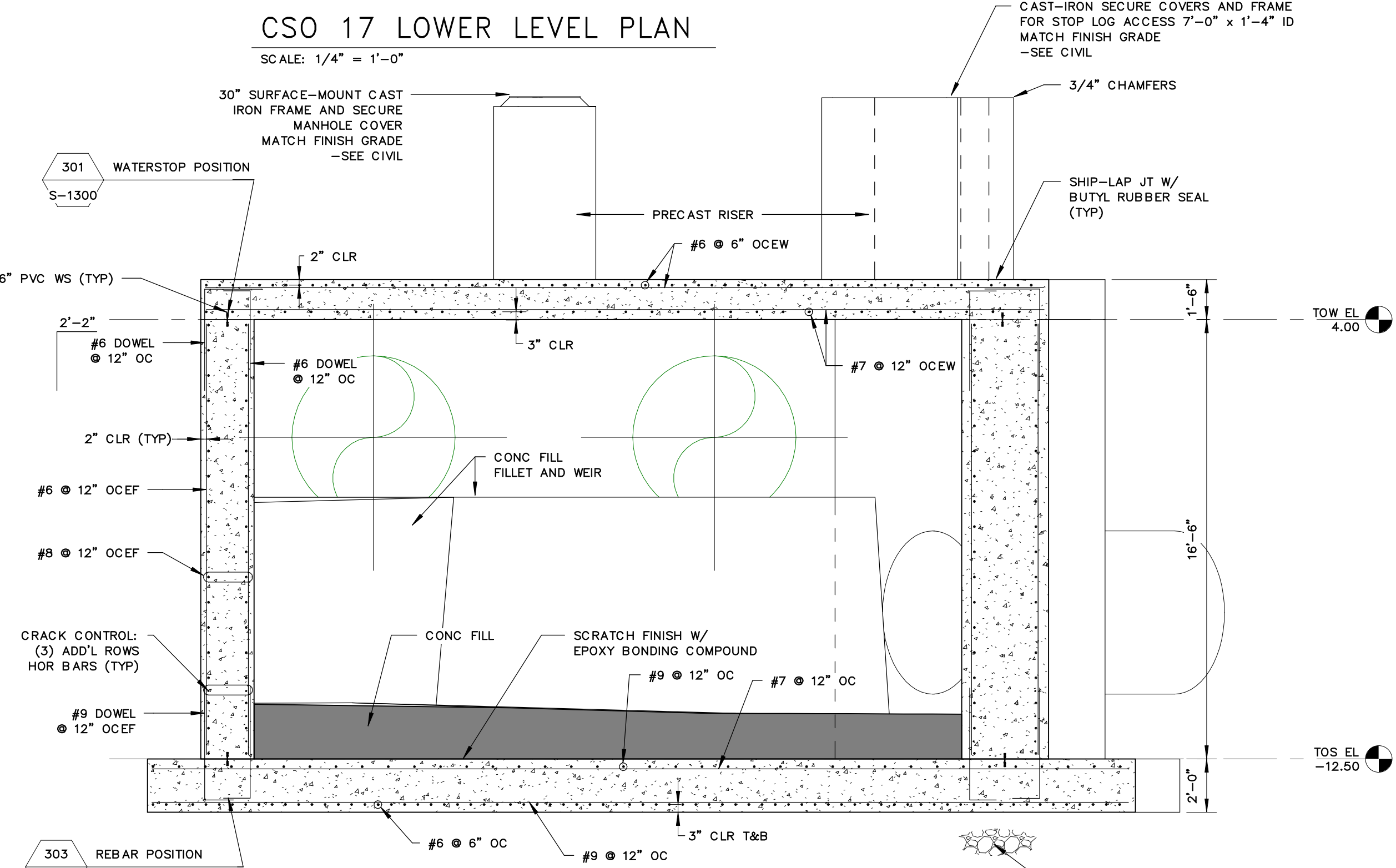
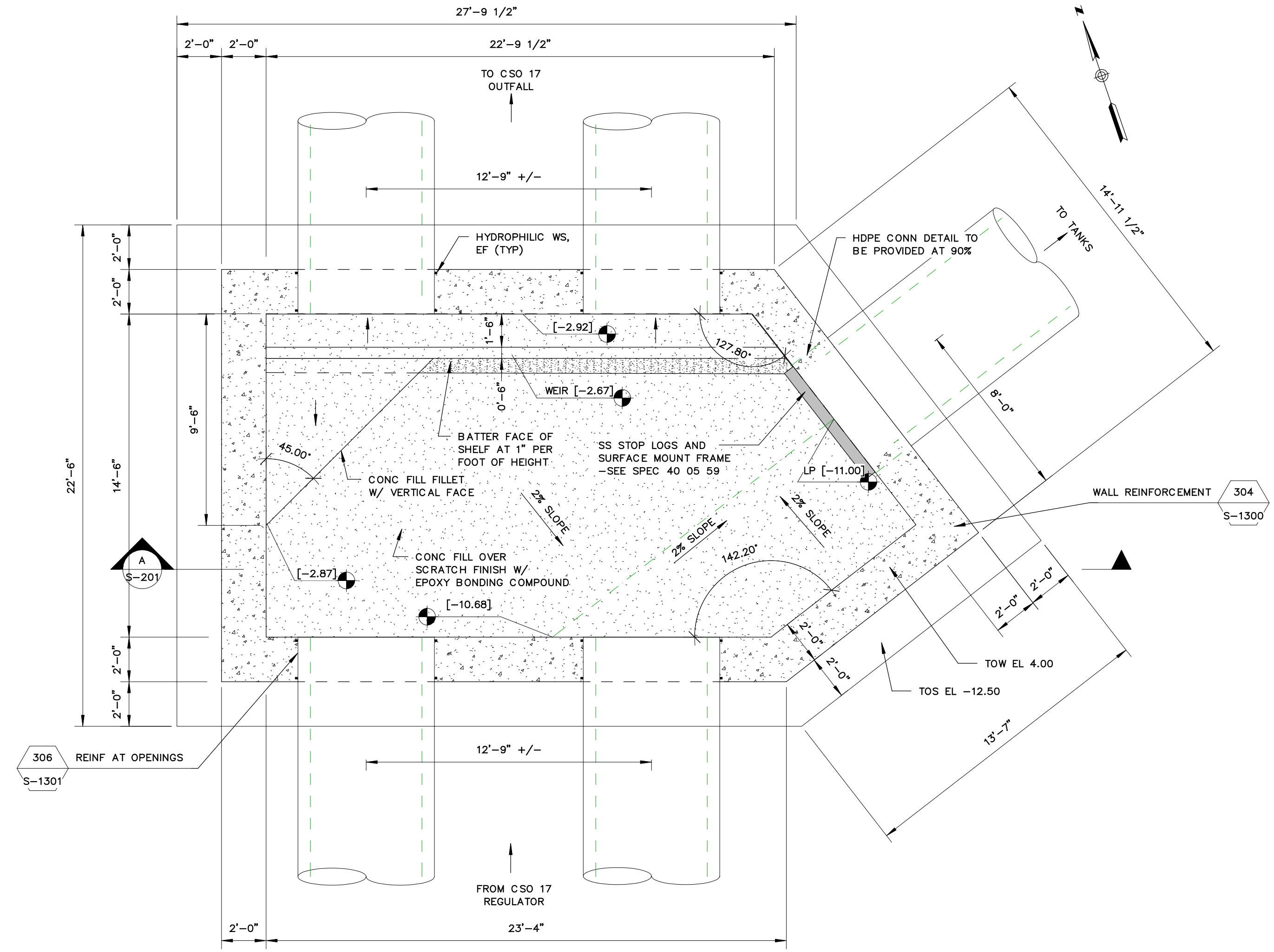
DIVERSION STRUCTURE NOTES

- REFER TO STRUCTURAL NOTES SHEET S-001, EARTHWORK SPECIFICATION 31 00 00, AND GEOTECHNICAL REPORT FOR SITE SUBGRADE PREPARATION, GROUNDWATER, DEWATERING, SHORING, AND ROCK EXCAVATION REQUIREMENTS.
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- ALL CONSTRUCTION JOINTS ARE SHOWN IN THESE DRAWINGS.
- TIGHTNESS TESTING IN ACCORDANCE WITH ACI 350.1 IS NOT REQUIRED. ACTIVELY LEAKING CRACKS WILL BE REPAIRED BY POLYURETHANE CRACK INJECTION AND/OR CRYSTALLINE WATERPROOFING SURFACE COATING SPECIFIED IN 03 63 00 AND 03 01 06 RESPECTIVELY. REPAIRS SHALL BE PERFORMED AFTER BACKFILLING WITHIN THE WARRANTY PERIOD.
- REFER TO SHEET S-1300 FOR CONCRETE TANK STANDARD DETAILS. DETAILS SHOWN ON SHEET S-1300 APPLY TO ALL WORK, UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALL TANK SUBGRADE CONDITIONS WILL BE INSPECTED AND APPROVED BY GEOTECHNICAL ENGINEER, PRIOR TO PLACING REBAR.
- REFER TO SPECIFICATION 03 30 20 FOR CONCRETE TESTING REQUIREMENTS AND TESTING FREQUENCY.



CSO 17 LOWER LEVEL PLAN

SCALE: 1/4" = 1'-0"



SECTION A
S-201
SCALE: 1/4" = 1'-0"

SEE GEOTECHNICAL REPORT FOR EARTHWORK AND SUBBASE REQUIREMENTS

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CSO 17 DIVERSION STRUCTURE

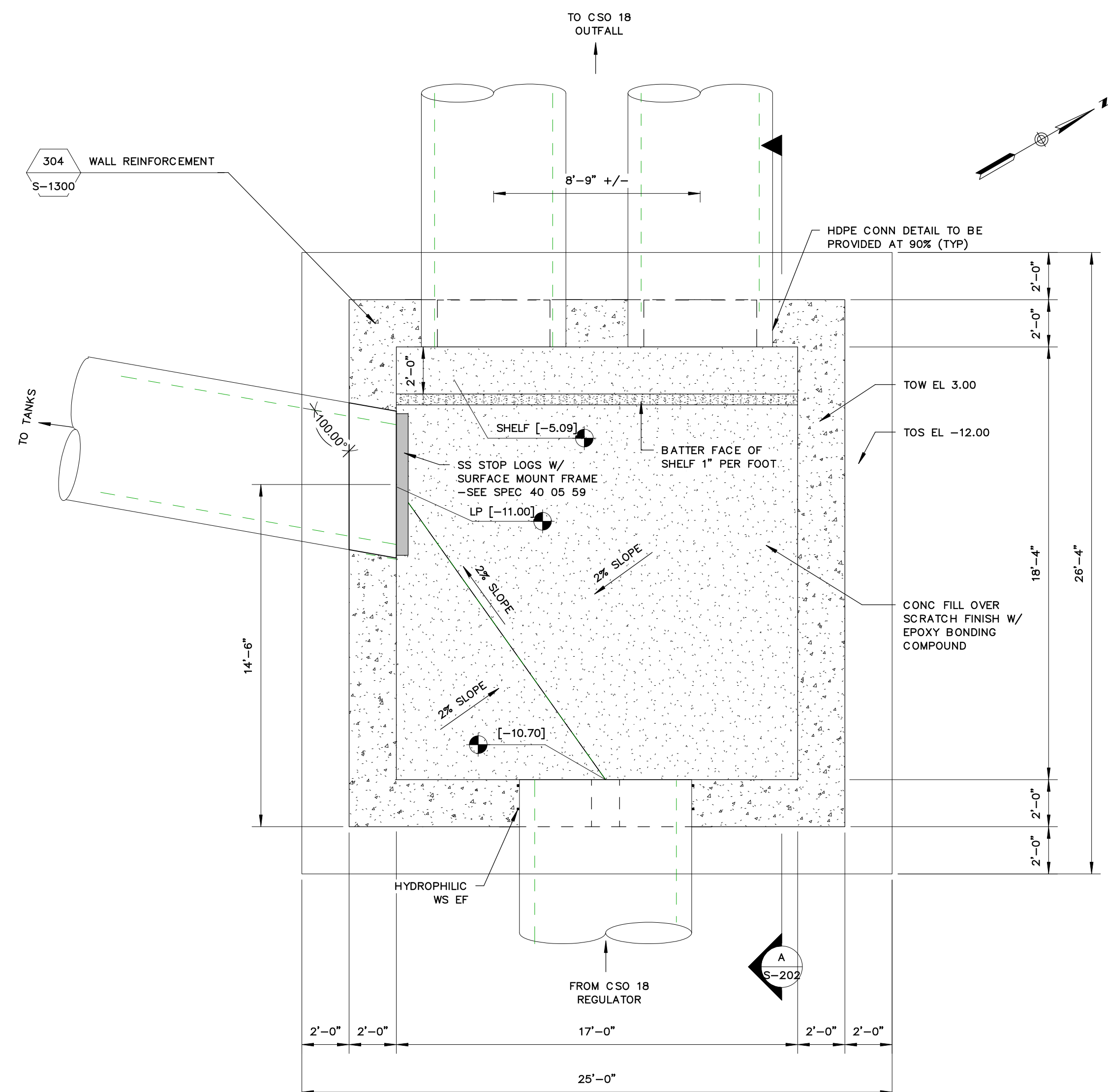
CITY OF PORTLAND PUBLIC WORKS
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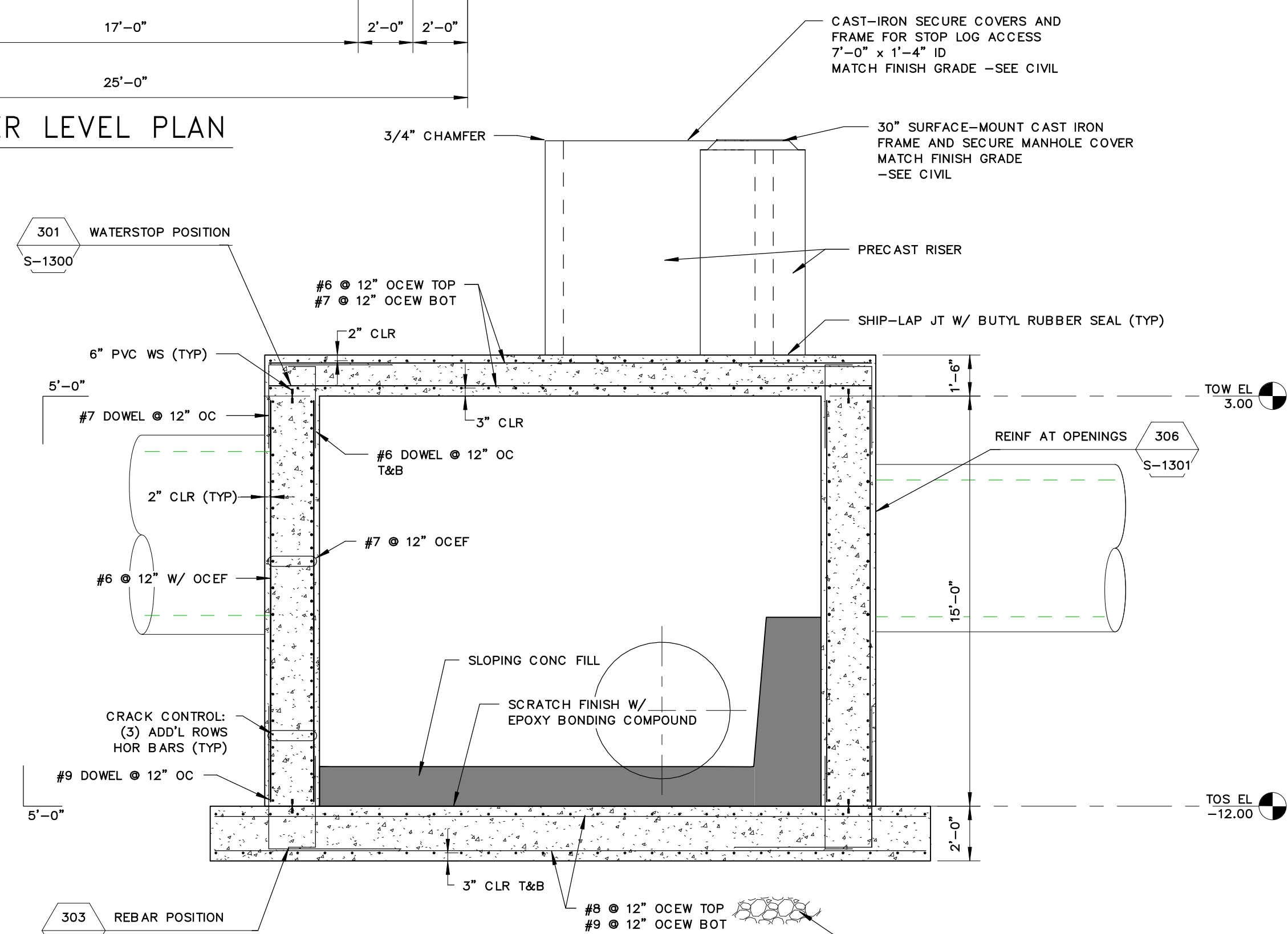
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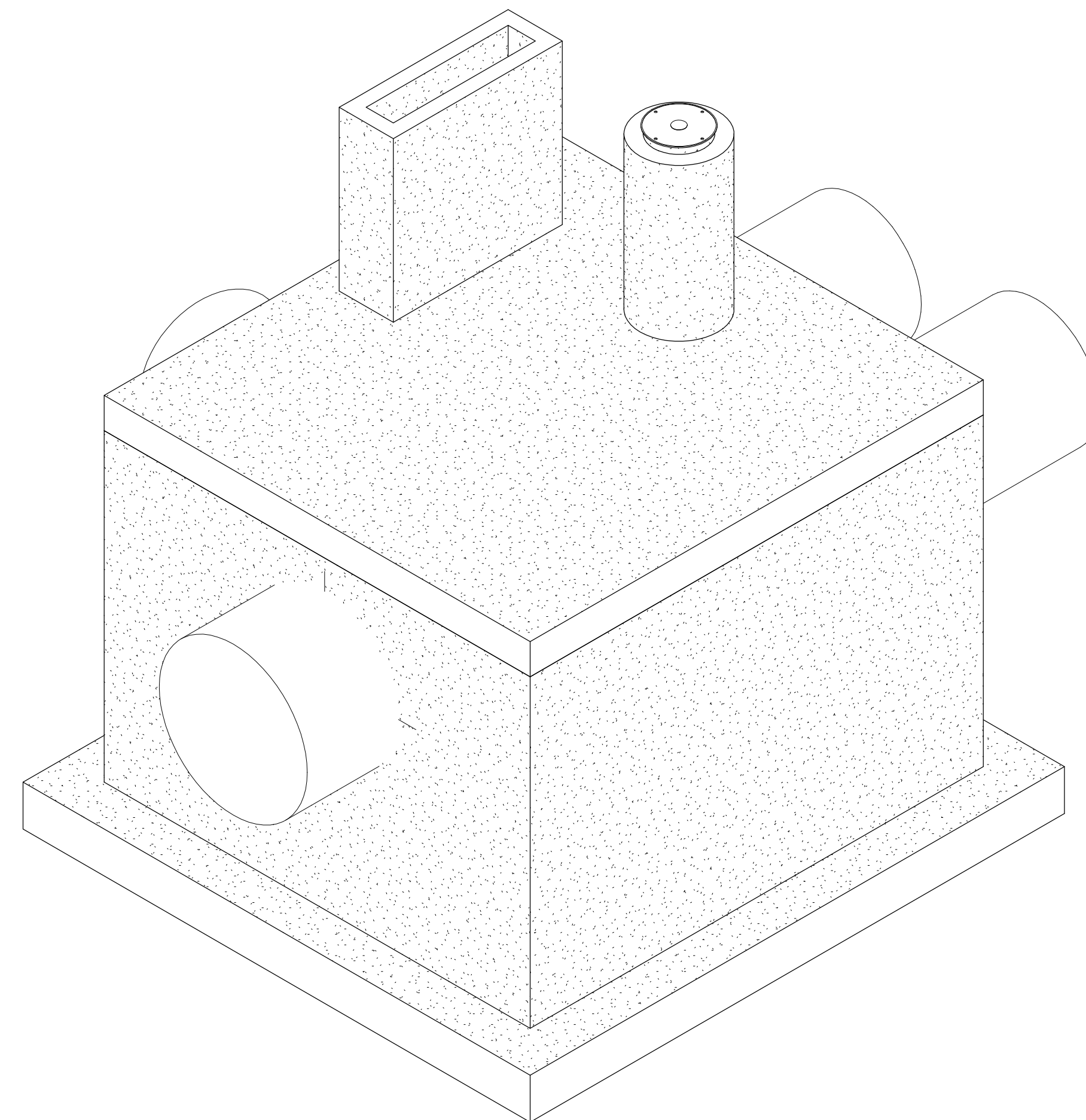
CS0 18 LOWER LEVEL PLAN

SCALE: 1/4" = 1'-0"



SECTION

SCALE: $1/4" = 1'-0"$



CS0 18 ISOMETRIC VIEW

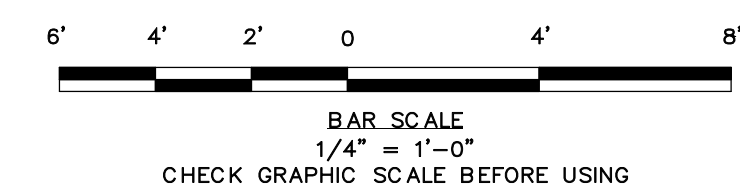
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STRUCTURAL GENERAL NOTES:

1. REFER TO ELECTRICAL AND MECHANICAL DRAWINGS FOR ADDITIONAL NEW RELATED WORK.
2. CONCRETE SUBCONTRACTOR SHALL COORDINATE PIPE PENETRATIONS WITH MECHANICAL SUBCONTRACTOR SUBMITTALS.

DIVERSION STRUCTURE NOTES

1. REFER TO STRUCTURAL NOTES SHEET S-001, EARTHWORK SPECIFICATION 31 00 00, AND GEOTECHNICAL REPORT FOR SITE SUBGRADE PREPARATION, GROUNDWATER, DEWATERING, SHORING, AND ROCK EXCAVATION REQUIREMENTS.
2. "[XXX.XX]" INDICATES ELEVATION OF CONCRETE FILL. REFER TO SPECIFICATION 03 16 00 FOR CONCRETE FILL REQUIREMENTS.
3. ALL CONSTRUCTION JOINTS ARE SHOWN IN THESE DRAWINGS.
4. TIGHTNESS TESTING IN ACCORDANCE WITH ACI 350.1 IS NOT REQUIRED. ACTIVELY LEAKING CRACKS WILL BE REPAIRED BY POLYURETHANE CRACK INJECTION AND/OR CRYSTALLINE WATERPROOFING SURFACE COATING SPECIFIED IN 03 63 00 AND 03 01 06 RESPECTIVELY. REPAIRS SHALL BE PERFORMED AFTER BACKFILLING WITHIN THE WARRANTY PERIOD.
5. REFER TO SHEET S-1300 FOR CONCRETE TANK STANDARD DETAILS. DETAILS SHOWN ON SHEET S-1300 APPLY TO ALL WORK, UNLESS SPECIFICALLY NOTED OTHERWISE.
6. ALL TANK SUBGRADE CONDITIONS WILL BE INSPECTED AND APPROVED BY GEOTECHNICAL ENGINEER, PRIOR TO PLACING REBAR.
7. REFER TO SPECIFICATION 03 30 20 FOR CONCRETE TESTING REQUIREMENTS AND TESTING FREQUENCY.



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**WOODWARD
& CURRAN**

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CSO 18 DIVERSION STRUCTURE

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO: 0232069

DATE: APRIL 2020

SCALE: 1/4" = 1'-0"

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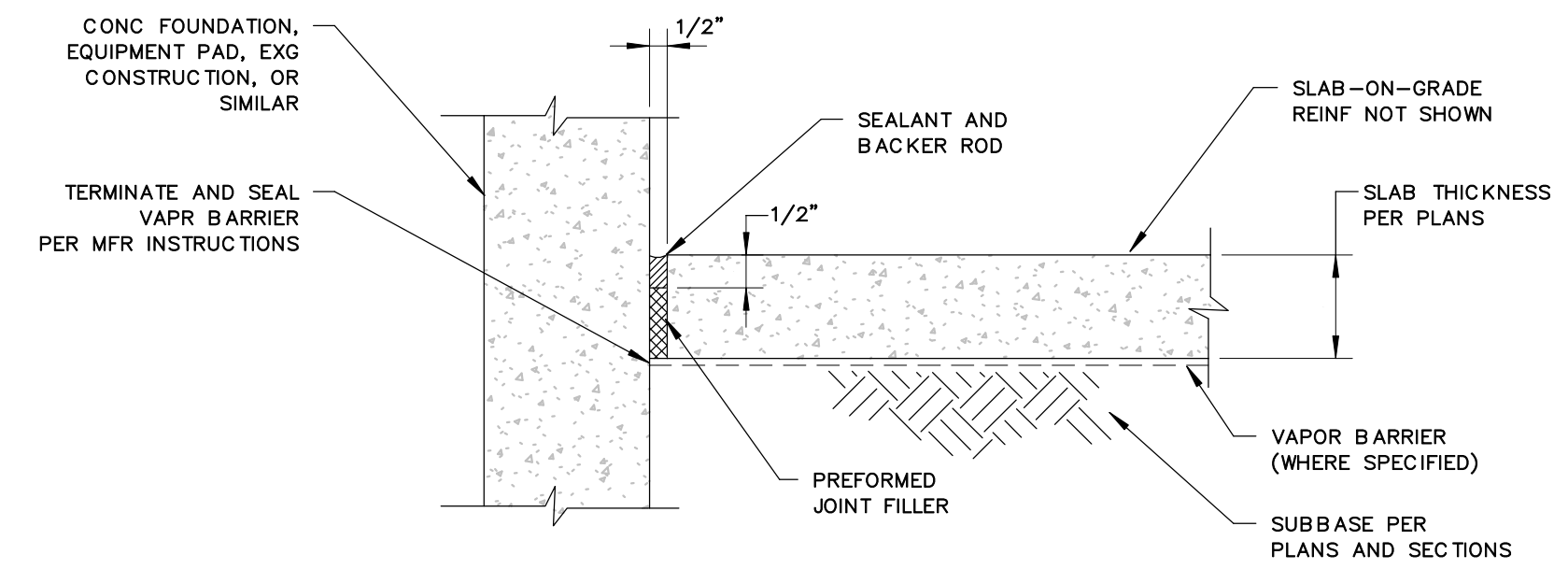
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BACK COVE SOUTH
STORAGE FACILITY

S-1301

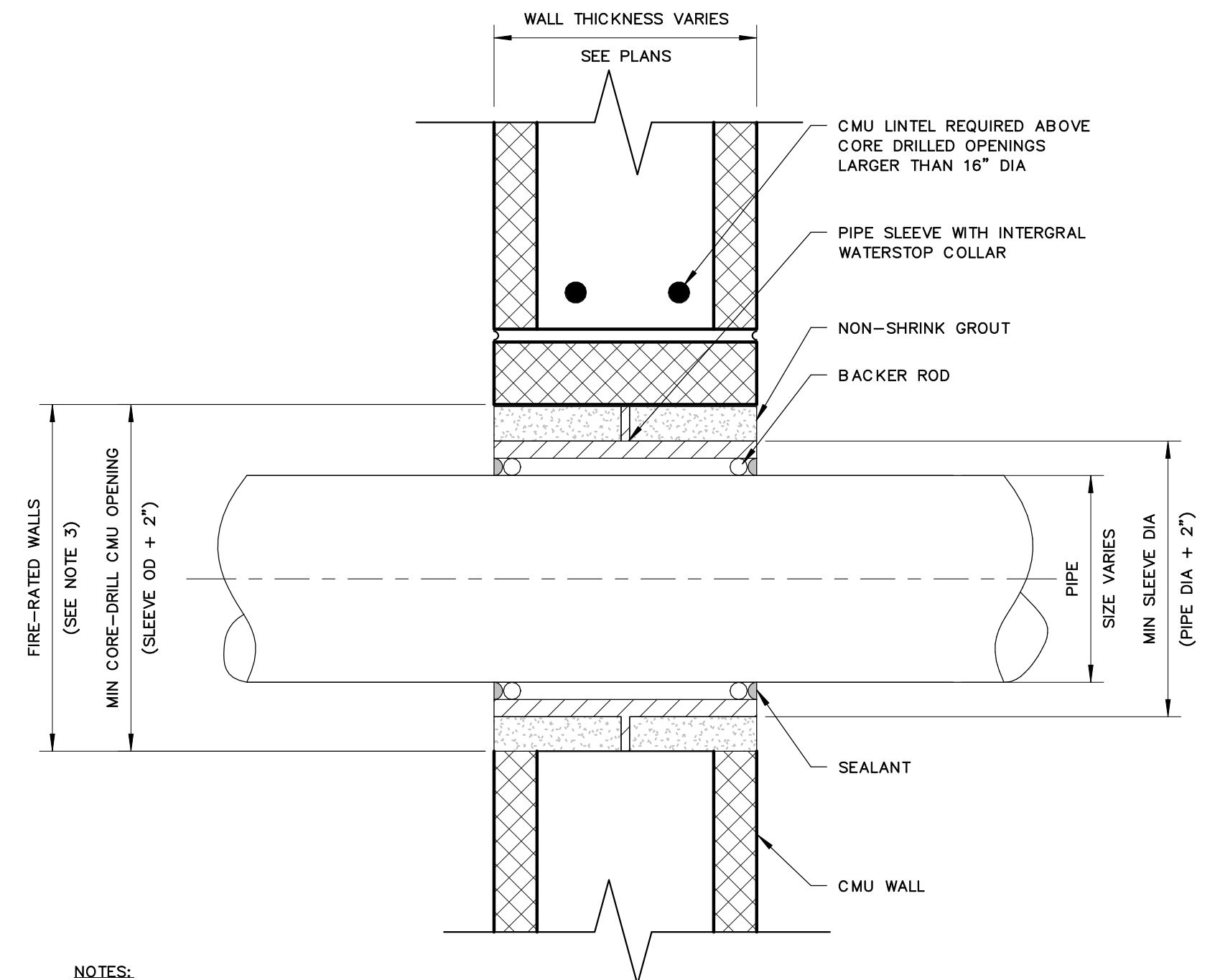
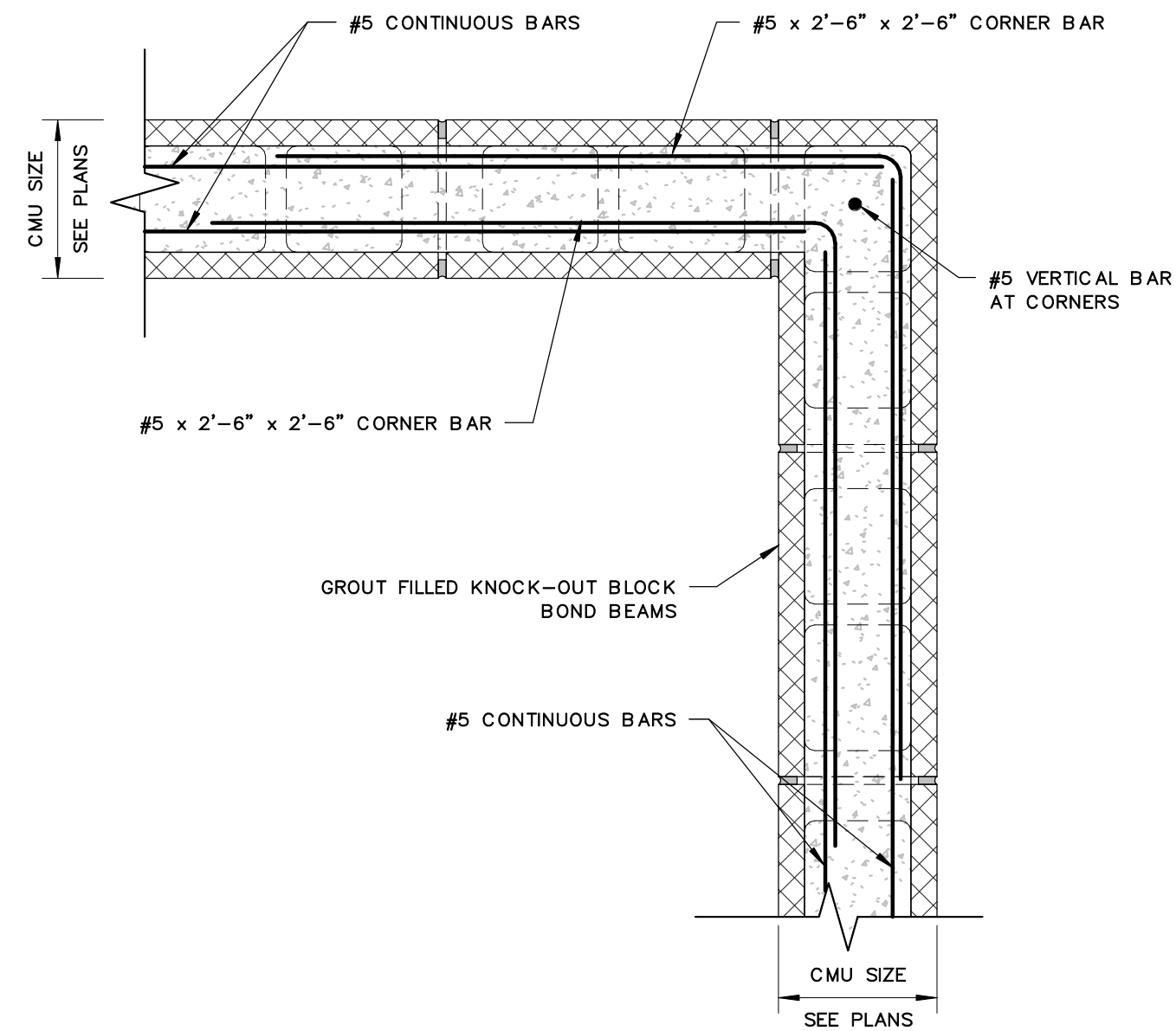


312 ISOLATION JOINT (IJ)
SCALE: NTS



S-1302

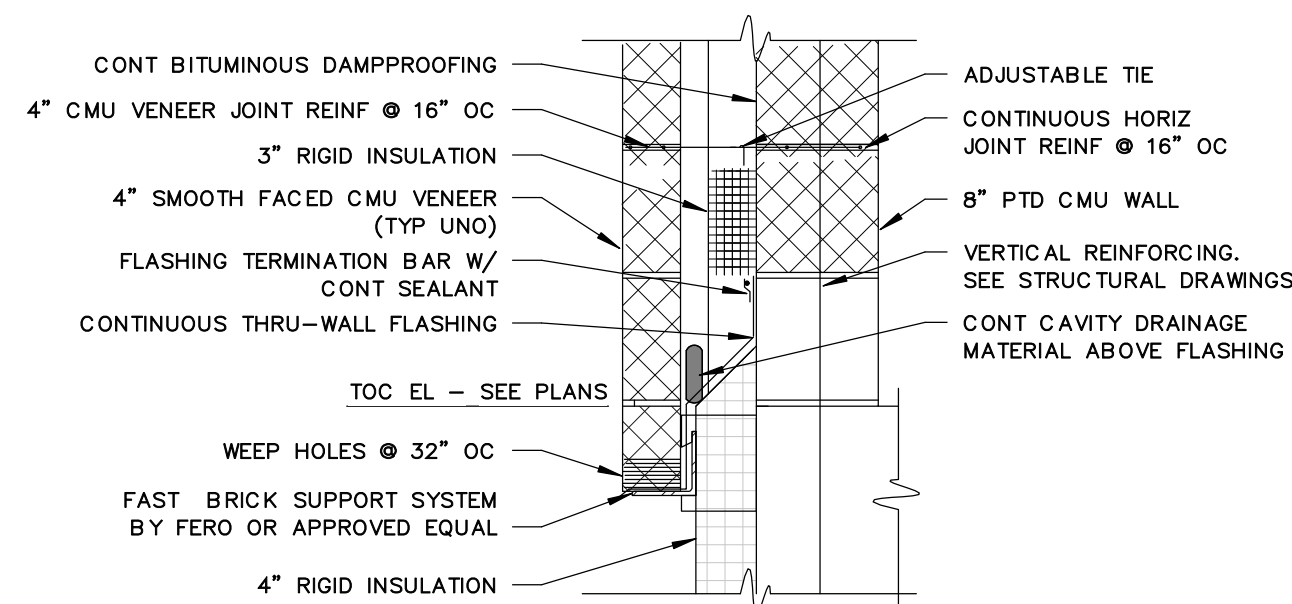
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SCALE: 3" = 1'-0"

SCALE: 1 1/2" = 1'-0"

SCALE: 3" = 1'-0"



SCALE: 1 1/2" = 1'-0"

SCALE: 1" = 1'-0"

MASONRY DETAILS

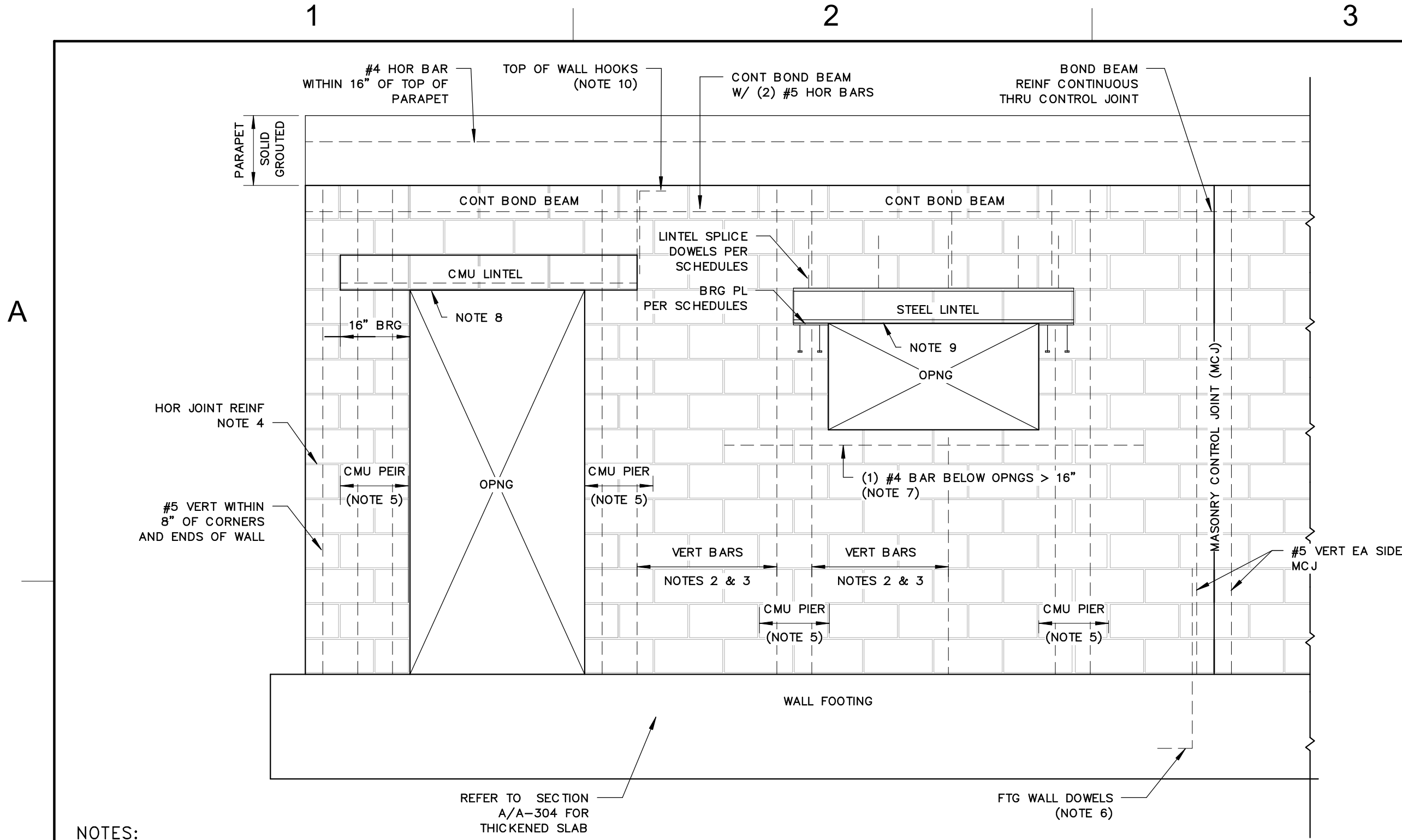
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO:	0232069.00
DATE:	APRIL 2020
SCALE:	AS NOTED
SHEET:	55 OF 104

S-1400

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NOTES:

1. GENERAL: DETAIL APPLIES TO ALL EXTERIOR WALLS AND INTERIOR SHEAR WALLS (WHERE DENOTED ON PLANS) TO COMPLY WITH ACI 530-13 PROVISIONS FOR INTERMEDIATE REINFORCED MASONRY SHEAR WALLS AS PERMITTED IN SEISMIC DESIGN CATEGORIES A, B, AND C.

2. WALL REINFORCEMENT FOR EXTERIOR WALLS AND SHEAR WALLS: AS SHOWN ABOVE AND AS FOLLOWS

ELECTRICAL MAINTENANCE BUILDING: #5 VERT @ 48" OC
TYP TOP WALL BOND BEAM: 8" DEEP WITH (2) #5 HOR BARS

3. WALL REINFORCEMENT FOR INTERIOR WALLS:

#4 VERTICAL REINFORCEMENT @ 48" OC
TOP OF WALL BOND BEAM: 8" DEEP W/ (2) #4 HOR BARS

4. HORIZONTAL JOINT REINFORCEMENT (ALL CMU WALLS): NO 9 GAGE LADDER-TYPE JOINT REINFORCEMENT AT 16" OC VERTICAL SPACING
5. CMU PIERS: PROVIDE SOLID GROUTED CMU PEIRS WITH FULL-HEIGHT VERTICAL REINFORCEMENT PER STRUCTURAL PLANS AND SCHEDULE ON THIS SHEET. PROVIDE FOUNDATION WALL OR WALL FOOTING DOWELS AT ALL CMU PIER VERTICAL WALL REINFORCEMENT LOCATIONS.

6. CMU BOTTOM WALL DOWELS: PROVIDE STRAIGHT #5 SPLICE DOWELS EMBEDDED 17" INTO WALL FOOTINGS WITH 90 DEGREE END HOOKS. PROVIDE 20" EXTENSION INTO CMU WALLS. REQUIRED AT ALL VERTICAL CMU WALL LOCATIONS.

7. OPENING BOTTOM BARS: FOR EXTERIOR WALLS AND SHEAR WALLS, PROVIDE (1) #4 BAR BELOW ALL WALL OPENINGS GREATER THAN 16" WIDE. EXTEND BAR 24" PAST EA SIDE OF OPENING.

8. CMU LINTELS: PROVIDE KNOCK-OUT, OPEN BOTTOM LINTEL UNITS. CMU LINTELS SHALL EXTEND 16" PAST EACH FACE OF OPENING. PASS CMU PIER VERTICAL DOWELS CONTINUOUS THROUGH LINTEL. FINISH BOTTOM OF EXPOSED LINTEL BLOCKS WITH NON-SHRINK GROUT AND FINISH PAINT TO MATCH INTERIOR CMU WALL FINISH.

9. STEEL LINTELS: ONLY PERMITTED WHERE CLEARLY DENOTED ON STRUCTURAL DRAWINGS AND TO SUPPORT NEW OPENINGS IN EXISTING WALLS.

10. TOP OF WALL DOWELS: PROVIDE TOP OF CMU WALL #5 DOWELS, 20" LONG WITH 7" HOOKS, TO SPLICE ALL VERTICAL WALL REINFORCEMENT INTO TOP OF CMU BOND BEAM TO RESIST ROOF UPLIFT FORCES.

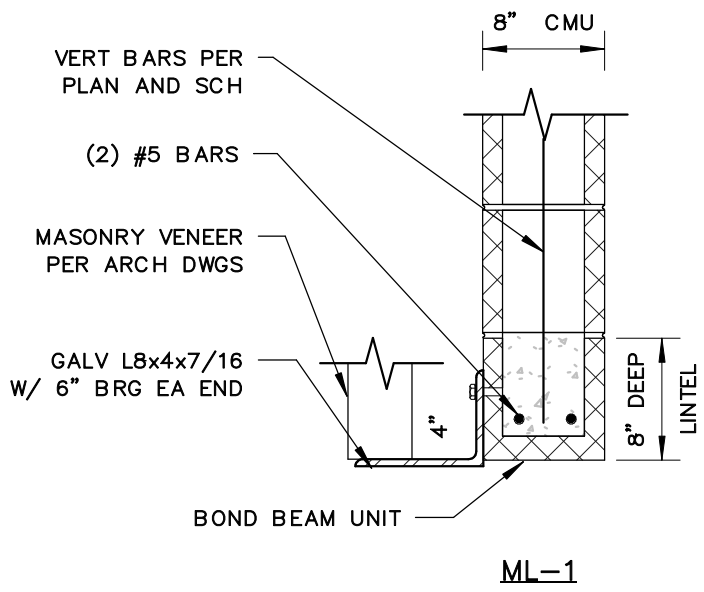
405 CMU WALL REINFORCEMENT
SCALE: 1/2" = 1'-0"

MASONRY AND CONCRETE LINTEL SCHEDULE								
MARK	LINTEL TYPE	WIDTH (IN)	DEPTH (IN)	REINFORCING			VENEER SUPPORT L	NOTES
				BOTTOM	TOP	STIRRUPS		
ML-1	CMU	8	8	(2) #5	N/A	N/A	L8x4x7/16	

LINTEL SCHEDULE NOTES:

- REFER TO STRUCTURAL DRAWINGS FOR LINTEL LOCATIONS
- PROVIDE LINTELS FOR ALL OPENINGS GREATER THAN 12" IN WIDTH. SEE MECHANICAL, PROCESS, ELECTRICAL, PLUMBING, AND HVAC DRAWINGS FOR LOCATIONS AND QUANTITIES OF OPENINGS
- REFER TO DETAIL 405 FOR ADDITIONAL DETAILS

406 CMU LINTELS
SCALE: 1" = 1'-0"



MINIMUM CMU REINFORCING BAR SPLICE LENGTHS		
REBAR SIZE	VERTICAL SPLICE LENGTH (IN)	HORIZONTAL SPLICE LENGTH (IN)
3	12	20
4	13	35
5	20	55
6	41	N/A
7	52	N/A
8	MECHANICAL SPLICES	N/A

SCHEDULE NOTES:

- SPLICE LENGTHS PER ACI 530-13, EQUATION 8-12
- VALUES ARE BASED ON $f'm=2,000$ PSI AND UNCOATED REINFORCEMENT.
- VERTICAL SPLICE LENGTHS: $9 \times$ BAR DIA CONTROLS EQUATION 8-12, ASSUMING VERTICAL BARS ARE PLACED IN THE CENTER OF WALL (8", 10", OR 12" CMU)
- HORIZONTAL SPLICE LENGTHS: MIN $1-1/2"$ COVER CONTROLS EQUATION 8-12

407 CMU REBAR SPLICE LENGTHS
SCALE: 1" = 1'-0"

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CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 56 OF 104

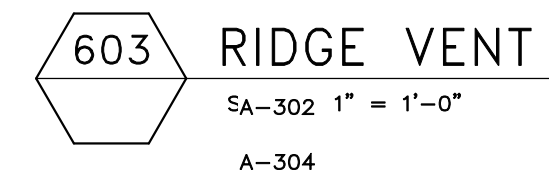
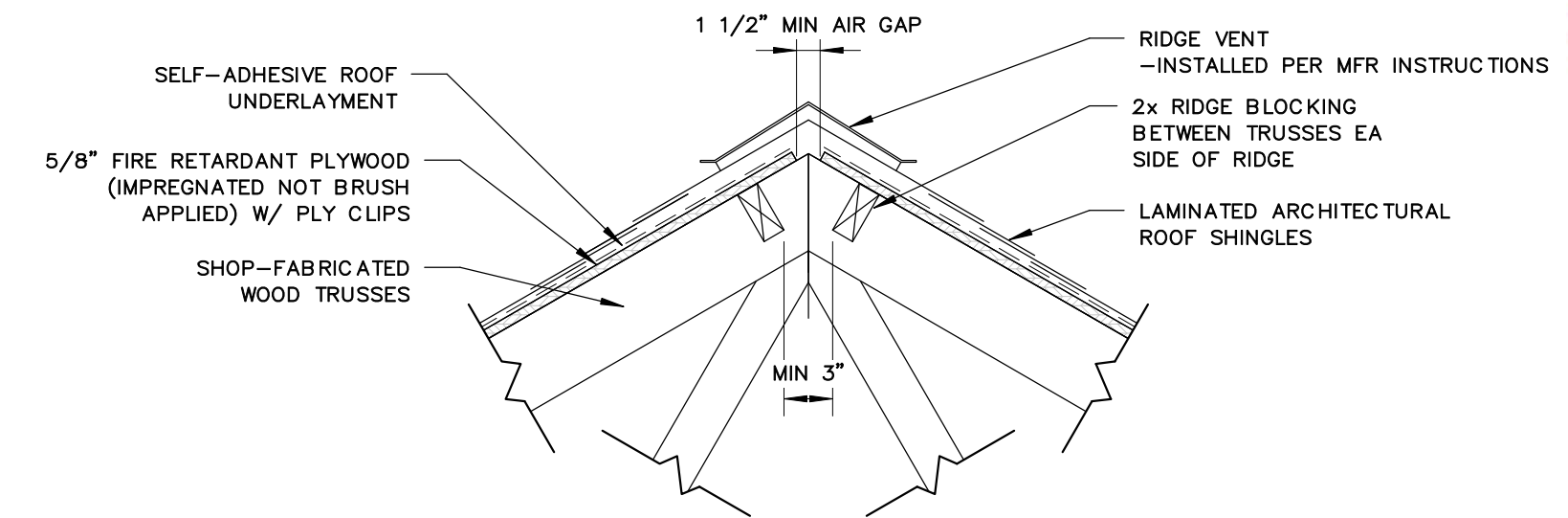
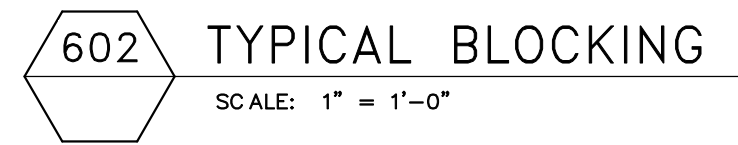
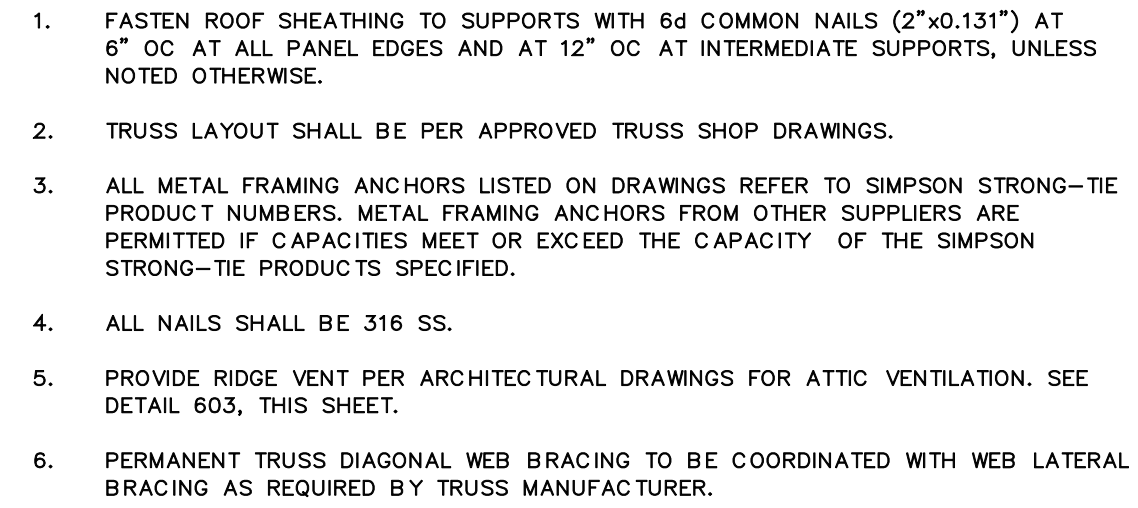
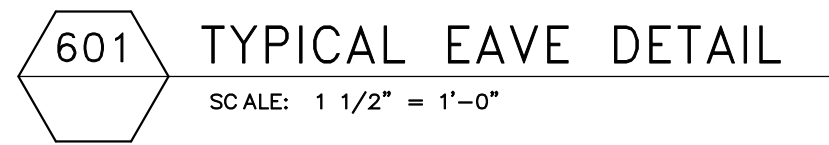
S-1401

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MASONRY SCHEDULES AND DETAILS

DESIGNED BY: CHM
DRAWN BY: CHM

CHECKED BY: SJT
DATE: 4/1/20



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ROUGH CARPENTRY ROOF FRAMING, SECTIONS & DETAILS

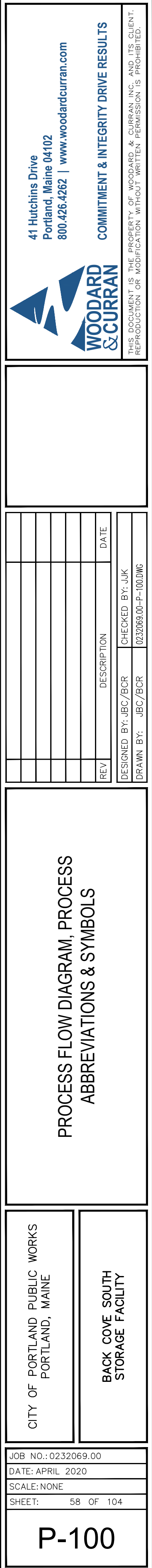
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BACK COVE SOUTH
STORAGE FACILITY

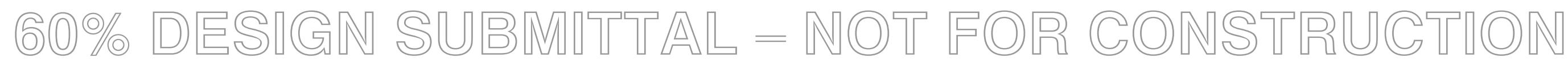
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S-1600

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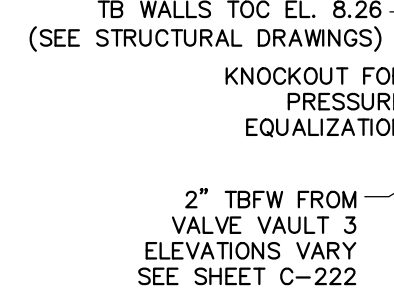
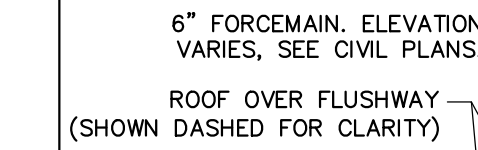
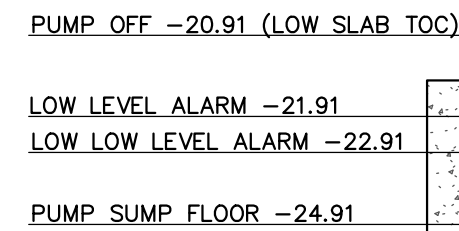
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P-102

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P-100

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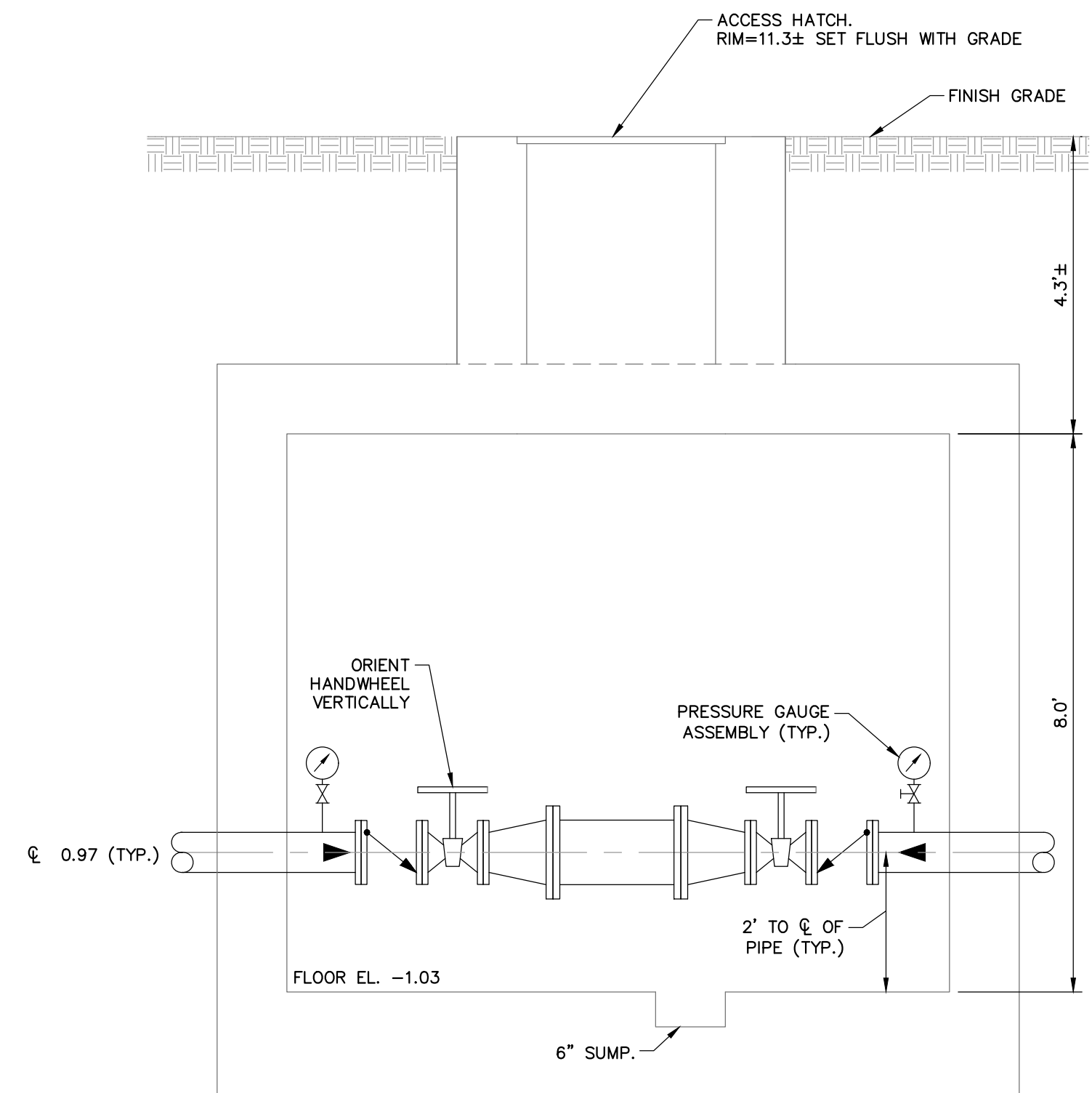
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	DRAWN BY: BCR	02/2089.00-P-20.00W

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 61 OF 104

P-201

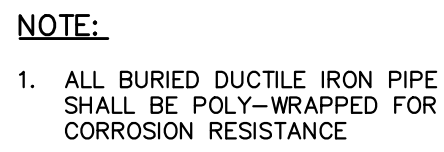


SECTION A
SCALE: 1" = 2' P-202

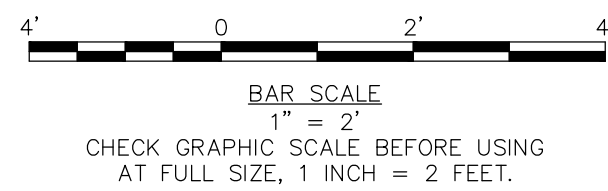
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P-202

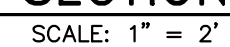


SCALE: 1" = 2'



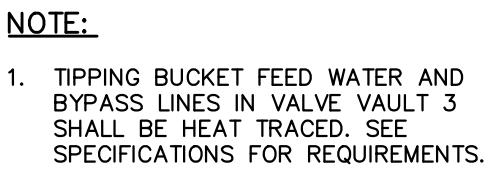
SCALE: 1" = 2'

(P-203)



P-203

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PIPING SYMBOLS

	UNION		FLEXIBLE PIPE CONNECTOR
	FLANGE		EXPANSION JOINT
	PIPE ANCHOR		CONCENTRIC REDUCER/INCREASER
	PIPE GUIDE OR SLEEVES		ECCENTRIC REDUCER/INCREASER
	PIPE ELBOW TURNED DOWN		DIRECTION OF FLOW
	PIPE ELBOW TURNED UP		PUMP
	PIPING TEE-DOWN		FINNED TUBE BASEBOARD
	PIPING TEE-UP		DIFFERENTIAL PRESSURE TRANSMITTER
	PIPE RISER		LOW WATER CUT OFF
	FCO FLOOR CLEAN OUT		TEMPERATURE VALVE
	CO CLEAN OUT		3-WAY MOTORIZED VALVE
	WCO WALL CLEAN OUT		TEMPERATURE SENSOR
	PIPE PITCHES DOWN		DRAIN COCK
	GATE VALVE		VACUUM BREAKER
	BALL VALVE		BACKFLOW PREVENTER
	BUTTERFLY VALVE (MANUAL)		FREEZE-STAT
	2-WAY CONTROL VALVE		HEATING OR COOLING COIL
	3-WAY CONTROL VALVE		PLEATED FILTER
	MULTI-PURPOSE VALVE		PRESSURE DIFFERENTIAL GAUGE
	BALANCING VALVE		FAN
	CHECK VALVE		FUEL OIL FILTER
	PLUG VALVE		LEVEL SENSOR
	GLOBE VALVE		PEX TO RIGID PIPE CONNECTION
	NEEDLE VALVE		THERMOSTAT (T'STAT) OR TEMP. SENSOR
	BACK FLOW PREVENTER		SMOKE DETECTOR
	SOLENOID VALVE		SWITCH
	PRESSURE REDUCING OR REGULATING VALVE		TRAP
	PRESSURE RELIEF VALVE		
	STRAINER W/BLOWDOWN		
	STRAINER		
	MANUAL AIR VENT		
	AUTOMATIC AIR VENT		
	PRESSURE SWITCH		
	FLOW SWITCH		
	PRESSURE GAUGE AND COCK		
	THERMOMETER AND WELL		
	TEMPERATURE & PRESSURE TAP (PETE'S PLUG)		
	HOSE END DRAIN VALVE WITH CAP		

HVAC GENERAL NOTES

1. COORDINATE WORK WITH ALL OTHER TRADES, PURCHASE AND/OR INSTALLATION OF ALL WORK.
2. ALL PIPING SHALL BE INSTALLED AS INDICATED ON THE DRAWINGS IN A NEAT MANNER. PROVIDE SUPPORTS AS REQUIRED BY CODES AND MANUFACTURER'S RECOMMENDATIONS. PIPING SHALL BE SET UP AND DOWN AND OFFSET TO SUIT FIELD CONDITIONS. DIELECTRIC COUPLINGS SHALL BE USED WHERE DISSIMILAR METALS ARE JOINED.
3. PROVIDE ALL WIRING, TUBING AND THERMOSTATS AND ALL MISCELLANEOUS APPURTENANCES TO MEET THE INTENT OF THESE DOCUMENTS. INSTALL NEW THERMOSTATS AT 4.5 FEET ABOVE FINISHED FLOOR.
4. ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH LOCAL CODES AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
5. THE HVAC DRAWINGS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. PROVIDE ALL PIPE TRANSITIONS REQUIRED FOR CONNECTION TO EQUIPMENT.

AIR DISTRIBUTION SYMBOLS

	RECTANGULAR SUPPLY DUCT. (FIRST NUMBER IS SIDE SHOWN) DIMENSIONS IN INCHES
	12"Ø 12 INCH ROUND SUPPLY DUCT
	RECTANGULAR EXHAUST / RETURN DUCT. (FIRST NUMBER IS SIDE SHOWN) DIMENSIONS IN INCHES
	12"Ø 12 INCH ROUND RETURN DUCT
	MOTORIZED DAMPER
	RELIEF DAMPER
	FLEXIBLE DUCT
	DUCT FLEXIBLE CONNECTOR
	RETURN DUCT TURNED UP OR DOWN (DASHED)
	SUPPLY DUCT TURNED UP OR DOWN (DASHED)
	EXHAUST DUCT TURNED UP OR DOWN (DASHED)
	ROUND DUCT ELBOW DOWN
	ROUND DUCT ELBOW UP
	SQUARE TO ROUND TRANSITION
	CAP (DUCT AND/OR PIPE)
	EA EXHAUST AIR
	OA OUTSIDE AIR
	RA RETURN AIR
	SA SUPPLY AIR
	VD VOLUME DAMPER
	FD FIRE DAMPER
	SD SMOKE DAMPER
	SMD COMBINATION SMOKE/FIRE DAMPER
	RECTANGULAR ELBOW W/TURNING VANES
	DIRECTION OF AIR FLOW (SUPPLY)
	DIRECTION OF AIR FLOW (RETURN/EXHAUST)
	3 M101 DETAIL NO. SHEET NO. WHERE DETAIL IS LOCATED
	AC-1 EQUIPMENT TAG AND EQUIPMENT NO.
	CONNECT TO EXISTING
	UNDERCUT DOOR
	LOUVERED DOOR

ABBREVIATIONS

AAV	AUTOMATIC AIR VENT	EXIST.	EXISTING	RA	RETURN AIR
ACU	AIR CONDITIONING UNIT	FBO	FURNISHED BY OWNER	RF	RETURN FAN
AD	ACCESS DOOR	FC	FLEXIBLE CONNECTION	RG	RETURN GRILLE
AFF	ABOVE FINISHED FLOOR	FCV	FLOW CHECK VALVE	RH	RELIEF HOOD
AHU	AIR HANDLING UNIT	FCU	FAN COIL UNIT	RHC	REHEAT COIL
AP	ACCESS PANEL	FCO	FLOOR CLEANOUT	RM	ROOM
AS	AIR SEPARATOR	FD	FIRE DAMPER	RPZ	REDUCED PRESSURE ZONE BFP
ATC	AUTOMATIC TEMPERATURE CONTROL	FG	FIBERGLASS	RR	RETURN REGISTER
AV	AIR VENT	FT	FINNED TUBE RADIATION	RV	RELIEF VALVE
B	BOILER	FS	FLOW SWITCH	S	SANITARY
BB	BASEBOARD	GC	GENERAL CONTRACTOR	SA	SUPPLY AIR
BOC	BOTTOM OF CONCRETE	GPM	GALLONS PER MINUTE	SCV	SELF CONTAINED VALVE
BDD	BACKDRAFT DAMPER	HB	HOSE BIBB	SD	SMOKE DETECTOR
BG	BLAST GATE	HC	HEATING COIL	SF	SUPPLY FAN
BFP	BACKFLOW PREVENTER	HP	HEAT PUMP	SG	SUPPLY GRILLE
BLDG	BUILDING	HRU	HEAT RECOVERY UNIT	SR	SUPPLY REGISTER
BOD	BOTTOM OF DUCT	HTR	HEATER	SS	STAINLESS STEEL
BOP	BOTTOM OF PIPE	H & V	HEATING AND VENTILATION	TG	TRANSFER GRILLE
BTU	BRITISH THERMAL UNIT	HVAC	HEATING, VENTILATING AND AIR CONDITIONING	TDV	TRIPLE DUTY VALVE
C	CONDENSATE	HW	HOT WATER	TMV	TEMPERATURE MIXING VALVE
CAS	COMBUSTION AIR SYSTEM	HX	HEAT EXCHANGER	TOD	TOP OF DUCT
CC	COOLING COIL	IH	INTAKE HOOD	TOP	TOP OF PIPE
CD	CONDENSATE DRAIN	IN. W.G.	INCHES WATER GAUGE	TTS	TIGHT TO STEEL
CFF	CAPPED FOR FUTURE	IV	INTAKE VENT	TV	TURNING VANE(S)
CFM	CUBIC FEET PER MINUTE	L	LOUVER	TYP	TYPICAL
CGD	COMBUSTION GAS DETECTION	LD	LINED DUCT	UH	UNIT HEATER
CLG	CEILING	LSD	LINEAR SLOT DIFFUSER	UIC	UP IN CHASE
CO	CLEANOUT	M	MOTOR OPERATED DAMPER (MOD)	UIW	UP IN WALL
CONT	CONTINUATION	MAU	MAKE UP AIR UNIT	UV	UNIT VENTILATOR
COORD	COORDINATE	MAX	MAXIMUM	V	VENT
CTE	CONNECT TO EXISTING	MBH	1000 BTU/HR.	VAV	VARIABLE AIR VOLUME
CU	CONDENSING UNIT	ME	MECHANICAL ENGINEER	VB	VACUUM BREAKER
CUH	CABINET UNIT HEATER	MFR	MANUFACTURER	VTR	VENT THRU ROOF
CV	CONTROL VALVE	MIN	MINIMUM	VD	VOLUME DAMPER
CW	COLD WATER	MPV	MULTI-PURPOSE VALVE	VCOFF	VALVED AND CAPPED FOR FUTURE
DC	DUCT COIL	MTD	MOUNTED	VFD	VARIABLE FREQUENCY DRIVE
DDC	DIRECT DIGITAL CONTROL	MUA	MAKE UP AIR	VS	VARIABLE SPEED
DIA	DIAMETER	NPW	NON-POTABLE WATER	W	WASTE
DN	DOWN	NTS	NOT TO SCALE	W/	WITH
DWG	DRAWING	OA	OUTSIDE AIR	WCO	WALL CLEANOUT
DWH	DOMESTIC WATER HEATER	OED	OPEN ENDED DUCT	WH	WALL HYDRANT
EA	EXHAUST AIR	OBD	OPPOSED BLADE DAMPER	WMS	WIRE MESH SCREEN
EF	EXHAUST FAN	OSV	OIL SAFETY VALVE		
ER	EXHAUST REGISTER	P	PUMP		
ERV	ENERGY RECOVERY UNIT	PL	PLUMBING		
ET	EXPANSION TANK	PRV	PRESSURE REDUCING VALVE		
ETR	EXISTING TO REMAIN	R	RELIEF VENT		

PIPING DESIGNATIONS

C	CONDENSATE	HPS	HIGH PRESSURE STEAM
CD	CONDENSATE DRAIN	HHWR	HEATING HOT WATER RETURN
CHWR	CHILLED WATER RETURN	HHWS	HEATING HOT WATER SUPPLY
CHWS	CHILLED WATER SUPPLY	LPS	LOW PRESSURE STEAM
CWR	CONDENSER WATER RETURN	MPS	MEDIUM PRESSURE STEAM
CWS	CONDENSER WATER SUPPLY	RG	REFRIGERANT GAS
CW	COLD WATER	RL	REFRIGERANT LIQUID
DCW	DOMESTIC COLD WATER	S	SANITARY
DHW	DOMESTIC HOT WATER	V	VENT
F.O.R.	FUEL OIL RETURN		
F.O.S.	FUEL OIL SUPPLY		

NOTE:
SYMBOLS AND ABBREVIATIONS SHOWN ON THIS SHEET ARE GENERAL AND MAY NOT HAVE BEEN USED ON THIS PROJECT.

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DESCRIPTION

DATE

CHECKED BY: BMT
DRAWN BY: MRC

22020600-H-001JWS

HVAC LEGEND AND GENERAL NOTES

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

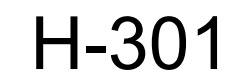
JOB NO.: 02320609.00

DATE: APRIL 2020

SCALE: NTS

SHEET: 65 OF 104

H-001



DEHUMIDIFIER SCHEDULE								
SYMBOL	SERVICE	CFM	CAPACITY PINTS/DAY	ELECTRICAL		MANUFACTURER	MODEL	NOTES
				VOLT-PHASE	FLA/RLA			
DH-1	ELECTRIC ROOM	445	120	115V/1P	5.9	QUEST	HI-E Dry 120	
1. PROVIDE WITH INTEGRAL CONDENSATE PUMP								

POSITIVE PRESSURE/FILTRATION UNIT SCHEDULE								
SYMBOL	SERVICE	OUTDOOR CFM	RECIRCULATION CFM	MOTOR HP	VOLT—PHASE	MANUFACTURER	HOUSING MODEL	NOTES
PPU—1	ELECTRICAL ROOM	50	50	1.0	480V—3P	PURAFIL	PPU—500	

DUCTLESS HEAT PUMP SCHEDULE															
MANUFACTURER	SERVICE	INDOOR UNIT				OUTDOOR UNIT								NOTES	
		TAG	MODEL	COOLING MBH	HEATING MBH	TAG	MODEL	SEER	VOLT-PHASE	RLA	MCA	MOCP	CONTROLLER/STARTER		
													BY		SCCR
DAIKIN	ELECTRICAL ROOM	IU-1	FCQ48TAVJU	48	48	CU-1	RZQ48TAVJU	17	208-230/1P	19.0	29.1	35.0	MFR		1,2,3,4,5

NOTES:

1. PROVIDE OUTDOOR UNIT WITH STAINLESS STEEL WEATHER HOOD.
2. PROVIDE OUTDOOR UNIT WITH STAINLESS STEEL WALL MOUNT KIT.
3. PROVIDE OUTDOOR UNIT WITH LOW AMBIENT KIT RATE FOR -3° F.
4. PROVIDE WITH WALL MOUNTED THERMOSTAT.

UNIT HEATER SCHEDULE – ELECTRIC									
SYMBOL	SERVICE	CFM	KW	VOLT/PHASE	HEATING BTU/H	MANUFACTURER	MODEL	WEIGHT LBS	NOTES
UH-1	METER ROOM	300	1.5	208V/1P	5100	REZNOR	EGW	20	1

NOTES:

1. PROVIDE WITH MANUFACTURES CEILING MOUNTING KIT

LOUVER SCHEDULE									
SYMBOL	SERVICE	CFM	SIZE WxH (IN.)	FREE AREA VEL. FRM	S.P. IN W.C.	FINISH	MANUFACTURER	MODEL	REMARKS
L-1	OUTSIDE AIR INTAKE	50	12x12	200	0.1	TYPE 2	RUSKIN	ELF375DX	

FINISH TYPE:
TYPE 1. MILL FINISH
TYPE 2. 215-R1 CLEAR ANODIZED
TYPE 3. BAKED ENAMEL FINISH ON PRETREATED PRIME PAINT. STANDARD COLOR - SELECTION BY OWNER
TYPE 4. BAKED ENAMEL FINISH ON PRIME COATED METAL. STANDARD COLOR - SELECTION BY OWNER
TYPE 5. DURANODIC BRONZE - LIGHT, MEDIUM, DARK
TYPE 6. PVDF (KYNAR 500, HYLAR 5000, OR DUANAR). STANDARD COLOR - SELECTION BY OWNER

4/22/2020 11:26:50 AM

C:_RevitStandards\ Revit Local Files\2019-23206900-H-Elec-Bldg_bthayer.rvt

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[illegible]

HVAC SCHEDULES

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

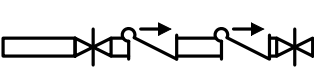
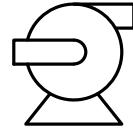
BACK COVE SOUTH
STORAGE FACILITY

JOB NO:	0232069.00
DATE:	APRIL 2020
SCALE:	AS NOTED
SHEET:	67 OF 104

H-302

60% DESIGN SUBMITTAL - NOT FOR CONSTRUCTION

PLUMBING GENERAL NOTES

	HOSE BIB OR WALL FAUCET
	WALL HYDRANT
	CHECK VALVE
	BALL VALVE
	BALANCING VALVE
	BUTTERFLY VALVE
	OS&Y VALVE
	STRAINER
	CONTROL VALVE
	RELIEF VALVE
	CIRCULATOR PUMP
	UNION
	CAMLOCK FITTING
	FLOW INDICATOR
	TO DRAIN
	NEEDLE VALVE
	PRESSURE REGULATOR
— G — G —	PROPOSED GAS PIPING
—	PROPOSED COLD WATER
— — — — —	PROPOSED HOT WATER
— — — — —	PROPOSED HOT WATER RE-CIRCULATION
— TW —	PROPOSED TEMPERED WATER
 —	PIPE TURNED UP
 —	PIPE TURNED DOWN
	PIPE BREAK (PIPE CONTINUES THOUGH NOT SHOWN)
— D —	PROPOSED DRAIN PIPING
— SW —	PROPOSED STORMWATER
— — — — —	PROPOSED ABOVE SLAB VENT PIPING
— — — — —	PROPOSED BELOW SLAB VENT PIPING
— CD —	PROPOSED CONDENSATE DRAIN LINE
	PROPOSED FLOOR DRAIN
	PROPOSED CLEANOUT
	BACK FLOW PREVENTOR
	WATER METER
	REDUCER
	PRESSURE / TEMP. GAUGE
	TRAP PRIMER
	WATER HAMMER ARRESTOR OF PDI SIZE REQUIRED
	WALL CLEANOUT
	CONNECT TO EXISTING
	CENTRIFUGAL PUMP
	DETAIL NO. SHEET NO. WHERE DETAIL IS LOCATED
	EQUIPMENT TAG EQUIPMENT NO.

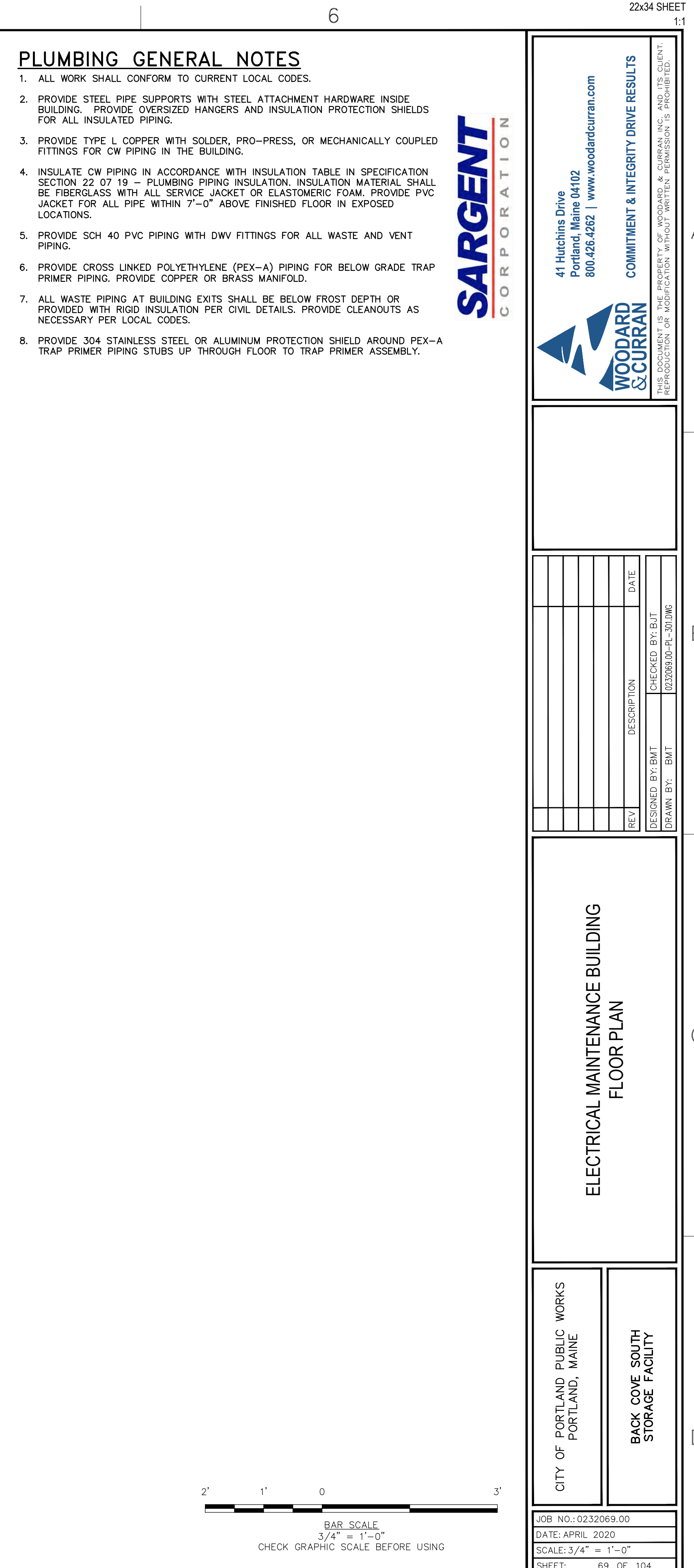
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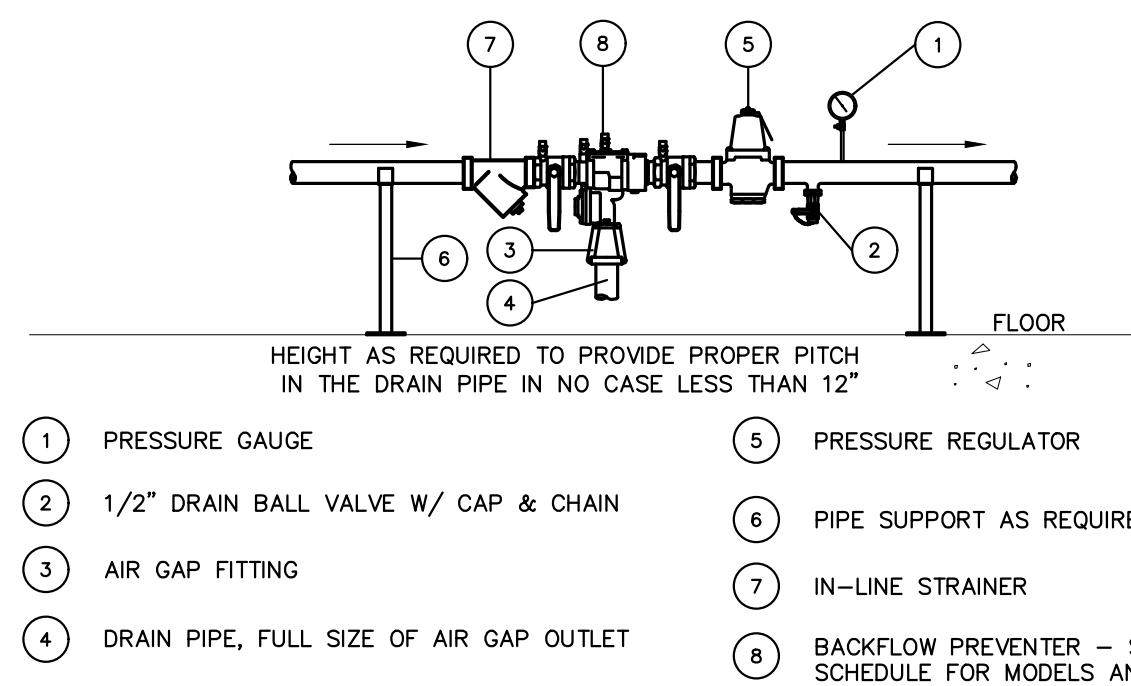
PLUMBING LEGEND AND GENERAL NOTES

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: NONE
SHEET: 68 OF 104

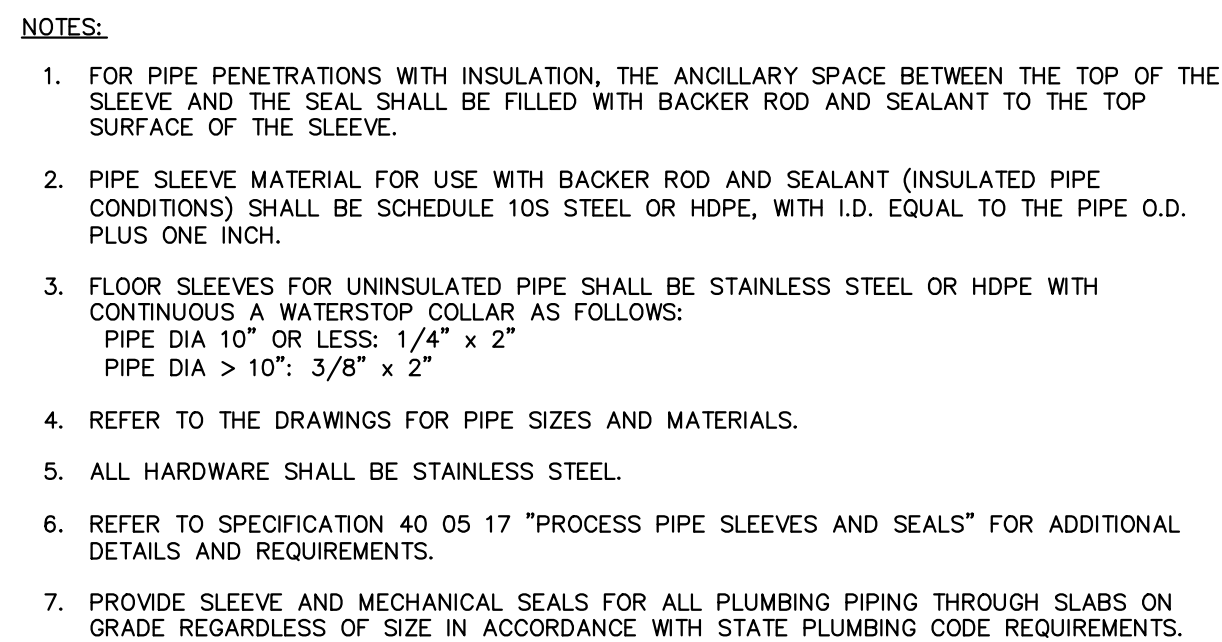
PL-001

60% DESIGN SUBMITTAL - NOT FOR CONSTRUCTION



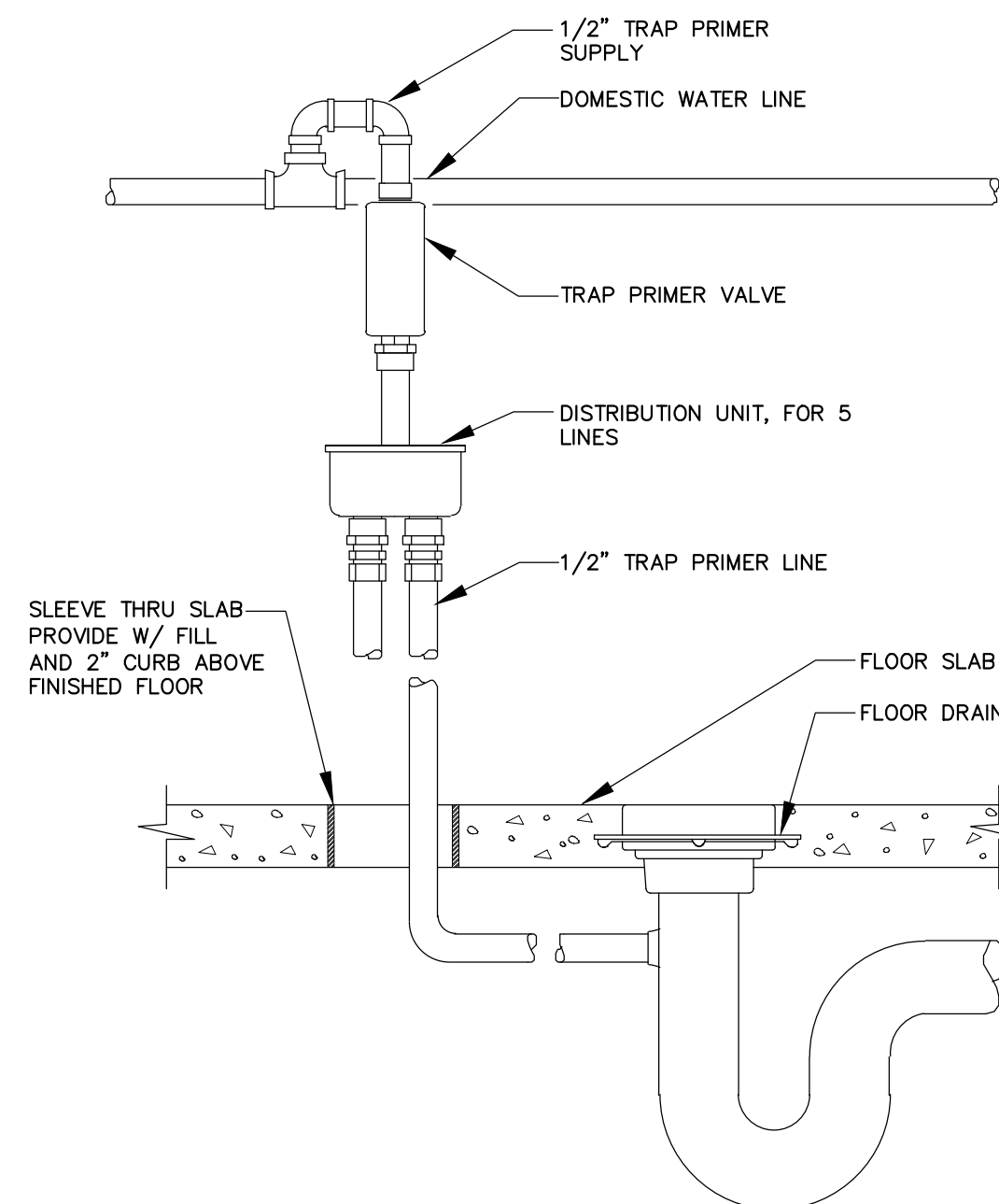


2 TYPICAL BACKFLOW PREVENTER DETAIL
- SCALE: NTS



NEW CONCRETE (PIPING SMALLER THAN 2")

SCALE: N.T.S.



SCALE: NTS

[illegible]

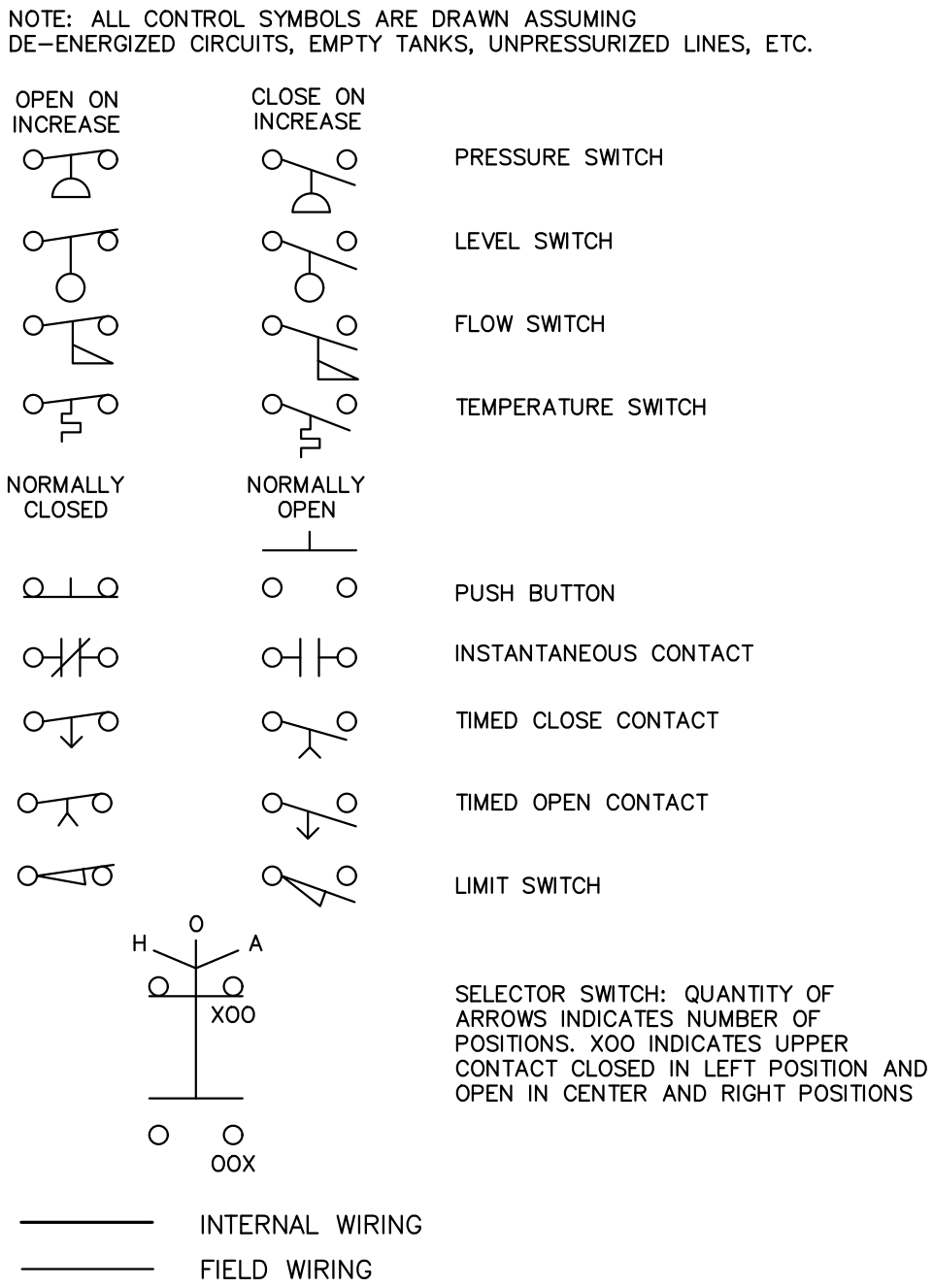
PLUMBING SCHEDULES AND DETAILS

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINEBACK COVE SOUTH
STORAGE FACILITY

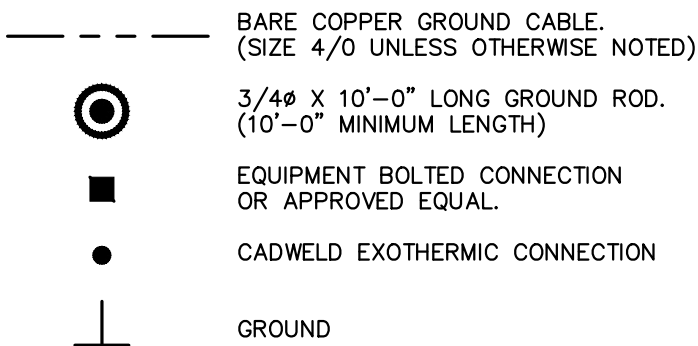
JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: NTS
SHEET: 70 OF 104

PL-302

CONTROL DIAGRAM SYMBOLS



ABBREVIATIONS

[illegible]

ECM	ELECTRIC METALLIC TUBING
FAM	FIRE ALARM ANNUNCIATOR
FAP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OTHERS
FUWE	FURNISHED WITH EQUIPMENT
G.C.	GENERAL CONTRACTOR
G.C.	GENERATOR
G.CND	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND
GH	HORSEPOWER
HZ	FREQUENCY IN CYCLES/SECOND
IG	ISOLATED GROUND
IMT	INTERMEDIATE METALLIC CONDUIT
JBOX	JUNCTION BOX
K	KILO
KCMIL	1000 CIRCULAR MILS
KVA	KILOVOLT AMPERE
KVAR	KILOVOLT AMPERE REACTIVE
KWATT	KILOWATT
KWH	KILOWATT HOUR
MCC	MOTOR CONTROL CENTER
MCB	MAIN CIRCUIT BREAKER
MFG	MANUFACTURER
MH	MANHOLE
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MT	MOTOR
MV	MEDIUM VOLTAGE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEUT	NEUTRAL
NO	NORMALLY OPEN
OL	OVERLOAD ELEMENT
PF	POWER FACTOR
PH	PHASE
PRI	PRIMARY
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
RGS	RIGID STEEL CONDUIT
RTD	RESISTANCE TEMPERATURE DETECTOR
SEC	SECONDARY
SS	STAINLESS STEEL
SV	SOLENOID VALVE
TEMP	TEMPERATURE
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYSP	TYPICAL
UE	UNDERGROUND ELECTRIC
UG	UNDERGROUND

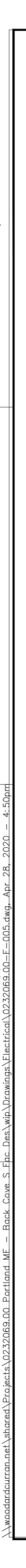
ELECTRICAL LEGEND

PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 71 OF 104

E-001



KEYED NOTES:

1. EXISTING ELECTRICAL SERVICE TO BE DEMOLISHED. COORDINATE EXTENSION AND RECONSTRUCTION OF EXISTING LOADS FROM NEW PANEL LP-2 TO THE NEW ELECTRICAL MAINTENANCE BUILDING.
2. POWER FOR EXISTING LOADS INCLUDING, BUT NOT LIMITED TO, LIGHTING AND CROSS-WALK SIGNALS TO BE DERIVED FROM NEW PANEL LP-2. ENSURE POWER TO ALL EQUIPMENT IS MAINTAINED THROUGH THE DURATION OF CONSTRUCTION.

[illegible]

ELECTRICAL DEMOLITION PLAN

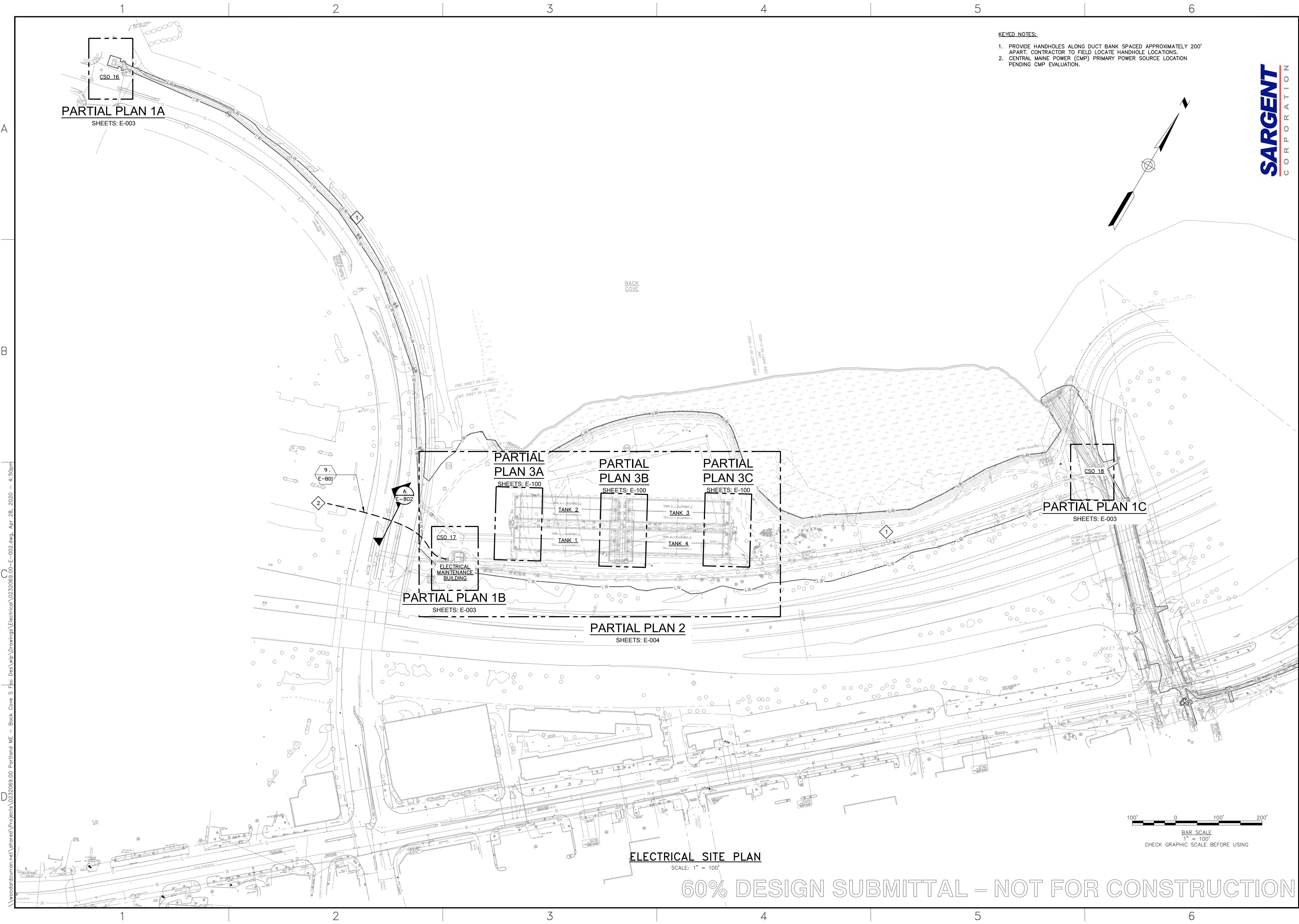
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.:0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 72 OF 104

E-005

60% DESIGN SUBMITTAL - NOT FOR CONSTRUCTION



- KEYED NOTES:
1. PROVIDE HANDHOLES ALONG DUCT BANK SPACED APPROXIMATELY 200' APART. CONTRACTOR TO FIELD LOCATE HANDHOLE LOCATIONS.
 2. CENTRAL MAINE POWER (CMP) PRIMARY POWER SOURCE LOCATION PENDING CMP EVALUATION.

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COMMITMENT & INTEGRITY DRIVE RESULTS

REV	DESCRIPTION	DATE

DESIGNED BY: SEH	CHECKED BY: AJF
DRAWN BY: SEH	0232069.00-E-002JWG

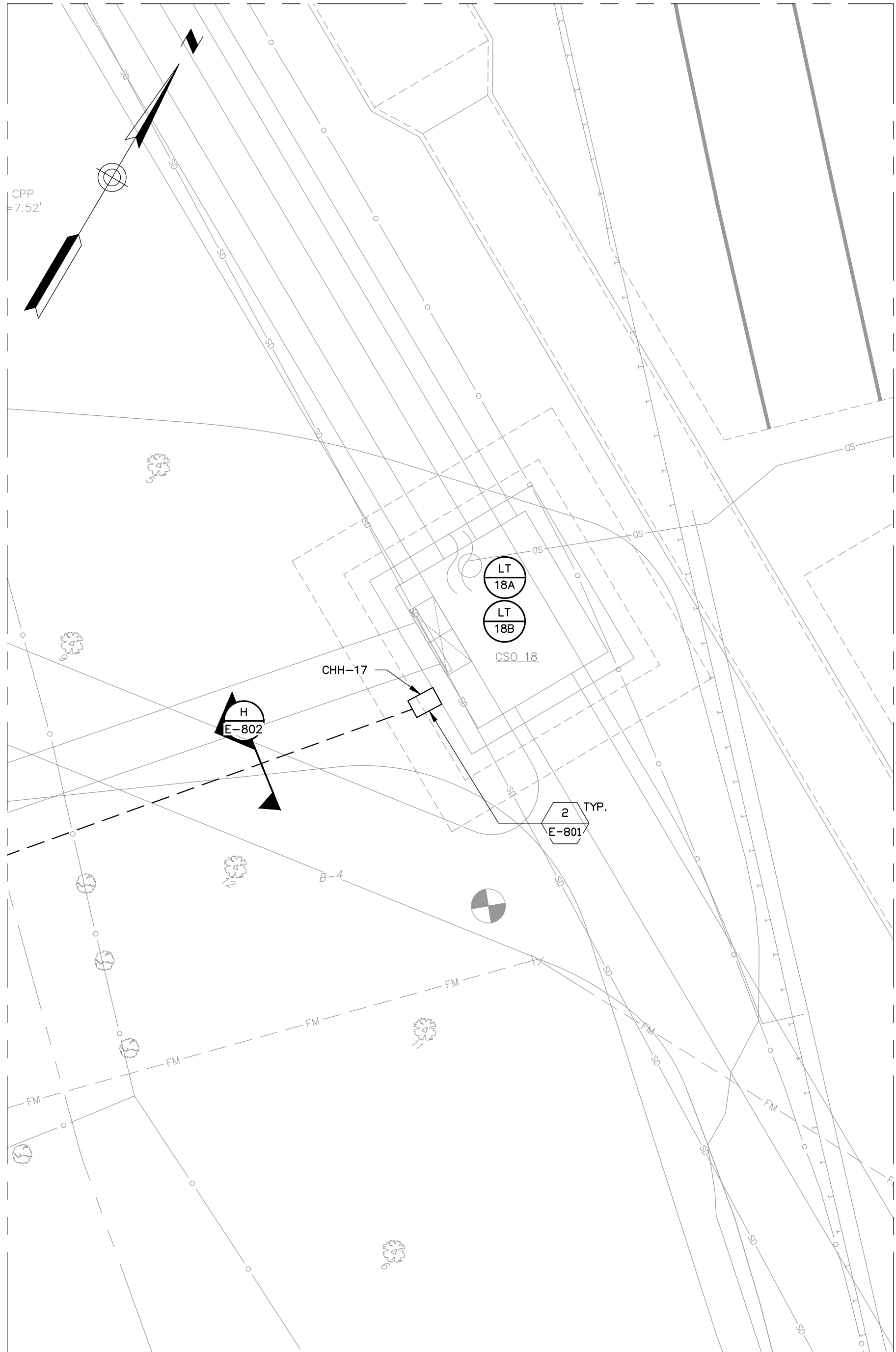
ELECTRICAL OVERALL SITE PLAN

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 73 OF 104

E-002



PARTIAL ELECTRICAL SITE PLAN 1C
CSO-18
SCALE: 1" = 10' 10'

60% DESIGN SUBMITTAL - NOT FOR CONSTRUCTION

- KEYED NOTES:**
1. PROVIDE (905A-6) HEAVY DUTY 4'X6' MANHOLE/ JUNCTION BOX IN ACCORDANCE WITH CENTRAL MAINE POWER REQUIREMENTS. REFERENCE ILLUSTRATION 34 FROM THE CMP HANDBOOK OF REQUIREMENTS FOR ELECTRIC SERVICE AND METER INSTALLATIONS.
 2. PROVIDE 7'X7' TRANSFORMER PAD IN ACCORDANCE WITH CENTRAL MAINE POWER REQUIREMENTS.

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COMMITMENT & INTEGRITY DRIVE RESULTS

CITY OF PORTLAND PUBLIC WORKS PORTLAND, MAINE	BACK COVE SOUTH STORAGE FACILITY
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E-003



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[illegible]

ELECTRICAL PARTIAL SITE PLAN 2

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH STORAGE FACILITY

JOB NO.: 0232069.00
 DATE: APRIL 2020
 SCALE: AS NOTED
 SHEET: 75 OF 104

E-004

ANCE BUILDING



	REV	DESCRIPTION	DATE
		DESIGNED BY: SEH	CHECKED BY: SEH
		DRAWN BY: SEH	0232089.00-E-060.DWG

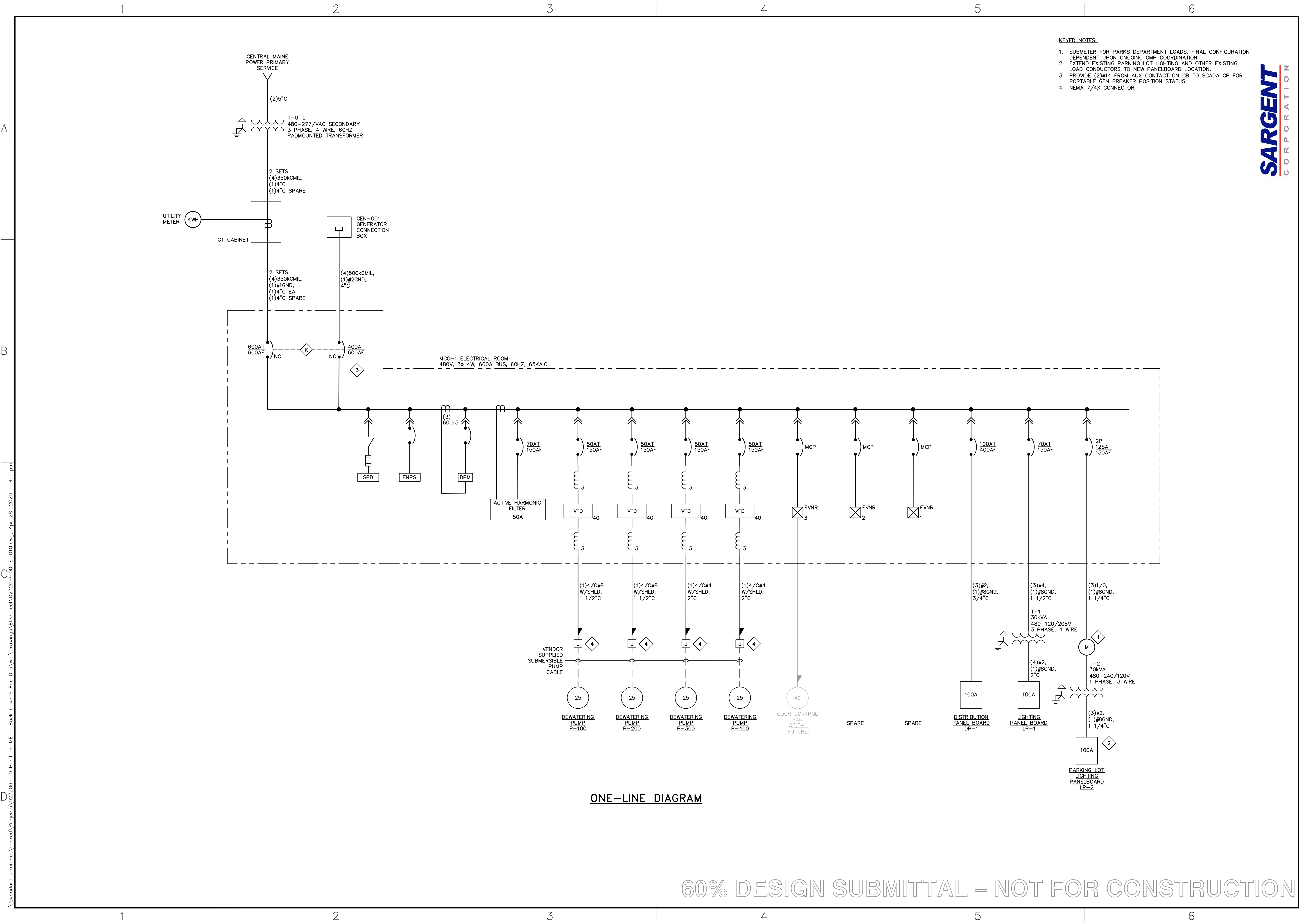
SITE GROUNDING PLAN

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.:0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 76 OF 104

E-050



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DATE

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DRAWN BY: SEH
DATE: 02/20/2020

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PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00

DATE: APRIL 2020

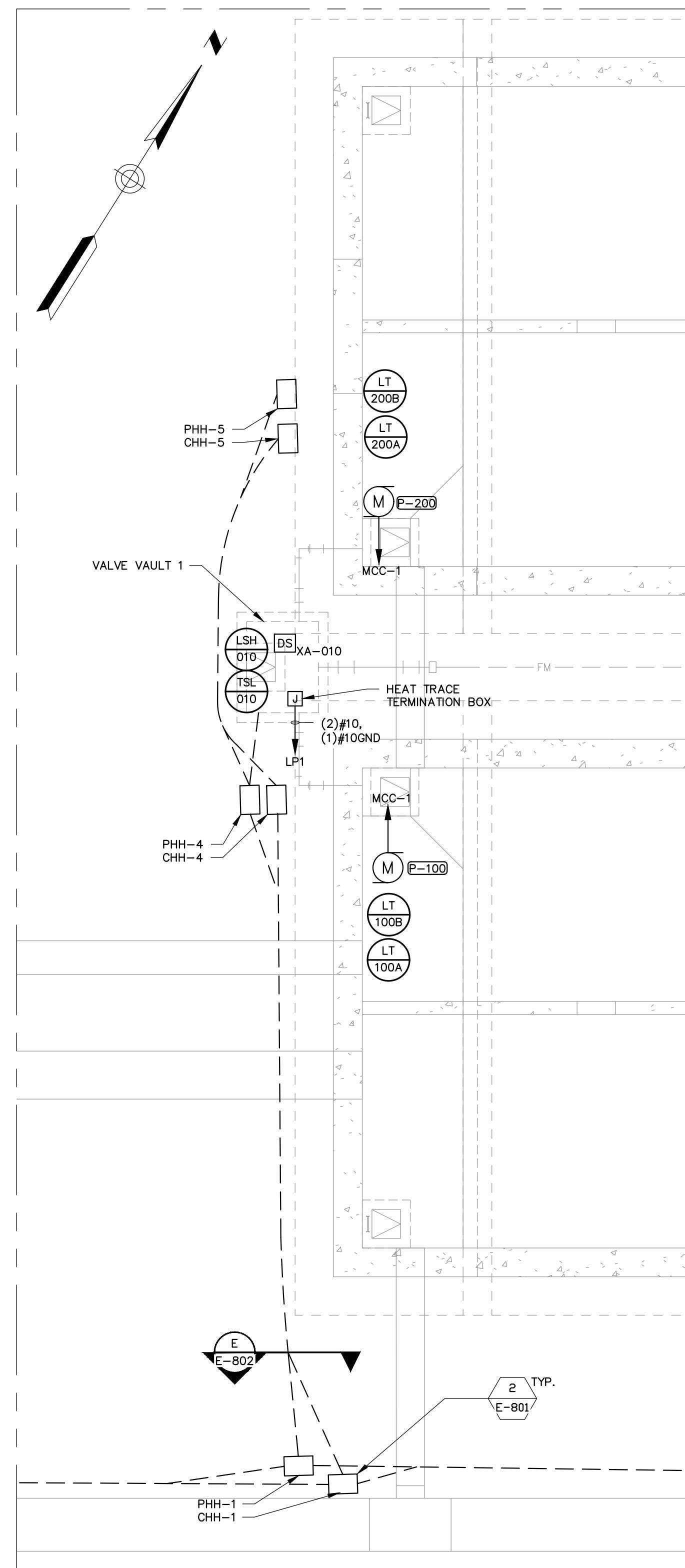
SCALE: AS NOTED

SHEET: 77 OF 104

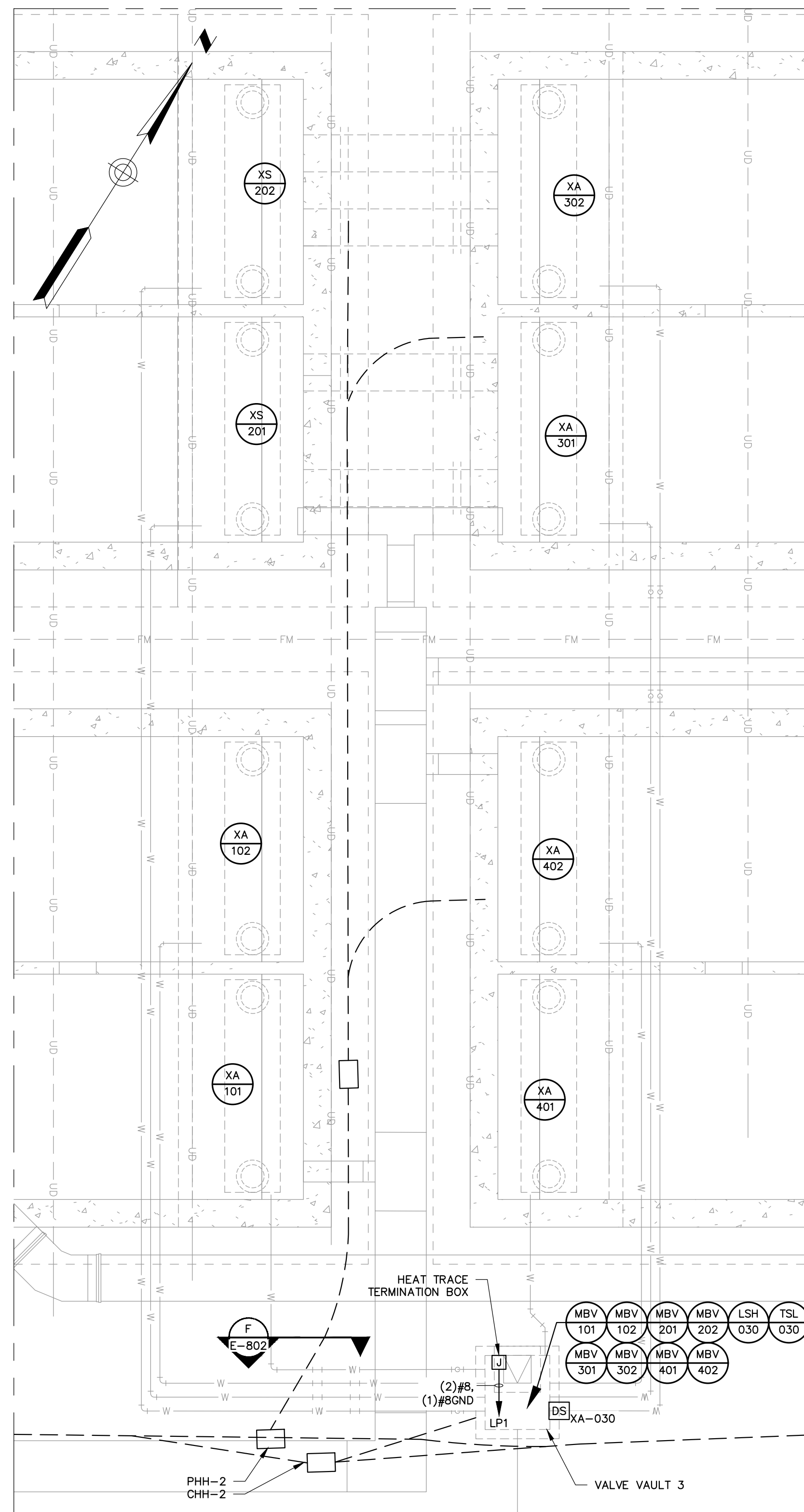
E-010

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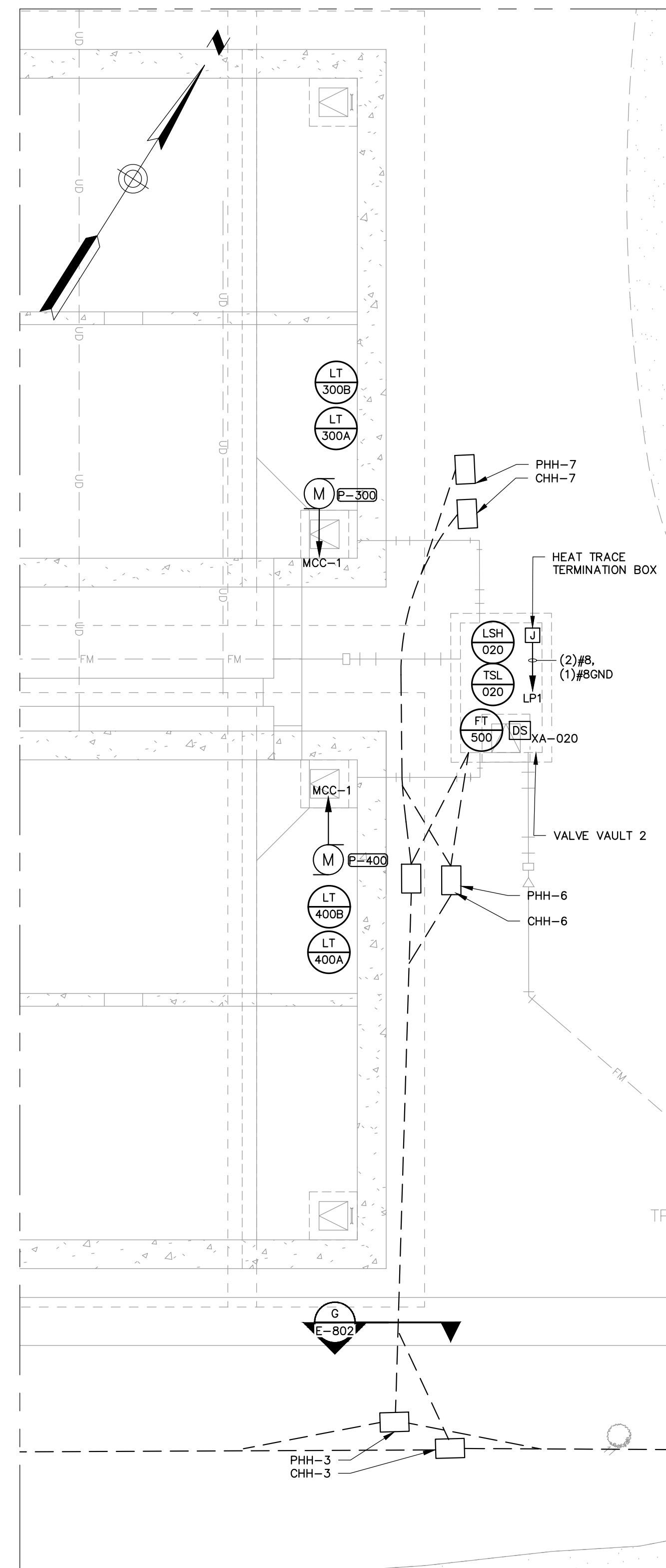
COMMITMENT & INTEGRITY DRIVE RESULTS



PARTIAL ELECTRICAL SITE PLAN 3A
WEST END OF TANKS AND
VALVE VAULT 1



PARTIAL ELECTRICAL SITE PLAN 3B
CENTER OF TANKS AND
VALVE VAULT 3



PARTIAL ELECTRICAL SITE PLAN 3C
EAST END OF TANKS AND
VALVE VAULT 2

GENERAL NOTES:

1. ALL ITEMS SHOWN WITH LIGHT DESIGNATION INDICATES EXISTING EXISTING.
2. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATES NEW WORK, UNLESS SPECIFICALLY INDICATED OTHERWISE.
3. ALL EQUIPMENT AND LOCATIONS ARE SHOWN DIAGRAMMATICALLY AND SHALL BE COORDINATED IN THE FIELD PRIOR TO INSTALLATION.
4. PRIMARY CMP SOURCE PENDING CENTRAL MAINE POWER EVALUATION.
5. REFER E-010 AND E-500 FOR CONDUIT AND CABLE REQUIREMENTS ASSOCIATED WITH EQUIPMENT NOT EXPLICITLY SHOWN THIS SHEET.

5. INTERIOR OF STORAGE TANKS IS A CLASS 1 DIVISION 1 HAZARDOUS LOCATION. VALVE VAULT 1 AND VALVE VAULT 2 ARE CLASS 1 DIVISION 2 HAZARDOUS LOCATIONS. ALL ELECTRICAL SHALL BE INSTALLED IN ACCORDANCE WITH NEC FOR HAZARDOUS LOCATIONS.

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[illegible]

TANK POWER AND CONTROLS PLAN 1

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 78 OF 104

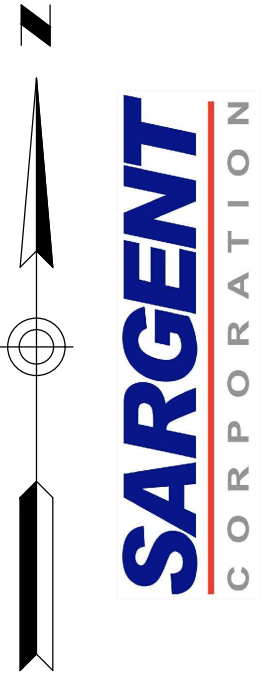
E-100

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\\woodardcurran.net\shared\Projects\0232069.00 Portland WE - Back Cove S File Des\vip Drawings\Electrical\0232069.00-E-101.dwg, Apr 28, 2020 - 4:51pm

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JOB NO.: 0232069.00

DATE: APRIL 2020

SCALE: AS NOTED

SHEET: 79 OF 104

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

E-101

TANK POWER AND CONTROLS PLAN 2

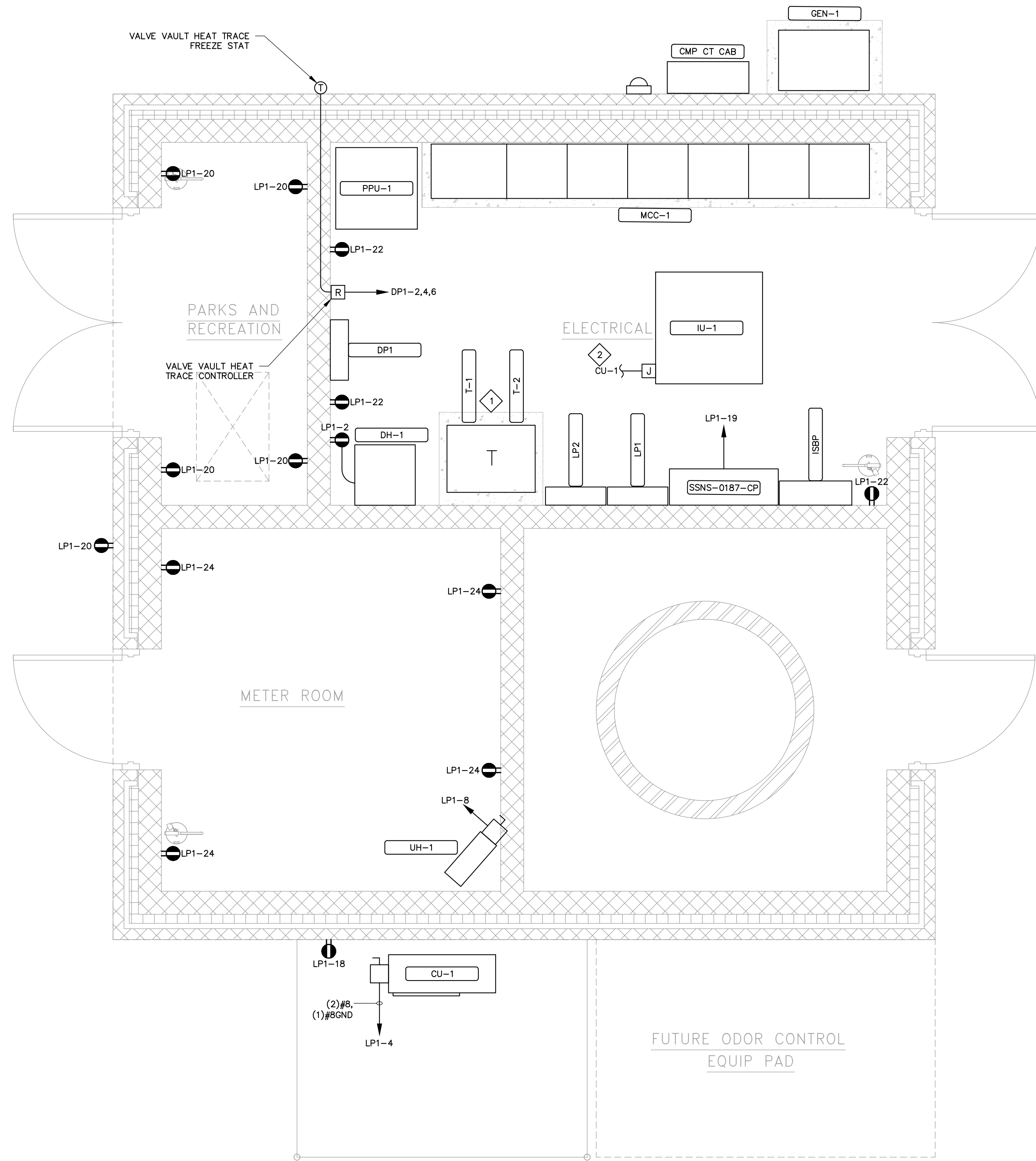
REV	DESCRIPTION	DATE
DESIGNED BY: SEH	CHECKED BY: AJF	
DRAWN BY: SEH		023069.00-E-101.DWG



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GENERAL NOTES:

1. ALL ITEMS SHOWN WITH BOLD DESIGNATION INDICATES NEW WORK, UNLESS OTHERWISE NOTED.
2. EQUIPMENT SHOWN IS PRELIMINARY AND DIAGRAMMATIC. CONTRACTOR SHALL COORDINATE AND FIELD VERIFY EXACT LOCATIONS PRIOR TO EXECUTION OF WORK.
3. REFERENCE ONE-LINE DIAGRAM FOR CONDUIT AND CABLE SIZES NOT LISTED ON THIS SHEET.

KEYED NOTES:

1. PROVIDE STEEL RACK ASSEMBLY TO ACCOMMODATE INSTALLATION OF TRANSFORMERS IN A STACKED CONFIGURATION.
2. PROVIDE MANUFACTURER REQUIRED CABLE BACK TO ASSOCIATED EXTERIOR MOUNTED CONDENSING UNIT.

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[illegible]

ELECTRICAL MAINTENANCE BUILDING POWER AND CONTROL PLAN

PORTLAND, MAINE

BACK COVE SOUTH STORAGE FACILITY

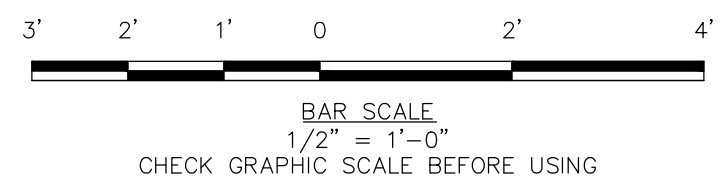
JOB NO.: 0232069.00
 DATE: APRIL 2020
 SCALE: AS NOTED
 SHEET: 80 OF 104

E-200

ELECTRICAL MAINTENANCE BUILDING
POWER AND CONTROL PLAN

SCALE: 1/2"=1'-0"

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D0232

SCALE: 1/2"=1'-0"

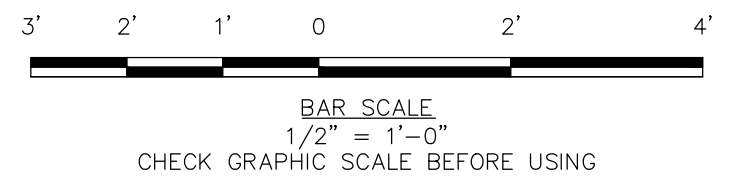
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三-201



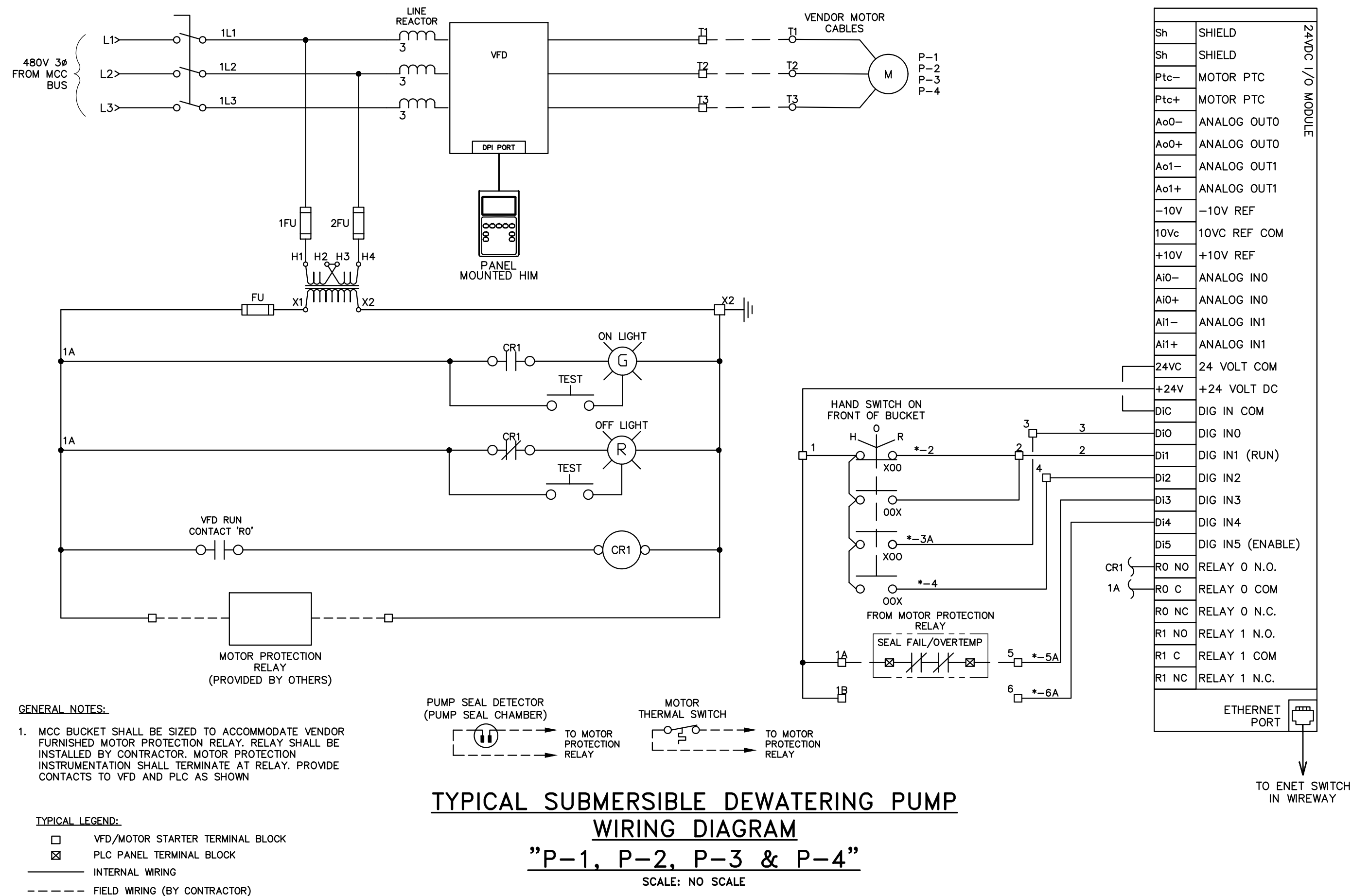


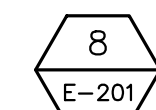
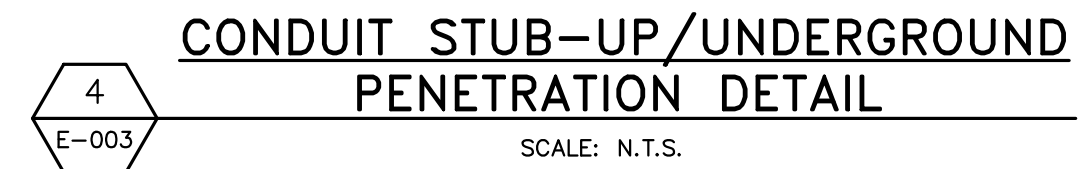
E-500

LIGHT FIXTURE SCHEDULE							
TYPE	MANUFACTURER	CATALOG NUMBER	TYPE	WATTAGE	VOLTAGE	MTG.	REMARKS/RECOMMENDATIONS
A	4" LED ENCLOSED AND GASKETED FIXTURE W/ MEDIUM LUMEN OUTPUT						
	COLUMBIA OR EQUAL	LXEM4-40ML-RFA-EJ-SSL	LED	47	120/277	SUSPENDED	
B	EXTERIOR WALL MOUNTED LED ENTRY LIGHT W/ TYPE IV DISTRIBUTION						
	HUBBELL OR EQUAL	LNC-7LU-3K-4-1	LED	17	120/277	WALL	COORDINATE MOUNTING HEIGHT WITH ARCHITECTURAL ELEVATIONS.
	LED EXIT SIGN W/ TEST SWITCH AND AC ON LIGHT						
	DUAL-LITE (OR EQUAL)	LXURWE	LED	3.8	120/277	WALL	PROVIDE SELF DIAGNOSTIC ELECTRONICS.
	EMERGENCY LIGHT W/ TEST SWITCH AND AC ON LIGHT						
	DUAL-LITE (OR EQUAL)	LZ30-03L	LED	1	120/277	WALL	PROVIDE WITH NUMBER OF HEADS AS INDICATED ON THE DRAWINGS. PROVIDE SELF DIAGNOSTIC ELECTRONICS.
	LED EXIT SIGN EMERGENCY LIGHT COMBO W/ TEST SWITCH AND AC ON LIGHT						
	DUAL-LITE (OR EQUAL)		LED		120/277	WALL	PROVIDE WITH NUMBER OF HEADS AS INDICATED ON THE DRAWINGS. PROVIDE SELF DIAGNOSTIC ELECTRONICS.

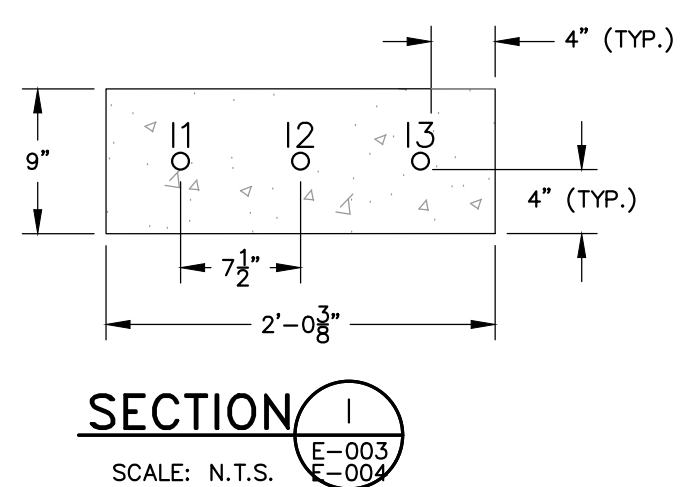
SCALE: NO SCALE

60% DESIGN SUBMITTAL - NOT FOR CONSTRUCTION





E-801



DUCT BANK SCHEDULE								
SECTION ID	CONDUIT ID	USE	SIZE	FROM	TO	VIA	DESCRIPTION	NOTES
A	A1	POWER	4"	UTILITY POLE	PADMOUNT TRANSFORMER	N/A	UTILITY PRIMARY	
	A2	POWER	4"	UTILITY POLE	PADMOUNT TRANSFORMER	N/A	UTILITY PRIMARY	
	A3	POWER	4"	UTILITY POLE	PADMOUNT TRANSFORMER	N/A	UTILITY PRIMARY	
B	B1	POWER	4"	PADMOUNT TRANSFORMER	MCC-1	CT CABINET	UTILITY SECONDARY	
	B2	POWER	4"	PADMOUNT TRANSFORMER	MCC-1	CT CABINET	UTILITY SECONDARY	
	B3	SPARE POWER	4"	PADMOUNT TRANSFORMER	MCC-1	CT CABINET	SPARE UTILITY SECONDARY	
	B4	SPARE POWER	4"	PADMOUNT TRANSFORMER	MCC-1	CT CABINET	SPARE UTILITY SECONDARY	
C	C1	INST	3/4"	ISBP	CSO-16	N/A	CSO-16 DISCRETE	
	C2	INST	3/4"	ISBP	CSO-16	N/A	CSO-16 ANALOG	
	C3	SPARE INST	3/4"	ISBP	CSO-16	N/A	CSO-16 SPARE	
	I1	INST	3/4"	ISBP	CSO-17	N/A	CSO-17 DISCRETE	
	I2	INST	3/4"	ISBP	CSO-17	N/A	CSO-17 ANALOG	
	I3	SPARE INST	3/4"	ISBP	CSO-17	N/A	CSO-17 SPARE	
D	D1	POWER	1"	LP-1	VALVE VAULT 3	CHH-1,CHH-2	VALVE VAULT 3 SUMP PUMP	
	D2	POWER	1"	SSNS-0187-CP	VALVE VAULT 3	CHH-1,CHH-2	MBV 101,102,201,202	
	D3	POWER	1"	SSNS-0187-CP	VALVE VAULT 3	CHH-1,CHH-2	MBV 301,302,401,402	
	D4	POWER	1-1/2"	LP-1	VALVE VAULT 3	CHH-1, CHH-2	VALVE VAULT 3 HEAT TRACE	
	D5	SPARE POWER	1"	LP-1	VALVE VAULT 3	CHH-1, CHH-2	SPARE POWER	
	E1	POWER	1-1/2"	MCC-1	P-100	PHH-1	TANK 1 DEWATERING PUMP	
	E2	POWER	1-1/2"	MCC-1	P-200	PHH-1	TANK 2 DEWATERING PUMP	
	E3	POWER	1"	LP-1	VALVE VAULT 1	PHH-1	VALVE VAULT 1 SUMP	
	E4	POWER	1-1/2"	DP-1	VALVE VAULT 1	PHH-1	VALVE VAULT 1 HEAT TRACE	
	E5	SPARE POWER	1-1/2"	ELECTRICAL BUILDING	VALVE VAULT 1	PHH-1	SPARE POWER	
	G1	POWER	2"	MCC-1	P-300	PHH-1, PHH-2, PHH-3	TANK 3 DEWATERING PUMP	
	G2	POWER	2"	MCC-1	P-400	PHH-1, PHH-2, PHH-3	TANK 4 DEWATERING PUMP	
	G3	POWER	1"	LP-1	VALVE VAULT 2	PHH-1, PHH-2, PHH-3	VALVE VAULT 2 SUMP	
	G4	POWER	1-1/2"	DP-1	VALVE VAULT 2	PHH-1, PHH-2, PHH-3	VALVE VAULT 2 HEAT TRACE	
	G5	SPARE POWER	2"	ELECTRICAL BUILDING	VALVE VAULT 2	PHH-1, PHH-2, PHH-3	SPARE POWER	
	H1	INST	3/4"	ISBP	CSO-18	CCH-1, CHH-2, CHH-3	CSO-18 DISCRETE	
	H2	INST	3/4"	ISBP	CSO-18	CCH-1, CHH-2, CHH-3	CSO-18 ANALOG	
	H3	SPARE INST	3/4"	ISBP	CSO-18	CCH-1, CHH-2, CHH-3	CSO-18 SPARE	
	G6	INST	2"	ISBP	VALVE VAULT 2	CCH-1, CHH-2, CHH-3	TK 3 & 4 AND VV-2 DISCRETE	
	G7	INST	2"	ISBP	VALVE VAULT 2	CCH-1, CHH-2, CHH-3	TK 3 & 4 AND VV-2 ANALOG	
	G8	SPARE INST	2"	ISBP	ADMIN BLDG CP-01	CCH-1, CHH-2, CHH-3	TK 3 & 4 AND VV-2 SPARE INST	
	F1	INST	1"	ISBP	TIPPING BUCKETS	CHH-1, CHH-2	TIPPING BUCKET POSITION	
	F2	INST	1"	ISBP	TIPPING BUCKETS	CHH-1,CHH-2	SPARE INST	
	E6	INST	2"	ISBP	VALVE VAULT 1	CHH-1	VV-1 DISCRETE	
E7	INST	2"	ISBP	VALVE VAULT 1	CHH-1	TANK 1 & 2 ANALOG		
E8	SPARE INST	2"	ISBP	VALVE VAULT 1	CHH-1	TANK 1 & 2 AND VV-1 SPARE INST		
D6	INST	2"	CP-01	VALVE VAULT 3	CHH-1,CHH-2	VALVE VAULT 3 DISCRETE		
D7	INST	2"	CP-01	VALVE VAULT 3	CHH-1,CHH-2	VALVE VAULT 3 ANALOG		
D8	SPARE INST	2"	CP-01	VALVE VAULT 3	CHH-1,CHH-2	SPARE INST		
E	E1	POWER	1-1/2"	MCC-1	P-100	PHH-1	TANK 1 DEWATERING PUMP	
	E2	POWER	1-1/2"	MCC-1	P-200	PHH-1	TANK 2 DEWATERING PUMP	
	E3	POWER	1"	LP-1	VALVE VAULT 1	PHH-1	VALVE VAULT 1 SUMP	
	E4	POWER	1-1/2"	DP-1	VALVE VAULT 1	PHH-1	VALVE VAULT 1 HEAT TRACE	
	E5	SPARE POWER	1-1/2"	ELECTRICAL BUILDING	VALVE VAULT 1	PHH-1	SPARE POWER	
	E6	INST	2"	ISBP	VALVE VAULT 1	CHH-1	VV-1 DISCRETE	
	E7	INST	2"	ISBP	VALVE VAULT 1	CHH-1	TANK 1 & 2 ANALOG	
	E8	SPARE INST	2"	ISBP	VALVE VAULT 1	CHH-1	TANK 1 & 2 AND VV-1 SPARE INST	
F	F1	INST	1"	ISBP	TIPPING BUCKETS	CHH-1,CHH-2	TIPPING BUCKET POSITION	
	F2	INST	1"	ISBP	TIPPING BUCKETS	CHH-1,CHH-2	SPARE INST	
G	G1	POWER	2"	MCC-1	P-300	PHH-1, PHH-2, PHH-3	TANK 3 DEWATERING PUMP	
	G2	POWER	2"	MCC-1	P-400	PHH-1, PHH-2, PHH-3	TANK 4 DEWATERING PUMP	
	G3	POWER	1"	LP-1	VALVE VAULT 2	PHH-1, PHH-2, PHH-3	VALVE VAULT 2 SUMP	
	G4	POWER	1-1/2"	DP-1	VALVE VAULT 2	PHH-1, PHH-2, PHH-3	VALVE VAULT 2 HEAT TRACE	
	G5	SPARE POWER	2"	ELECTRICAL BUILDING	VALVE VAULT 2	PHH-1, PHH-2, PHH-3	SPARE POWER	
	G6	INST	2"	ISBP	VALVE VAULT 2	CCH-1, CHH-2, CHH-3	TK 3 & 4 AND VV-2 DISCRETE	
	G7	INST	2"	ISBP	VALVE VAULT 2	CCH-1, CHH-2, CHH-3	TK 3 & 4 AND VV-2 ANALOG	
	G8	SPARE INST	2"	ISBP	ADMIN BLDG CP-01	CCH-1, CHH-2, CHH-3	TK 3 & 4 AND VV-2 SPARE INST	
H	H1	INST	3/4"	ISBP	CSO-18	CCH-1, CHH-2, CHH-3	CSO-18 DISCRETE	
	H2	INST	3/4"	ISBP	CSO-18	CCH-1, CHH-2, CHH-3	CSO-18 ANALOG	
	H3	SPARE INST	3/4"	ISBP	CSO-18	CCH-1, CHH-2, CHH-3	CSO-18 SPARE	
I	I1	INST	3/4"	ISBP	CSO-17	N/A	CSO-17 DISCRETE	
	I2	INST	3/4"	ISBP	CSO-17	N/A	CSO-17 ANALOG	
	I3	SPARE INST	3/4"	ISBP	CSO-17	N/A	CSO-17 SPARE	

TAG NAME:	LT-16B	LT-16A	-	-	-
MANUFACTURER:	BLUE RIBBON	ENDRESS HAUSER	-	-	-
MODEL NUMBER:	BC001-004	MICROPILOT FMR20-CBPBNVCEXR01+R8	-	-	-
CALIBRATION:	24 VDC	24 VDC	-	-	-
RANGE DATA:	0-36.4 FT	0-11 FT	-	-	-
OTHER INFORMATION:	LOOP POWERED, 4-20mA	LOOP POWERED, 4-20mA	-	-	-

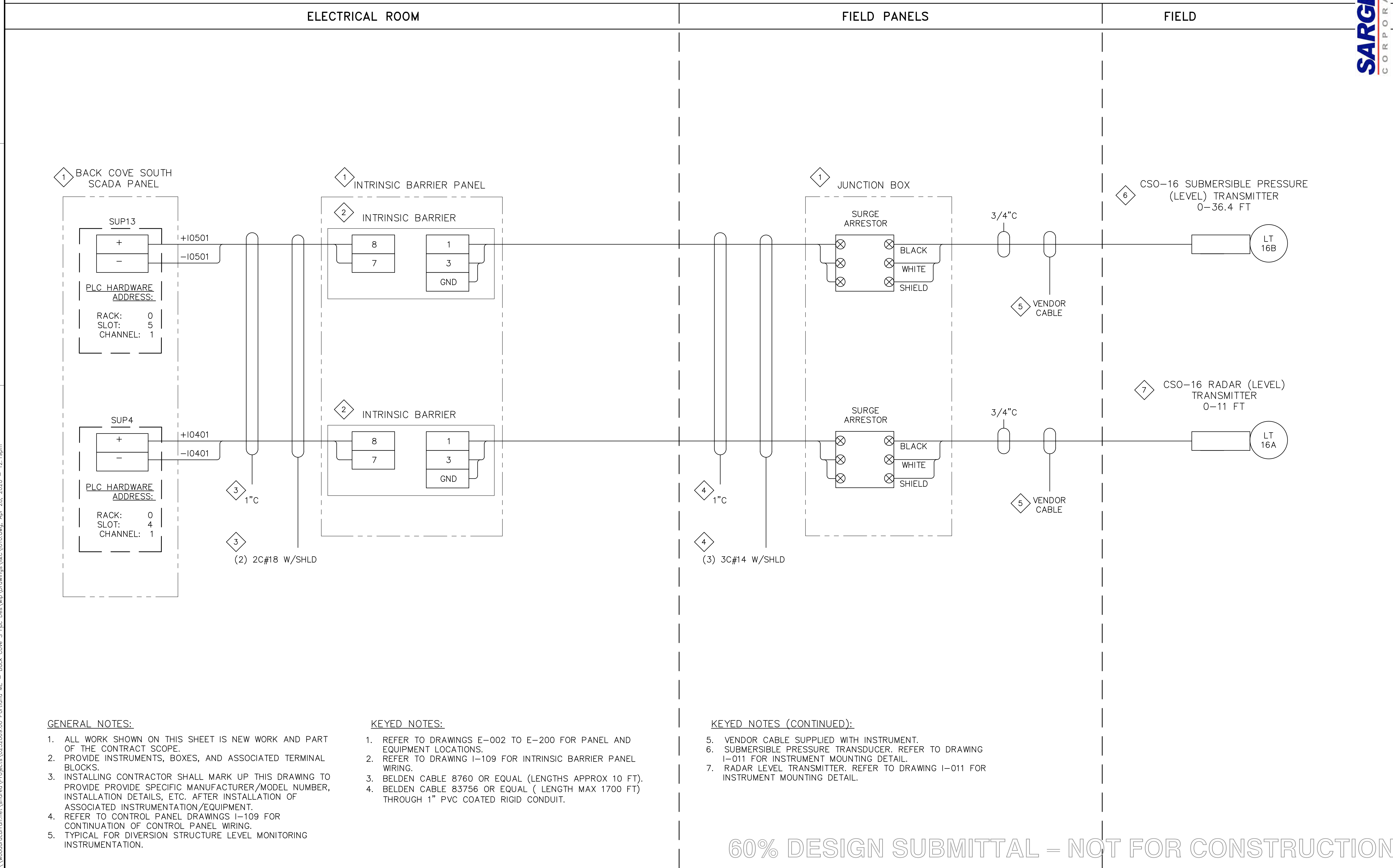
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INSTRUMENTATION & CONTROLS
DETAIL SHEET 1

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINEBACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: NTS
SHEET: 89 OF 104

I-010



GENERAL NOTES:

- KEYED NOTES:

- KEYED NOTES:

- 0% DESIGN SUBMITTAL – NOT FOR CONSTRUCTION



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BACK COVE SOUTH
STORAGE FACILITY

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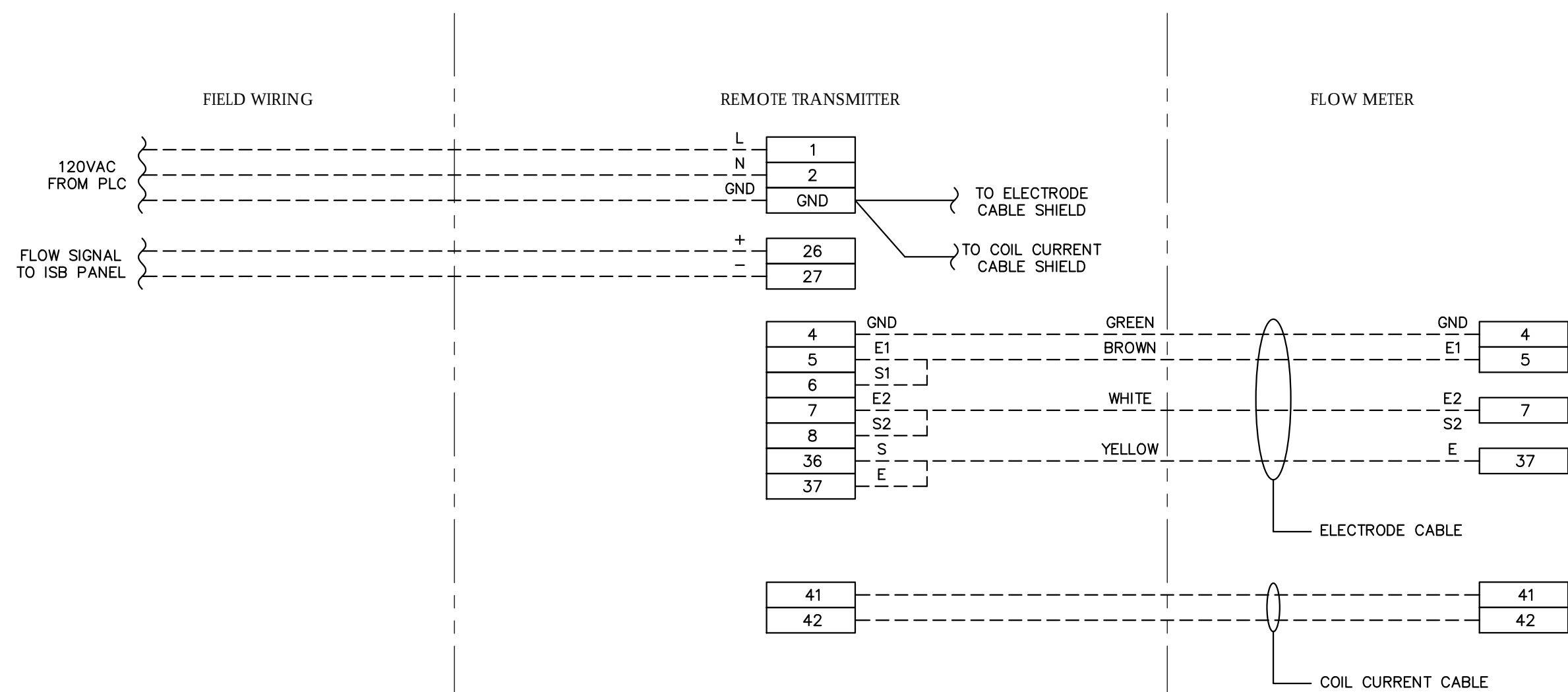
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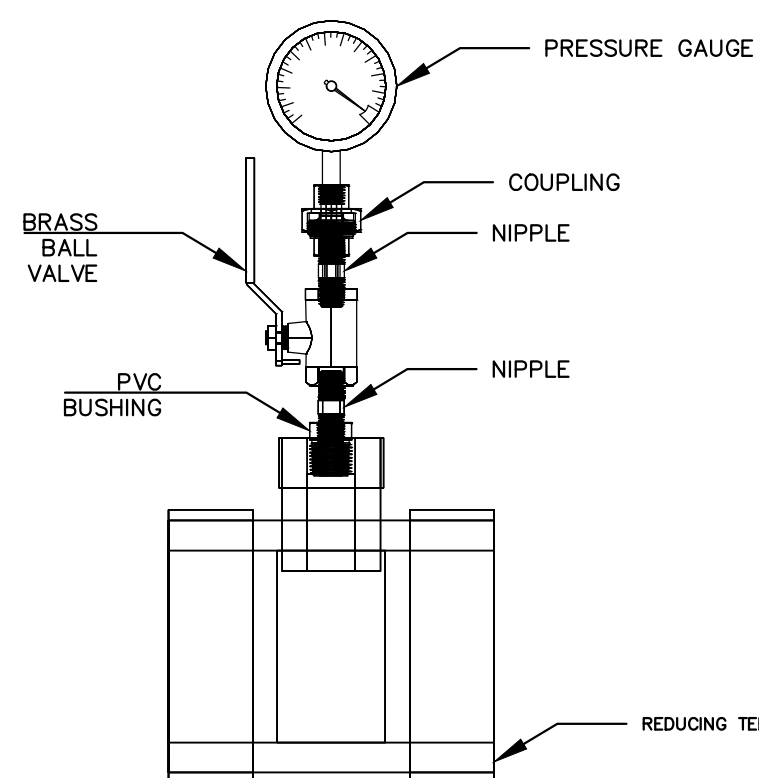
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PRESSURE GAUGE INSTALLATION DIAGRAM



The diagram illustrates the 100 Series Ultrasonic Flowmeter. The side view on the left shows a horizontal pipe with flow direction indicated by an arrow labeled 'FLOW'. The flowmeter is mounted on the pipe. Callout 1 points to the central processing unit, callout 2 points to the sensor electrodes on the pipe, callout 3 indicates the distance from the pipe centerline to the sensor electrodes, and callout 4 points to the transducer unit. The top view on the right shows the circular sensor electrodes and the transducer unit. Callout 5 points to the sensor electrodes.

- KEYED NOTES:**
1. THE SENSOR SHOULD BE MOUNTED SO THAT THE ARROW POINTS IN THE DIRECTION OF PROCESS FLOW.
 2. HORIZONTAL INSTALLATION SHOULD BE RESTRICTED TO LOW PIPING SECTIONS THAT ARE NORMALLY FULL.
 3. INSTALL MAG FLOW SENSOR WITH MINIMUM LENGTHS OF STRAIGHT PIPE EQUAL TO 5X PIPE DIAMETER AT THE INLET & 2X PIPE DIAMETER AT THE OUTLET.
 4. **GROUNDING NOTES:**
 - 4.1. METER BODY SHALL BE CONNECTED TO EARTH GROUND POTENTIAL
 - 4.2. GROUND RINGS OR GROUNDED ELECTRODES ARE REQUIRED IF THE ADJACENT PIPING IS LINED OR MADE OF A NON-CONDUCTIVE MATERIAL
 - 4.3. CONTRACTOR SHALL VERIFY ZERO POTENTIAL BETWEEN GROUNDING RINGS, FLOWTUBE, AND TRANSMITTER GROUND TERMINAL.
 5. HORIZONTAL INSTALLATIONS REQUIRE THE ELECTRODES TO BE POSITIONED ALONG THE HORIZONTAL CENTERLINE OF THE PIPE.
 6. CLASS 1 DIV II APPLICATIONS REQUIRE SEPARATE CONDUIT FOR FLOWTUBE COIL CABLE & ELECTRODE CABLE.

- GENERAL NOTES:
1. REMOTE MOUNTED TRANSMITTERS SHALL BE INSTALLED IN LOCATION AND LEVEL TO FACILITATE EASE OF OPERATOR VIEWING AND OUT OF FLOOD ZONE.
 2. REMOTE MOUNTED TRANSMITTER OPTIONS INCLUDE WALL MOUNTED UNITS AND FIELD MOUNTED UNITS.
 3. REMOTE MOUNTED TRANSMITTERS ARE SHIPPED WITH A MOUNTING BRACKET AND MAY BE MOUNTED TO A PIPE UP TO 2" DIAMETER OR TO A FLAT SURFACE.
 4. THE MOUNTING SITE FOR THE TRANSMITTER SHOULD PROVIDE ENOUGH ROOM FOR SECURE MOUNTING, EASY ACCESS TO CONDUIT ENTRIES, FULL OPENING OF THE TRANSMITTER COVER, & EASY READABILITY OF THE LOCAL OPERATOR INTERFACE (LOI).
 5. TRANSMITTERS CAN BE ORDERED WITH 1/2-14 NPT OR M20 FEMALE THREADED CONDUIT ENTRIES.
 6. CONDUIT CONNECTIONS SHOULD BE MADE IN ACCORDANCE WITH NATIONAL, LOCAL, AND PLANT ELECTRIC CODES.
 7. UNUSED CONDUIT ENTRIES SHOULD BE SEALED WITH THE APPROPRIATE CERTIFIED PLUGS.
 8. DIGITAL SIGNALING OUTPUT CABLES SHOULD NOT RUN IN SAME CONDUIT AS INCOMING POWER CABLES.

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INSTRUMENTATION & CONTROLS
DETAIL SHEET 3

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: NTS
SHEET: 91 OF 104

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FIELD NOTES

- 1) INCLUDE A DRAWING POCKET INSIDE THE PANEL LARGE ENOUGH TO STORE A COMPLETE SET OF SYSTEM DIAGRAMS, AND DRAWINGS.
- 2) ANALOG CABLES: 2-CONDUCTOR WITH SHIELD. BELDEN #8760 OR EQUAL.
- 3) LEAVE FREE SPACE ABOVE PLC FOR VENTILATION.
- 4) IDENTIFY ALL WIRES AS SPECIFIED BY THE NATIONAL ELECTRICAL CODE HANDBOOK AND THE FOLLOWING:

POWER DISTRIBUTION WIRES.....BLACK
NEUTRAL WIRES.....WHITE
AC CONTROL CIRCUIT WIRES.....RED
DC CONTROL CIRCUIT WIRES.....BLUE
DC COMMON WIRES.....WHITE W/BUE STRIPE
GROUND WIRES.....GREEN W/YELLOW STRIPE
WIRES THAT MAY REMAIN.....ORANGE
ENERGIZED WHEN THE MAIN
DISCONNECT IS IN THE OFF
POSITION
- 5) SIZE ALL WIRE IN ACCORDANCE WITH NEC CODES. SINGLE CONDUCTORS: STRANDED COPPER WITH THWN INSULATION, RATED FOR 600 VAC, AND UL LISTED AS MTW, UNLESS NOTED OTHERWISE. MINIMUM CONDUCTOR SIZE: #14AWG. #16 AWG MAY BE USED ONLY FOR THE INDIVIDUAL WIRES CONNECTING DIRECTLY TO AN I/O TERMINAL ON THE PLC SWING ARM. THE HOT AND NEUTRAL CONDUCTOR SUPPLYING EACH SWING ARM SHALL REMAIN #14 AWG. GROUND CONDUCTOR SIZE: AS INDICATED ON THE DRAWINGS. WHERE NOT INDICATED, THEY SHALL BE #14 AWG OR LARGER.
- 6) BOND PLC CHASSIS, PANEL DOORS, SIDE PANELS, BACK PANELS AND GROUND BUS TOGETHER WITH WIRES SIZED AS SHOWN ON THE DRAWING.
- 7) TAG ALL WIRES AT EVERY TERMINATION POINT. SHORT WIRE LENGTHS, (LESS THAN 8") WHERE THE ENTIRE CONDUCTOR IS VISIBLE MAY BE TAGGED AT JUST ONE END. WIRE LABELS FOR WIRES SMALLER THAN NO. 4. SHALL BE VINYL, SELF ADHESIVE, WRAPAROUND, WITH MACHINE PRINTED NUMBERS AND LETTERS. WIRE SIZES NO. 4 AND LARGER AND MULTI CONDUCTOR CABLES SHALL BE MARKED WITH ONE-PIECE, NYLON LOCKING MACHINE PRINTED MARKER TIES EQUAL TO PANDUIT PLM SERIES. WIRE TAG NUMBER SHALL BE AS INDICATED ON THE DRAWINGS
- 8) DO NOT ROUTE ANY COMMUNICATION CABLES IN WIREWAYS WITH 120 VAC WIRING. ROUTE ALL THESE CABLES AWAY FROM 120 VAC WIRING. WHERE 120 VAC CONDUCTORS MUST BE CROSSED, DO SO AT RIGHT ANGLES AND PROVIDE AT LEAST 1" SEPARATION.
- 9) CONNECT NO MORE THAN TWO WIRES TO ANY ONE TERMINAL. PROVIDE TERMINAL BLOCKS WITH A SAFETY COVER OR BE FINGER SAFE TO PROTECT PERSONNEL FROM SHOCK. MOUNT ALL TERMINAL BLOCKS ON DIN RAILS. SUPPLY ALL HARDWARE NEEDED TO PROVIDE A COMPLETE TERMINAL STRIP ASSEMBLY, INCLUDING BUT NOT LIMITED TO: MISCELLANEOUS SEPARATORS, TOP JUMPER BARS, SIDE JUMPER BARS, MACHINE PRINTED TERMINAL BLOCK TAGS, FASTENERS, BRACKETS FOR RAISING 35MM RAIL, ETC
- 10) RAISE AND CENTER ALL TERMINAL STRIPS SET BETWEEN WIRE WAYS TO FACILITATE WIRING, UNLESS OTHERWISE NOTED. PROVIDE A MINIMUM OF 1-1/2 INCH BETWEEN TERMINALS AND WIRE WAY ON BOTH SIDES OF TERMINAL STRIP. INSTALL END BARRIERS FOR EACH STYLE OF TERMINAL. INSTALL END STOPS ON EACH SECTION OF TERMINALS OR RELAYS. USE MACHINE PRINTED TAGS TO MARK TERMINAL STRIPS. WHEREVER POSSIBLE, MAKE ALL TERMINAL BLOCK CONNECTIONS FOR THE PANEL WIRING ON THE TOP OR RIGHT SIDE OF THE TERMINAL STRIP AND LEAVE THE BOTTOM OR LEFT SIDE FREE FOR FIELD TERMINATIONS, UNLESS NOTED OTHERWISE.
- 11) PROVIDE ENGRAVED PLASTIC NAMEPLATES. EITHER PAINT FILLED ENGRAVINGS OR 2 COLOR LAMINATIONS ARE ACCEPTABLE.
- 12) ALL OPERATOR CONTROL DEVICES (BUTTONS, SWITCHES, METERS, DISPLAYS, ETC.) SHALL HAVE NAMEPLATES.
- 13) PROVIDE A SET OF AS-BUILT DRAWINGS WITH THE PANEL. THESE SHALL BE COMPLETE, ALLOWING ENGINEER TO PRODUCE A SET OF "RECORD" DRAWINGS SHOWING ALL WIRE NUMBERS WITHIN THE PANEL AND THE DEVICE TERMINAL NUMBERS TO WHICH THEY CONNECT. REQUIRED INFORMATION SHALL INCLUDE BUT NOT BE LIMITED TO:
 - A. ALL WIRE TAG NUMBERS.
 - B. TERMINAL CONNECTION POINTS FOR POWER AND NEUTRAL FEEDS.
 - C. ANY DEVIATIONS FROM THE EQUIPMENT LOCATIONS SHOWN ON THE DRAWINGS. PRIOR APPROVAL SHOULD BE OBTAINED BEFORE MAKING SUCH CHANGES.
- 14) SAVE ALL MATERIAL DATA SHEETS AND LITERATURE. WHERE PRODUCT DATA IS PROVIDED ON THE PACKAGE, MAKE A CLEAR COPY OF THE DATA AND INCLUDE WITH OTHER DATA SHEETS. INCLUDE ALL THIS MATERIAL WITH THE PANEL DURING DELIVERY.
- 15) EQUIPMENT LOCATIONS SHALL BE AS SHOWN ON THE DRAWINGS. THE PANEL BUILDER SHALL NOTIFY ENGINEER OF ANY PHYSICAL CONFLICTS OR OTHER PROBLEMS THAT COULD CAUSE PROBLEMS WITH THE INSTALLATION OR OPERATION OF THE PANEL BEFORE ASSEMBLING THE PANEL. RESOLUTION OF SUCH CONFLICTS SHALL BE APPROVED BY ENGINEER PRIOR TO PANEL ASSEMBLY.
- 16) PROVIDE ALL EQUIPMENT AS SHOWN ON THE BILL OF MATERIALS INCLUDED IN THIS DRAWING PACKAGE. SUBMIT ANY DEVIATION FROM THE BILL OF MATERIALS FOR APPROVAL IN WRITING PRIOR TO FABRICATION.

- 4) SIZE ALL WIRES IN ACCORDANCE WITH NEC CODES. SINGLE CONDUCTORS SHALL BE STRANDED COPPER WITH THWN INSULATION, RATED FOR 600 VAC, AND UL LISTED AS MTW, UNLESS NOTED OTHERWISE. MINIMUM CONDUCTOR SIZE SHALL BE #14 AWG. GROUND CONDUCTOR SIZE SHALL BE AS INDICATED ON THE DRAWINGS. WHERE NOT INDICATED, IT SHALL BE #14 AWG OR LARGER.
- 5) LOCATE CONDUIT ENTRIES INTO ENCLOSURES TO ASSURE ADEQUATE WIRE BENDING SPACE. ROUTE WIRING SO THAT DOOR MOUNTED EQUIPMENT WILL NOT INTERFERE WITH IT WHEN THE DOOR IS CLOSED.
- 6) LOCATE INTRINSICALLY SAFE WIRING CONDUIT ENTRIES INTO ENCLOSURE AS CLOSE AS POSSIBLE TO THE WIREWAY PROVIDED FOR INTRINSICALLY SAFE FIELD WIRING SO THAT ALL INTRINSIC WIRING IS ISOLATED (AT LEAST 2") FROM ALL OTHER FIELD AND PANEL WIRING AND SECURED. ROUTE INTRINSICALLY SAFE FIELD WIRING THROUGH THE WIREWAY PROVIDED EXCLUSIVELY FOR INTRINSICALLY SAFE WIRING. ALL WIRING SHALL BE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE ARTICLE 504. OTHER APPLICABLE ARTICLES INCLUDE 501 & 515.
- 7) ENGINEER HAS IDENTIFIED AS MANY OF THE PLC INPUTS AND OUTPUTS AS POSSIBLE THAT WILL BE NEEDED TO MAKE THE CONTROL PROGRAM OPERATE AS REQUIRED. ADDITIONAL I/O MAY BE IDENTIFIED WHEN THE CONTROL PROGRAM IS WRITTEN AND REQUIRE WIRING. THESE SHALL BE CONSIDERED PART OF THESE SHOP DRAWINGS. THE INSTALLING CONTRACTOR SHALL INSTALL 10% SPARE CONDUCTORS TERMINATED ON TERMINAL BLOCKS ON BOTH ENDS TO MEET ADDITIONAL I/O REQUIREMENTS.
- 8) TAG ALL WIRES AT EVERY TERMINATION POINT. SHORT WIRE LENGTHS, (LESS THAN 8") WHERE THE ENTIRE CONDUCTOR IS VISIBLE MAY BE TAGGED AT JUST ONE END. WIRE LABELS FOR WIRES SMALLER THAN NO. 4, SHALL BE VINYL, SELF ADHESIVE, WRAPAROUND, WITH MACHINE PRINTED NUMBERS AND LETTERS. WIRE SIZES NO. 4 AND LARGER AND MULTI CONDUCTOR CABLES SHALL BE MARKED WITH ONE-PIECE, NYLON LOCKING MACHINE PRINTED MARKER TIES EQUAL TO PANDUIT PLM SERIES. WIRE TAG NUMBER SHALL BE AS INDICATED ON THE DRAWINGS.
- 9) DO NOT ROUTE ANY COMMUNICATION CABLES IN WIREWAYS WITH 120 VAC WIRING. ROUTE ALL THESE CABLES AWAY FROM 120 VAC WIRING. WHERE 120 VAC CONDUCTORS MUST BE CROSSED, DO SO AT RIGHT ANGLES AND PROVIDE AT LEAST 1" SEPARATION.
- 10) DO NOT CONNECT MORE THAN TWO WIRES TO ANY ONE TERMINAL.

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PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: NTS
SHEET: 92 OF 104

I-101

BILL OF MATERIAL						SARGENT CORPORATION						WOODARD & CURRAN						CITY OF PORTLAND PUBLIC WORKS PORTLAND, MAINE						BACK COVE SOUTH STORAGE FACILITY																	
ITEM QTY. MANUFACTURER PART NUMBER DESCRIPTION DESIGNATION						ITEM QTY. MANUFACTURER PART NUMBER DESCRIPTION DESIGNATION						ITEM QTY. MANUFACTURER PART NUMBER DESCRIPTION DESIGNATION						ITEM QTY. MANUFACTURER PART NUMBER DESCRIPTION DESIGNATION						ITEM QTY. MANUFACTURER PART NUMBER DESCRIPTION DESIGNATION																	
****ENCLOSURE & RELATED EQUIPMENT****						****WIREDUCT (CONT.)****						****HIGH VOLTAGE RELATED EQUIPMENT****						****POWER SUPPLIES****						****COMMUNICATIONS****						****MISCELLANEOUS PANEL EQUIPMENT****						****SPARE EQUIPMENT TO BE PROVIDED IN UNOPENED PACKAGING AT PANEL DELIVERY****					
1 1 HOFFMAN CSD603612 ENCLOSURE, NEMA 4 PAINTED STEEL, 60.00" x 36.00" x 12.00" ENCLOSURE						100 12FT PANDUIT F3X4LG6 WIRING DUCT, 3"W x 4"H						108 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						138 1 SOLA SDN 20-24-100C POWER SUPPLY, 120VAC IN, 24VDC, 20AMP PWS1						146 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						164 1 PANDUIT UGB2-0-414-6 GROUND BAR						185 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
2 1 HOFFMAN CP6036 BACK PANEL, 58.25" x 34.25" SUB PANEL						101 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						109 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						139 1 SOLA SDU 20-24 POWER MODULE, 24VDC IN, 24VDC OUT, 20AMP PWM1						147 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						165 1 PANDUIT UGB2-0-414-6 GROUND BAR						186 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
3 1 HOFFMAN AFK1212 ENCLOSURE FLOOR STAND KIT, 12.00" HIGH						102 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						110 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						140 1 SOLA SDU 24-BAT BATTERY MODULE, 24VDC BM1						148 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						166 1 PANDUIT UGB2-0-414-6 GROUND BAR						187 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
4 1 HOFFMAN HGF5ETH DATA INTERFACE PORT						103 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						111 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						141 1 SOLA SDU 24-BAT BATTERY MODULE, 24VDC BM1						149 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						167 1 PANDUIT UGB2-0-414-6 GROUND BAR						188 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
5 1 HOFFMAN AA61SHLF1818 FOLDING SHELF, GRAY						104 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						112 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						142 1 SOLA SDU 24-BAT BATTERY MODULE, 24VDC BM1						150 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						168 1 PANDUIT UGB2-0-414-6 GROUND BAR						189 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
6 1 HOFFMAN AA61SHLF1818 FOLDING SHELF, GRAY						105 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						113 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						143 1 SOLA SDU 24-BAT BATTERY MODULE, 24VDC BM1						151 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						169 1 PANDUIT UGB2-0-414-6 GROUND BAR						190 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
7 2 SAGINAW CONTROLS SCE-BV4XKIT ENCLOSURE VENTILATOR						106 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						114 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						144 1 SOLA SDU 24-BAT BATTERY MODULE, 24VDC BM1						152 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						170 1 PANDUIT UGB2-0-414-6 GROUND BAR						191 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
8 1 HOFFMAN AA61SHLF1818 FOLDING SHELF, GRAY						107 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						115 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						145 1 SOLA SDU 24-BAT BATTERY MODULE, 24VDC BM1						153 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						171 1 PANDUIT UGB2-0-414-6 GROUND BAR						192 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
9 1 HOFFMAN AA61SHLF1818 FOLDING SHELF, GRAY						108 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						116 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						146 1 SOLA SDU 24-BAT BATTERY MODULE, 24VDC BM1						154 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						172 1 PANDUIT UGB2-0-414-6 GROUND BAR						193 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
10 1 HOFFMAN AA61SHLF1818 FOLDING SHELF, GRAY						109 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						117 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						147 1 SOLA SDU 24-BAT BATTERY MODULE, 24VDC BM1						155 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						173 1 PANDUIT UGB2-0-414-6 GROUND BAR						194 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
11 1 HOFFMAN AA61SHLF1818 FOLDING SHELF, GRAY						110 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						118 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						148 1 SOLA SDU 24-BAT BATTERY MODULE, 24VDC BM1						156 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						174 1 PANDUIT UGB2-0-414-6 GROUND BAR						195 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
12 1 HOFFMAN AA61SHLF1818 FOLDING SHELF, GRAY						111 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						119 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						149 1 SOLA SDU 24-BAT BATTERY MODULE, 24VDC BM1						157 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						175 1 PANDUIT UGB2-0-414-6 GROUND BAR						196 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
13 1 HOFFMAN AA61SHLF1818 FOLDING SHELF, GRAY						112 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						120 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						150 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						176 1 PANDUIT UGB2-0-414-6 GROUND BAR						197 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC											
14 1 HOFFMAN AA61SHLF1818 FOLDING SHELF, GRAY						113 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						121 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						151 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						177 1 PANDUIT UGB2-0-414-6 GROUND BAR						198 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC											
15 1 HOFFMAN AA61SHLF1818 FOLDING SHELF, GRAY						114 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						122 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						152 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						178 1 PANDUIT UGB2-0-414-6 GROUND BAR						199 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC											
16 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC						115 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						123 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						153 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						179 1 PANDUIT UGB2-0-414-6 GROUND BAR						200 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC											
17 1 ALLEN BRADLEY 5069-FPD 5069 COMPACT I/O FIELD POTENTIAL DISTRIBUTOR MODULE FPD						116 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						124 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						154 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						180 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
18 2 ALLEN BRADLEY 5069-IB16 5069 COMPACT I/O 24V DC INPUT MODULE, 16 PT. PLC, SLOTS 1 & 2						117 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						125 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						155 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						181 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
19 1 ALLEN BRADLEY 5069-OW16 5069 COMPACT I/O RELAY OUTPUT MODULE 16 PT. PLC, SLOT 3						118 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						126 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						156 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						182 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
20 1 ALLEN BRADLEY 5069-IA16 5069 COMPACT I/O 120VAC DIGITAL INPUT MODULE, 16 PT. PLC, SLOT 7						119 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						127 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						157 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						183 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
21 3 ALLEN BRADLEY 5069-IF8 5069 COMPACT I/O ANALOG INPUT MODULE, 8 CH. PLC, SLOTS 4, 5, 6						120 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						128 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						158 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						184 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
22 7 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						121 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						129 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						159 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						185 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
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24 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						123 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						131 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						161 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						187 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
25 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						124 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						132 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						162 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						188 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
26 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						125 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						133 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						163 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						189 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
27 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						126 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						134 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						164 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						190 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
28 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						127 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						135 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						165 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						191 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
29 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						128 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						136 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						166 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						192 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
30 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						129 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						137 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						167 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						193 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
31 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						130 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						138 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						168 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						194 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
32 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						131 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						139 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						169 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						195 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
33 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						132 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						140 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						170 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						196 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
34 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						133 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						141 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						171 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						197 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
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38 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						137 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						145 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						175 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						201 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
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41 1 ALLEN BRADLEY 5069-RTB18-SCREW 5069 COMPACT I/O REMOVABLE TERMINAL BLOCKS PLC, SLOTS 1-7						140 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						148 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						178 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						204 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
42 1 AUTOMATION DIRECT EA9-T10WCL OPERATOR INTERFACE TERMINAL, 10-INCH, TOUCH PANEL, 24VDC OIT						141 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						149 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						179 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						205 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC																	
****TERMINAL BLOCKS & RELATED EQUIPMENT****						****WIREDUCT****						****HIGH VOLTAGE RELATED EQUIPMENT****						****POWER SUPPLIES****						****COMMUNICATIONS****						****MISCELLANEOUS PANEL EQUIPMENT****						****SPARE EQUIPMENT TO BE PROVIDED IN UNOPENED PACKAGING AT PANEL DELIVERY****					
50 86 ALLEN BRADLEY 1492-JD3 TERMINAL BLOCK 2 TIER TB2, TB3						96 6FT PANDUIT F1X4LG6 WIRING DUCT, 1"W x 4"H						108 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						138 1 SOLA SDN 20-24-100C POWER SUPPLY, 120VAC IN, 24VDC, 20AMP PWS1						146 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						164 1 PANDUIT UGB2-0-414-6 GROUND BAR						185 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					
51 30 ALLEN BRADLEY 1492-EBJD3 TERMINAL BLOCK END BARRIER, 2 TIER TB2, TB3						97 6FT PANDUIT C1LG6 WIRING DUCT COVER, 1"W						109 12FT PANDUIT C3LG6 WIRING DUCT COVER, 3"W						139 1 SOLA SDU 20-24 POWER MODULE, 24VDC IN, 24VDC OUT, 20AMP PWM1						147 1 CALAMP 140-5018-502 136-174 MHZ VIPER LICENSED IP ROUTER RADIO MODEM RADIO MODEM						165 1 PANDUIT UGB2-0-414-6 GROUND BAR						186 1 ALLEN BRADLEY 5069-L330ER COMPACTLOGIX PLC PROCESSOR PLC					

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41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com



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INSTRUMENTATION & CONTROLS
SCADA PANEL BILL OF MATERIALS

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 02202069.00
DATE: APRIL 2020
SCALE: NTS
SHEET: 93 OF 104

I-102

60% DESIGN SUBMITTAL – NOT FOR CONSTRUCTION

NAMEPLATE SCHEDULE			
ITEM	DIMENSION	DESCRIPTION	FABRICATION COMMENTS
A	5" x 1"	SSNS-0187-CP	NAMEPLATE TO BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375



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Portland, Maine 04102
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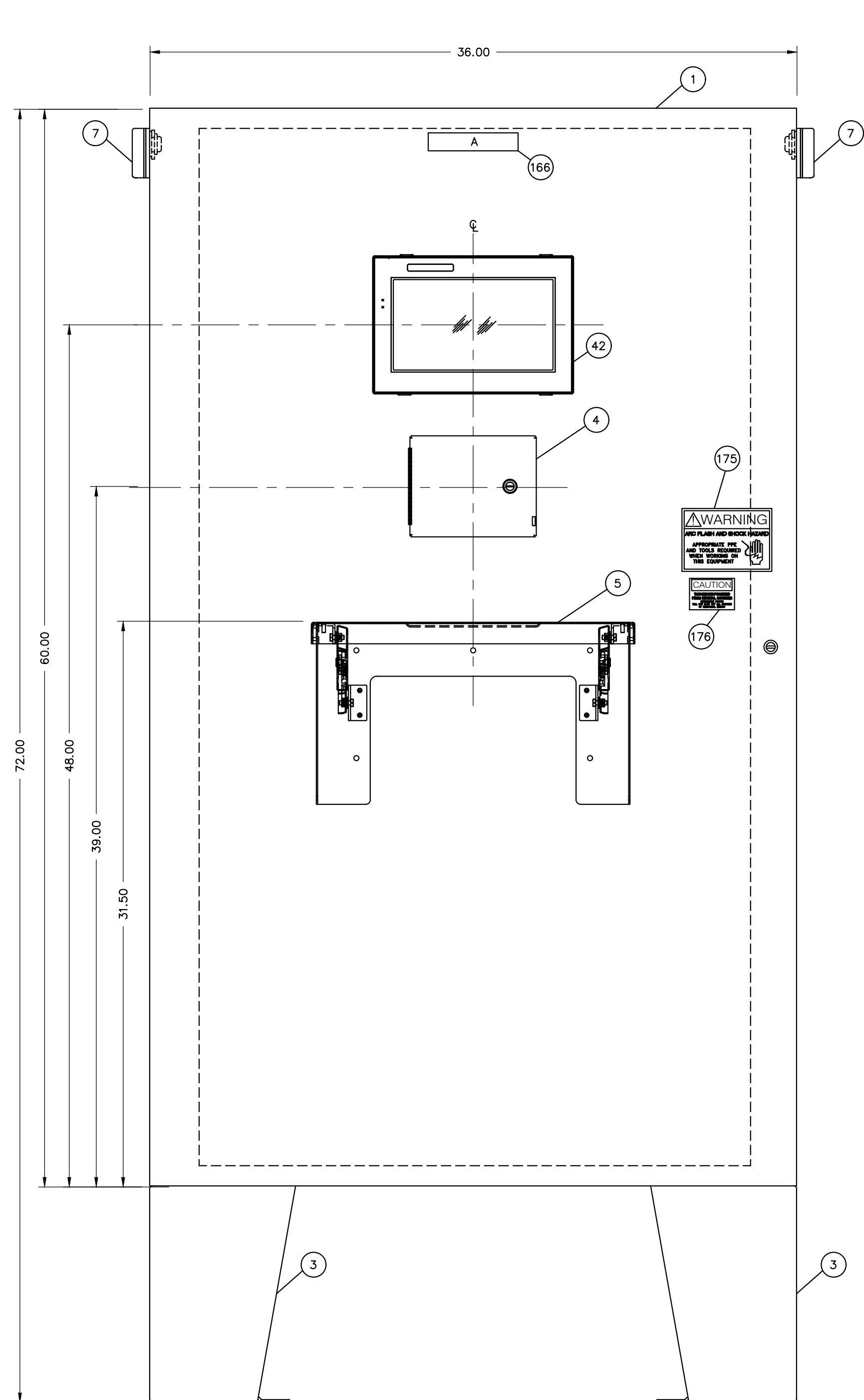
INSTRUMENTATION & CONTROLS

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

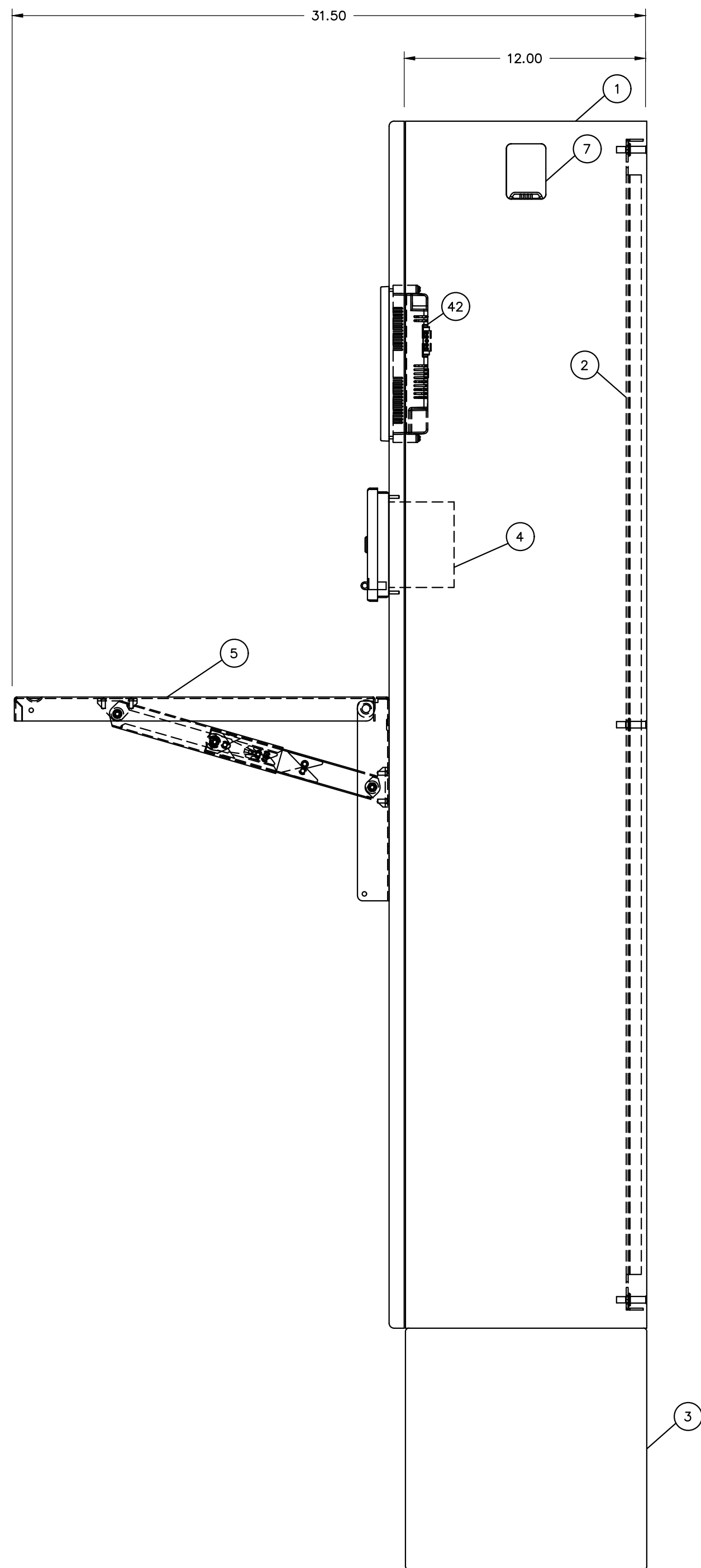
BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: NTS
SHEET: 94 OF 104

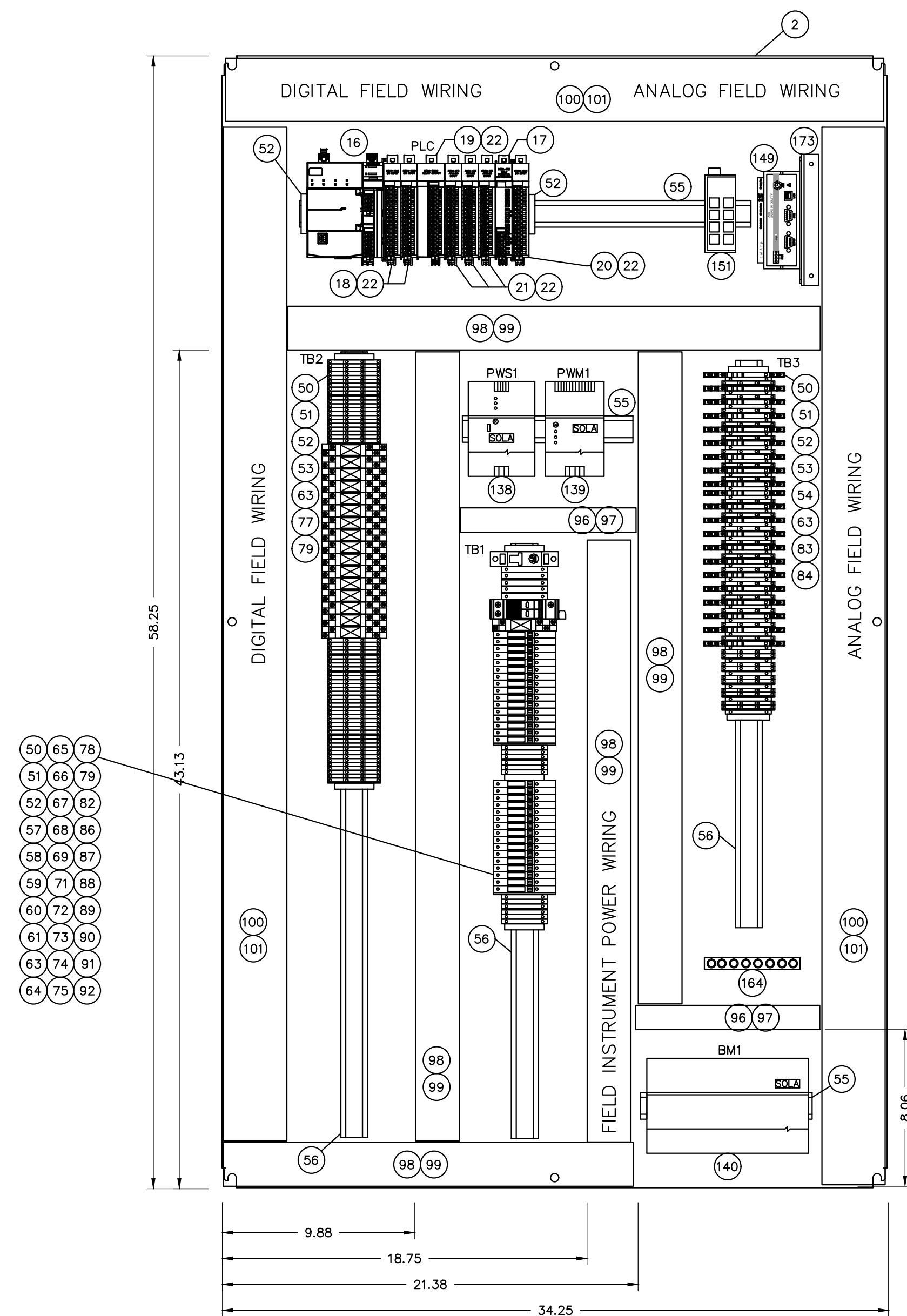
I-103



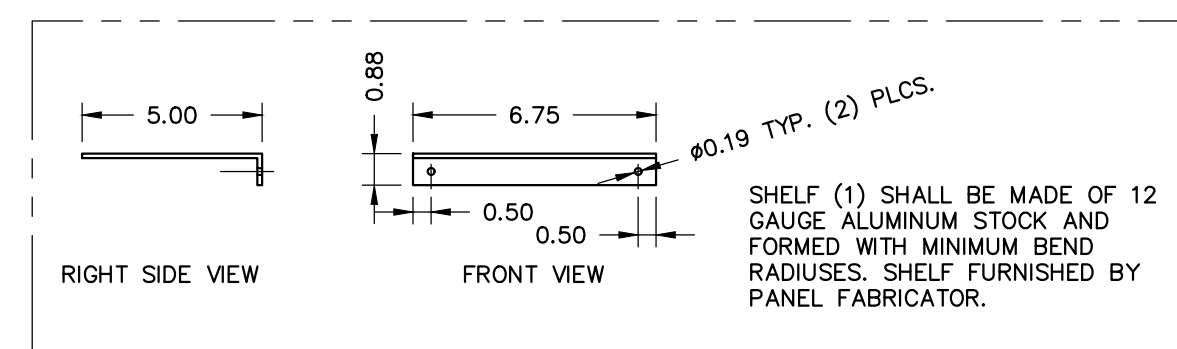
ENCLOSURE FRONT VIEW



ENCLOSURE RIGHT SIDE VIEW

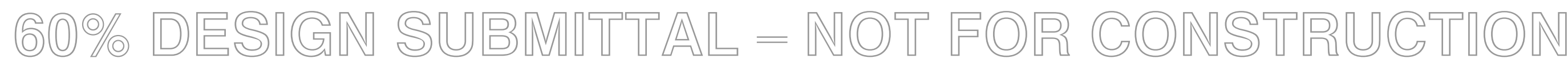


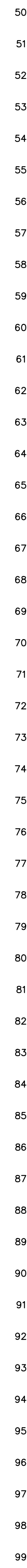
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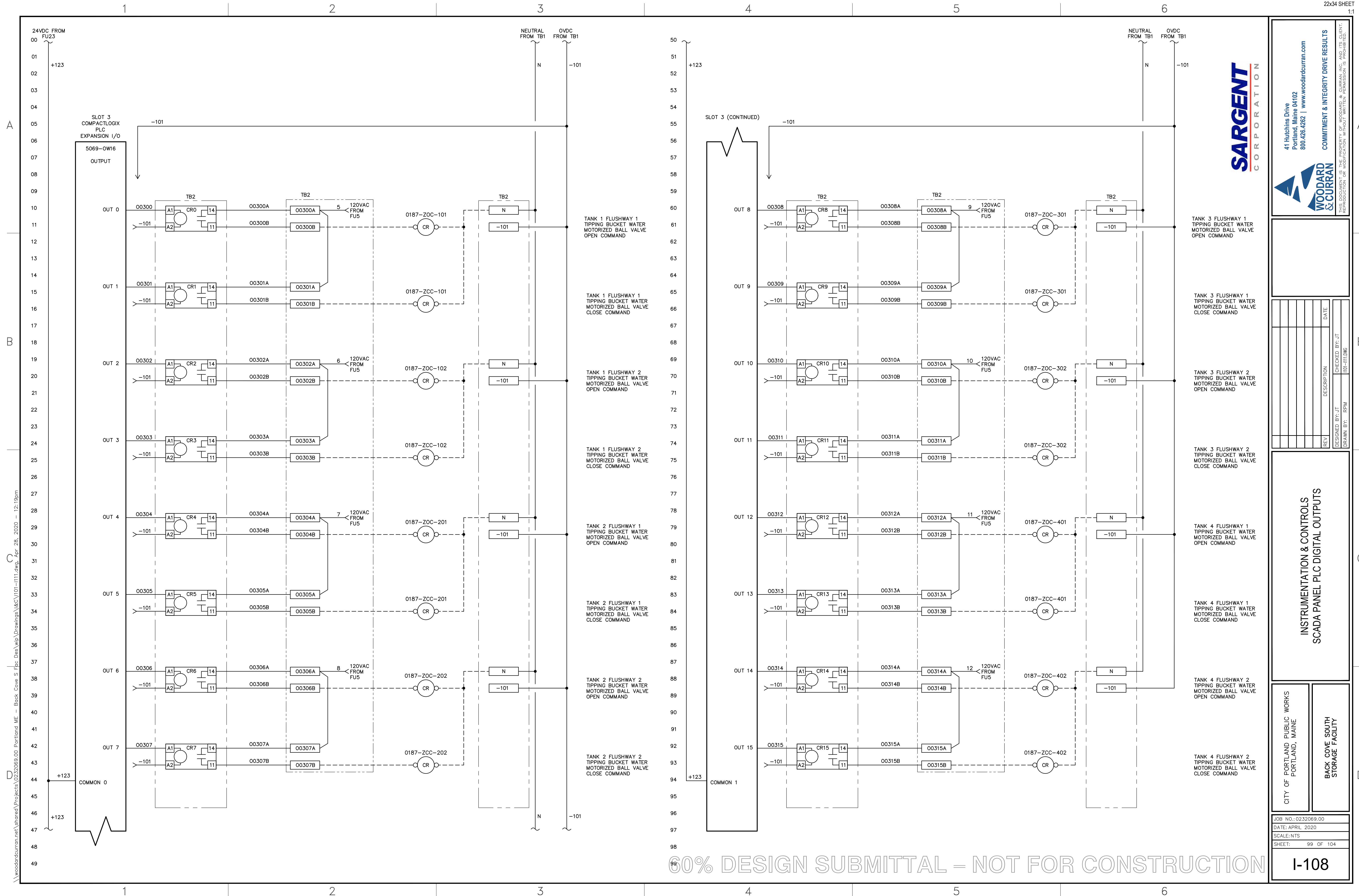


RADIO SUPPORT SHELF DETAIL

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		DESIGNED BY: JT	
		DRAWN BY: RPM	1101-111.DWG

INSTRUMENTATION & CONTROLS

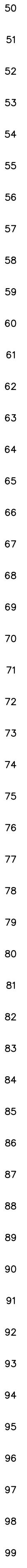
SCADA PANEL PLC DIGITAL OUTPUTS

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
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	DRAWN BY: RPM	1001-1111.DWG

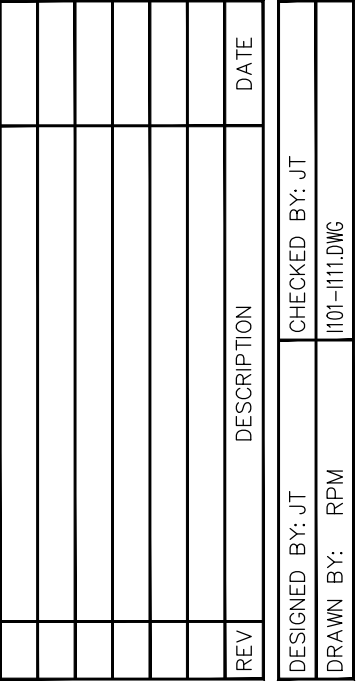
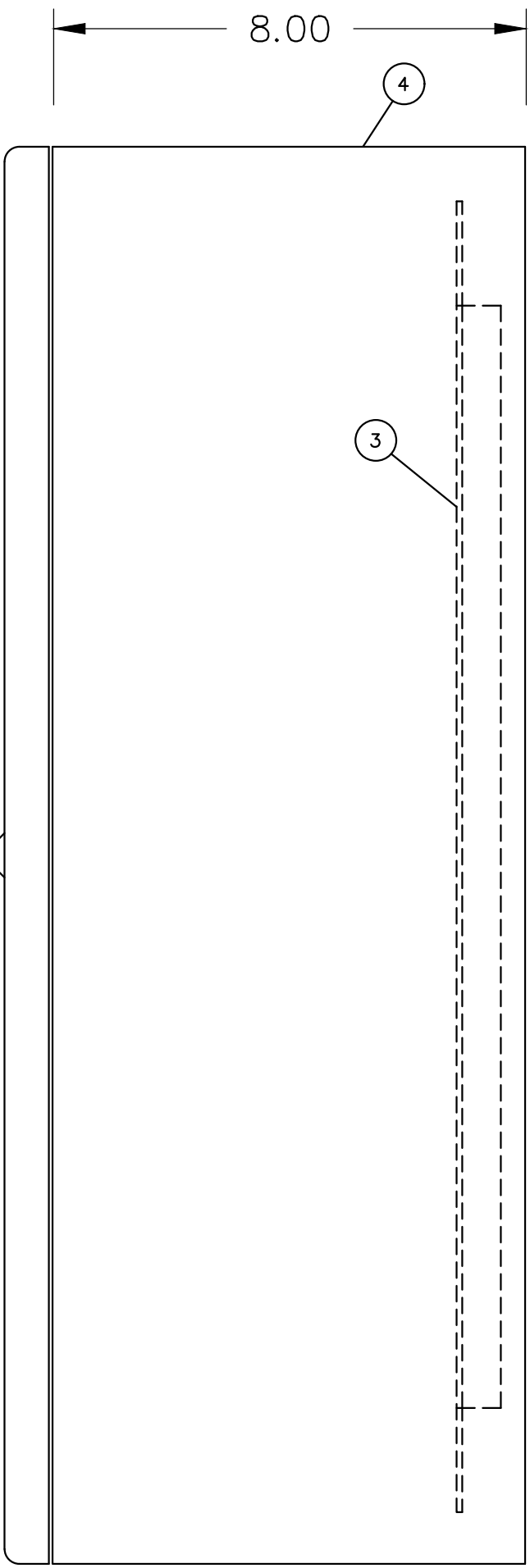
INSTRUMENTATION & CONTROLS

BACK COVE SOUTH
STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: NTS
SHEET: 102 OF 104

-111

NAMEPLATE SCHEDULE			
ITEM	DIMENSION	DESCRIPTION	FABRICATION COMMENTS
B	8.50" x 1"	INTRINSIC BARRIER PANEL	NAMEPLATE TO BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375. QUANTITY: 1
C	8.50" x 1"	INTRINSICALLY SAFE WIRING	NAMEPLATE TO BE YELLOW WITH BLACK LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375. QUANTITY: 5



INSTRUMENTATION & CONTROLS INTRINSIC BARRIER PANEL EQUIPMENT LAYOUT

CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

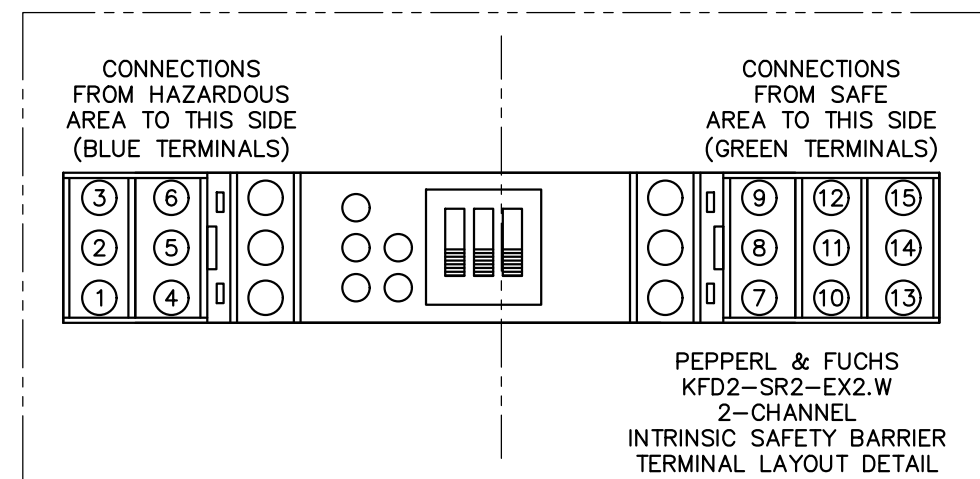
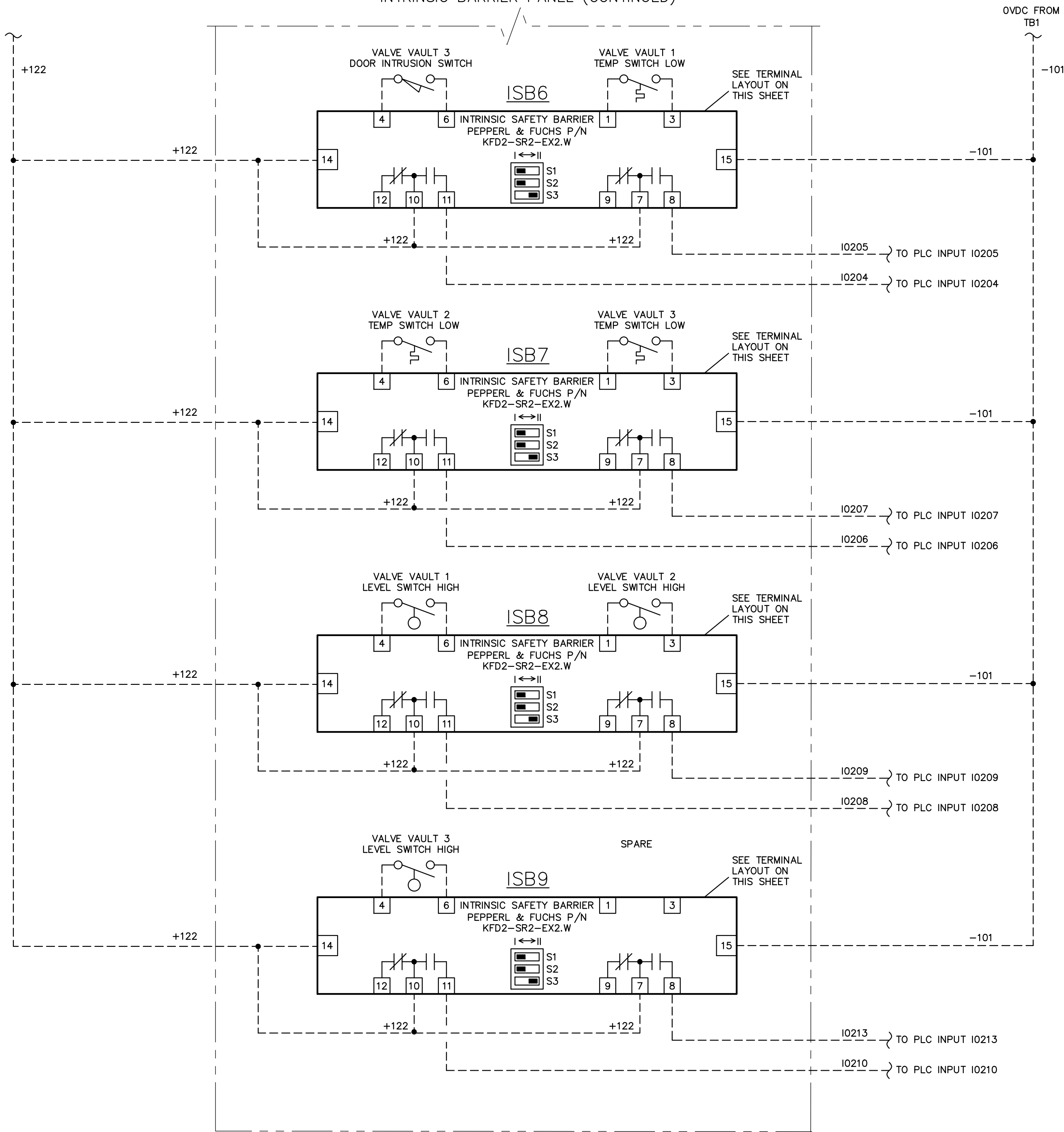
BACK COVE SOUTH STORAGE FACILITY

JOB NO.: 0232069.00
DATE: APRIL 2020
SCALE: NTS
SHEET: 103 OF 104

I-112

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INTRINSIC BARRIER PANEL (CONTINUED)



SEE PLC I/O FOR INTRINSIC
WIRING DETAILS ASSOCIATED
WITH ANALOG CIRCUITS.

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B

C

D

A

B

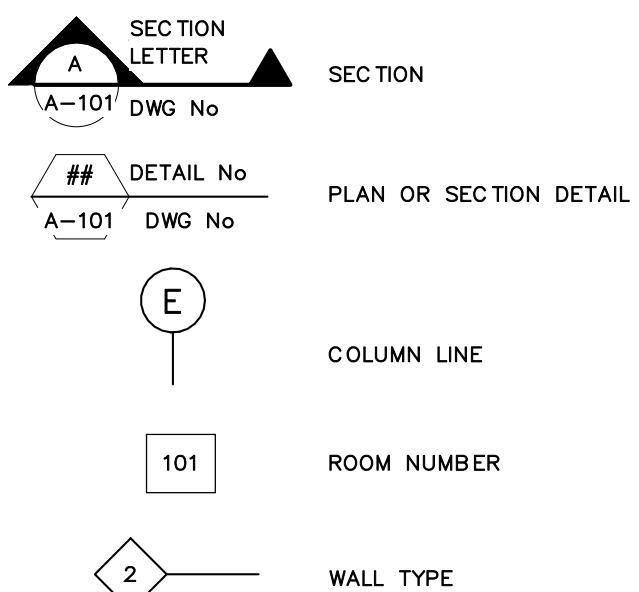
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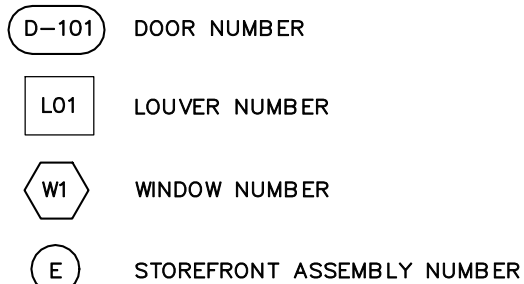
ABBREVIATIONS:

&	AND	HD	HEAVY DUTY	SAT	SUSPENDED ACOUSTIC TILE
∠	ANGLE	HDR	HAND RAIL	SB	SEAMLESS BASE
⊙	AT	HDWR	HARDWARE	SCHED	SCHEDULE
[	CHANNEL	HDWD	HARDWOOD	SCRN	SCREEN(ED)
⌀	DIAMETER	HGR	HANGER	SEC	SECTION
°	DEGREES	HGT	HEIGHT	SF	SEAMLESS FLOORING, SQUARE FOOT
AB	ANCHOR BOLT	HM	HOLLOW METAL	SGFT	STRUCTURAL GLAZED FACING TILE
ABV	ABOVE	HOR	HORIZONTAL	SHT	SHEET
ACI	AMERICAN CONCRETE INSTITUTE	HP	HIGH POINT	SK	SIMILAR
ACMU	ACOUSTICAL MASONRY UNIT	IN	INCH(ES)	SLNT	SEALANT
ACT	ACOUSTICAL CEILING TILE	INSUL	INSULATE, INSULATION	SPEC	SPECIFIED, SPECIFICATION
ADH	ADHESIVE	JC	JANITOR'S CLOSET	S.S.	STAINLESS STEEL
AFF	ABOVE FINISHED FLOOR	JT	JOINT	SSK	SERVICE SINK
AHU	AIR HANDLING UNIT	LAB	LABORATORY	STA	STATION
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	LAD	LADDER	STD	STANDARD
ALUM	ALUMINUM	LAV	LAVATORY	STL	STEEL
ANOD	ANODIZED	LKR	LOCKER	STOR	STORAGE
ASSY	ASSEMBLY	LLH	LONG LEG HORIZONTAL	STRU	STRUCTURE, STRUCTURAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS STANDARDS	LLV	LONG LEG VERTICAL	STWY	STAIRWAY
AWS	AMERICAN WELDING SOCIETY	LTL	LINTEL	SUPT	SUPERINTENDENT
		LP	LOW POINT	SUSP	SUSPEND(ED)
				SUPV	SUPERVISOR
BD	BOARD	M	METERS	T	TREADS
BLDG	BUILDING	MAS	MASONRY	TB	TERRAZZO BASE
BLK	BLOCK, BLOCKING	MATL	MATERIAL	T+B	TOP AND BOTTOM
BM	BEAM	MAX	MAXIMUM	T+G	TONGUE AND GROOVE
BOF	BOTTOM OF FOOTING	MCC	MOTOR CONTROL CENTER	TEMP	TEMPERED, TEMPERATURE
BOT	BOTTOM	MFR	MANUFACTURER	TERR	TERRAZZO
BRG	BEARING	MGR	MANAGER	THK	THICK(NESS)
BRK	BRICK	MIN	MINIMUM	THR	THRESHOLD
BS	BOTH SIDES	MISC	MISCELLANEOUS	TKBD	TACK BOARD
		MM	MILLIMETERS	TOC	TOP OF CONCRETE
C TO C	CENTER TO CENTER	MMB	MEMBRANE	TOS	TOP OF STEEL
CABT	CABINET	MO	MASONRY OPENING	TOW	TOP OF WALL
CEM	CEMENT	MR	MOISTURE RESISTANT	TOIL	TOILET
CEM F	CEMENTITIOUS FINISH	MTD	MOUNTED, MOUNTING	TPG	TOPPING
CF	COMPRESSIBLE FILLER	MTL	METAL	TSL	TOP OF SLAB
CGFB	CEMENTITIOUS GLASS FIBER BOARD	N/A	NOT APPLICABLE	TWF	THROUGH WALL FLASHING
CH	CONCRETE HARDENER	NIC	NOT IN CONTRACT	TYP	TYPICAL
CHAM	CHAMFER	NO	NUMBER	UC	UNDERCUT
CIP	CAST IN PLACE	NOM	NOMINAL	U/D	UNDERDRAIN
CJ	CONTROL JOINT	NTS	NOT TO SCALE	UNO	UNLESS NOTED OTHERWISE
CL - EQ	CENTER LINE			UR	URINAL
CLG	CEILING	OC	ON CENTER	VB	VAPOR BARRIER
CLKG	CAULKING	OCEF	ON CENTER EACH FACE	VC T	VINYL COMPOSITION TILE
CLR	CLEAR	OCEW	ON CENTER EACH WAY	VENT	VENTILATE
CMU	CONCRETE MASONRY UNIT	OFF	OFFICE	VERT	VERTICAL
COL	COLUMN	OPNG	OPENING	VTR	VENT THROUGH ROOF
COMP	COMPRESSIBLE	OPP	OPPOSITE		
CONC	CONCRETE	OPPHD	OPPOSITE HAND OVERHEAD	W	WIDTH, WIDE
CONT	CONTINUOUS, CONTINUE	PERIM	PERIMETER	W/A	WHERE APPLICABLE
CARPET	CARPET	PL	PLATE, PROPERTY LINE	WC	WATER CLOSET
CRS	COURSES	PLK	PLANK	WD	WOOD
CT	CERAMIC TILE	PM	PRESSED METAL	WDW	WINDOW
		PR	PAIR	WF	STEEL WIDE FLANGE
		PRC	PRECAST	W/O	WITHOUT
		PREFAB	PREFABRICATED	WPRG	WATERPROOFING
		PRMLD	PREMOLDED	WWF	WELDED WIRE FABRIC
		PSF	PER SQUARE FOOT		
		PSI	PER SQUARE INCH		
		PT	PRESSURE TREATED		
		PTD	PAINTED		
		PWD	PLYWOOD		
DET	DETAIL	R	RISERS		
DF	DRINKING FOUNTAIN	RB	RUBBER BASE		
DIA	DIAMETER	RD	ROOF DRAIN		
DIAG	DIAGONAL	REC	RECORD		
DIM	DIMENSION	RECP	RECEPTACLE		
DN	DOWN	REINF	REINFORCE, REINFORCING		
DPRG	DAMPPOOFING	REQ'D	REQUIRED		
DPS	DUST PROOF SEALER	REV	REVISION, REVISED		
DR	DRAIN	RFG	ROOFING		
DWG	DRAWING	RGH	ROUGH		
		RJ	RUSTICATION JOINT		
EA	EACH	RLG	RAILING		
EL	ELEVATION	RM	ROOM		
ELEC	ELECTRICAL	RO	ROUGH OPENING		
ELEV	ELEVATOR	R+S	BACKER ROD AND SEALANT		
EQ	EQUAL(LY)	RT	RUBBER TILE		
EQP	EQUIPMENT	RWL	RAIN WATER LEADER		
EXG	EXISTING				
EXP	EXPANSION, EXPOSED				
EW	ELECTRIC WATER COOLER				
FA	FIRST AID KIT				
FD	FLOOR DRAIN				
FE	FIRE EXTINGUISHER				
FF	FACTORY FINISH, FINISHED FLOOR				
FGL	FIBERGLASS				
FIN	FINISH(ED)				
FL	FLOOR				
FR	FRAME				
FRT	FIRE RETARDANT TREATED				
DLR	FILLER				
FT	FOOT, FEET				
FXD	FIXED				
GA	GAUGE				
GALV	GALVANIZED				
GL	GLASS				
GR	GRADE				
GRTG	GRATING				
GYP	GYPSON				

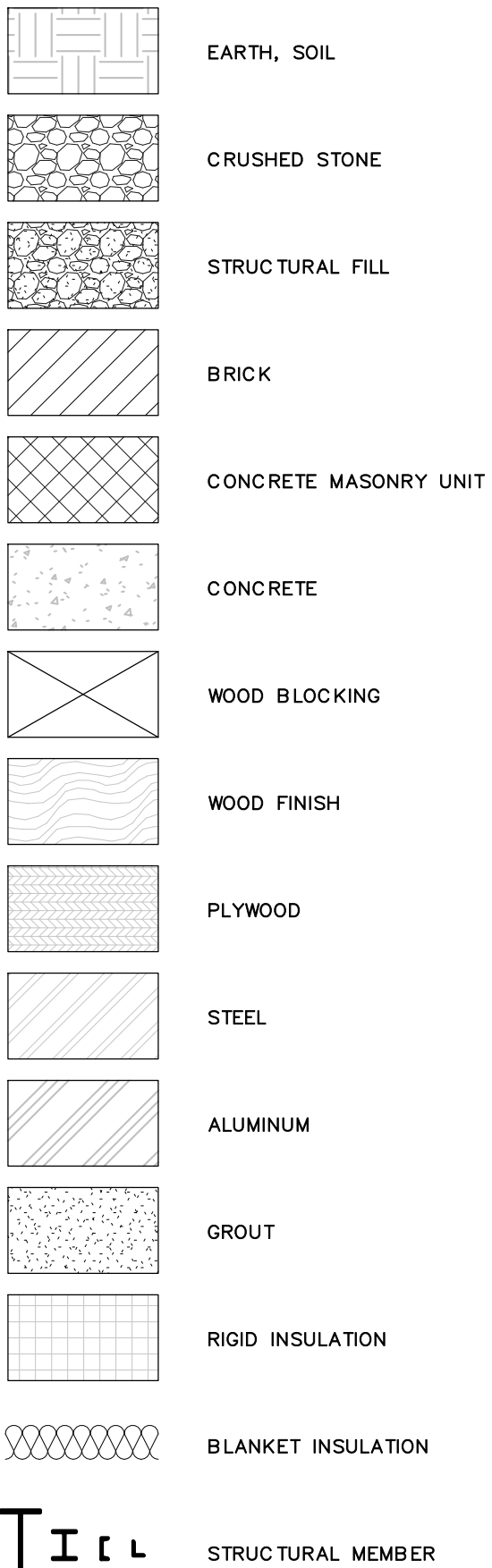
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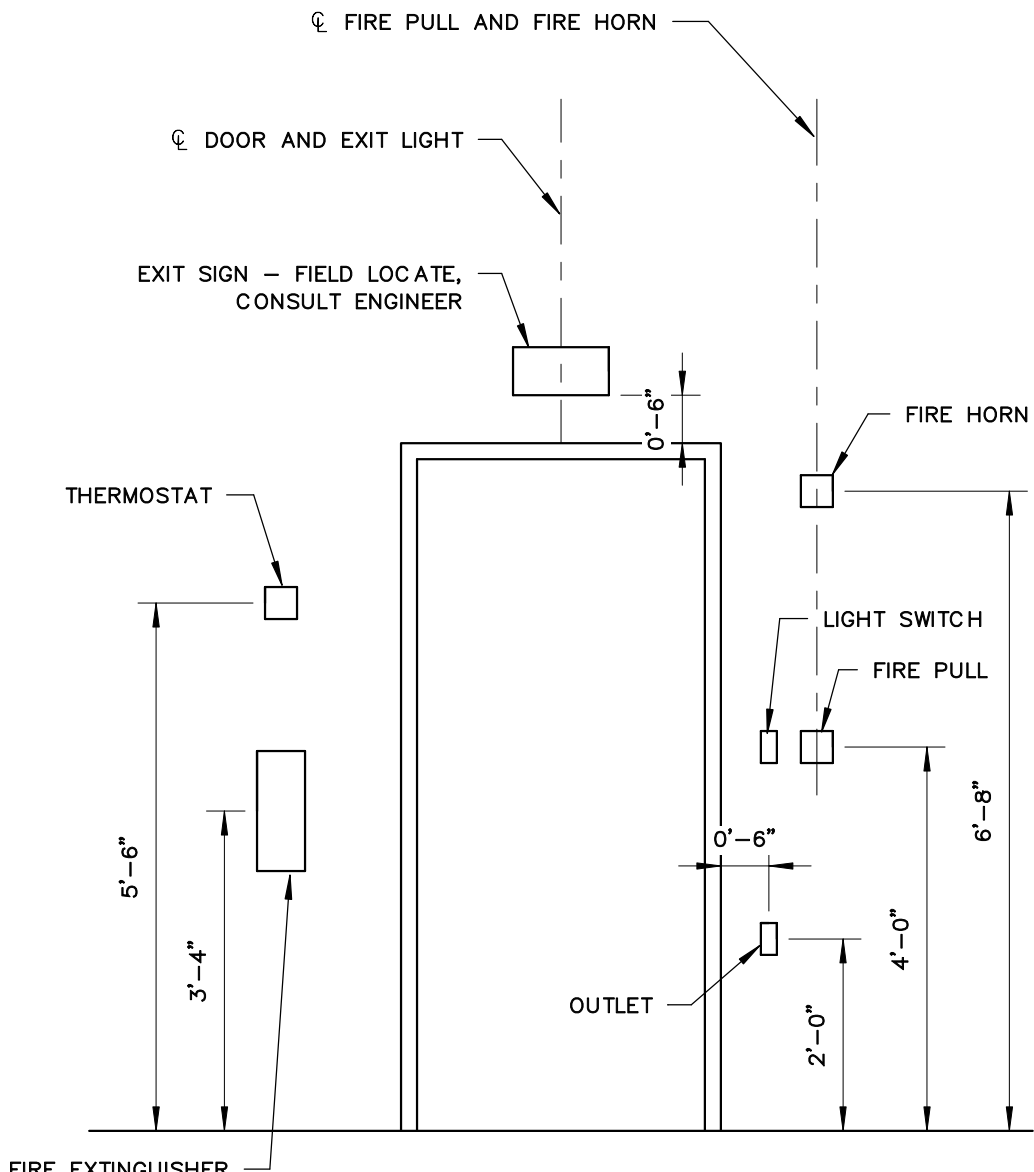
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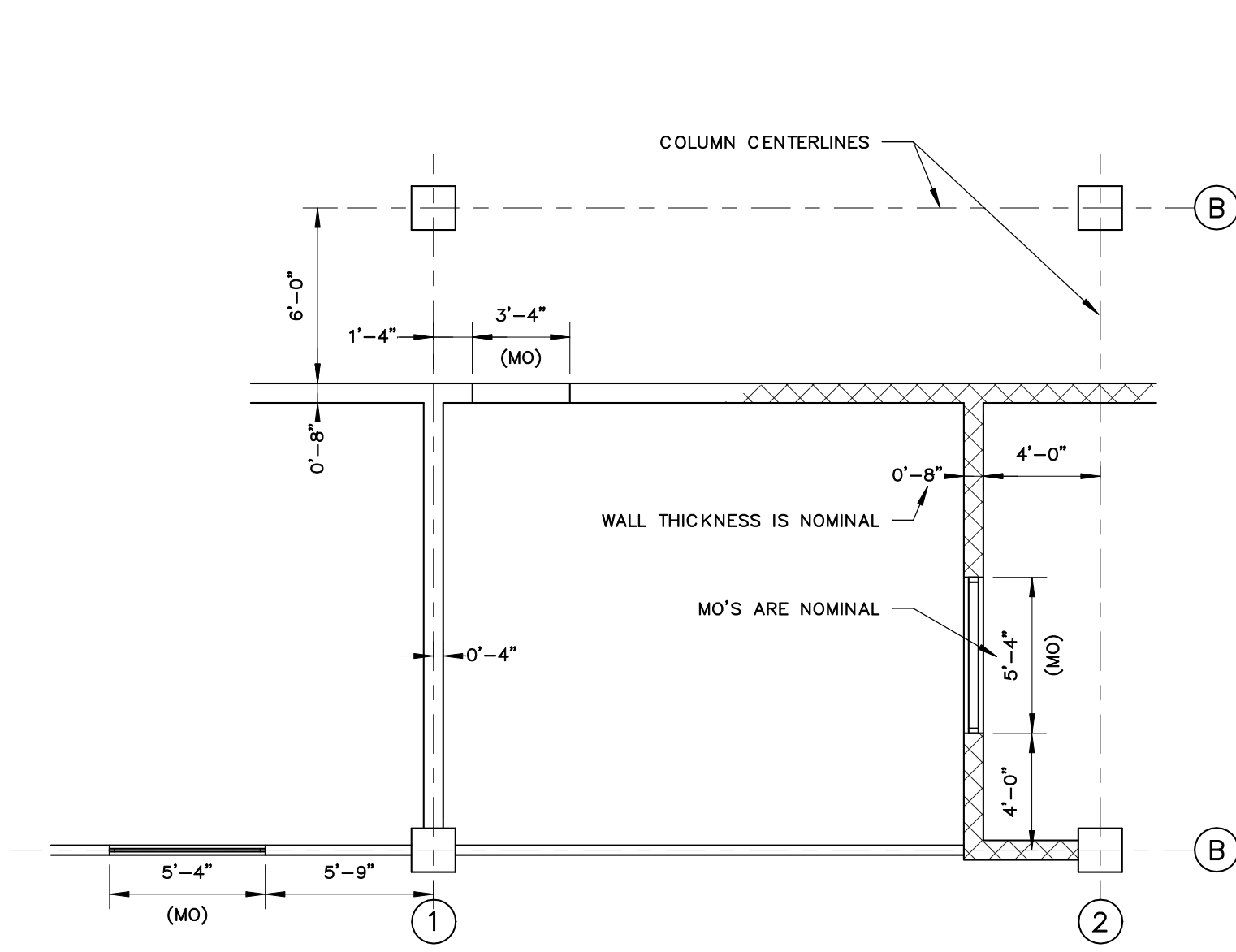
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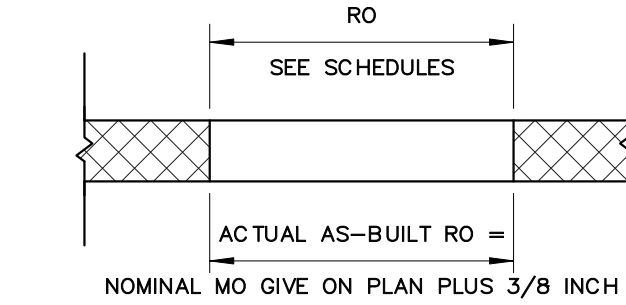
TYPICAL MOUNTING HEIGHTS



MODULAR DIMENSIONING SYSTEM



AS-BUILT DIMENSIONS

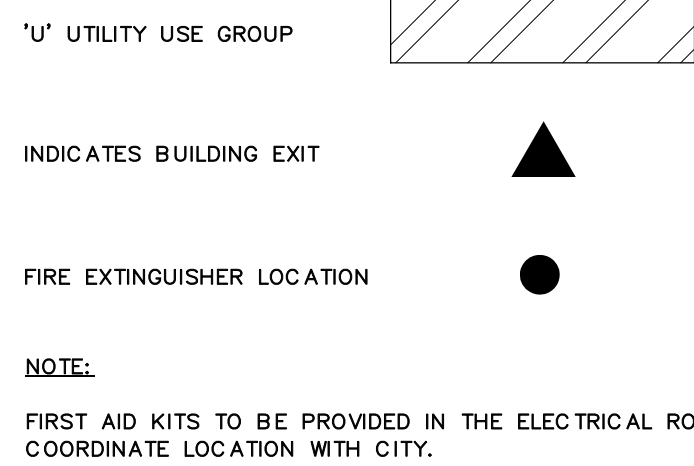


WINDOW OR LOUVER OPENING IN PLAN

BUILDING CODE – 2015 INTERNATIONAL BUILDING CODE AS AMENDED BY MAINE UNIFORM BUILDING AND ENERGY CODE

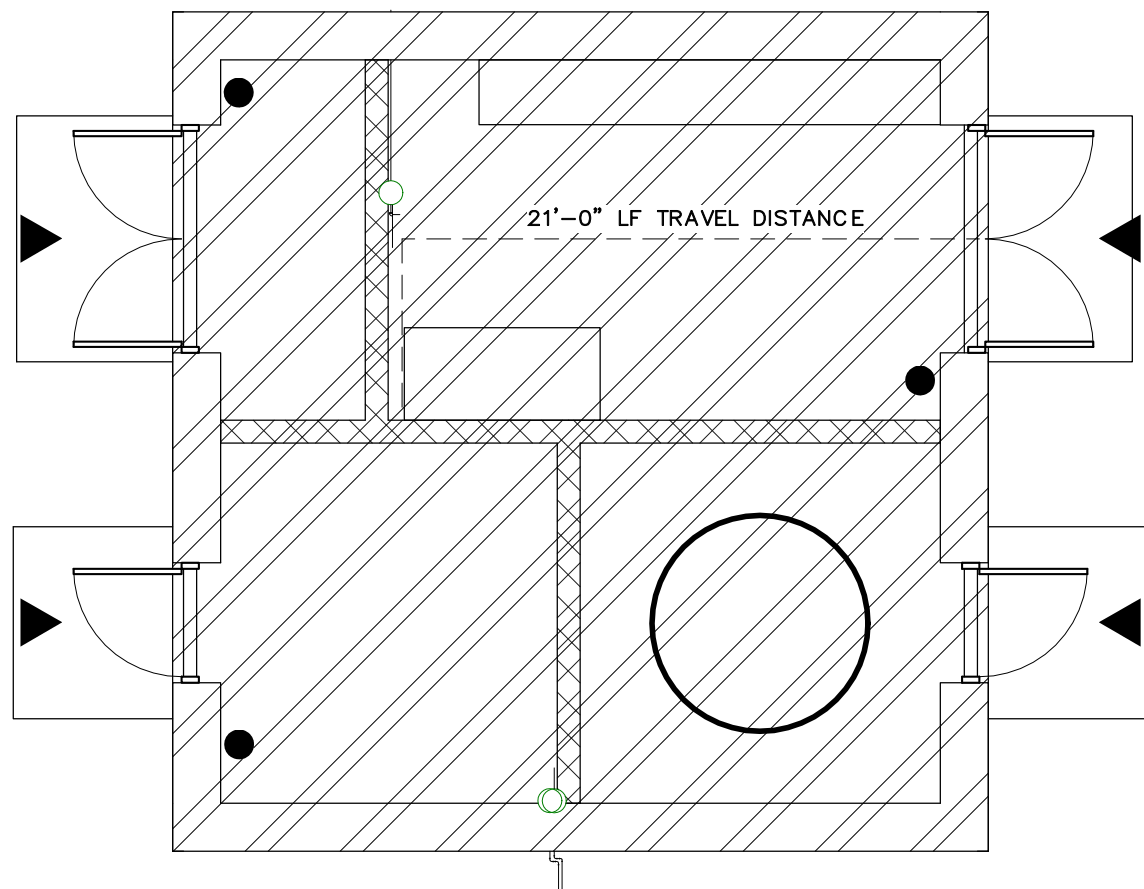
CODE REFERENCE	ELECTRICAL MAINTENANCE BUILDING
BUILDING OCCUPANCY (312.1)	U: UTILITY (ACCESSORY BUILDING FOR UTILITY)
TYPE OF CONSTRUCTION (602.5)	TYPE V-B
BUILDING HEIGHT (504.3)	ALLOWED: 40-FT PROPOSED: 14-FT
BUILDING STORIES (504.4)	ALLOWED: 1 PROPOSED: 1
BUILDING AREA (506.2)	ALLOWED: 5,500 SQ FT PROPOSED 415 SQ FT
REQUIRED SEPARATION (508.4)	NO SEPARATION REQUIRED
INCIDENTAL USES (509)	N/A
FIRE RATING BUILDING ELEMENTS (601)	0-HOURS FOR TYPE V-B CONSTRUCTION
BUILDING CLASSIFICATION (NFPA 820)	UNCLASSIFIED
INTERIOR FINISH REQUIREMENTS (803.11)	NO RESTRICTIONS
AUTOMATIC SPRINKLER SYSTEMS (903)	NOT REQUIRED; NOT PROVIDED
PORTABLE FIRE EXTINGUISHERS (906)	PROVIDED
FIRE ALARMS AND DETECTION (907)	NOT REQUIRED; SMOKE & HEAT DETECTION PROVIDED
OCCUPANT LOAD FACTOR (1004.1.2)	MECHANICAL EQUIPMENT ROOM: 300 GROSS
NUMBER OF OCCUPANTS (1004.1.2)	2 OCCUPANTS
NUMBER OF EXITS (1006.2.1)	1 EXIT PER ROOM
TRAVEL DISTANCE TO SINGLE EXIT (1006.3.2(2))	ALLOWED: 75-FT PROVIDED: 21-FT
ACCESSIBILITY (1103.2.4)	GROUP U OCCUPANCIES NOT REQUIRED TO MEET ICC A117.1 REQUIREMENTS
LEED CERTIFICATIONS (PORTLAND, MAINE CODE OF ORDINANCES CHAPTER 6)	NOT REQUIRED; BUILDING AREA < 2,000 SQ FT

CODE SUMMARY LEGEND:



ELECTRICAL MAINTENANCE BUILDING

SCALE: 3/16" = 1'-0"



SARGENT CORPORATION

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Portland, Maine 04102
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ARCHITECTURAL LEGEND, ABBREVIATIONS, AND CODE SUMMARY

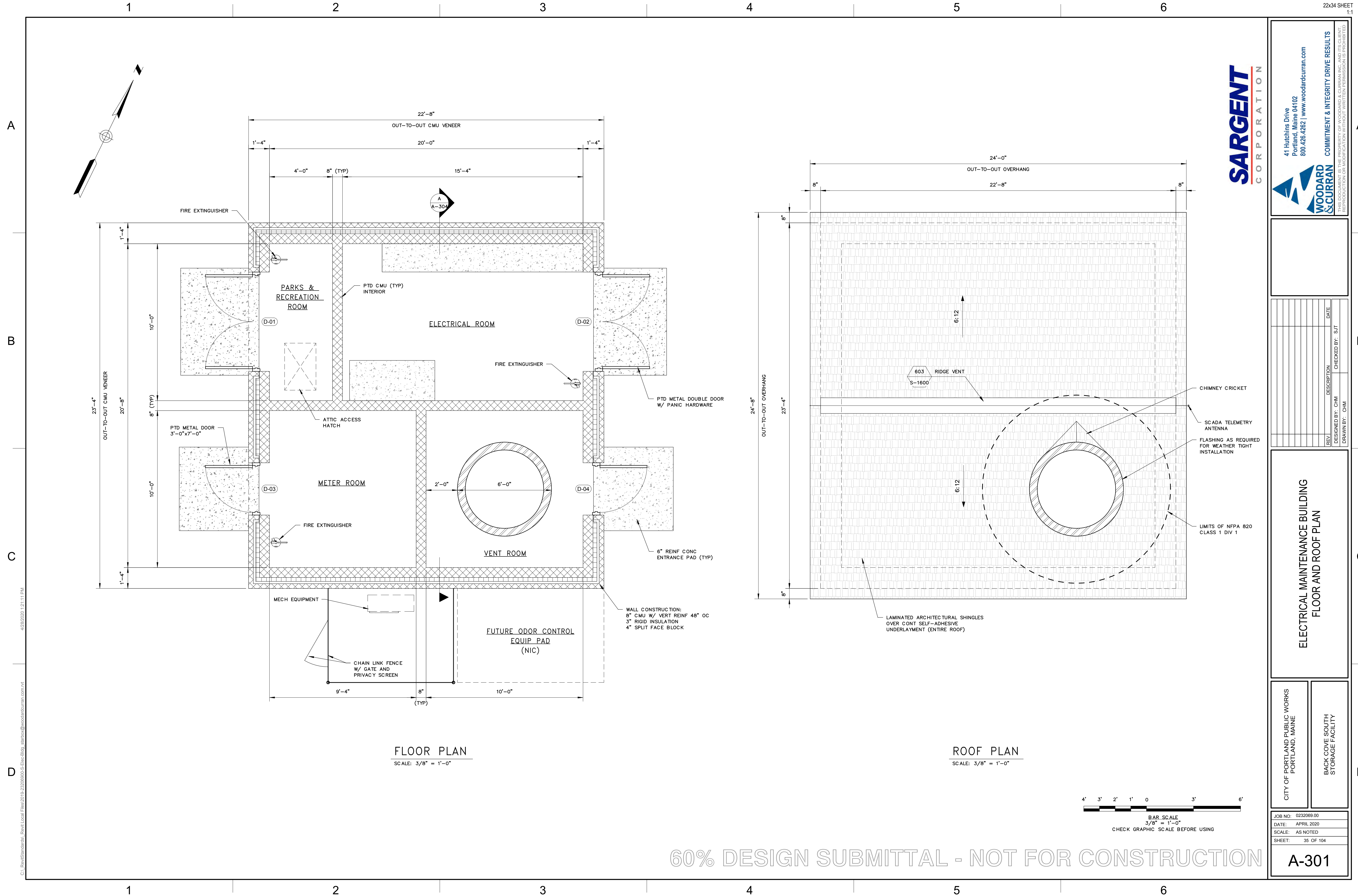
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO:	0232069.00
DATE:	APRIL 2020
SCALE:	AS NOTED
SHEET:	34 OF 104

A-001

60% DESIGN SUBMITTAL - NOT FOR CONSTRUCTION





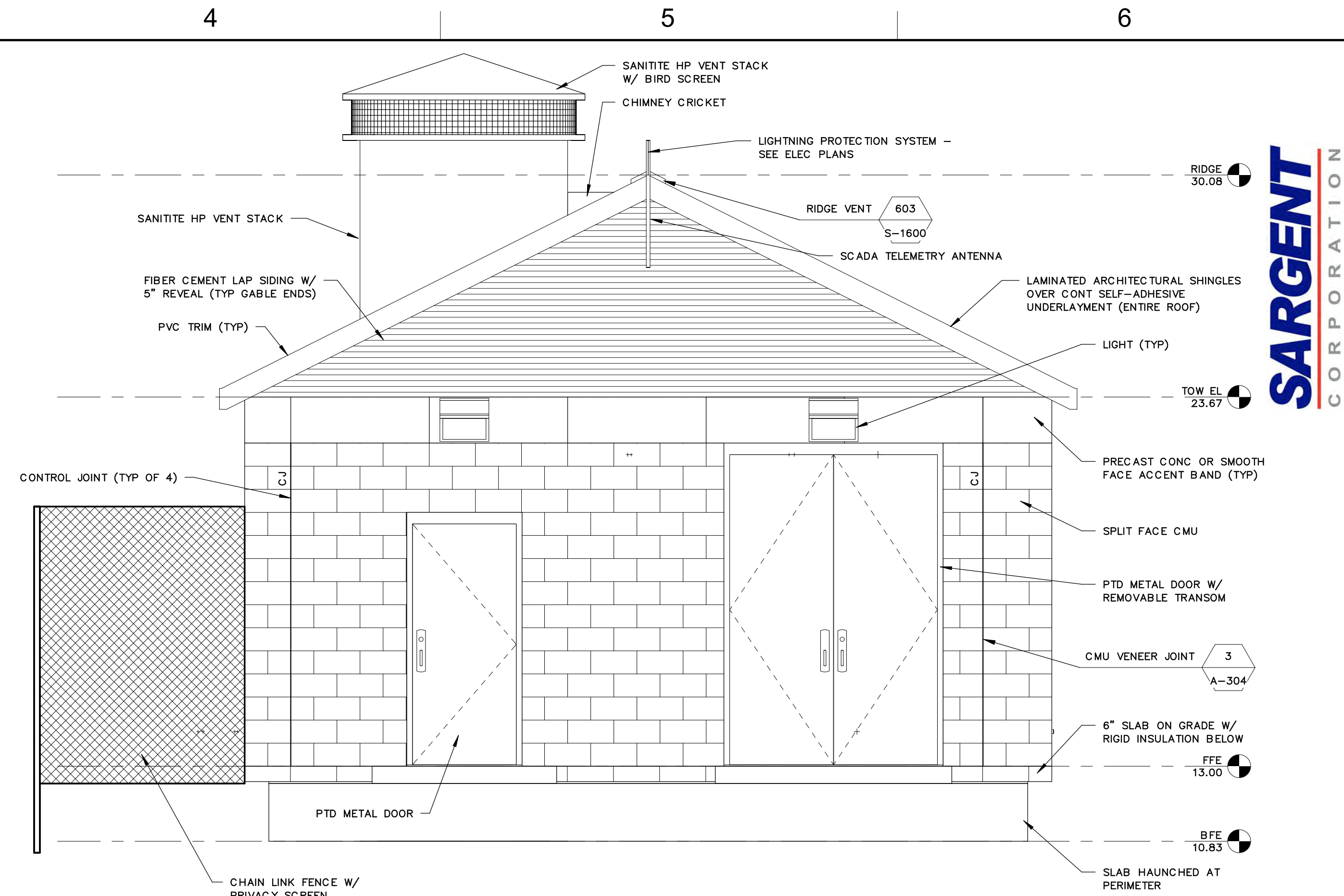
NORTH ELEVATION

SCALE: $3/8" = 1'-0"$



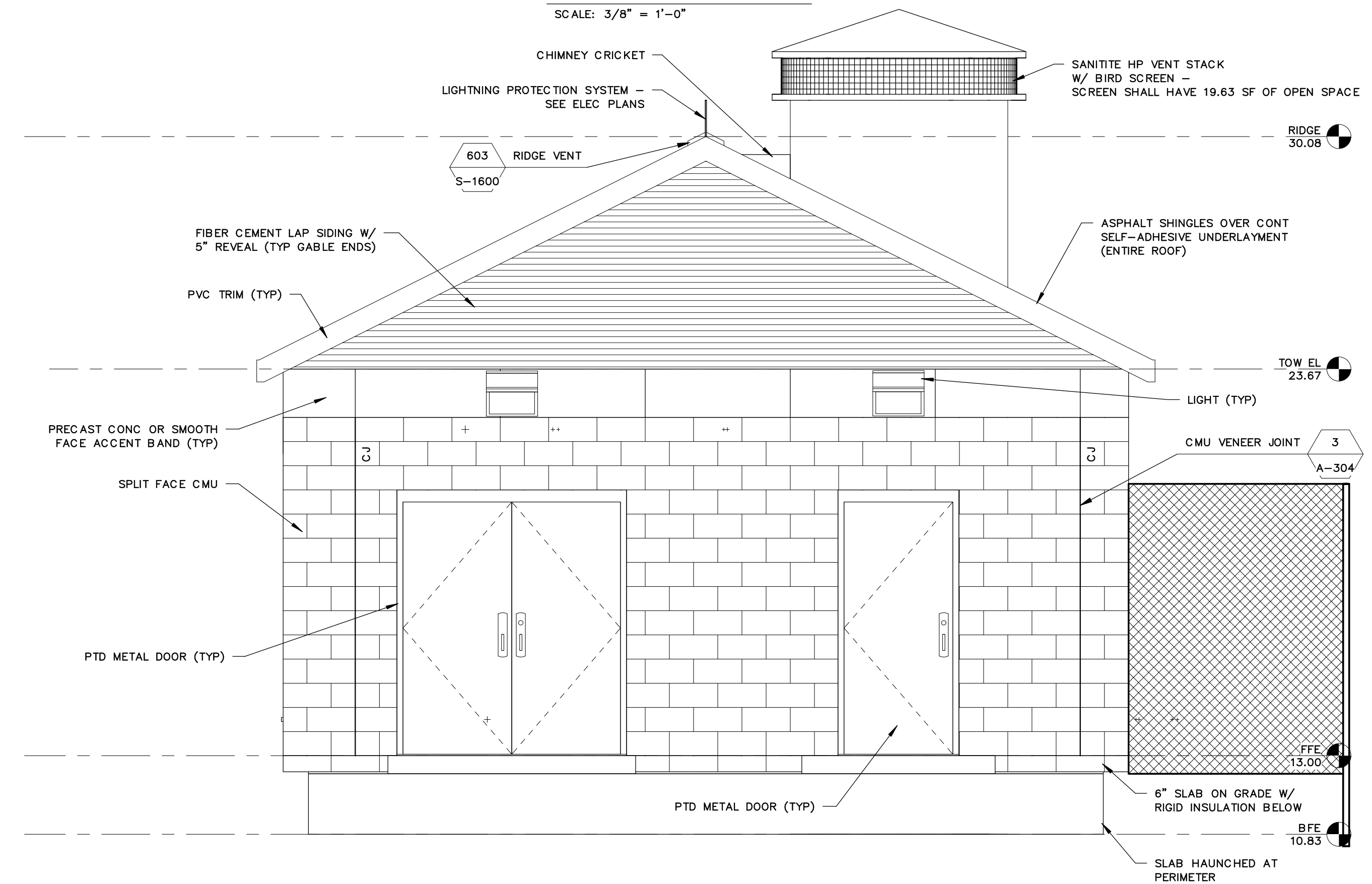
SOUTH ELEVATION

SCALE: $3/8" = 1'-0"$



EAST ELEVATION

SCALE: $\frac{3}{8}" = 1'-0"$



WEST ELEVATION

SCALE: $\frac{3}{8}" = 1'-0"$

60% DESIGN SUBMITTAL - NOT FOR CONSTRUCTION

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C



3



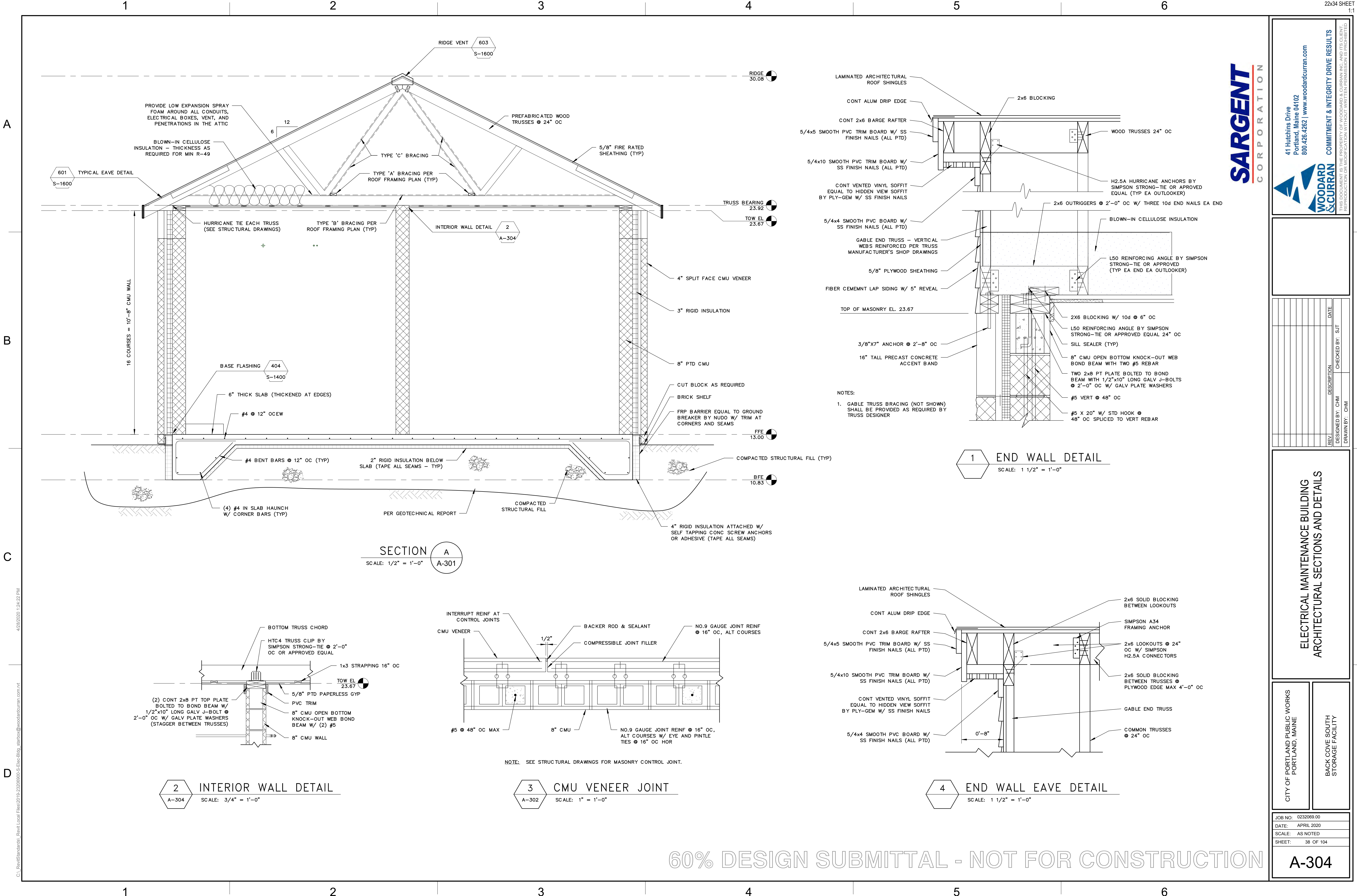
B



6

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REV	DESCRIPTION	CHECKED BY	DATE
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2	DRAWN BY: CHM	CHM	

ELECTRICAL MAINTENANCE BUILDING
ARCHITECTURAL SECTIONS AND DETAILS

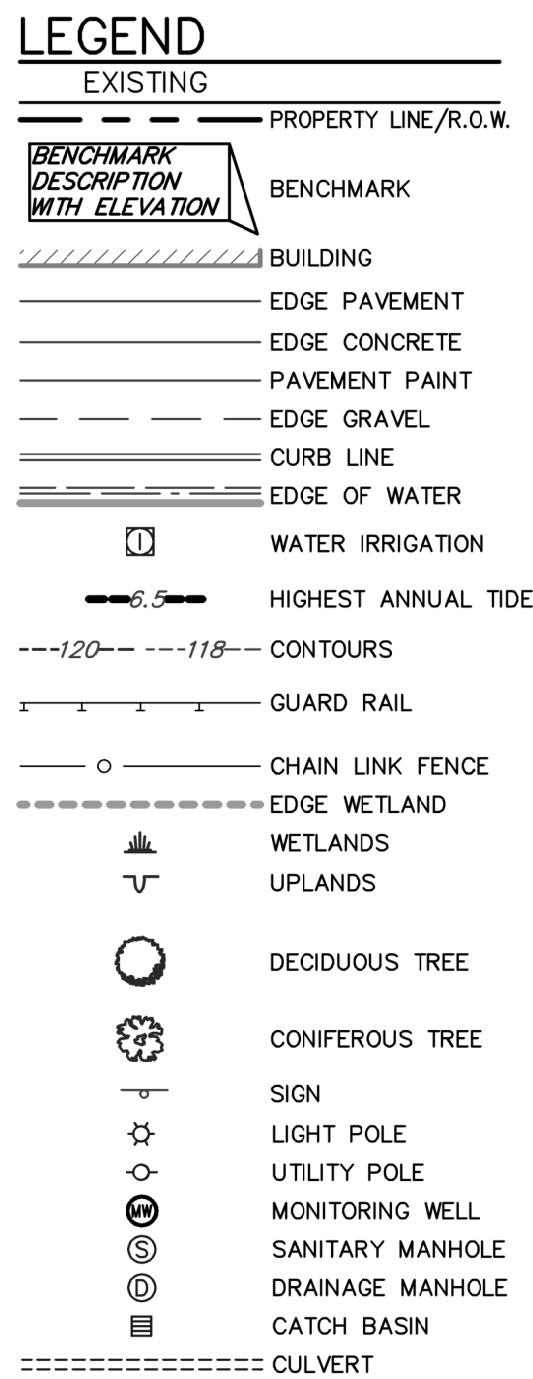
CITY OF PORTLAND PUBLIC WORKS
PORTLAND, MAINE

BACK COVE SOUTH
STORAGE FACILITY

JOB NO: 0232069.00
DATE: APRIL 2020
SCALE: AS NOTED
SHEET: 38 OF 104

A-304

60% DESIGN SUBMITTAL - NOT FOR CONSTRUCTION

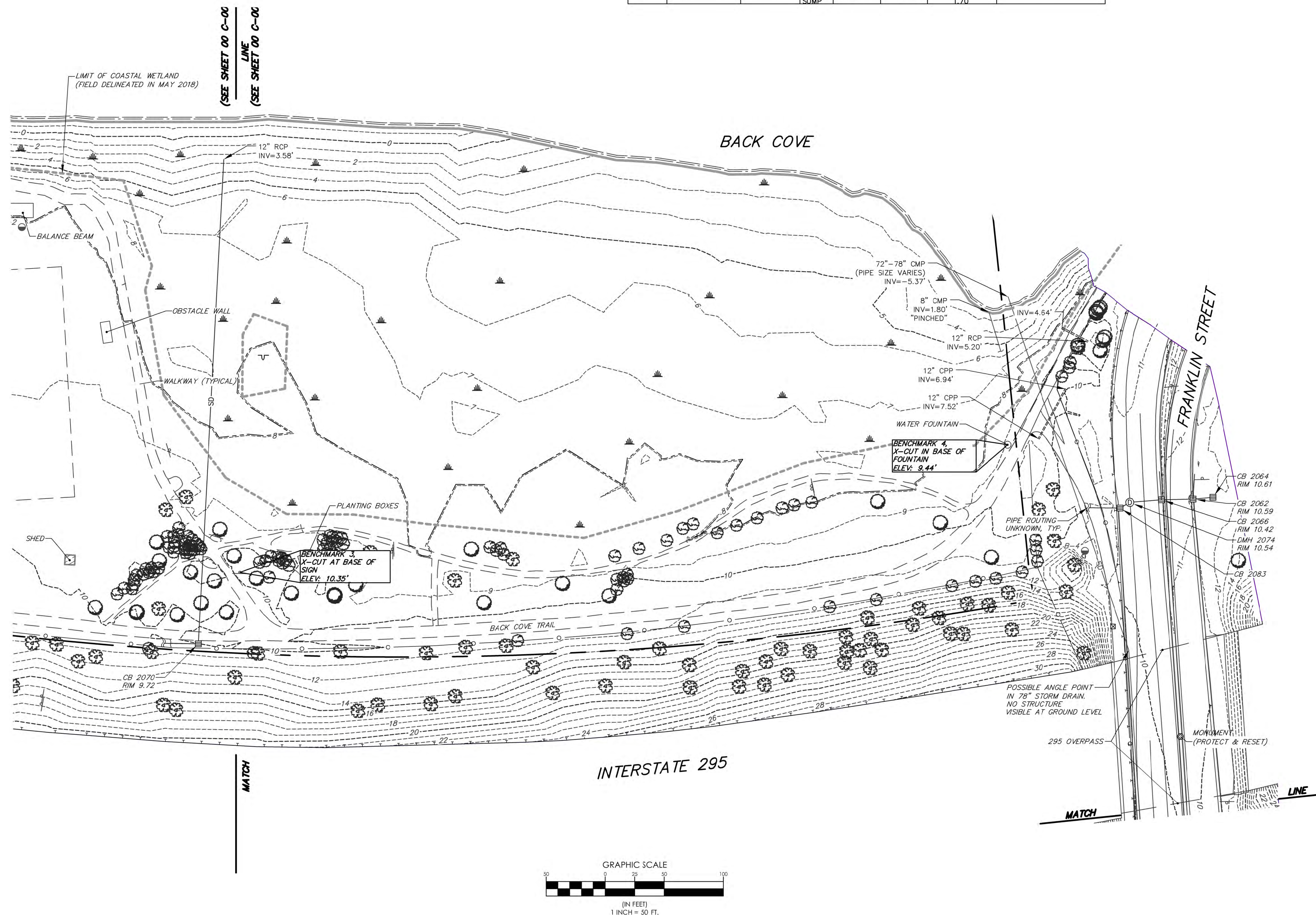


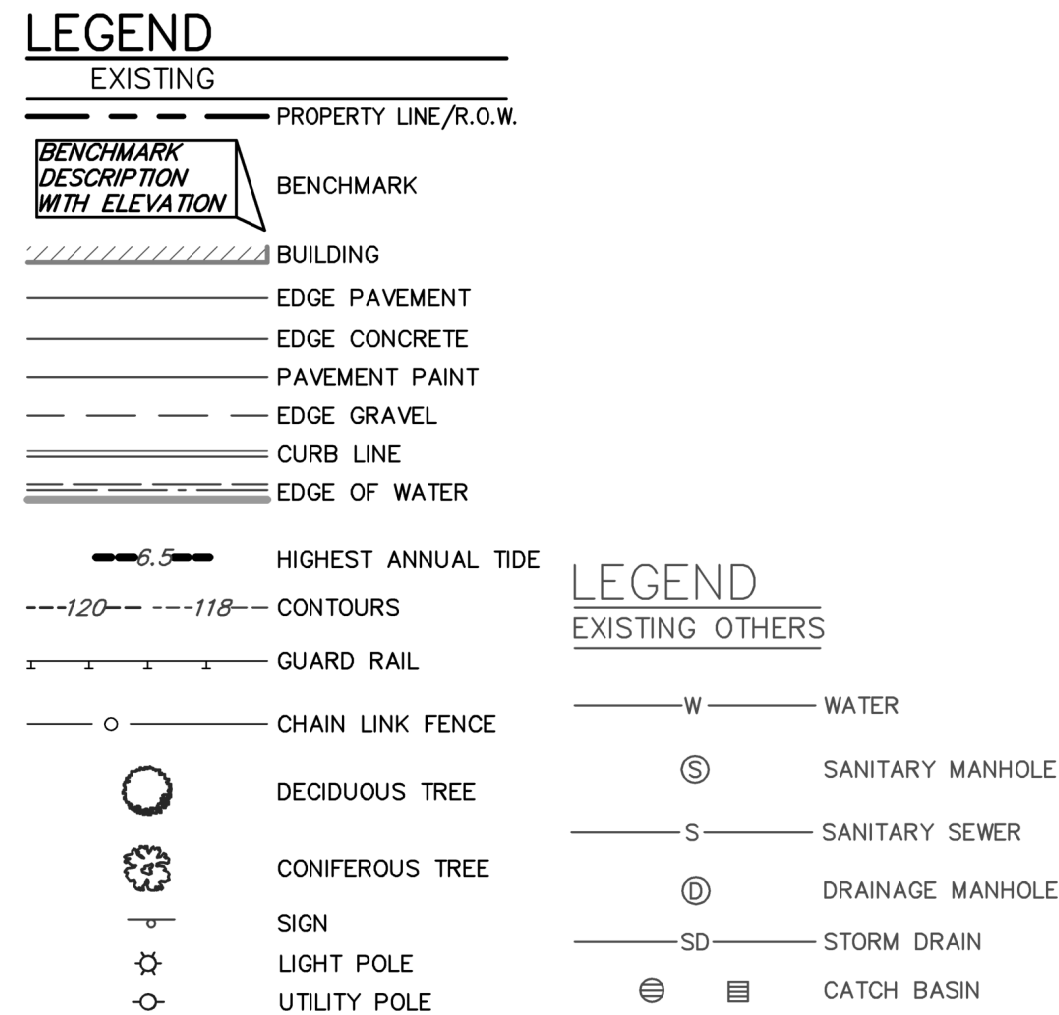
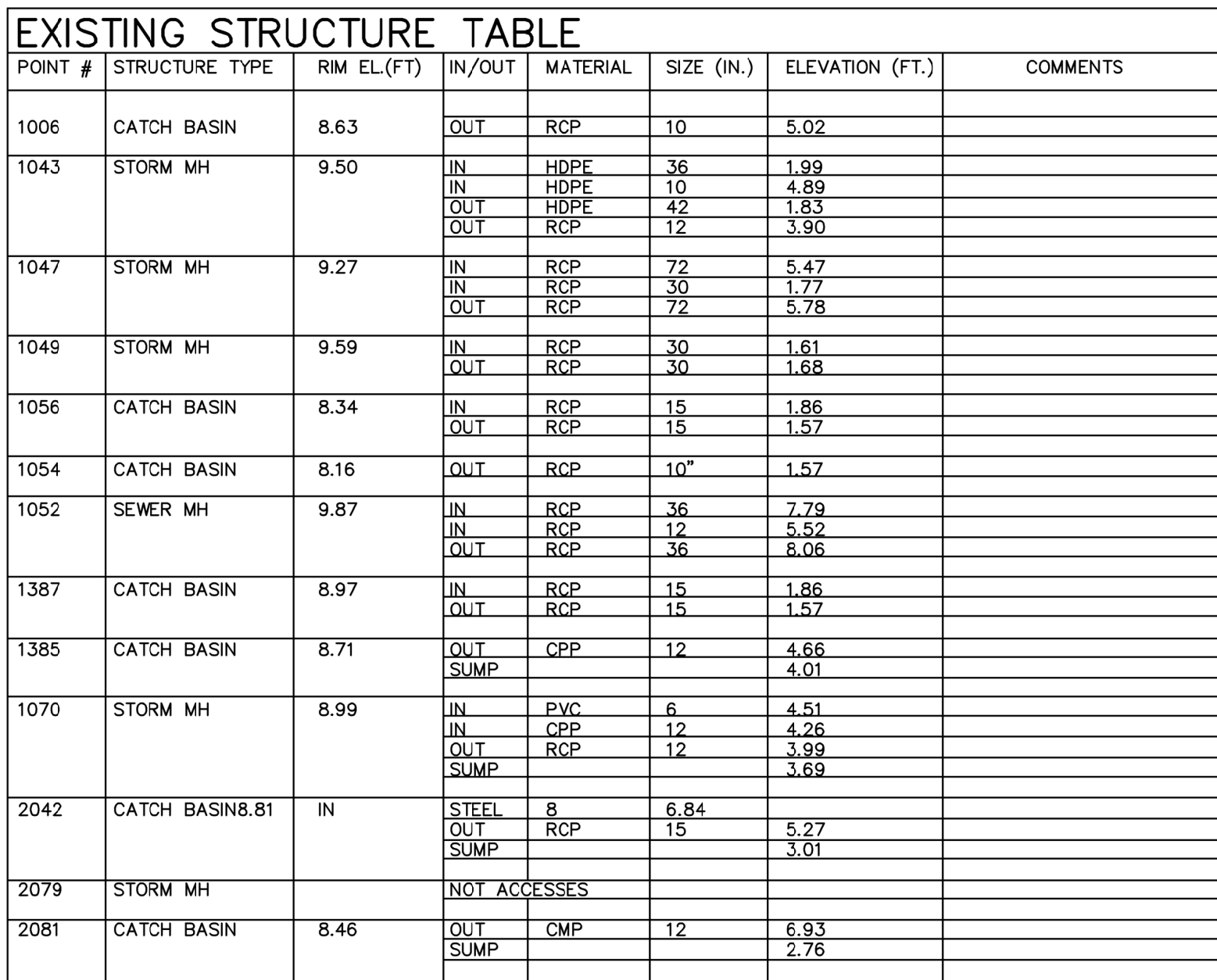
INDICATIVE
DESIGN ONLY
RFP DOCUMENT
GUIDELINE FOR
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AECOM TECHNICAL SERVICES, INC.
TWO CITY CENTER, SUITE 200
PORTLAND, ME 04101
PHONE: 207.775.2800
www.aecom.com

17025 EC.dwg, TAB:EC3

[illegible]

TOPOGRAPHIC SURVEY
OF:
BACK COVE SOUTH STORAGE FACILITY
BACK COVE PARK & FRANKLIN STREET
PORTLAND, MAINE
FOR:
CITY OF PORTLAND PUBLIC WORKS
55 PORTLAND STREET
PORTLAND, MAINE 04101

PROJECT NO.	SCALE
17025	1" = 20'

SHEET 00 C-004

17025 EC dwo TAB·EC4



PLANNING BOARD MEMORANDUM PORTLAND, MAINE

83 Middle Street
Level III Subdivision; IZ Conditional Use; Parking
PL-0001079-2020 and PL-000132-2020
Middle Street Housing Partners, LP (Community Housing of Maine, Inc.), Applicant

Submitted to: Portland Planning Board
Workshop Date: July 14, 2020

Prepared by: Caitlin Cameron, Urban Designer
Date: July 8, 2020

I. INTRODUCTION

Community Housing of Maine, Inc. has submitted Level III Subdivision and Inclusionary Zoning Conditional Use applications for a residential project on Franklin Street between Middle and Newbury streets in the India Street neighborhood. In addition, the parking approval is also being considered as part of this application. The proposal is for a single five-story building with 50 affordable, age-restricted apartments on floors two through five with ground floor structured parking and 1,480 square feet of ground floor retail space. The parking is provided on-site with a combination of 12 structured spaces and one car-share space. All of the required five affordable units will be provided on-site. The project is located in the India Street Form-Based Code (IS-FBC) zone (Urban Active and Urban Transitional subdistrict), is within 100' of a historic landmark, and is subject to an advisory Historic Preservation design review. As the project is located in the IS-FBC zone, an accompanying Level II Site Plan application is under reviewed by the Planning Authority.

The focus of this workshop is discussion of the proposed reduction in parking requirements (See VI. Zoning Assessment).

Applicant: CHOM - Community Housing of Maine, Inc. (represented by Brian Kilgallen)

Agent and Engineer: Terradyn Consultants, LLC (Michael Tadema-Wielandt)

Architect: CWS Architects (Ben Walter)



II. REQUIRED REVIEWS

Review Type	Applicable Standards
New construction under 50,000 sf	Level II Site Plan Review and ISFBC UA/UT Design Review
Within 100' of a Historic Landmark	Advisory Review - Historic Preservation Staff
Subdivision (50 dwelling units)	Planning Board Level III Subdivision Review
Multi-Family Residential >10 units	Planning Board Inclusionary Zoning Conditional Use
Parking Requirement	Planning Board approval for reduced parking

III. PROJECT DATA

<i>SUBJECT</i>	<i>DATA</i>
Total area of the site	13,842 sf
Total Disturbed Area	13,842 sf
Existing Zoning	ISFBC (UA, UT)
Existing Use	Vacant
Proposed Use	Residential, retail
Impervious Surface Area	
--Existing	7,488 sf
--Proposed	11,717 sf
--Net Change	+4,229 sf
Building Footprint	
--Existing	0 sf
--Proposed	9,715 sf
--Net Change	+9,715 sf
Building Floor Area	
--Existing	0 sf
--Proposed	45,770 sf
-Net Change	+45,770 sf
Proposed Room Mix	
-Efficiency	23
-One-bedroom	23
-Two-bedroom	4
Parking Spaces	12 + carshare = 19 spaces (47 required)
Bicycle parking Spaces	19 (none existing)
Estimated Cost of the project:	unknown

IV. EXISTING CONDITIONS

The subject property is within the India Street neighborhood and has frontage on three streets – Middle, Franklin, and Newbury. The property is currently vacant between Middle and Newbury and is used as a City parking lot. Several small older buildings abut facing Hampshire Street/Middle Street. The recent Luminato (169 Newbury Street) and Verdante (56 Hampshire Street) condominium buildings share the evolving Franklin Street streetscape where taller buildings are warranted for the wide arterial street.

The site is within the India Street Form-based Code (IS-FBC) zone and situated at a prominent, gateway corner of Franklin and Middle streets. Middle Street is designated as Urban Active (UA) zoning subdistrict which emphasizes active frontage. Franklin and Newbury are Urban Transitional (UT) zoning subdistricts which provide more flexibility on the level of active frontage, massing, and scale. The corner at Middle and Franklin has irregular lot lines and underground utility vaults – it is for that reason a small, landscaped plaza is kept open.

Middle Street is considered a main retail street of the neighborhood and includes historic building fabric; this proposal is within 100' of a landmark building located across the street and is being reviewed specifically for how it fits into the established streetscape of Middle Street. The streetscape includes two to three story, red brick buildings with traditional storefront ground floors with symmetrical, regular rhythm façade composition on upper floors.

Parking is limited in this neighborhood of dense development. Many new projects in this area rely on off-site, proximate parking. In this case, the building includes some structured parking at the ground floor facing Franklin/Newbury which are considered less active streets. This allows the new development to have a good relationship to the street wall and maximize the lot for active uses on Middle Street.

The proposal is located within an established, built-up neighborhood. As an infill project, the impacts are limited – relying on existing infrastructure systems, not creating additional impervious surface, or creating new roadways. The most significant impacts for evaluation are traffic and parking which are shown to be less than would be the case in an equivalent non-age restricted project in the applicant's parking assessment ([Attachment Q](#)) due to the characteristics and driving habits of the population being served by this development.

V. PROPOSED DEVELOPMENT

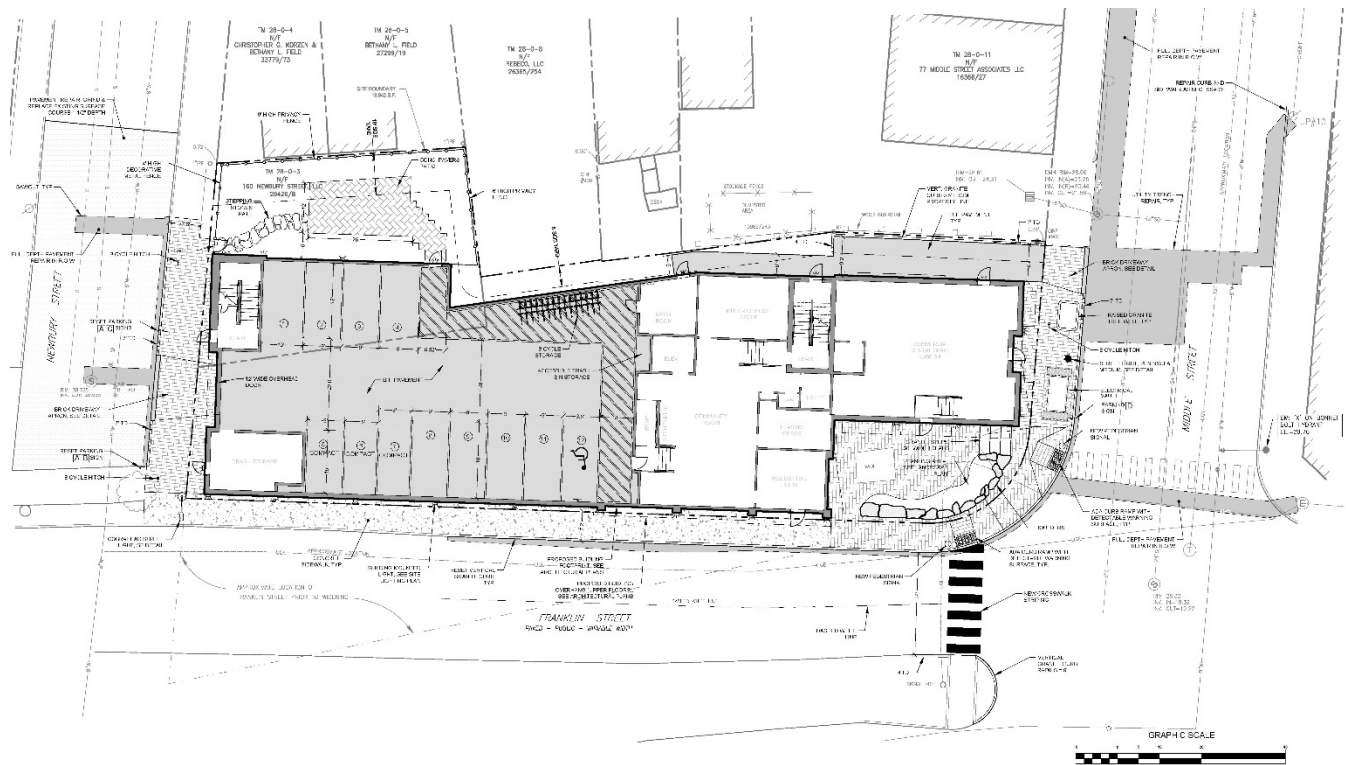


Figure 2 Proposed Site Plan

The proposed building is shown in the plan set and described in the applicant's submittal. This image shows the overall project viewed from Franklin and Middle streets. The design review was conducted by Planning and Historic Preservation staff.



Figure 3 View of Project from Franklin St

The proposal includes:

- 50 affordable apartments (23 efficiencies, 23 one-bedrooms, 4 two-bedrooms), age-restricted to 62+
 - Among these are 5 workforce housing units as required by Inclusionary Zoning
- Bike Storage
- Structured parking for 12 vehicles (including one car-share car)
- One retail space (approximately 1,480 sf)
- Three waiver requests
 - Driveway separation (Middle Street)
 - Number of compact spaces
 - Reduced drive aisle width

VI. ZONING ASSESSMENT (INCLUDING PARKING REQUIREMENT)



Figure 4 Project Zoning

The project is located within the India Street Form-based Code zone (IS-FBC) with frontage on Middle Street (Urban Active subdistrict) and Franklin and Newbury Street (Urban Transitional subdistrict). Under the Level II Site Plan application, the project was reviewed for compliance with the zoning and dimensional standards. The applicant did have several waiver requests regarding number of compact parking spaces, drive aisle width, and driveway separation. The project otherwise meets all dimensional and use requirements including lot coverage, setbacks, height, building width, and frequency of entries. The IS-FBC zone does not include density requirements and has very permissive allowed uses.

The project is seeking Planning Board approval to provide less than the required number of parking spaces. Under Division 20, the required amount of parking for the project is 47 spaces (50 residential units – 3).

Ch 14 Division 20 Off-Street Parking states the following:

(k) 2. “The required parking for multi-unit residential buildings may be partially met through provision of shared-use vehicles, which are vehicles owned and maintained by the owner/manager of the building and available for use on a fee basis to the residents of the building. One shared use vehicle shall be deemed to satisfy eight (8) required car spaces, but in no case shall more than 50% of the parking requirement be satisfied by shared vehicle use.”

(k) 3. “The Planning Board may establish a parking requirement that is less than the normally required number of spaces upon a finding of unique conditions that result in a lesser parking demand, such as housing for persons who cannot drive, housing that participates in a travel demand management program, availability of transit, etc.”

Based on these provisions, the applicant proposes a reduced requirement to a total of 19 spaces = 40% of the zoning requirement.

- The applicant is providing 12 on-site, structured parking spaces
- One parking space is proposed to be a car-share space

The applicant has provided a parking analysis for the request to reduce the parking requirement ([Attachment Q](#)). Mike Tremblay, staff reviewer for Department of Public Works, has made the following comments related to parking request ([Attachment 1](#)).

- *The site's parking shortfall is significant. The Applicant provided justification for the proposed parking supply, specifying that the site will be used for housing for elderly persons with disabilities. The Applicant should confirm whether, and to what extent, healthcare providers will be making home visits to the site, as this may change the parking demand calculation.*
- *The applicant suggests that a shared vehicle will be provided on-site, which would count for eight parking spaces provided instead of just one. The Applicant should be aware that Uhaul's carshare program is no longer operating in Portland. The Applicant should provide information about how carshare would work in this context.*
- *The Applicant should consider whether the expected residents of the development (elderly persons with disabilities) may warrant additional accessible spaces. Similarly, the proposed waiver for compact spaces may not be appropriate in this context.*

One recent project was approved by the Planning Board (July 24, 2018) with similar parameters:

	Required Parking	Reduced Parking	Development Description
178 Kennebec Street	51 spaces	18 surface parking spaces = 35% 10 residential 6 retail 1 pick-up drop off 1 car share space	51 apartments, age-restricted

A condition of approval was proposed in that case:

- The Applicant shall conduct a Parking Demand Study following the occupancy of the project with the methods of the Study to be reviewed and approved by Planning Staff. If the study identifies a parking supply deficit, the applicant shall either secure off-site parking spaces or make a contribution to the City's Parking In-Lieu Fee program.

Waivers for that project included:

- The Planning Board voted unanimously 7-0 to waive the Technical Standard, Section 1.14 to allow a 22-foot-wide aisle in the parking lot.
- The Planning Board voted unanimously 7-0 to waive the Technical Standard, Section 1.14 and Figures I-27 to I-29 to allow 61% compact spaces (11 spaces).

Regarding the car-share, several multi-family buildings have been approved with the use of the car-share provision:

1. 17 Carleton Street – provided by U-Haul
2. 409 Cumberland Avenue – provided by U-Haul
3. 81 High at Danforth – provided by the building management with the following condition of approval:
 - *No certificate of occupancy shall be issued to any unit unless and until the two commonly shared vehicles have been purchased, are present on the site and are available for use by the building occupants.*

VII. PUBLIC COMMENT

This hearing was noticed to 145 neighbors and interested parties and the public notice appeared in the *Portland Press-Herald* on July 2nd and July 3rd, 2020. The applicant held a Neighborhood Meeting on June 10th, 2020 with eight (8) attendees and the notes are included in Attachment O. Two public comments were received (Attachment PC1) regarding clarification of drawings and how zoning is met, concerns over the use of Newbury Street (a narrow, dead end street) as the main access for the parking garage, and the parking layout. The majority of the comments are related to building height and rooftop design, and architectural design which are part of the Level II Site Plan review by the Planning Authority.

VIII. RIGHT, TITLE AND INTEREST AND FINANCIAL/TECHNICAL CAPACITY

The project combines two lots. The applicant provided evidence of Right, Title, and Interest in the form of two deeds, lease and donation agreements (Attachment C). The City of Portland is providing the applicant the option for a 99-year ground lease. The second parcel associated with this project is being donated by the current property owner. A 4' right of way crosses the property but has been unused for 100 years.

IX. SUBDIVISION REVIEW

(14-497(a). Review Criteria)

The proposed development has been reviewed by staff for conformance with the relevant review standards of the City of Portland's subdivision ordinance. Staff comments are below and in *Attachments 1-3*.

1. Water, Air Pollution

The project is not anticipated to result in undue air or water pollution.

2 & 3. Adequacy of Water Supply

The applicant has provided evidence of capacity from the Portland Water District.

4. Soil Erosion

No unreasonable soil erosion or reduction in the capacity of the land to hold water is anticipated. The Site Plan (Plan P7) and Erosion Control Plan (Plan P9) provide information about stabilizing the site during and after construction.

5. Impacts on Existing or Proposed Highways and Public Roads

Newbury Street is under moratorium – impacts to that street/sidewalk must meet the requirements for moratorium streets. Mike Tremblay, staff reviewer for the Department of Public Works, makes the following comments (Attachment 1):

- The signal cabinet appears to have been moved from its existing location, but no replacement location has been identified. This issue needs to be resolved before approval. The Applicant should work with Kevin Thomas, the City's traffic operations coordinator, to identify an appropriate location of the signal cabinet if necessary.*
- As the signal cabinet and pedestrian poles are proposed to be relocated, the Applicant shall provide the City with a traffic signal plan, designed by a PE and approved by DPW, prior to approval.*

6. Sanitary Sewer/Stormwater Disposal

A 6-inch sewer line is proposed to service the building and would outlet to Middle Street. No grease trap is proposed. The applicant received Wastewater Capacity Authorization from the Department of Public Works in order to meet the *City of Portland Technical Manual's* standards. The stormwater treatment plan is still being reviewed by staff.

7. Solid Waste

The applicant has proposed a trash and recycling room located within the building to be disposed of with an independent waste contractor from Newbury Street. The project is not anticipated to cause an unreasonable burden on the ability of the City to dispose of solid waste (Attachments L) but is asked to coordinate with the Luminato development – evidence of schedule and traffic impacts are requested.

- *The Applicant identified the location of solid waste within the site, but it is not clear how solid waste will be picked up. The applicant should describe and/or provide a diagram of how garbage will be removed from the site, including necessary truck maneuvers, location where a truck will park to load garbage, etc.*

8. Scenic Beauty

This proposal is not deemed to have an adverse impact on the scenic beauty of the area. The project is within the 100' of a historic landmark (78-86 Middle Street) and received advisory review from Historic Preservation staff. (Attachment 2)

9. Comprehensive Plan

India Street Sustainable Neighborhood Plan

The adopted neighborhood plan includes the following goals and principles met by this proposal (Attachment I):

Goal – Vitality – the project adds 50 new units bringing more people to the neighborhood

Goal – Diversity of building types and residents – The project targets a different demographic for the neighborhood.

Principle 7: Guided Growth – the project provides dense residential development in one of the areas identified as potential growth and infill development sites.

Principle 8: Form of Development – High residential density, maintaining the pedestrian-scale blocks, continuous sidewalks, and street-oriented buildings – these concepts are all included in the project.

Incentives for Affordable Housing and Housing – Sustaining Portland's Future

The City believes that it is in the public interest to promote an adequate supply of affordable housing for its residents. The proposed project is required under the newly adopted Division 30, Section 14-487, Ensuring Workforce Housing to provide at least 10% workforce housing units. As described below and in (Attachment 2), the project proposes to provide three on-site rental units. Housing stock is placed in a multi-modal neighborhood with good connections to several neighborhoods, offices, and services.

10. Financial and Technical Capacity

As noted above, the applicant has provided evidence of financial and technical capacity (Attachment D).

11. Wetland/Water Body Impacts

Project is not located within a watershed of any pond or lake or within 250 feet of any wetland, great pond or river.

12. Groundwater Impacts

There are no anticipated impacts to groundwater supplies.

13. Flood-Prone Area

Per the FEMA flood maps, the site is not located in a flood zone.

14. Wetland/Water Body Impacts

No potential wetlands within the proposed subdivision.

15. Wetland/Water Body Impacts

No river, stream or brook within or abutting the proposed subdivision.

(14-497(c) Conformity with Code) Any proposed subdivision shall be in conformity with all relevant provisions of this Code. This project has been reviewed for conformity with the zoning code and Site Plan Ordinance, with Planning Authority approval pending for the associated Level II Site Plan. A zoning checklist and waiver request is included (Attachment J).

X. INCLUSIONARY ZONING CONDITIONAL USE

The applicant is required by Division 30, Section 14-487 to provide five workforce housing units (on-site or off-site) or pay the fee-in-lieu. The applicant has proposed to provide five (5) of these units on-site. The Housing Program Manager has the following comments (Attachment 3):

- *[The Applicant] has elected to provide fifty (50) affordable units (50-60% AMI) for thirty years. The applicant is providing a greater percentage of affordable units at lower income targets than required by the Ensuring Workforce Housing Ordinance.*
- *Staff has determined this project exceeds the affordability requirements of Division 30, Section 14-487.*

XI. PLANNING BOARD CONSIDERATIONS

Staff request feedback from the Planning Board on the parking reduction request, taking into consideration the staff review comments and applicant materials. Planning Board is asked to weigh in on the following:

- Off-street parking reduction: 19 spaces = 40% of required 47 spaces
- Car-share feasibility (equivalent to 8 parking spaces)

Outstanding items to be resolved:

- Stormwater review
- Solid Waste disposal plan
- Traffic signal cabinet location, traffic signal plan
- Parking reduction + carshare plan

ATTACHMENTS:

Attachments to Memorandum

1. Department of Public Works
2. Zoning/Design Checklist
3. IZ Conditional Use

Public Comments

PC1 Derek Veilleux 7.3.20

PC1 Kevin Rodel and Katy Longley 7.9.20

Applicant's Submittal

- A. Development Description
- B. Conformity with Design Standards
- C. Right, title and Interest
- D. Technical & Financial Capacity
- E. State & Federal Permits
- F. Easements
- G. Natural Features
- H. Stormwater Management
- I. Consistency with Master Plans
- J. Zoning Checklist + Waiver Request
- K. Utilities
- L. Solid Waste

- M. Fire Safety
- N. Construction Management Plan
- O. Neighborhood Meeting Package
- P. Wastewater Capacity
- Q. Parking Assessment

Plans

- P1 C1.0 Cover Sheet
- P2 C1.1 General Notes
- P3 Survey
- P4 C2.0 Recording Plat
- P5 C3.0 Existing Conditions & Demolition Plan
- P6 C3.1 Construction Management Plan
- P7 C2.0 Site Plan
- P8 C5.0 Grading Drainage Plan
- P9 C5.1 Erosion & Sediment Control Notes & Details
- P10 C6.0 Site Utility Plan
- P11 C7.0 Photometric Lighting Plan
- P12 C8.0 Site Details
- P13 C8.1 Utility & Drainage Details
- P14 C8.2 Street Light Details
- P15 C9.0 Vehicle Movement Plan 1
- P16 C9.1 Vehicle Movement Plan 2
- P17 L1.0 Landscape Plan & Planting Details
- P18 A1.10 Ground Floor Plan
- P19 A1.2 2nd Floor Plan
- P20 A1.3 3rd Floor Plan
- P21 A1.4 4th Floor Plan
- P22 A1.5 5th Floor Plan
- P23 A1.6 Roof Plan
- P24 A3.01 Elevations
- P25 A3.02 Elevations
- P26 Renderings

Here are my comments on 83 Middle Street:

- The signal cabinet appears to have been moved from its existing location, but no replacement location has been identified. This issue needs to be resolved before approval. The Applicant should work with Kevin Thomas, the City's traffic operations coordinator, to identify an appropriate location of the signal cabinet if necessary.
- As the signal cabinet and pedestrian poles are proposed to be relocated, the Applicant shall provide the City with a traffic signal plan, designed by a PE and approved by DPW, prior to approval.
- The Franklin Street Master Plan calls for Newbury Street to be connected to Franklin Street in the future. In this event, the Applicant should be aware that the City may restrict the garage driveway in some way (right-out only, or right-in/right-out only, etc.) to maintain safety.
- The Applicant identified the location of solid waste within the site, but it is not clear how solid waste will be picked up. The applicant should describe and/or provide a diagram of how garbage will be removed from the site, including necessary truck maneuvers, location where a truck will park to load garbage, etc.
- The site's parking shortfall is significant. The Applicant provided justification for the proposed parking supply, specifying that the site will be used for housing for elderly persons with disabilities. The Applicant should confirm whether, and to what extent, healthcare providers will be making home visits to the site, as this may change the parking demand calculation.
- The applicant suggests that a shared vehicle will be provided on-site, which would count for eight parking spaces provided instead of just one. The Applicant should be aware that Uhaul's carshare program is no longer operating in Portland. The Applicant should provide information about how carshare would work in this context.
- The Applicant should consider whether the expected residents of the development (elderly persons with disabilities) may warrant additional accessible spaces. Similarly, the proposed waiver for compact spaces may not be appropriate in this context.

Thank you,
Mike

Development Review Checklist

IS-FBC

Level I / Level II / **Level III** / Master Plan
 Project Name: CHOM Housing
 Address: 83 Middle Street
 Description: Alteration / Addition / **New Construction**
 Date Received: 5/10/20 **Prelim** / Final
 Planner: Caitlin Cameron

Subdistrict UN / **UT** / UA

	Complies	More Info	Does Not Comply	N/A	Comments
PURPOSE					
General Guiding Principles	☒	☐	☐	☐	
Subdistrict Intent	☒	☐	☐	☐	UT Federal + Franklin; UA Middle
GENERAL DEV. STANDARDS					
(a) Prohibited Uses	☒	☐	☐	☐	Residential/retail
(b) Siting Standards					
Mid-Block Permeability	☐	☐	☐	☒	
Frontage Req. – Additional Building Length	☒	☐	☐	☐	UT Newbury = 58' < 100' UA Middle = 34' < 50' UT Franklin = 193' with structured parking, massing variation
Setbacks	☒	☐	☐	☐	
Small Lot < 35'	☐	☐	☐	☒	
Side Yard less than 5'	☐	☐	☐	☒	
Special corner treatment	☒	☐	☐	☐	Corner plaza
Attached Buildings	☐	☐	☐	☒	
Landscaping & Screening					
Surface Parking	☐	☐	☐	☒	
Front yard - Height	☒	☐	☐	☐	4' < 6' max
Front yard - Visual Permeability	☒	☐	☐	☐	Visual permeability required above 2', detail provided, met
Side/Rear yard - Height	☒	☐	☐	☐	6' < 8' max.
	Complies	More Info	Does Not Comply	N/A	Comments

(c) Height Standards					
Height Bonus - Eligible?	☐	☐	☐	☒	
Height Bonus – Conditions Green Roof + Pervious = 50% lot	☐	☐	☐	☐	
(d) Parking Standards	☐	☒	☒	☐	47 spaces required, 11 provided - PB approval required
SUBDISTRICT DIMS REQ.					
Siting Standards					
Orientation	☒	☐	☐	☐	UT principal façade; UA retail facade
Corner Condition	☒	☐	☐	☐	
Lot Coverage	☒	☐	☐	☐	70% < 90%
Frontage Requirements					
Building Length	☒	☐	☐	☐	
Additional Bldg Length	☒	☐	☐	☐	Franklin complies; Newbury, Middle not seeking additional length
Fenestration Req. (UA)	☒	☐	☐	☐	60% met on Middle Street
Setbacks					
Principal Building					
Front Yard	☒	☐	☐	☐	All front yards less than 5'
Side Yard	☒	☐	☐	☐	At least 10' on UT side yard
Side Yard	☒	☐	☐	☐	At least 5' on UA side yard
Exceptions?	☒	☐	☐	☐	Corner condition
Rear Yard	☐	☐	☐	☒	No rear yards
	Complies	More Info	Does Not Comply	N/A	Comments
Building Entries					
Frequency	☒	☐	☐	☐	Newbury = 2 required, 2 provided Franklin = 2 required, 2 provided Middle = 1 required, 1 provided

Principal Entry Orientation	☒	☐	☐	☐	Principal entry on Franklin; 1 retail entry on Middle
Principal Entry Elevation	☒	☐	☐	☐	All entries at grade
Height Standards					
Principal Building					
Height	☒	☐	☐	☐	Height is less than 65' on UT streets, Meets 50' maximum on UA street
Stories	☒	☐	☐	☐	4 stories on Middle; 5 stories on Franklin/Newbury
Stepbacks (UT, bonus)	☒	☐	☐	☐	For UT building, 10' stepbacks required after 45' height for side yards adjacent to UN property.
Accessory Building(s)	☐	☐	☐	☒	
Parking Standards					
Surface Parking Location	☐	☐	☐	☒	
Garage Door Setback	☒	☐	☐	☐	Door is setback from facade
Garage Door Opening	☒	☐	☐	☐	12' door

IS-FBC: Building Design Standards (BDS)

	Complies	More Info	Does Not Comply	N/A	Comments
BUILDING DESIGN STANDARDS (BDS)					Review (6/23/20) Caitlin Cameron, Deb Andrews, Christian Roadman *see summary at end of checklist
1. Neighborhood Context					
Intent	☒	☐	☐	☐	
Guidelines	☒	☐	☐	☐	Material palette and number of architectural expressions were simplified to create a more cohesive design across the building. On Middle – façade composition revised to reflect context which has more symmetrical, regular composition. Rhythm and pattern of windows is more regular and reflects the patterns found on Middle Street. The accent feature on the corner is a contemporary expression of a bay which brings emphasis to the corner and provides massing variation similar to a traditional bay window.
2. Massing & Proportion					
Intent	☒	☐	☐	☐	Massing appropriately places the larger, longer mass on Franklin and the vertically proportioned, four-story mass on Middle Street.
Guidelines	☒	☐	☐	☐	
Standard 2.1	☐	☐	☐	☒	
3. Articulation & Composition					
Intent	☒	☐	☐	☐	
Guidelines	☒	☐	☐	☐	The Middle Street storefront design creates the appropriate scale and activity. The ground floor composition and articulation

					now better relates to the upper floors and is more consistent across the whole building with changes appropriate to the functions.
Standard 3.1: 3 required	☒	☐	☒	☐	The two primary façades use: recessed entrances, projection at corner, material change; Federal and Franklin include canopies at entries. Newbury Street is considered a secondary façade on a minor street – 2 articulation elements include: change of material, expression lines at roof and floor delineation
Standard 3.2	☐	☒	☐	☐	More information needed regarding material detailing and transitions.
Standard 3.3: Blank Wall	☒	☐	☐	☐	Newbury Street: length of blank wall is 17' < 30' on ground floor, 27' < 30' on upper floors
4. Fenestration					
Intent	☒	☐	☐	☐	The visibility and activity on Middle is well-addressed by the active storefront. The ratio of solid to void on the upper floors was revised to provide a more visually interesting compositions on visible elevations. The regular pattern and proportions better relates to the patterns found on Middle Street. Staff agree providing emphasis on the corner as a visible gateway location makes sense – the bay is a contemporary element introducing massing variation. The main portions of the building keep a regular form, massing, and fenestration pattern that relates to the traditional patterns – the contemporary/asymmetrical bay and canopy elements make sense for the overall massing and façade composition of this contemporary project on a prominent corner even though these elements differ from the symmetrical compositions of the traditional facades.
Guidelines	☐	☐	☐	☐	The pattern of openings are symmetrical and reflective of façade composition on Middle Street.
Standard 4.1 (UA only)	☒	☐	☐	☐	

Standard 4.2	☒	☐	☐	☐	The ratio of opening to void on Middle Street was revised to reflect the typical condition.
Standard 4.3	☒	☒	☐	☐	Glass must be transparent.
Standard 4.4	☐	☐	☐	☒	

	Complies	More Info	Does Not Comply	N/A	Comments
5. Building Materials					
Intent	☒	☐	☐	☐	Existing characteristic of buildings in Portland is the consistent use of a few materials with simple placement. The material palette should be used to unify the building and create a cohesive presence.
Guidelines	☐	☐	☒	☐	Masonry block is not a typical ground floor material for a residential/mixed-use building. Red brick on Middle Street is appropriate – brick and mortar selection should be similar to what is found in Middle Street context. Exposed aggregate creates industrial or institutional character at ground level. Why does the color change on Newbury Street? How does this contribute to the intent to have a cohesive design? Proposed condition of approval: material sample of brick, mortar, ground face block
6. Building Entries					
Intent	☒	☐	☐	☐	Entries provided on all street facades.
Guidelines	☒	☐	☐	☐	Residential entrance emphasized in scale with the overall building. Canopy is differentiated in character from commercial entrance.
Standard 6.1	☒	☐	☐	☐	Principal entrance faces Franklin Street addressing the corner with emphasis using canopy, fenestration.
Standard 6.2 (UA only)	☒	☐	☐	☐	
Standard 6.3	☒	☐	☐	☐	
Standard 6.4	☒	☐	☐	☐	
Standard 6.5	☒	☐	☐	☐	
Standard 6.6	☒	☐	☐	☐	Slight setback
Standard 6.7: Frequency	☒	☐	☐	☐	
7. Roof Lines					
Intent	☒	☐	☐	☐	Circulation towers are integrated and minimized in the design. Rooftop mechanicals are minimized with placement and screening.

Guidelines	☒	☐	☐	☐	
Standard 7.1	☒	☐	☐	☐	
Standard 7.2	☒	☐	☐	☐	Flat roof form/parapet
8. Structured Parking					
Intent	☒	☐	☐	☐	
Guidelines	☒	☐	☐	☐	The structured parking is integrated into the ground floor of the building – the ground floor should use the same material palette as the rest of the building.
Standard 8.1	☐	☐	☒	☐	Façade includes: material changes
Standard 8.2	☒	☐	☐	☐	Cars are fully concealed
Standard 8.3	☒	☐	☐	☐	
Standard 8.4	☒	☐	☐	☐	

Summary:

- Overall design/massing:
 - o Appreciate that the ground floor datum line is matched at the inverted corner transition. The step up on Franklin Street is a better transition point and the alignment of the floors gives more visual continuity to the most visible corner of the building.
 - o Revisions to the articulation and material palette successfully bring cohesiveness to the building.
- Rhythm/pattern/fenestration:
 - o This is much improved as relates to Middle and Franklin street experience and relationship to the façade compositions of Middle Street.
- Articulation/Materials:
 - o Given the number of materials proposed, staff would like to see sample board as final condition of approval to understand how the materials relate to each other and the context buildings.
 - o Concern about how the brick portion relates to Middle Street – would like to see samples of the brick and mortar. These should be similar in color, shade, contrast, and level of flashing as the context brick.
 - o Ground face block often feels institutional or industrial. How does this selected material at the base of Franklin Street relate to the other materials?
- Entrances:
 - o Franklin Street: Revisions to residential entrance are positive – corner orientation and level of fenestration bring good activity and emphasis to this

prominent corner and the plaza space. The canopy design is still not resolved in scale/proportion – this should either be a slimmer shelf or have a width that matches the Middle Street corner element. Current design does not relate to any other characteristic or element of the building and feels tacked on, not integrated into overall building design.



Caitlin Cameron <ccameron@portlandmaine.gov>

83 Middle - comments this week

Victoria Volent <vvolent@portlandmaine.gov>

Wed, May 20, 2020 at 11:40 AM

To: Caitlin Cameron <ccameron@portlandmaine.gov>

Hi Caitlin,

Community Housing of Maine (CHOM) is proposing to construct a five-story building with 50 units of affordable rental housing for residents age 62 and over. Eleven units will be set aside for Long Term Stayers (LTS). The site will be leased for 99-years from the City of Portland.

City financial assistance awarded to this project include \$330,000 in Affordable Housing Development funds (comprised of both HOME and Housing Trust Funds), and CDBG funding of \$200,000. As the recipient of local and federal housing subsidies, CHOM is required to maintain an on-going affordability period of 30 years. Twenty (20) units will be affordable to households earning at or below 50% Area Median Income, and thirty (30) units will be affordable to households earning at or below 60% Area Median Income.

Division 30, Section 14-487, Ensuring Workforce Housing, requires at least ten percent (10%) of the dwelling units in the development shall meet the definition of Workforce Housing units for sale or for rent. Section 14-487 (e) 7 sets the minimum term of affordability at ten (10) years for a project in which 100% of the units will be affordable to rental households earning at or below 100% Area Median Income.

Based on the requirements outlined in Section 14-487, the development is required to provide a minimum of five (5) Workforce Units (100% AMI) for ten years. CHOM has elected to provide fifty (50) affordable units (50-60% AMI) for thirty years. The applicant is providing a greater percentage of affordable units at lower income targets than required by the Ensuring Workforce Housing Ordinance. Staff has determined this project exceeds the affordability requirements of Division 30, Section 14-487.

Thank you,

Victoria

Victoria Volent
Housing Program Manager
Housing and Community Development
Phone: 207-482-5028
Fax: 207-874-8949
www.portlandmaine.gov

[Quoted text hidden]

1 DEVELOPMENT DESCRIPTION

1.1 OVERVIEW

Community Housing of Maine intends to construct a 5-story mixed use building including 50-apartments for 55+ residents on a 13,842 square foot parcel located at 83 Middle Street in Portland, Maine. The site is identified as Lots 3 and 17, Block O, on the City of Portland Assessors' Map 28. The site is located in the India Street Form-Based Code Zone and is currently developed with a paved parking area.

1.2 PROJECT PURPOSE AND NEED

The proposed project includes redevelopment of a previously developed lot in an area that has utility infrastructure in place and will provide residential units that are compatible with the existing neighborhood.

Parking for the residences will be located on the 1st floor level in the northwest section of the building that will be accessed from Newbury Street. The ground floor also contains a 1,480 square foot commercial space, a mechanical room and a community room, kitchenette and office for the residential units. The residential apartments will be located on the 2nd through 5th floors.

1.3 EXISTING CONDITIONS

The existing site is located on the northeast side of Middle Street between Franklin Street and Hampshire Street in Portland's India Street neighborhood and is developed with a paved parking area previously used by city vehicles. The site is in the India Street-Form Based Code (IS-FBC) zoning district.

Underground utilities in Franklin, Middle and Newbury Streets include water, gas, power and sewer. The sewer in Middle Street carries a combination of both stormwater and wastewater.

Brick sidewalks with granite curb exists along the site's Newbury and Middle Street frontages. A bituminous sidewalk with granite curb is located on Franklin Street. The existing paved parking lot on site connects directly to Middle Street. There are two on-street parking spaces on Newbury Street, along the site's frontage. There is currently no on-street parking available on Middle and Franklin Streets in front of the site.

Newbury Street abuts the site to the north, Commercial and Residential use abuts the site to the east, Middle Street abuts the site to the south and Franklin abuts the site to the west. The site is currently accessed from Middle Street. The street conditions in the vicinity of the Project Site are:

Street Name	Description	On-street Parking	Sidewalk	Notes
Franklin	Two way traffic (2 lanes in each direction) separated by median.	No	Bituminous	
Newbury Street	Approximately 31' wide paved way with two-way traffic in a 50' wide public ROW.	Yes	Brick	
Middle Street	Approximately 44' wide paved way with two-way traffic in a 66' wide public ROW.	Yes	Brick	

The existing site slopes from north to south (Newbury Street to Middle Street) at approximately 5%. Middle Street is approximately ten feet lower in elevation than Newbury Street. Photographs of the existing site are provided in Attachment 1-A.

1.4 PROPOSED DEVELOPMENT

The development program includes the following components:

1.4.1 ON-SITE

A new five-story building with a footprint of 9,692 square feet will be constructed on the site. The ground floor will feature parking for the residences, a community room, office, mechanical space and a separate 1,480 sf commercial unit. Floors 2 – 5 will feature 50 apartments, all of which will be income restricted. The total building floor area is 45,770 square feet. Elevation views and perspective renderings of the proposed building are provided in Attachment 1-B.

The residential lobby will be accessed from the Franklin Street frontage. The first-floor commercial space will be accessed from the Middle Street frontage and the patio area adjacent to Franklin Street. Bicycle parking will be provided on bike racks along the east corner of the parking area. The mail slots for the apartments will be located in the lobby. The trash room will be accessed from the community room for trash removal, and a mechanical room is located adjacent to the multipurpose on the first floor.

1.4.2 OFF-SITE IMPROVEMENTS

The applicant is proposing improvements to the sidewalks within the public ROW along the Franklin, Middle and Newbury Street frontage. Brick sidewalks and granite curb will be reconstructed along the Middle and Newbury Street frontages. A new concrete sidewalk with granite curb will be constructed on the east side of Franklin Street. The alignment of the Franklin Street curbline will be revised, resulting in a narrowing of the northbound lanes on Franklin Street to 24' total, which matches the width of Franklin Street south of the Middle Street intersection.

1.5 TRAFFIC

The Institute of Traffic Engineers Trip Generation Manual was used to estimate vehicle trips for the proposed project. Using Land Use Code 221 – Multifamily Housing (Mid-Rise), the ITE manual estimates that the 50 residential units will generate approximately 24 vehicle trips during the PM peak hour and approximately 271 vehicle trips on a weekday.

However, the number of trips generated by the proposed project is expected to be lower than the estimates because many of the residents will not have vehicles. The residential units will be income restricted, which typically results in fewer residents owning cars, and the project will only have 12 on-site parking spaces, which is expected to attract residents who do not own vehicles.

The project's proximity to places of work and entertainment make it possible for the majority of residents to not own vehicles. The project's location will encourage walking and alternative modes of transportation, and therefore the number of trips per day will likely be less than the published data suggests. The relatively small amount of traffic that will be generated by the project is not expected to have a significant effect on the surrounding street network.

1.6 PARKING

The proposed project is a senior affordable housing projected located in the IS-FBC zoning district. According to Division 20 of the Land Use Ordinance, the project should include one parking space per dwelling unit, with an exemption for the first three units. For the 50 proposed apartments, this equals 47 parking spaces. The commercial rental space on the first floor is approximately 1,480 sf, which does not require parking because it is less than 2,000 sf.

The applicant believes that parking demand will be far less than 47 parking spaces for the 50 residential units due to the project's location and the fact that senior affordable housing tenants have a lower vehicle ownership rate than tenants of market rate housing. A Parking Assessment was completed for the project by Bill Bray, P.E. of Traffic Solutions. Mr. Bray's analysis concludes that peak parking demand will be approximately 16 spaces.

The applicant is proposing to meet the parking demand by providing 11 parking spaces for resident vehicles plus one shared vehicle, which Division 20 of the Land Use Ordinance equates to 8 parking spaces. In total, the applicant is proposing to provide the equivalent of 19 parking spaces. The eleven off-street parking spaces, including one accessible space, and the shared vehicle will be provided on the ground floor of the building. Based on its experience with similar projects, the applicant believes that the proposed parking arrangement will satisfy parking demand.

For residents without vehicles, several means of alternative transportation is available. A Metro Bus stop is located on the southwest corner of Franklin and Middle Streets,

approximately 100 feet from the project site, and 16 bicycle parking spaces will be provided inside the parking garage.

1.7 UTILITIES AND STORMWATER

The proposed project will include the installation of new utility services to the building. All new utility services will be provided from the existing utilities available within Middle and Newbury Streets. The proposed locations of the new utility services are shown on the Utility Plan (Sheet C-6.0). More information on proposed utility services is provided in Section 11 of this application.

The proposed development will result in an increase in impervious area of approximately 4,200 square feet, but non-roof impervious area will be decreased. Post-development stormwater runoff will closely follow existing runoff patterns. The roof runoff will be collected in a roof drain system that is directly discharged to the existing combined sewer in Middle Street. Water collected within the covered parking garage will flow through an oil/water separator before being conveyed to the combined sewer in Newbury Street. More information on stormwater runoff from the site is provided in Section 9 of this application.

1.8 ATTACHMENTS

Attachment 1-A – Existing Site Photographs

Attachment 1-B – Building Elevation Views & Renderings

Attachment 1-C – Parking Assessment

ATTACHMENT 1-A

Existing Site Photographs

EXISTING SITE PHOTOGRAPHS

83 MIDDLE STREET, PORTLAND, MAINE
MIDDLE STREET HOUSING PARTNERS, LP



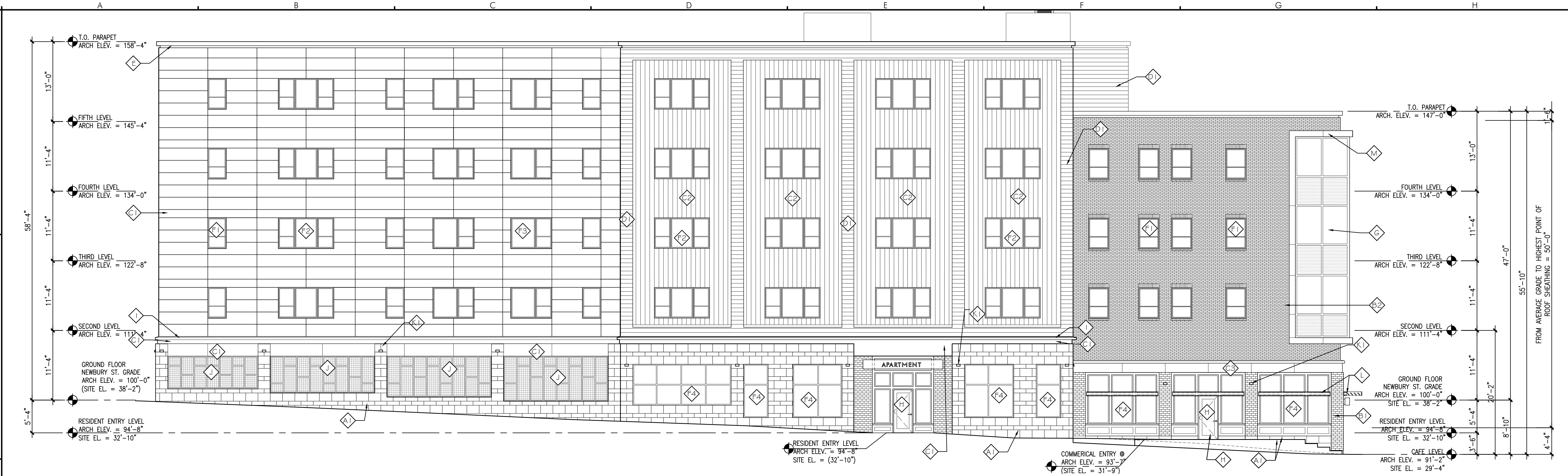
Photo 1 – 83 Middle Street site from Middle Street, facing Newbury Street.



Photo 2 – 83 Middle Street Site from Newbury Street, facing Middle Street.

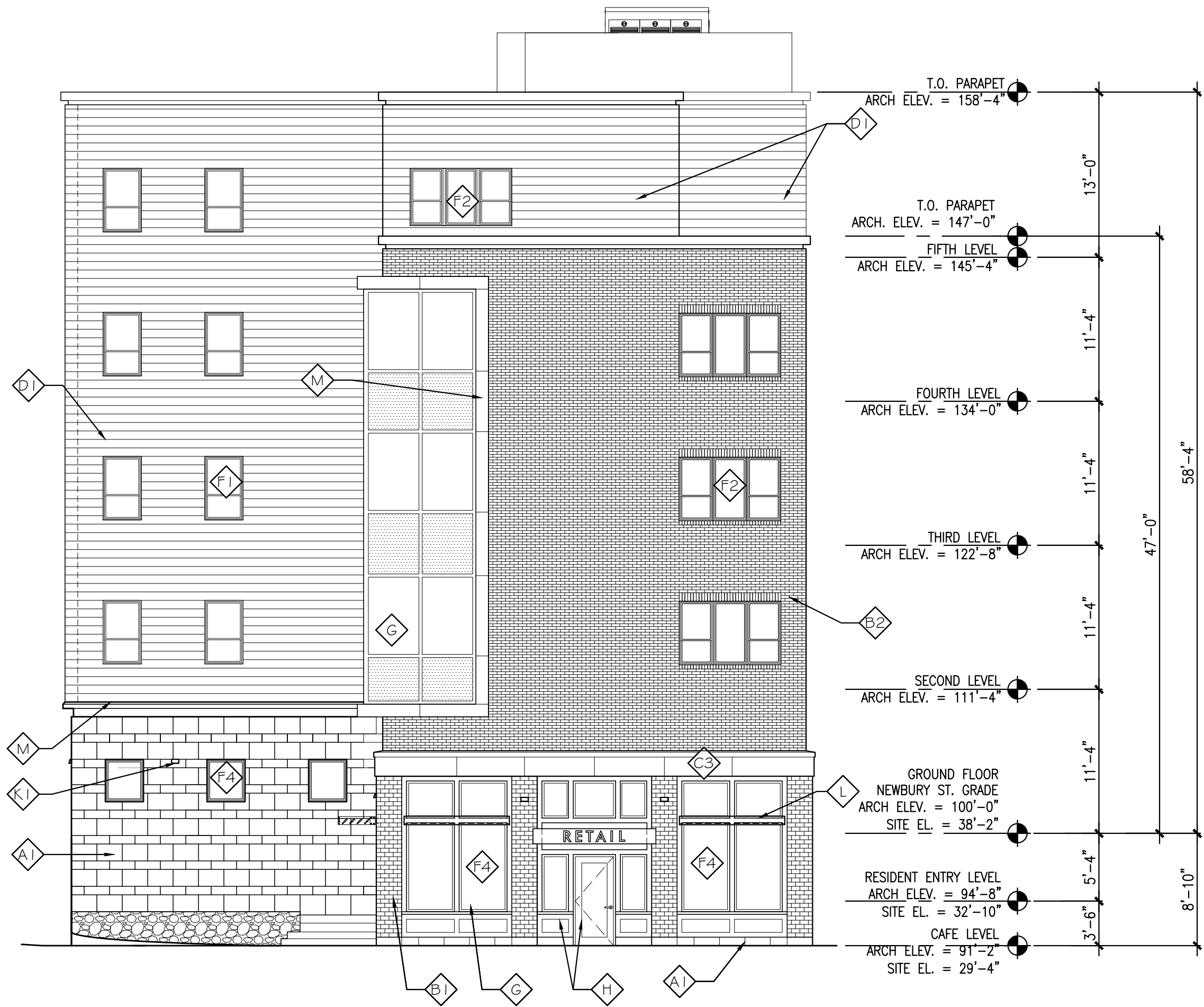
ATTACHMENT 1-B

Building Elevation Views & Perspective Renderings



A3 BUILDING ELEVATION

REFERENCED FROM: SCALE: 1/8" = 1'-0"



A5 BUILDING ELEVATION

REFERENCED FROM: SCALE: 1/8" = 1'-0"

EXTERIOR FINISH MATERIAL LEGEND

CODE	MATERIAL	COLOR AND FINISH	PATTERN LEGEND
D1	WESTBROOK CONCRETE BLOCK MANUFACTURE	COLOR: GF-326, GROUND FACE TEXTURE	
D2	ECONO MODULAR SIZE BRICK - 3 5/8" x 3 5/8" x 7-5/8"	COLOR: ACADEMY SMOOTH SERIES NARROW FLASHED RANGE	
D3	MODULAR SIZE THIN BRICK - 5/8" x 2 1/4" x 7-5/8"	COLOR: ACADEMY SMOOTH SERIES, NARROW FLASHED RANGE	
D4	HARDIE REVEAL PANEL SYSTEM - 5/16" SMOOTH FACE W/ SURROUNDED TRIM, STACKED LAYOUT. FACTORY PRIMED AND FACTORY FINISH.	COLOR: SHERWIN WILLIAMS URBANE BRONZE, FACTORY-FINISH	
D5	HARDIE ARTISAN SHIPLAP VERTICAL SIDING - .625", 10.25" WIDTH WITH 9" EXPOSURE. FACTORY PRIMED AND FIELD FINISH.	COLOR: SHERWIN WILLIAMS CARNELIAN, FIELD PAINT	
D6	HARDIE REVEAL PANEL SYSTEM - 5/16" SMOOTH FACE W/ SURROUNDED TRIM, STACKED LAYOUT. FACTORY PRIMED AND FACTORY FINISH.	COLOR: SHERWIN WILLIAMS AMAZING GRAY, FACTORY - FINISH	
D7	FIBERCEMENT LAP SIDING - 5/16", 9.25" SMOOTH TEXTURED, 8" EXPOSURE FACTORY PRIMED AND FIELD FINISH	COLOR: SHERWIN WILLIAMS AMAZING GRAY, SATIN FINISH, FIELD PAINT	
D8	BREAK METAL TRIM, PAINTED	PAINT: SHERWIN WILLIAMS URBANE BRONZE	
D9	SINGLE HUNG WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
D10	TRIPLE WINDOWS - SINGLE HUNG/ PICTURE WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
D11	DOUBLE WINDOWS - SINGLE HUNG/ PICTURE WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
D12	LARGE PICTURE WINDOWS ON FIRST FLOOR BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
D13	ALUMINUM THERMAL STOREFRONT WINDOW SYSTEM BY KAWNEER, TRIFAB VERSAGLAZE 451/451T, PELLA 250 SERIES OR EQUAL	COLOR: TERRATONE	
D14	ALUMINUM THERMAL STOREFRONT ENTRANCE DOOR WITH SIDELITES SYSTEM BY KAWNEER, TRIFAB VERSAGLAZE 451/451T, PELLA 250 SERIES OR EQUAL	COLOR: TERRATONE	
D15	BREAK METAL TRIM AT FIRST FLOOR, PAINTED	PAINT: SW IN THE NAVY	
D16	DECORATIVE GRILLES VENT	COLOR: TERRATONE /OPTIONS TO FOLLOW	
D17	EXTERIOR WALL MOUNT LIGHT FIXTURE	MODEL: BEGA 22-261 COLOR: BLACK	
D18	EXTERIOR WALL MOUNT LIGHT FIXTURE	MODEL: LNC2 LITEPAK BY HUBBELL LIGHTING; COLOR: BLACK	
D19	36" SUNSHADE SYSTEM BY CRL ALUMINUM MANUF. - 6" TALL SQUARE OUTRIGGER WITH 1x6" RECTANULAR FASCIA AND INFILL BLADES	COLOR: TBD	
D20	HARDIE REVEAL PANEL SYSTEM - 5/16" SMOOTH FACE W/ SURROUNDED TRIM, STACKED LAYOUT. FACTORY PRIMED AND FIELD FINISH.	COLOR: SHERWIN WILLIAMS IN THE NAVY, FACTORY-FINISH	

D5 ELEVATION NOTES

REFERENCED FROM:

DESIGNER

CWS ARCHITECTS
ARCHITECTURE | INTERIOR DESIGN
264 US ROUTE ONE SUITE 100-A
SCARBOROUGH, MAINE 04074
207.774.4441
WWW.CWSARCH.COM

OWNER

CHOM COMMUNITY
HOUSING OF MAINE

PROJECT

MIDDLE STREET
APARTMENTS

DRAWING

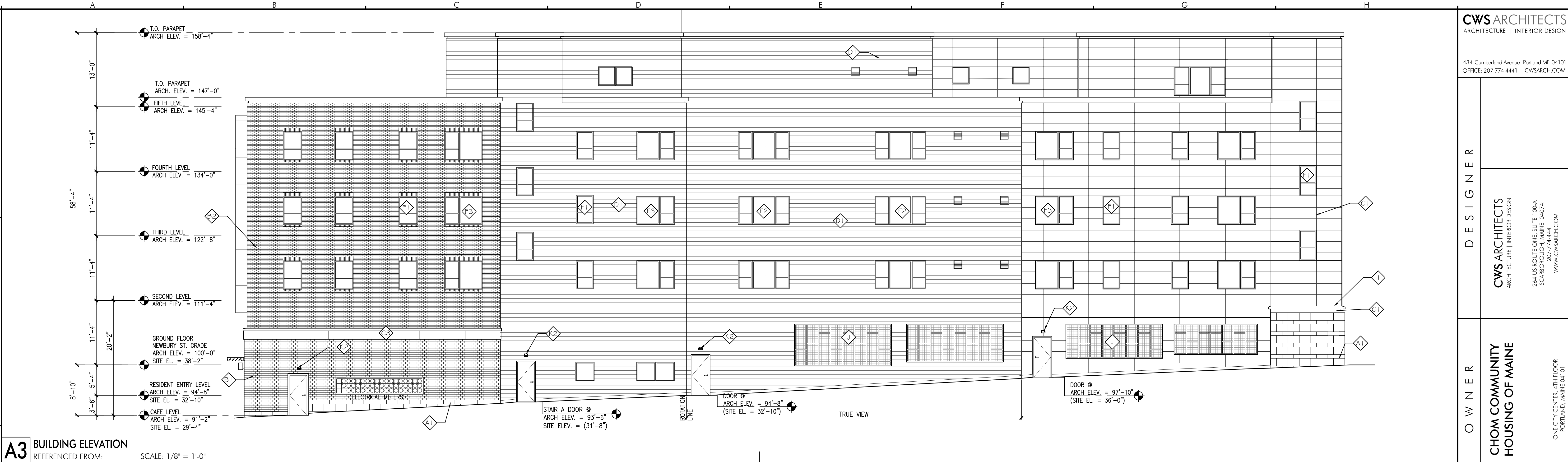
BUILDING ELEVATIONS

REVISIONS

NO.	DESCRIPTION	DATE

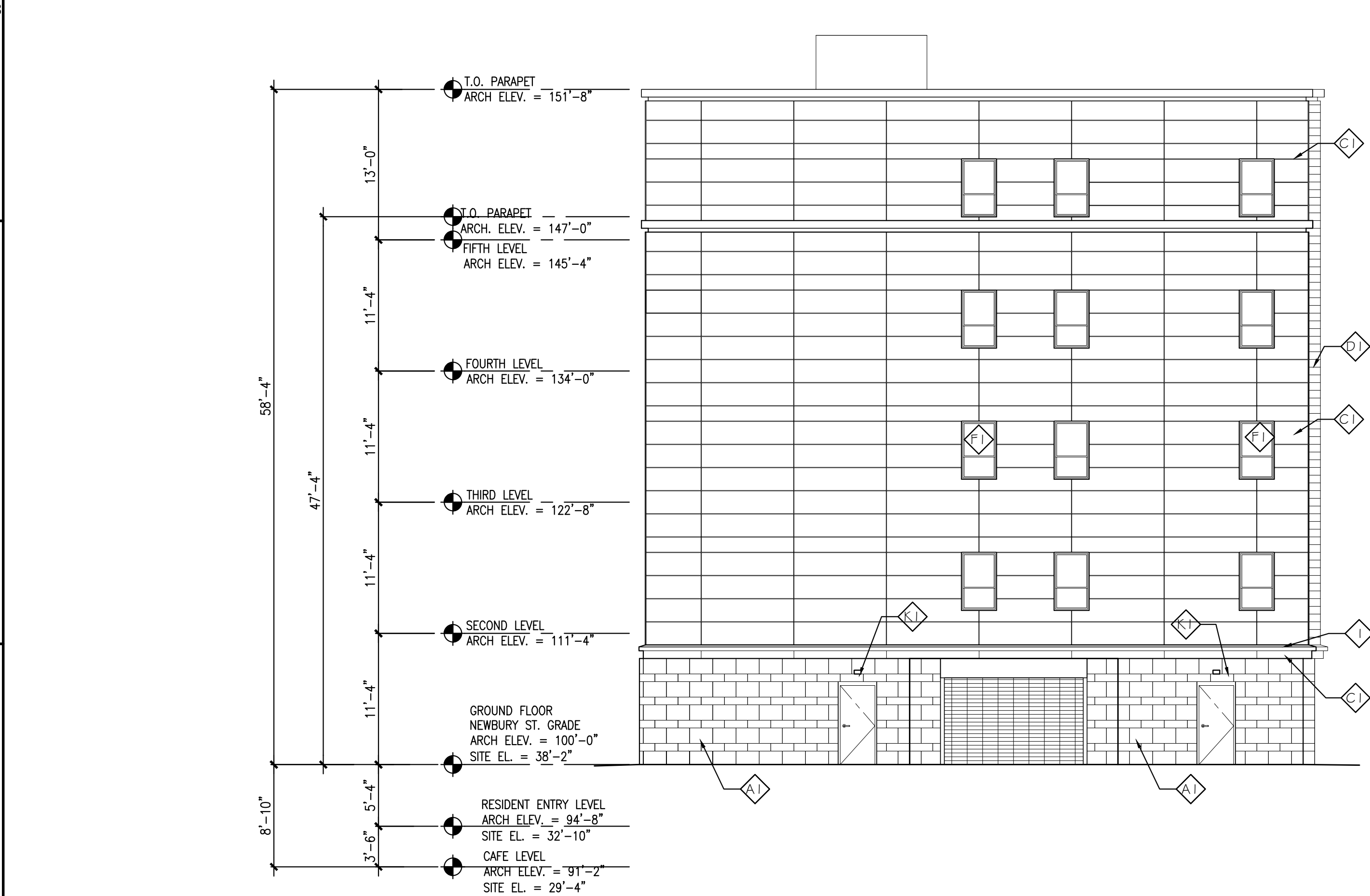
DRAWING NUMBER

A3.01



A3 BUILDING ELEVATION

REFERENCED FROM: SCALE: 1/8" = 1'-0"



A5 BUILDING ELEVATION

REFERENCED FROM: SCALE: 1/8" = 1'-0"

EXTERIOR FINISH MATERIAL LEGEND			
CODE	MATERIAL	COLOR AND FINISH	PATTERN LEGEND
A1	WESTBROOK CONCRETE BLOCK MANUFACTURE	COLOR: GF-326, GROUND FACE TEXTURE	
B1	ECONO MODULAR SIZE BRICK - 3 5/8" x 3 5/8" x 7-5/8"	COLOR: ACADEMY SMOOTH SERIES NARROW FLASHED RANGE	
B2	MODULAR SIZE THIN BRICK - 5/8" x 2 1/4" x 7-5/8"	COLOR: ACADEMY SMOOTH SERIES, NARROW FLASHED RANGE	
C1	HARDIE REVEAL PANEL SYSTEM - 5/16" SMOOTH FACE W/ SURROUNDED TRIM, STACKED LAYOUT. FACTORY PRIMED AND FACTORY FINISH.	COLOR: SHERWIN WILLIAMS URBANE BRONZE, FACTORY-FINISH	
C2	HARDIE ARTISAN SHIPLAP VERTICAL SIDING - .625", 10.25" WIDTH WITH 9" EXPOSURE. FACTORY PRIMED AND FIELD FINISH.	COLOR: SHERWIN WILLIAMS CARNELIAN, FIELD PAINT	
C3	HARDIE REVEAL PANEL SYSTEM - 5/16" SMOOTH FACE W/ SURROUNDED TRIM, STACKED LAYOUT. FACTORY PRIMED AND FACTORY FINISH.	COLOR: SHERWIN WILLIAMS AMAZING GRAY, FACTORY - FINISH	
D1	FIBERCEMENT LAP SIDING - 5/16", 9.25" SMOOTH TEXTURED, 8" EXPOSURE FACTORY PRIMED AND FIELD FINISH	COLOR: SHERWIN WILLIAMS AMAZING GRAY, SATIN FINISH, FIELD PAINT	
E	BREAK METAL TRIM, PAINTED	PAINT: SHERWIN WILLIAMS URBANE BRONZE	
F1	SINGLE HUNG WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
F2	TRIPLE WINDOWS - SINGLE HUNG/ PICTURE WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
F3	DOUBLE WINDOWS - SINGLE HUNG/ PICTURE WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
F4	LARGE PICTURE WINDOWS ON FIRST FLOOR BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
G	ALUMINUM THERMAL STOREFRONT WINDOW SYSTEM BY KAWNEER, TRIFAB VERSAGLAZE 451/451T, PELLA 250 SERIES OR EQUAL	COLOR: TERRATONE	
H	ALUMINUM THERMAL STOREFRONT ENTRANCE DOOR WITH SIDELITES SYSTEM BY KAWNEER, TRIFAB VERSAGLAZE 451/451T, PELLA 250 SERIES OR EQUAL	COLOR: TERRATONE	
I	BREAK METAL TRIM AT FIRST FLOOR, PAINTED	PAINT: SW IN THE NAVY	
J	DECORATIVE GRILLES VENT	COLOR: TERRATONE /OPTIONS TO FOLLOW	
K1	EXTERIOR WALL MOUNT LIGHT FIXTURE	MODEL: BEGA 22-261 COLOR: BLACK	
K2	EXTERIOR WALL MOUNT LIGHT FIXTURE	MODEL: LNC2 LITEPAK BY HUBBELL LIGHTING; COLOR: BLACK	
L	36" SUNSHADE SYSTEM BY CRL ALUMINUM MANUF. - 6" TALL SQUARE OUTRIGGER WITH 1x6" RECTANULAR FASCIA AND INFILL BLADES	COLOR: TBD	
M	HARDIE REVEAL PANEL SYSTEM - 5/16" SMOOTH FACE W/ SURROUNDED TRIM, STACKED LAYOUT. FACTORY PRIMED AND FIELD FINISH.	COLOR: SHERWIN WILLIAMS IN THE NAVY, FACTORY-FINISH	

D5 ELEVATION NOTES

REFERENCED FROM:





ATTACHMENT 1-C

Parking Assessment



Traffic Solutions
William J. Bray, P.E.
17 Mountview Drive
Gorham, ME 04038
(207) 400-6890
trafficsolutions@maine.rr.com

April 21, 2020

Parking Assessment

Proposed

Middle Street Apartments

INTRODUCTION

Community Housing of Maine is proposing construction of a five-story apartment building on a parcel of land located at 83 Middle Street in the City of Portland, Maine. The proposed apartment building will include 50-units of low-income housing for senior residents, 62 years of age and older with disabilities. Forty-seven (47) of the 50 apartment units are single-bedroom and three are two-bedroom units.

The City's Zoning Ordinance presently requires one parking space for each proposed residential unit on the peninsular (Sec. 14-332.1 (k) except;

"The required parking for multi-unit residential buildings may be partially met through provisions of shared use vehicles...One shared use vehicle shall be deemed to satisfy eight (8) required car spaces..."

"No parking shall be required for the first three units in the R-6 Residential Zone..."

"The planning board may establish a parking requirement that is less than the normally required number of spaces upon a finding of unique conditions that result in a lesser parking demand, such as housing for persons who cannot drive, housing that participates in a travel demand management program, availability of transit... etc."

The proposed site design provides a total of 12 on-site parking spaces, including one "car-share" space, which are located under the proposed building and are directly accessed through an overhead garage door located along the Newbury Street frontage of the site. The Applicant will secure a private vendor to provide "car share" services to the site and/or will operate an acceptable service through their property management company.

This parking study provides an analytical process that clearly demonstrates the “average” peak parking demand requirement of the proposed 83 Middle Street low income senior-adult housing project is considerably less than the city’s zoning requirement.

National parking rates published by the Institute of Transportation Engineers were averaged with local parking data collected at two similar residential properties located on the Portland Peninsular to develop a more site-specific parking demand requirement for the proposed 83 Middle Street site.

PARKING DEMAND

National parking demand data presented in the Institute of Transportation Engineers (ITE) “**PARKING GENERATION**” publication is typically the instrument used in estimating the actual average peak parking demand of a development site. The 5th edition, which was published in January 2019, represents the most current copy of the noted ITE document. The ITE manual provides “average” peak parking demand rates for more than 100 land-use categories including: residential, lodging, recreational, institutional, medical, retail, office, services, etc.

Land-use #223 Affordable Housing - Seniors A subset of the Affordable Housing land-use category was selected in estimating the average peak parking demand of the proposed project. An average peak parking demand rate of 0.42 spaces per unit is provided under this land-use category. The projected parking rate is based upon a total of three study sites with a combined number of 97 apartment units. Both study metrics are less than what is typically desirable in projecting, with a high level of confidence, the average peak parking demand rate for a specific development site. Based upon the national parking data the proposed 50-unit residential apartment project is expected to generate an average peak parking demand of 21 parking spaces.

Local parking data previously collected at two senior low-income housing sites located on the Portland Peninsular suggests the national parking rate likely over states the actual peak parking demand requirements of a low-income senior housing project. Parking utilization surveys were conducted at two existing senior-adult low-income housing facilities on the Portland Peninsular to augment the national parking demand data. The existing sites included: 1) 47 Smith Street a 20-unit site and 2) Danforth on High, a 30-unit site. A total of 20 spaces are provided at the 47 Smith Street site and 13 parking spaces are located at the Danforth on High apartment site. Parking utilization data was gathered at both sites in the early morning (prior to 6:00 a.m.) on two separate days. Table 1, as follows, presents the results of the parking surveys:

Table 1
Parking Utilization Data
Existing Portland Peninsular Senior Housing Facilities

Facility Location	Number of Apartment Units	Number of Parking Spaces	Occupied Spaces – Day 1	Occupied Spaces – Day 2
47 Smith Street	20	20	5 spaces	6 spaces
Danforth on High	30	13	4 spaces	4 spaces
TOTAL	50	33	9 spaces	10 spaces

The results of the local Portland based parking survey shows a combined average peak parking demand of **9.5** parking spaces for the two senior adult apartment sites or an average peak parking demand of 0.19 spaces per apartment unit ($9.5 \div 50 = 0.19$ spaces per apartment unit). The local parking data would suggest a total of ten spaces is adequate to meet the parking demand requirements of the proposed 83 Middle Street low-income senior apartment project.

Traffic Solutions, to conservatively project the average peak parking demand requirements of the proposed affordable senior-adult project, averages the peak parking demand requirements derived from both the national and local parking data, which provides an estimated parking demand requirement of 16 parking spaces ($21 + 10 = 31 \div 2 = 15.5$ or 16 spaces).

SUMMARY

- National parking demand rates presented in the most current publication of the Institute of Transportation Engineers “**PARKING GENERATION**” publication for an affordable housing project for seniors provides an estimated average peak parking demand rate of 0.42 spaces per unit. Local parking data gathered at two senior housing project sites located on the Portland Peninsular suggests a much lower parking demand rate of 0.19 spaces per unit is applicable for an affordable housing project for senior residents. Averaging both data points yields an average peak parking demand of 0.31 spaces per unit or a total of 16 parking spaces.
- The City’s Zoning Ordinance in Chapter 14.332.1 (k) requires residential development on the peninsular to provide one parking space per apartment unit or specific to the proposed 83 Middle Street project a total of 50 parking spaces. National parking data and local parking studies performed at similar residential housing sites on the Portland Peninsular, as documented in the preceding text, would suggest the zoning requirement of one space per residential units overstates the actual parking requirements of the proposed site. City Staff, in a January 2015 report to the Planning Board, indicated their concurrence that a reduced parking demand rate for peninsular apartment projects was appropriate.
- The City Code provides two parking space reductions; 1) an 8-space parking reduction if a “*shared-use vehicle*” is located on-site and 2) no parking is required for the first three units in the R-6 zone. The site design provides an on-site space for the “*shared-use vehicle*”. These two exceptions reduce the parking demand requirements of the proposed site based upon the City Code to a total of 39 parking spaces.
- The City Ordinance also allows the Planning Board, “*The planning board may establish a parking requirement that is less than the normally required number of spaces upon a finding of unique conditions that result in a lesser parking demand, such as housing for persons who cannot drive, housing that participates in a travel demand management program, availability of transit... etc.*”
- The Applicant respectfully requests the Planning Board in their deliberations consider the following added information in determining the parking demand requirement for the proposed site:
 1. The body of the Parking Assessment report, as summarized above, conclusively demonstrates the appropriateness of a much lower parking space requirement for the proposed apartment project. The parking study suggests a peak parking demand value of 16 spaces is appropriate for the proposed 83 Middle Street project.
 2. The location of the proposed 83 Middle Street site provides easy, direct, and convenient access to reliable and continually operating public transportation. There are several bus stops located within walking distance of the property, including one located 135-feet from the main entrance of the proposed building.
 3. Provisions for a shared car service is proposed for the project with one of the 12 parking spaces dedicated for the car shared vehicle.
 4. The proposed project provides ample, secure, and covered bicycle storage on the property exclusively for resident use.



14 CONFORMITY WITH APPLICABLE DESIGN STANDARDS

14.1 OVERVIEW

This project conforms to all applicable Site Plan Standards of Section 14-526 of the city's Land Use Ordinance as described in the following narrative.

(a) Transportation Standards

1. Impact on Surrounding Street Systems:

The project will not have a significant impact on the surrounding street system. Vehicles will access the site and parking areas from existing access points and the estimated number of new vehicle trips generated by the project is insignificant compared to existing trips on surrounding streets.

2. Access and Circulation:

a. Site Access and Circulation

- (i) Pedestrian access to the site will be provided via public sidewalks along the Middle, Newbury and Franklin Street frontages. Door controlled access will be provided at each of the building entry locations.
- (ii) Vehicle access to the garage will be from Newbury Street, across from the Luminato parking garage entrance. Because Newbury Street ends adjacent to the project site, there is very limited traffic on this section of the street. The project will not create conflicts with existing turning movements and traffic flows.
- (iii) Drive up features are not proposed
- (iv) Site access has been designed so as not to impede potential future connection to adjacent streets.

b. Loading and Servicing

- (i) The commercial space on Middle Street may use the paved access on the east side of the building for parking or servicing. Delivery or service vehicles for the building are expected to be infrequent and will use on-street parking.

c. Sidewalks.

- (i) Brick sidewalks will be constructed along the site's Newbury and Middle Street frontages, and concrete sidewalk will be constructed on Franklin

Street. All sidewalk improvements shall conform to the City of Portland Technical Manual as shown on the project drawings.

- (ii) Sections of sidewalk located along Franklin, Middle, and Newbury Streets will be replaced in accordance with City of Portland Technical Design Standards.
- (iii) The building will be accessed directly from the public sidewalks on Middle and Franklin Streets. Residents of the building using the parking garage will access the building from within the garage.

3. Public Transit Access:

- a. Metro Bus Route 8 (Peninsula Loop) runs by the project site, along Middle and Franklin Streets. The nearest bus stop to the project is at the southwest corner of Middle and Franklin Streets, approximately 100 feet from the site. The project does not meet the minimum threshold to require a new transit facility.

4. Parking:

a. Location and Required Number of Vehicle Parking Spaces:

- (i) The proposed project is an affordable housing projected located in the IS-FBC zoning district. According to Division 20 of the Land Use Ordinance, the project should include one parking space per dwelling unit, with an exemption for the first three units. For the 50 proposed apartments, this equals 47 parking spaces. The commercial rental space on the first floor is approximately 1,480 sf, which does not require parking because it is less than 2,000 sf.

Section 14-332.1(k)3 of the Land Use Ordinance allows the reviewing authority to establish a parking requirement for residential development on the peninsula that is less than the normally required number of spaces if unique conditions result in a reduced parking demand. The applicant believes that parking demand will be far less than 47 parking spaces for the 50 residential units due to the project's location and the fact that affordable housing tenants have a lower vehicle ownership rate than tenants of market rate housing. Other projects?

Twelve off-street parking spaces will be provided on the ground floor of the building, including one accessible space and three compact spaces. Based on its experience with affordable housing, the applicant believes that 12 parking spaces will satisfy parking demand.

For residents without vehicles, several means of alternative transportation is available. A Metro Bus stop is located on the southwest corner of Franklin and Middle Streets, approximately 100 feet from the project site, and 16 bicycle parking spaces will be provided inside the parking garage.

- (ii) A parking study is not required for the project.
- (iii) Not applicable. The proposed number of parking spaces will not exceed the minimum parking requirements by 10% or more.
- (iv) The proposed parking spaces meet the minimum dimensional standards of the City of Portland Technical Manual. The proposed access aisles are narrower than the 24' standard due to physical constraints of the parking garage. The access aisle varies from 20' to 21.9'. Dimensions of two parking spaces directly adjacent to walls will have increased widths to allow for additional maneuver area. Additional maneuver area is also available beyond the 20' access aisle for spaces #8 – 12, which will make backing out of these spaces easier.
- (v) The proposed covered parking surface will be constructed of bituminous pavement.

b. Location and Required Number of Bicycle Parking Spaces:

- (i) The project requires 2 bicycle parking spaces for every 5 dwelling units, or 20 spaces. Fifteen bicycle spaces will be provided at bicycle racks inside the parking garage, and four spaces will be provided on bike hitches to be installed on Middle and Newbury Streets of the first floor of the building near the vehicle parking area.

c. Motorcycles and Scooter Parking:

- (i) No formal motorcycle or scooter parking is provided.

d. Snow Storage:

- (i) Snow removal on the site will only be necessary within the paved access drive on the east side of the building and within the garden area adjacent to Newbury Street. Snow may be stored directly adjacent to these areas. If snow accumulates to an extent that site access is compromised, it will be removed from the site as needed.
- (ii) Snow will not be stored in parking areas, and will not affect stormwater management systems.

5. Transportation Demand Management (TDM):

- a. A TDM plan is not required for this project.

(b) Environmental Quality Standards

1. Preservation of Significant Natural Features:

- a. The development site has been entirely developed and does not contain any significant natural features including wetlands, vernal pools or other protected resources or wildlife habitats.
- b. No preservation areas are located adjacent to the project site.
- c. No waiver is required.

2. Landscaping and Landscaping Preservation:

a. Landscape Preservation.

- (i) Four existing street trees located adjacent to Franklin Street must be removed as they are located within the footprint of the proposed building.
- (ii) Not applicable.
- (iii) Not applicable.
- (iv) Waiver: Preservation of existing trees is not possible, as they are located within the footprint of the proposed building. A planting plan has been developed to install as many trees is reasonable on the site, including one street tree on Middle Street, and two trees within a planting area at the corner of Middle and Franklin Streets. Additional plantings are proposed in the garden area located adjacent to Newbury Street. See the Landscape Plan (L-1.0) located in the plan set.
- (v) The project is not in the Shoreland Zone

b. Site Landscaping.

(i) Landscaped Buffers:

- (a) No loading or servicing areas, dumpsters, storage areas, or utility structures are proposed outside the building.
- (b) The IS-FBC zoning district has no minimum front yard setback. Sidewalks will extend to the building wall along all street frontages.

(c) Not applicable.

(d) Not applicable.

(ii) Parking Lot Landscaping:

(a) Not applicable.

(b) Not applicable.

(c) Not applicable.

(d) Not applicable.

(e) Not applicable.

(iii) Street Trees

(a) The relatively narrow sidewalks and frequency of underground utilities adjacent to the proposed building make the installation of street trees impractical around the majority of the building. One street tree is proposed along the Middle Street frontage, and two additional trees are proposed in a landscape area at the intersection of Middle and Franklin Streets. See the Landscape Plan (L-1.0) located in the plan set for the location and species of proposed street trees.

(b) There is limited opportunity to plant street trees within the public right of way. Five additional trees are proposed within the garden area adjacent to Newbury Street, three of which are within 20' of the Newbury Street right of way. All proposed plantings are shown on the Landscape Plan (L-1.0) included in the plan set.

3. Water Quality, Stormwater Management and Erosion Control:

a. Stormwater:

The existing project site contains approximately 7,488 square feet of impervious surface, mostly comprised of a paved surface parking lot. Redevelopment of the project site will result in an increase of approximately 4,229 square feet of impervious area and a total impervious surface of 11,717 square feet, including 9,715 square feet of roof and 2,002 square feet of sidewalk and patio area.

In the existing condition, runoff from the entire site drains into the Middle Street combined sewer and storm drain network. In the post-development condition, runoff from the building will be conveyed directly to the Middle Street combined

sewer via a roof drain. Runoff from the remainder of the site will continue to drain overland to Middle Street, where it will be collected in the combined sewer system.

- (i) The project will not result in flooding of adjacent lots.
 - (ii) Runoff volumes and rates will not increase onto adjacent lots.
 - (iii) Volumes and rates of stormwater runoff into Middle Street is expected to remain unchanged. The project will not create ponding, flooding, or other drainage problems within the surrounding streets.
 - (iv) Volumes and rates of stormwater runoff into the city's storm drain network are expected to be similar to existing volumes and rates. The project will not create problems downstream or exceed the capacity of the system.
- b. The project will meet the basic standard of Section 5 of the Technical Manual regarding erosion and sedimentation control. A site specific erosion and sedimentation control plan has been developed for the project with an emphasis on perimeter control, limiting disturbance, and rapid stabilization. The locations of proposed erosion control measures are shown on the Grading, Drainage and Erosion Control Plan (Sheet C-5.0), and erosion control notes and details area shown on Sheet C-5.1.
- The project will result in less than 5,000 square feet of non-roof impervious area and is not required to meet the General or Flooding Standards. The project is not required to meet the Redevelopment standards.
- c. Not Applicable. The project is not located within the watershed of an urban impaired stream.
 - d. Not applicable. The project is not a Level I minor residential development.
 - e. The project will be served by both a public wastewater system and public drainage system. The project will not pose a risk of groundwater contamination.
 - f. Wastewater will flow to the public sewer system, which is adequately sized for the project flows.

(c) Public Infrastructure and Community Safety Standards.

1. Consistency with City Master Plans:

- a. The project has been designed to be consistent with the City of Portland Land Use Ordinance and off-premises infrastructure.

b. Not applicable.

2. Public Safety and Fire Prevention:

- a. The site has been designed to promote safety and security for residents and their guests. Access to the residential lobby will utilize keyed entry. Site lighting will provide added security.
- b. Emergency vehicle access will be via Newbury and Middle Streets.
- c. An existing fire hydrant is located on the south side of Middle Street directly across from the site. The proposed building will also feature sprinklers for fire suppression.

3. Availability and Adequate Capacity of Public Utilities:

- a. The project will be served by public water and sewer utilities. The Portland Water District has indicated their ability to serve the project with water (See Section 11 of this application). A Wastewater Capacity Application has been completed and will be forwarded to Brad Roland at the City of Portland.
- b. Underground power will be provided to the proposed building from a new transformer located in an underground vault to be installed in the Middle Street sidewalk.
- c. All new utility infrastructure will meet the provisions of the Technical Manual.
- d. The project will be connected to the public sewer system within Middle Street.
- e. The sanitary sewer and stormwater collection systems were designed to comply with City standards.
- f. A trash room will be located in the northwest corner of the building, on the ground floor. Residents will access the trash room from the parking garage. A private trash collection company will be selected for trash hauling from the site.

(d) Site Design Standards

1. Massing, Ventilation and Wind Impact:

- a. The bulk, location and height of the proposed building will not result in adverse impacts to abutting properties.

- b. The bulk, location and height of the proposed building will not substantially reduce the value or utility of adjacent structures.
- c. HVAC systems will be located on the roof of the building, and will not be visible from the street. Venting is proposed to be directed away from public spaces and adjacent residential sites.

2. Shadows:

- a. The project is not expected to cause shadows on publicly available open space, or have an adverse effect on vegetation as a result of shadows cast from the proposed building.

3. Snow and Ice Loading:

- a. The proposed building will have a flat roof. Accumulated snow and ice will not fall onto adjacent properties or public ways.

4. View Corridors:

- a. The project site is located outside of any protected view corridors.

5. Historic Resources:

- a. The development is not within a designated historic district.
- b. The project is located directly across the street from the Abraham S. Leavy Block, a historic landmark building that currently houses several restaurants. Coordination between the project architect and the City of Portland Historic Preservation Program Manager and Urban Designer will ensure compliance with the requirements of this section.
- c. There are no known archaeological resources on the site.

6. Exterior Lighting:

a. Site Lighting

- (i) Exterior site lighting will be provided by building mounted lights along sidewalks. All fixtures will feature full cut-off optics to prevent unintended light pollution. Proposed lighting is shown on the Lighting Photometric Plan (Sheet C-7.0).

b. Architectural and Specialty Lighting:

(i) No architectural or specialty lighting is proposed.

(ii) No up-lighting is proposed.

c. Street Lighting

(i) No street lights are proposed.

7. Noise and Vibration:

Noise levels are expected to meet the permitted levels for the IS-FBC Zone.

a. HVAC and Mechanical Equipment

(i) HVAC equipment will be located on the roof and will meet all applicable state and federal emissions requirements. The units will not be visible from the surrounding streets or adjacent sites.

(ii) An emergency generator will be provided for this project and will be operated in accordance with the City of Portland Code of Ordinances Section 14-526.

8. Signage and Wayfinding:

a. All signage shall meet the requirements of the Manual on Uniform Traffic Devices (MUTCD) and Division 22 of the City Code.

(i) The project is not subject to a Certificate of Appropriateness.

(ii) Not applicable. No commercial or directional traffic signage is proposed as part of the project.

(iii) No on-site directional signage is proposed.

(iv) Not applicable. No waiver is required.

9. Zoning Related Design Standards:

a. The project is designed to meet the Design Principles and Standards for the IS-FBC Zone as specified in the City of Portland Design Manual.

2 Right, Title and Interest

2.1 OVERVIEW

The applicant is Middle Street Housing Partners, LP. The project site is comprised of the following parcels:

Map/Block/Lot	CCRD Book/Page	Record Owner
28/O/ Lot 003	29426/8	160 Newbury Street LLC
28/O/Lot 017	3029 / 547 10985 / 260	City of Portland

Community Housing of Maine, the general partner in Middle Street Housing, LP, has an Option to Lease agreement with the City of Portland for Lot 17. The deeds and lease agreement are attached in attachment 2-A.

Lot 3 will be donated to the applicant, through Community Housing of Maine, to enable development of the project. A copy of the deed and Donation Agreement is attached.

After construction, the applicant will retain ownership of and manage the building.

2.2 ATTACHMENTS

Attachment 2-A – Property Deed and Option to Lease Agreement Lot 28/O/17
Property Deed and Donation Agreement for Lot 28/O/3

ATTACHMENT 2-A

Title, Right, or Interest Documentation

CITY OF PORTLAND

CERTIFICATE OF TAKING OF PROPERTY

I, Arthur H. Duffett, being the duly elected and qualified City Clerk of the City of Portland, do hereby certify that the following Return of the Municipal Officers of the City of Portland dated January 15, 1968 laying out certain property for alteration and widening of Franklin Street was duly accepted by final action of the City Council of the City of Portland on February 5, 1968

I do hereby further certify that this certificate is being filed in the Cumberland County Registry of Deeds in conformity with the provisions of Section 3503 of Title 23 of the Maine Revised Statutes Annotated.

ATTEST:

Arthur H. Duffett
City Clerk of the City of Portland, Maine

THE MUNICIPAL OFFICERS OF THE CITY OF PORTLAND, having received a petition praying that Franklin Street, a public street or way in the City of Portland, be altered and widened, all as shown within the boundaries and admeasurements set forth on maps identified as Plates 22, 23, 24 and 25, dated December 1967, prepared by Edward C. Jordan Co. Inc., designated "Right of Way Requirements", hereby make return of their proceedings.

Said Municipal Officers gave due and legal notice to all parties interested of their intention to alter and widen said Franklin Street by posting notice of a public hearing thereon at the following locations, said postings being at least seven (7) days prior to the date of said hearing:

- On a telephone pole at Marginal Way and Franklin Street.
- On a telephone pole at Cumberland Avenue and Franklin Street.
- On a telephone pole at Commercial and Franklin Streets.
- On the bulletin board in the basement of City Hall; and
- On the bulletin board in the Cumberland County Courthouse,

all in the City of Portland, and having met at the time specified and the place designated in said notice, to wit, on the fifteenth day of January, 1968, at 7:00 P.M., in the City Council Chamber, City Hall, Portland, Maine, and having heard all parties interested and having determined that said Franklin Street should be altered and widened as set forth in said petition, did alter and widen Franklin Street, a public street or way in the City of Portland, within the boundaries and admeasurements set forth on maps identified as Plates 22, 23, 24 and 25, dated December 1967, prepared by Edward C. Jordan Co. Inc., designated "Right of Way Requirements".

Said altering and widening of said Franklin Street, a public street or way in the City of Portland, involves, among others, the following described properties, excepting Parcels 24-A-5, 22-F-16, 28-H-3 and 29-K-10.

24-A-5 - 249-251 Franklin Street - Chase Realty Co.

A certain lot or parcel of land situated in the City of Portland, bounded and described as follows:

Beginning at the intersection of the northeasterly side of Franklin Street with the southerly line of the location of the Portland Terminal Company, formerly of the Portland and Rochester Railroad; thence northwesterly by the northeasterly side of Franklin Street one hundred (100) feet, more or less, to other land of the Portland Terminal Company. thence northeasterly by said Portland Terminal Company land one hundred ninety-three (193) feet, more or less, to land now or formerly of Moddy; thence southeasterly by said Moddy land ten (10) feet, more or less, to the first mentioned land of the Portland Terminal Company; thence southerly by said Portland Terminal Company land to the northeasterly side of Franklin Street and the point of beginning.

Excepting therefrom the lot conveyed by the Chase Transfer Company to Nora T. Nallet et al by deed dated October 31, 1944 and recorded in Cumberland County Registry of Deed in Book 1767, Page 119.

24-A-38 - 245-247 Franklin Street - Doris M. Hanson

A certain lot or parcel of land, with the buildings thereon situation on the northeasterly side of Franklin Street in said Portland, and bounded and described as follows:

Beginning at a stake on said northeasterly side of Franklin Street at the intersection of said northeasterly side of Franklin Street with the westerly line of the location of the Portland Terminal Company, formerly the Portland & Rochester Railroad, said stake being distant northerly two hundred seventeen and sixty-seven one-hundredths (217.67) feet from the intersection of said northeasterly side of Franklin Street with the northerly side of Fox Street; thence northerly by said westerly side of said location of said Portland Terminal

Company, said line making an included angle of fifty-one degrees forty minutes ($51^{\circ} 40'$) with said northeasterly side of Franklin Street, a distance of ninety-four (94) feet to a stake; thence westerly by other land at right angles to said last described line a distance of forty-three and five-tenths (43.5) feet to a stake; thence southwesterly by other land, said line making an included angle of ninety-seven degrees (97°) with said last described line, a distance of fifty-four and seven-tenths (54.7) feet to a stake on said northeasterly side of Franklin Street; thence southerly by said northeasterly side of Franklin Street sixty-four (64) feet to the point of beginning.

24-A-2 - 139 Fox Street - Sara E. Bruns (Partial Taking)

A certain lot or parcel of land situated on the northerly side of Fox Street, in the City of Portland, being bounded and described as follows:

Beginning at a point on the northerly side of said Fox Street at the most easterly corner of land conveyed by Charles A. Burns, Jr. to Donald A. Bruns by deed dated October 14, 1955, and recorded in the Registry in Book 2257, Page 155, said point being 130 feet northeasterly from the north-easterly side of Franklin Street; thence by said northerly side of Fox Street on a course of $N. 48^{\circ} 49' 36'' E.$ a distance of 35' + to land now or formerly of Richard H. Anderson et al and the so-called Moody line; thence by said Anderson land a distance of 2.00' to a point; thence through land of Sara E. Bruns a distance of 35' + to a point on line of land of said Donald Bruns, said point being 7.00' northwesterly of said Franklin Street; thence by land of said Donald Bruns on a course of $S. 44^{\circ} 19' 54'' E.$ and parallel to the northeasterly side of Franklin Street a distance of 7.00' to the point of beginning.

3

24-A-28, 24-A-29 and 24-A-4 - 235 to 241 Franklin Street - Sara E. Bruns

Parcels identified on City of Portland Assessor's Plans as 24-A-28, 24-A-29 and 24-A-4 contained within a certain lot or parcel of land, situated in the City of Portland on the easterly side of Franklin Street, bounded and described as follows:

Beginning on said Franklin Street at the northwesterly corner of the land formerly of Thomas Shannahan, later owned by William W. Thomas; thence easterly along the northerly line of said Thomas' land to the northeast corner thereof; thence southeasterly by the land of said Thomas to Fox Street; thence easterly by said Fox Street to the Moody line, so-called, as shown and indicated on a plan recorded in Cumberland County Registry of Deeds in Plan Book 5, Page 24; thence northwesterly along said Moody line to the land of the Portland Terminal Company; thence southerly along the easterly line of said Portland Terminal land to said Franklin Street; thence southeasterly by said Franklin Street to the point of beginning.

24-A-3 - 227-233 Franklin Street - Louisa E. Bruns

A certain lot or parcel of land, with the buildings thereon, situated in said Portland, and bounded and described as follows:

Beginning at the intersection formed by the northeasterly side line of Franklin Street and the northwesterly side line of Fox Street; thence northeasterly by said Fox Street one hundred thirty (130) feet; thence northwesterly parallel with said northeasterly side line of Franklin Street one hundred (100) feet; thence southwesterly parallel with said northwesterly side line of Fox Street one hundred thirty (130) feet to said northeasterly side line of Franklin Street; and thence southeasterly by said northeasterly side line of Franklin Street one hundred (100) feet to the point of beginning.

24-C-1 - 256-262 Franklin Street - Mobil Oil Co. (Partial Taking)

A certain lot or parcel of land situated on the southwesterly side of Franklin Street, in the City of Portland, being bounded and described as follows:

Beginning at a point marking the intersection of the southwesterly side of Franklin Street and the southeasterly side of Marginal Way; thence by the southwesterly side of said Franklin Street on a course of $S. 44^{\circ} 19' 54'' E.$ a distance of 99.36' to land of the Portland Terminal Company; thence by said Portland Terminal Company land on a course of $S. 28^{\circ} 09' 06'' W.$ a distance of 15.73' to a point; thence through land of Mobil Oil Co. on a course of $N. 44^{\circ} 19' 54'' W.$ parallel to and 15.0' southwesterly from the southwesterly side of Franklin Street a distance of 64.98' to a point; thence on a course of $N. 73^{\circ} 36' 54'' W.$ a distance of 45.86' to the southeasterly side of said Marginal Way; thence by said Marginal Way on a course of $N. 49^{\circ} 03' 06'' E.$ a distance of 37.50' to the point of beginning.

549

24-C-4 - 228-240 Franklin Street - Lawrence M. Finkelman (Partial Taking)

A certain lot or parcel of land situated on the northwesterly side of Fox Street in the City of Portland, being bounded and described as follows:

Beginning at the intersection formed by the northwesterly side of said Fox Street and the southwesterly side of Franklin Street; thence by said northwesterly side of Fox Street on a course of S. 35° 16' 06" W. a distance of 40.00' to a point; thence through land of Lawrence M. Finkelman on a course of N. 6° 21' 06" E. a distance of 50.85' to a point on the southwesterly side of said Franklin Street; thence by said Franklin Street on a course of S. 44° 19' 54" E. a distance of 25.00' to the point of beginning.

24-L-13 - 215 Franklin Street - King E. Butland and Samuel Shulman

A certain lot or parcel of land situated in said Portland, Maine, bounded and described as follows:

Land on the east side of Franklin Street, in said Portland, No. 215, City Assessor's Plan 24, Block E, Lot 13, area about 4,715 sq. feet.

24-J-10 - 187 Franklin Street - Austin A. McIntyre et al

A certain lot or parcel of land with the buildings thereon, situated in said Portland and bounded and described as follows:

Beginning at the corner made by the intersection of the easterly side line of Franklin Street with the northerly side line of Lincoln Street, now Lancaster Street; thence running northerly by said Franklin Street twenty-seven (27) feet; thence easterly parallel with said Lincoln Street, now Lancaster Street, sixty-five (65) feet, to land now or formerly of Phebe Ann Mortensen; thence southerly by land now or formerly of said Mortensen twenty-seven (27) feet, to said Lincoln Street, now said Lancaster Street; thence westerly by said Lancaster Street sixty-five (65) feet to point of beginning.

24-D-3 - 216 Franklin Street - Salvatore, Inc.

A certain lot or parcel of land with the buildings thereon, situated on the westerly side of Franklin Street, in said Portland, and bounded and described as follows:

Beginning at the northerly corner of a lot of land now or formerly of Moses Gould, which corner is three hundred forty (340) feet northerly from the north side of Lancaster Street, formerly Lincoln Street, measured on the said line of Franklin Street; thence northerly by the said line of Franklin Street forty (40) feet; thence westerly parallel with said Gould line eighty (80) feet, more or less, to the division line established between land of Daniel Gould and Charles Q. Clapp; thence by said division line southerly forty (40) feet to said Gould line; thence easterly by said Gould line eighty (80) feet, more or less, to the point of beginning.

5

24-D-7 - 200-204 Franklin Street - Josephine R. Orfaly

A certain lot or parcel of land, with the buildings and improvements thereon erected, situated in said City of Portland on the westerly side of Franklin Street, Bounded and described as follows:

Commencing on the southwesterly side line of Franklin Street at the northeasterly corner of land formerly of Albert G. French; thence running northwesterly by said Franklin Street sixty-six (66) feet to land formerly of John Chase; thence running southwesterly by said Chase land eighty (80) feet to land formerly of one Randall; thence running southeasterly by said Randall land sixty (60) feet to said French land; thence running north-easterly by said French land eighty (80) feet to the point begun at; all of said distances being more or less and subject to such greater accuracy as a survey may disclose.

24-D-9 - 194-196 Franklin Street - Administrator of Veterans Affairs and Laureat J. Caron

A certain lot of land situated on the southwesterly side of Franklin Street, in said Portland, bounded as follows, viz:

Commencing at a stake in the southwesterly side of Franklin Street distant seventy-five (75) feet northwesterly from the northerly side line of Lincoln (now Lancaster) Street; thence northwesterly by the side line of Franklin Street forty (40) feet to a stake; thence southwesterly at a right angle from Franklin Street thirty-six and sixty-six hundredths (36.66) feet, more or less, to land sold by Daniel Gould to one Prince; thence by said Prince land forty (40) feet to a stake; thence northeasterly about thirty-six and ninety-five hundredths (36.95) feet to the bounds begun at, being the lot of land conveyed by Daniel Gould to Joel Whitney by his deed dated May 20, 1859 and recorded in Cumberland County Registry of Deeds in Book 293, Page 566.

Also another lot of land in the rear of and immediately adjoining the above described lot and being bounded as follows:

Commencing at the southerly corner of said Whitney's (Joel) land at a distance of seventy-five (75) feet, more or less, from the northwesterly side line of Lincoln (now Lancaster) Street; thence running southwesterly in a line parallel with said Lincoln (now Lancaster) Street to land formerly of Charles Q. Clapp; thence northwesterly on the line of said Clapp's land forty (40) feet; thence northeasterly in a line parallel with the first described line to the southerly corner of Herbert R. Sargent's land and westerly corner of said Whitney's (Joel) land at the point of contact; thence southeasterly on the line of said Whitney's (Joel) land to the point of beginning.

22-E-8 - 163-165 Franklin Street - Anthony Orfaly

A certain lot or parcel of land, with the buildings thereon, situated in Portland, bounded and described as follows:

Commencing at the corner made by the intersection of the north line of Oxford Street with the easterly line of Franklin Street; thence easterly by the north line of Oxford Street Eighty (80) feet to land of William Brown; thence by the division line established by deed of Sylvanus C. Hilborn to William Brown and Brown to Hilborn and recorded in the Cumberland County Registry of Deeds, Book 297, Page 40 and Book 297, Page 41 and which line runs parallel with the easterly sideline of Franklin Street, Eighty (80) feet northerly to the rear line of said Brown and Hilborn lot; thence westerly by line of a certain court in the rear of the premises herein conveyed to Franklin Street; thence southerly by the side line of Franklin Street to the point of beginning. Together with full right of way in the passageway leading from Franklin Street to the rear of said property, said passageway to be kept open as of the present width of thirty (30) feet.

Excepting and reserving, however, from the above described premises, a certain lot or parcel of land, with the buildings thereon, conveyed by Stella G. Nickerson et als to Ernest O. Porell, by deed dated April 4, 1942 and recorded in said Registry in Book 1672, Page 498.

22-F-16 - 193-195 Cumberland Avenue - Donat J. Gorneault, Sr., and Ruth M. Gorneault and Maine Savings Bank and Security Financial Corp.

A certain lot or parcel of land, with the buildings thereon, situated on Cumberland Avenue, in said City of Portland, said lot being composed of two parcels, bounded as follows:

The first fronting on the avenue, having land formerly of Eben D. Choate on the east and land formerly of Thomas T. Sawyer on the west, measuring thirty (30) feet and ten (10) inches in front between these limits, with six (6) feet additional in a common right of way on the west side of the lot and extending northward the same breadth, sixty-one (61) feet.

The second parcel adjoining the foregoing on the northward, having land formerly of George McLellan and the Misses Haynes on the west, and extending northwardly adjoining said lands last named, three and one-fourth (3 1/4) rods and extending eastwardly the same breadth, forty (40) feet, more or less, to the Robert Boyd line.

22-F-18 - 197 Cumberland Avenue - Celia H. Popkin

A certain lot or parcel of land situated in said Portland, with the buildings thereon, on the northerly side of Cumberland Avenue, and numbered 197 on said Cumberland Avenue, and bounded and described as follows:

Beginning at the easterly corner of land formerly owned by Mary D. Moody and now or formerly owned by Patrick H. Feeny on the northerly side of said Cumberland Avenue; thence running westerly on the line of said Feeny land sixty-six (66) feet, more or less, to land now or formerly owned by H. B. Sargent; thence northerly by said Sargent land and land now or formerly of Mary T. Mulloney thirty-four (34) feet six (6) inches, more or less, to land now or formerly of said Mulloney; thence southerly by said Mulloney land sixty-seven (67) feet four (4) inches, more or less, to said Cumberland Avenue, thence westerly by said Cumberland Avenue thirty-three (33)

551

feet, six (6) inches, more or less, to the point of beginning; meaning to convey the above described premises subject to a right of way over a strip thereof of three (3) feet on the easterly side or end of the same to be used in common by said Mulloney, said right of way or passage being six (6) feet wide, one half thereof on the within conveyed premises and the other half on said Mulloney lot according to agreement between the respective owners of said lots.

21-D-1, 21-D-2, 21-D-3, 21-D-4, 21-D-8 - 115-129 Franklin Street - Roman Catholic Bishop of Portland (Partial Taking)

A certain lot or parcel of land situated on the easterly side of Franklin Street, in the City of Portland, being bounded and described as follows:

Beginning at a monument marking the intersection of the easterly side of said Franklin Street and the southerly side of Cumberland Avenue; thence by said Franklin Street on a course of S. 44° 33' 18" E. a distance of 200.4' to the northwesterly corner of the parcel of land conveyed by William Mitchell to The Roman Catholic Bishop of Portland by deed dated November 23, 1926 and recorded in the Registry in Book 1249, Page 202; thence through land of the said Roman Catholic Bishop of Portland on a course of N. 25° 21' W. a distance of 192.93' to a point; thence on a course of N. 19° 42' 30" E. a distance of 24.65' to the southerly side line of said Cumberland Avenue; thence by said southerly side line of Cumberland Avenue on a course of S. 50° 26' 42" W. a distance of 86.00' to the point of beginning.

21-C-12 - 9-11 Quincy Street - Raffaella R. Balzano and Maine Savings Bank

A certain lot or parcel of land, with the buildings thereon, situated on the easterly side of Quincy Street, in the City of Portland, bounded and described as follows:

Beginning at a stake one hundred nineteen (119) feet northerly from Congress Street; thence northerly by said Quincy Street fifty-one (51) feet, more or less, to land formerly owned by James Lunt; thence easterly on the southerly line of said Lunt land forty-five and one-half (45 1/2) feet; thence southerly forty-six (46) feet, more or less, to land of heirs of J. D. Sawyer to a point forty-seven (47) feet from said Quincy Street; thence westerly forty-seven (47) feet to the point of beginning.

8

21-B-20 and 21-B-21 - 335-337 Congress Street - Sun Oil Co. (Partial Taking)

A certain lot or parcel of land situated on the northwesterly side of Congress Street and the southwesterly side of Quincy Street in the City of Portland, being bounded and described as follows:

Beginning at a point marking the intersection of the northwesterly side of Congress Street and the southwesterly side of Quincy Street; thence by said southwesterly side of Quincy Street on a course of N. 41° 53' 36" W. a distance of 87.08 feet to the southeasterly corner of land conveyed by Marcia I. Taylor to Elzerina C. Gagnon by deed dated October 7, 1946 and recorded in Cumberland County Registry of Deeds in Book 1841, Page 296; thence by said Gagnon land on a course of S. 48° 06' 24" W. a distance of 20.00' to a point; thence through land of the Sun Oil Co. on a course of S. 41° 53' 36" E. parallel to and 20.00' distant westerly from the southwesterly sideline of said Quincy Street a distance of 69.45' to a point; thence S. 13° 33' 24" W. a distance of 33.57' to a point on the northwesterly side of said Congress Street; thence by said northwesterly side of Congress Street on a course of N. 47° 02' 24" E. a distance of 48.00' to the point of beginning.

28-I-1 - 75-77 Franklin Street - Economy Wallpaper & Paint Co. Inc. and Majestic Realty Co.

A certain lot or parcel of land, with the buildings thereon, situated on the southeasterly corner of Federal and Franklin Streets in said Portland, and bounded and described as follows:

Beginning at said southeasterly corner of said streets and running thence southeasterly by said Franklin Street about forty-three and thirty-five one-hundredths (43.35) feet to land now or formerly of Mary A. Hunt; thence north-easterly by said Hunt land sixty-six (66) feet, more or less, to land now or formerly of W. H. Swett; thence northwesterly by said Swett land about forty (40) feet to said Federal Street; thence southwesterly by said Federal Street seventy (70) feet, more or less, to the place of beginning.

28-1-2 - 71-73 Franklin Street - Economy Wallpaper & Paint Co. Inc. and Majestic Realty Co.

A certain lot or parcel of land with the buildings thereon situated in said Portland, and bounded and described as follows:

Beginning at the westerly corner of land now or formerly of Joel Whitney in the northeasterly side line of Franklin Street, said point being Eighty-three and thirty-five one hundredths (83.35) feet southeasterly from the southeasterly side line of Federal Street; thence running north fifty-seven and one-quarter degrees east by said Whitney land Sixty-six (66) feet, more or less, to Swett's land; thence northwesterly by said Swett's land Forty (40) feet; thence westerly on a line parallel with the first course Sixty-six (66) feet, more or less, to said Franklin Street; thence southeasterly by said Franklin Street forty (40) feet, more or less, to the point of beginning.

28-I-3 - 69 Franklin Street - Goldie Punskey

A certain lot or parcel of land, with the buildings thereon, situated on the northeasterly side of Franklin Street, in said Portland, and bounded and described as follows:

Beginning on said northeasterly side of Franklin Street at a stake and nail, said stake being distant eighty-three and thirty-five hundredths (83.35) feet southeasterly from the southeast side line of Federal Street; thence running north $57\frac{1}{4}^\circ$ East, and making an angle of 95° from the east line of Franklin Street, sixty-six (66) feet to land now or formerly of one Swett; thence south-easterly by said Swett land to a point opposite the center of the partition wall between the house on the lot hereby conveyed and the house on the lot adjoining the same on the southeast; thence southwestwardly in a straight line to the center of said partition wall and continuing through the center of the same, sixty-six (66) feet, more or less, to the east side of said Franklin Street; thence northwestwardly by said Franklin Street to the point of beginning.

28-I-7 - 67 Franklin Street - Samuel S. Punskey

A certain lot and parcel of land, with the buildings thereon located and situated on the easterly side of Franklin Street, in said Portland, bounded and described as follows:

Being that portion of the lot of land described in a deed from Daniel Westcott and others to John Anderson, dated October 24, 1836, and recorded in the Cumberland County Registry of Deeds, Book 147, Page 554, and in the mutual releases of said John Anderson and Benjamin Redford dated May 10, 1847 and recorded in said Registry in Book 202, Page 220, which lies on the southeast side of a line commencing on said easterly side of Franklin Street at a point opposite the division wall between the two tenements of the block of houses erected on said lot by Joel Whitney and George T. Means. Thence through the center of said division wall to the rear line of the lot aforesaid, which said lot is situated on the easterly side of Franklin Street, the portion hereby conveyed being the southeast part of the same lot. Said lot contains 1,364 sq. feet according to valuation plans of said Portland and is numbered 67 on said Franklin Street.

28-I-8 - 63-65 Franklin Street - Milton Seavey

A certain lot or parcel of land with the buildings thereon situated on the northeasterly side of Franklin Street in said Portland, bounded and described as follows:

Beginning at the intersection of the northwesterly sideline of Newbury Street with the northeasterly sideline of Franklin Street; thence northwesterly by the northeasterly sideline of Franklin Street thirty-nine and ninety-seven one hundredths (39.97) feet, more or less, to land formerly of Joseph and Annie Berenson; thence northeasterly by said Berenson land sixty-one and seventy-eight one hundredths (61.78) feet, more or less, to the center line of the posts in the fence now standing between said Berenson land and land now or formerly of W. O. Pitcher; thence southeasterly by the general line of the northeasterly side of the building and of the stone wall now standing on the lot hereby conveyed fifty-five and twenty-seven one hundredths (55.27) feet, more or less to the said northwesterly sideline of Newbury Street; thence southwesterly by the said northwesterly sideline of Newbury Street sixty and thirteen one hundredths (60.13) feet, more or less, to the point of beginning.

Also the brick building at 63 Franklin Street, Portland, Maine, together with the lot of land upon which it now stands. The above mentioned brick building is now used for a bakery.

10

28-H-2 - 72 1/2 Franklin Street - Jacob S. Lamport

A certain lot or parcel of land, with the buildings thereon, situated on the southerly side of Federal Street in said Portland, and bounded and described as follows:

Beginning on the southerly line of Federal Street, at the northeasterly corner of land formerly of Emery C. Chase; thence southeasterly by said Chase land seventy-four (74) feet, more or less, to land now or formerly of J. Ahern; thence northeasterly by said Ahern land Seventy-one and thirty-five hundredths (71.35) feet to Franklin Street; thence northwesterly by said Franklin Street Ten and nine-tenths (10.9) feet to the southeast corner of land now or formerly of J. Cammett; thence southwesterly by said Cammett land to the southwesterly corner thereof; thence northwesterly by said Cammett land to Federal Street; thence southwesterly by said Federal Street to the point of beginning.

28-H-3 - 74-76 Franklin Street - Bernard Trencher

A certain lot or parcel of land, with the buildings thereon, situated on the southerly corner of Federal and Franklin Streets, in the City of Portland, bounded and described as follows:

Beginning at said corner; thence running easterly by said Franklin Street Forty-nine (49) feet one and three-fourths ($1\frac{3}{4}$) inches to a stake; thence at an angle to the right of $96^\circ 44'$ Forty-one (41) feet six (6) inches to land of the heirs of the late Stephen Noyes; thence to the right at an angle of $99^\circ 1'$ by land of said Noyes heirs Fifty-four (54) feet to said Federal Street; thence northeasterly by said Federal Street twenty-seven (27) feet ten (10)

28-0-1 - 166-168 Newbury Street - Bertha Seavey

A certain lot or parcel of land with the buildings thereon situated in the City of Portland, bounded and described as follows:

Beginning at the point of intersection of the northeasterly side of Franklin Street with the southeasterly side of Newbury Street; thence northeasterly by the southeasterly side line of Newbury Street forty-seven (47) feet, more or less, to land now or formerly of Frank Joseph; thence southeasterly along said Joseph's line twenty-six (26) feet to a point; thence southwesterly by land now or formerly of Jacob Sklar forty-four (44) feet, more or less, to the northeasterly side of Franklin Street at a point thirty-seven and one-half (37 1/2) feet southeasterly from the corner of Newbury and Franklin Street; thence northwesterly by the northeasterly side line of Franklin Street thirty-seven and one-half (37 1/2) feet, more or less, to the point of beginning.

28-0-2 - 164 Newbury Street - Heirs of Bella Berenson and Barnet Berenson, and those claiming by, through or under them.

A certain lot or parcel of land, with the buildings thereon, situated on the southerly side of Newbury Street, in the City of Portland, and bounded and described as follows:

Beginning on said Newbury Street at the northwest corner of land formerly of Samuel Wells, distant northeasterly seventy-two (72) feet, more or less, from the southeasterly corner of Franklin and Newbury Streets; thence southwesterly on Newbury Street twenty-five (25) feet to land formerly of Charles M. Plummer, and from these two points extending back southeasterly between said Wells and Plummer lots, and holding the width of twenty-five (25) feet a distance of forty-six (46) feet, more or less, to land formerly of Barbara E. Joyce.

11

28-0-14 - 57-59 Franklin Street - Harry L. Rice Devisees

A certain lot or parcel of land, with the buildings thereon, situated in the northeasterly side of Franklin Street in said Portland, bounded and described as follows:

Beginning on said northeasterly side of Franklin Street at the most southerly corner of lot described in conveyance recorded in the Cumberland County Registry of Deeds in Book 961, Page 219; thence southeasterly by said Franklin Street twenty-six and one-half (26 1/2) feet, more or less, to the northwesterly face of a brick wall standing on land now or formerly of Max Robinson, and from these two points extending northeasterly adjoining said land described in Book 961, Page 219 on the northeast and said Robinson land on the southeast, a distance of forty-seven (47) feet, more or less, to land now or formerly of Frank Josephs, together with the right and privilege of entering and using the northwesterly wall of the building adjoining on the southeasterly side.

28-0-6 - 55 Franklin Street - Salvatore, Inc.

A certain lot or parcel of land, with the buildings thereon, situated in the City of Portland, and bounded and described as follows:

Commencing at a point on the northeasterly side of Franklin Street, at the southerly corner of the premises first described in the deed of mortgage given by Max Robinson to the Portland Savings Bank dated October 21, 1912, and recorded in the Cumberland County Registry of Deeds in Book 900, Page 24, and thence running southeastwardly by said Franklin Street thirty-one (31) feet to a stake; and from these two points extending back from said street northeastwardly adjoining the premises described in said mortgage, and land now or formerly of Frank Josephs, on the northwest and holding the width of thirty (30) feet, a distance of about seventy-one (71) feet. Subject to the right and privilege granted Jacob Sklar in deed dated August 2, 1916, and recorded in Book 973, Page 426, of entering and using the northwesterly wall of the building situated on the lot hereby described.

28-N-5 - 172 Newbury Street - Frank Mallia and Sebastien Mallia, also known as Sebastiano Mallia and John Anthony Mallia

A certain lot or parcel of land, with the buildings thereon, situated on the southerly side of Newbury Street, in said Portland and bounded and described as follows, to wit:

Beginning at a point on said southerly side of Newbury Street distant forty-five (45) feet and six (6) inches from the southwest corner of Franklin and Newbury Streets; thence westerly by said Newbury Street forty-three (43) feet and six (6) inches to land formerly owned by F. G. Cummings; thence southerly by said Cummings land ninety-one (91) feet and six (6) inches, more or less, to a passageway; thence easterly forty-two (42) feet and three (3) inches, more or less, on the line of said passageway to land now or formerly of J. C. Tukesbury; thence northerly by land of said Tukesbury ninety-one (91) feet and six (6) inches, more or less, to the point of

28-N-13 - 46-54 Franklin Street - Gertrude Gordon and Casco Bank & Trust Co.

A certain lot or parcel of land with the buildings thereon, situated in said Portland, on the northwesterly corner of Middle Street and Franklin Street and bounded and described as follows:

Beginning at the point made by the intersection of the northerly side line of Middle Street with the westerly side line of Franklin Street; thence running westerly by said Middle Street thirty-nine and seven-twelfths (39 7/12) feet, more or less, to land formerly of D. B. Ricker and another, thence northerly by land formerly of D. B. Ricker and another, ninety-six and nine-twelfths (96 9/12) feet to a passageway; thence easterly by said passageway thirty-seven and seven-twelfths (37 7/12) feet to said Franklin Street; thence southerly by said Franklin Street ninety-six and nine-twelfths (96 9/12) feet to point of beginning. Also all right title and interest in and to the above mentioned passageway in the rear of said lot.

29-E-12 - 253-285 Fore Street - Jacob Agger and Maine Savings Bank (Partial Taking)

A certain lot or parcel of land situated on the northwesterly side of Fore Street, in the City of Portland, being bounded and described as follows:

Beginning at a point on the northwesterly side of said Fore Street, said point being the northeasterly corner of a lot of land conveyed by the Portland Renewal Authority to Jacob Agger and the southeasterly corner of land now owned by the City of Portland; thence southwesterly by said northwesterly side of Fore Street on a curve whose radius is 284.19 feet a distance (measured along the arc) of 92.63 feet to a point; thence by said Fore Street on a course of S. 07° 49' 30" W. a distance of 8.52 feet to a point; thence through land of Jacob Agger on a course of N. 51° 06' 57" W. a distance of 62.59 feet to land now or formerly owned by The Area Development Council Project #2, Inc.; thence by said land on a course of N. 38° 53' 03" E. a distance of 93.00 feet to a point on said City land; thence by said City land on a course of S. 51° 02' 57" E. a distance of 24.07 feet + to the point of beginning. Subject to easements and rights-of-way shown on the plan of the Vine-Deer-Chatham project area on file in the Cumberland County Registry of Deeds, in Plan Book 47, Page 48.

29-E-6 - 96-106 Middle Street - Alton B. Warren and Maine Savings Bank (Partial Taking)

A certain lot or parcel of land on the southeasterly side of Middle Street, in the City of Portland, bounded and described as follows:

Beginning at a point on the southeasterly side of said Middle Street; said point being 56.40 feet southwesterly from the westerly side of Franklin Street; thence by said Middle Street on a course of S. 51° 44' 44" W. a distance of 46.00 feet to a point; thence through land of Alton B. Warren on a course of S. 38° 15' 16" E. a distance of 16.00 feet to a point; thence on a course of N. 65° 31' 05" E. a distance of 49.07 feet to a point; thence on a course of S. 51° 01' 55" E. a distance of 18.00 feet to the northeasterly corner of the building; thence continuing on same course of S. 51° 01' 55" E. along the building line a distance of 102.21 feet to the most easterly corner of said building; thence following the building line on a course of S. 38° 58' 05" W. a distance of 10.00 feet to a point; thence on a course of S. 51° 02' 57" E. a distance of 70.07 feet to a point on line of land conveyed by the Portland Renewal Authority to Jacob Agger by deed recorded in the Registry in Book 2673, Page 61; thence by said Agger land on a course of N. 38° 51' 03" E. a distance of 14.55 feet + to a point and land of the City of Portland; thence by said City land on a course of N. 53° 02' 57" W. a distance of 217.62 feet to the point of beginning, together with a construction easement along Middle Street fifty feet long and sixteen feet wide as more fully described on Plate 22.

29-E-8 - 108 Middle Street - Area Development Council Project No. 2, Inc. and Maine Savings Bank - Construction Easements

Two construction easements, one fifty feet in width and thirty feet in depth adjoining land of Jacob Agger and one along Middle Street about twenty-five feet in length, adjoining land of Alton B. Warren, as more described on Plate 22.

29-K-10 - 55 1/2 Commercial Street - Daniel J. Casale, and Peter DePalmer

A certain lot or parcel of land with the buildings thereon and situated in said Portland bounded and described as follows:

Commencing on the northerly side of Commercial Street at the southwesterly corner of lot No. 28, on Plan 13 of Charles Edwards, recorded in Plan Book No. 2, Page 14, in Cumberland County Registry of Deeds which corner is fifty-seven and one-quarter (57 1/4) feet, on said street from the corner of the Tyler lot, so-called; thence on the line of the said lot No. 28, one hundred (100) feet; thence in a southwesterly direction parallel with Commercial Street thirty (30) feet, more or less, to the sideline of lot No. 26, on said Plan; thence southwardly on the line of said lot No. 26, one hundred (100) feet to Commercial Street; thence by Commercial Street eastwardly twenty-eight and six hundred twenty-five thousandths, (28.625) feet, to the point of beginning, being part of lot No. 27, on said Plan, together with all easements and rights of every nature appertaining to the said premises excepting and subject to a right of way to the land in the rear of the said premises hereby conveyed leading in from Commercial Street, which is now used in common with the owners of the adjoining lot No. 26 as

29-K-3 - 59-67 Commercial Street - W. L. Blake & Co. (Partial Taking)

A certain lot or parcel of land situated on the northwesterly side of Commercial Street, in the City of Portland, and bounded and described as follows:

Beginning at a point on the northwesterly side of Commercial Street, said point being located southwesterly one hundred seventy and nine hundred fifteen thousandths (170.915) feet on a course of S. 33° 25' 8" W. along the northwesterly side of said Commercial Street and from the southerly corner of the granite plinth of the brick building located at the intersection of the northerly side of Commercial Street and the easterly side of Franklin Street; thence by said Commercial Street on a course of S. 33° 25' 8" W. a distance of 65.00 feet to a point; thence through land of W. L. Blake & Co. on a course of N. 1° 18' 4" E. a distance of 83.88 feet to a point on line of land now owned by Daniel J. Casale, said point being on the division line between Lot No. 26 and Lot No. 27 as shown on plan of the division of land of Sturdivant heirs, recorded in the Registry of Deeds, in Plan Book 2, Page 14; thence by said division line and land of said Casale on a course of S. 48° 52' 9" E. a distance of 45.00 feet to the point of beginning. This taking is made subject to all rails on the premises located in the premises.

Also a certain lot or parcel of land situated in the City of Portland, being bounded and described as follows:

Beginning at a point on the southeasterly side of a lane leading from Franklin Street to Fore Street, and now owned by the Portland Renewal Authority, and the northwesterly corner of Lot No. 28 and the northeasterly corner of Lot No. 27, as shown on plan of the division of land of Sturdivant heirs, recorded in Cumberland County Registry of Deeds in Plan Book 2, Page 14, said Lot No. 28 being owned by W. L. Blake & Co. herein as recorded in Book 1068, Page 41; thence by the southeasterly side of said lane about S. 45° 43' 30" W. a distance of 36 feet more or less to the easterly side of Fore Street; thence by the easterly side of Fore Street on a course of S. 7° 49' 30" W. a distance of 31.08 feet to a point; thence through land of W. L. Blake & Co. on a course of N. 45° 43' 30" E. parallel to and twenty-five (25) feet distance from the southeasterly side of said land, a distance of Seventy (70) feet, more or less, to the westerly side of said Lot No. 28 and said W. L. Blake & Co. land; thence by said W. L. Blake & Co. land along the division line between said Lot No. 27 and Lot No. 28 on a course of N. 48° 33' 30" W. a distance of 25.07 feet to the point of beginning.

29-K-6 - 16-20 Rear Franklin Street - W. L. Blake & Co.

A certain lot or parcel of land together with the buildings thereon, situated in said Portland, and bounded and described as follows:

Beginning at a stake standing on a passageway leading from Fore Street to Franklin Street and at the northwest corner of land on Franklin Street formerly owned by one Tyler, and running thence southerly by said Tyler land seventy (70) feet to a stake, thence westerly on a line parallel with said passageway sixty-one (61) feet, more or less, to land now or formerly of the Moulton heirs; thence northerly by said Moulton land Seventy (70) feet to said passageway; thence easterly along said passageway sixty-one and one-half (61 1/2) feet to the starting point. Also all the right, title and interest which we possess in and to said passageway. Being the same premises conveyed by John Welch of Portland to Jacob Judelshon by his warranty deed dated June 13, 1893, and recorded in Cumberland Registry of Deeds in Book 604, Page 5. Also a certain other lot or parcel of land situated in said Portland and adjoining the above described lot and bounded and described as follows:

Commencing at a point seventy (70) feet from the southerly side of said passageway at the southwesterly corner of the above described lot; thence extending southerly towards Commercial Street on the dividing line of land of the Moulton heirs and land formerly of John Welch a distance of twelve (12) feet to a point; thence extending easterly from this point sixty (60) feet to land formerly of one Quinn at a point distant nine (9) feet from the easterly line of the above described lot conveyed by said Welch to said Judelshon by deed of June 13, 1893; thence northerly by said Quinn line nine (9) feet to the lot first above described; thence westerly by said lot to the point of beginning. Being the same lot conveyed by John Welch to said Jacob Judelshon by warranty deed dated April 20, 1900, and recorded in Cumberland Registry of Deeds, Book 688, Page 299. Both the above described lots being the same conveyed by said Jacob Judelshon to Eli Cohen as one parcel by warranty deed dated November 11, 1915, recorded in Cumberland Registry of Deeds, Book 956, Page 491.

29-K-8 - 45-49 Commercial Street - W. L. Blake & Co.

A certain lot or parcel of land, with the buildings thereon, situated on Franklin Street between Fore and Commercial Streets, in said Portland, bounded northeasterly by Franklin Street; northwesterly by a certain passageway; southwesterly by land formerly of Isaac Sturdivant, and southeasterly by Commercial Street; together with all my rights in and to said passageway adjoining said described lot, and in and to so much of said Commercial and Franklin Streets as adjoins said lot. Intending to convey all of the property and rights conveyed me by William L. Putnam and Galen C. Moses, Trustees under the will of William S. Perry, by their deed dated September 6, 1911, recorded in Cumberland County

28-N-6 and 28-N-16 - 170-172 Newbury Street - John and Ida Panarese

A certain lot or parcel of land with the buildings thereon, situated on the southerly corner of Newbury and Franklin Streets in said Portland, bounded and described as follows:

Beginning at said corner and running thence southwesterly on Newbury Street forty (40) feet, more or less, to land now or formerly of Francis Southworth; thence southeasterly by said Southworth's land ninety-one (91) feet, more or less, to a passageway called Waldo Court; thence northeasterly on said Court forty-four (44) feet, more or less, to Franklin Street; thence northwesterly on Franklin Street ninety-four (94) feet to the starting point; together with a right of way in common to the use of said passageway and Court.

22-P-10 - 145-147 Franklin Street - Mary C. White Heirs and John J. White

A certain lot or parcel of land with the buildings thereon situated in said Portland upon the easterly side of Franklin Street: measuring on said street forty-three (43) feet and four (4) inches and extending back holding the same width a northeasterly course until it comes to land now or formerly belonging to the heirs of Robert Boyd, deceased, the distance being one hundred twenty-three (123) feet, more or less. Being the same premises conveyed to Jep A. Kier by Howard B. Chase, Hazen M. Chase and Fannie L. Chase by their deed dated the twelfth day of February A.D. 1900 and recorded in the Cumberland County Registry of Deeds, Book 687, Page 145, to which reference is hereby made.

Being the premises numbered 147 on said street, as delineated on plan recorded in Cumberland County Registry of Deeds in Plan Book 5, Page 22.

24-J-7 - 61-63 Lancaster Street - Porell's Realty Inc.

A certain lot or parcel of land situated on the northerly side of Lancaster Street in the City of Portland, being bounded and described as follows:

Beginning at a point on the northerly side of said Lancaster Street, said point being 97.00 feet easterly from the easterly side of Franklin Street and also the southeasterly corner of the parcel of land conveyed by Udell Bramson to Ernest O. Porell by deed dated 17 June 1958 and recorded in the Registry in Book 2431, Page 22; thence by said Lancaster Street on a course of N 48° 56' 21" E. a distance of 19.59 feet to the southwesterly corner of a parcel of land conveyed by Ernest O. Porell to the Slum Clearance and Redevelopment Authority by deed dated 14 January 1961 and recorded in the Registry in Book 2584, Page 117; thence through land of Ernest O. Porell on a course of N 57° 21' 39" W. a distance of 69.81 feet to a point on the easterly line of Ernest O. Porell land recorded in Book 2431, Page 22; thence by the easterly line of Ernest O. Porell's lot on a course of S 41° 03' 39" E. a distance of 67.00 feet to the point of beginning.

24-J-8 - 65-67 Lancaster Street - Porell's Realty, Inc., and Ernest N. Gould

A certain lot or parcel of land situated on the northwesterly side of Lancaster Street in the City of Portland, and bounded and described as follows:

Beginning at a point on said northwesterly side of Lancaster Street, sixty-five (65) feet northeasterly from the northeasterly side of Franklin Street; thence northeasterly by said side of Lancaster Street thirty-two (32) feet to land now or formerly of John Higgins; thence northwesterly at right angles with said Lancaster Street and by said Higgins' land ninety (90) feet to the center of a passageway known as Anderson Lane; thence southwesterly by the center of Anderson Lane thirty-two (32) feet to a point; thence southeasterly on a line at right angles with said line of Lancaster Street ninety (90) feet to the point of beginning; subject to such rights as others may have to use a strip ten (10) feet in width along the northwesterly side of said premises, being that part located within the boundaries of said Anderson Lane.

And said Municipal Officers did estimate and award damages to the owners of said properties by reason of the said altering and widening of said Franklin Street, a public street or way in the City of Portland, as follows:

<u>Parcel No.</u>	<u>Address</u>	<u>Owner</u>	<u>Damages</u>
24-A-38	245-247 Franklin St.	Doris M. Hanson	\$ 3,500.00
24-A-2	139 Fox St. -	Sara E. Bruns)	
	(Partial Taking)	)	
24-A-28)		)	10,000.00
24-A-29)	235-241 Franklin St.	Sara E. Bruns)	
24-A-4)		)	
24-A-3	227-233 Franklin St.	Louisa E. Bruns	11,500.00
24-C-1	256-262 Franklin St.-	Mobil Oil Co.	2,900.00
	(Partial Taking)		
24-C-4	228-240 Franklin St.	Lawrence M. Finkelman	500.00
	(Partial Taking)		
24-L-13	215 Franklin St.	King E. Butland and Samuel Shulman	810.00
24-J-10	187 Franklin St.	Austin A. McIntyre et al	6,800.00
24-J-7	61-63 Lancaster St.	Porell's Realty Inc.	200.00
24-J-8	65-67 Lancaster St.	Porell's Realty Inc. and Ernest N. Gould	620.00
24-D-3	216 Franklin St.	Salvatore Inc.	7,000.00
24-D-7	200-204 Franklin St.	Josephine R. Orfaly	4,200.00
24-D-9	194-196 Franklin St.	Administrator of Veterans Affairs and Laureat J. Caron	2,600.00
22-E-8	163-165 Franklin St.	Anthony Orfaly	8,700.00

<u>Parcel No.</u>	<u>Address</u>	<u>Owner</u>	<u>Damages</u>
22-F-18	197 Cumberland Ave.	Celia H. Popkin	\$ 12,500.00
21-D-1)			)
21-D-2)	115-129 Franklin St.	Roman Catholic Bishop of Portland)	)
21-D-3)	(Partial Taking)		)
21-D-4)			) 12,000.00
21-D-8	172-196 Cumberland Ave.	Roman Catholic Bishop of Portland)	)
	(Partial Taking)		)
21-C-12	9-11 Quincy St.	Raffaella R. Balzano and Maine Savings Bank	5,200.00
21-B-20)			)
21-B-21)	335-337 Congress St.	Sun Oil Co.	22,000.00
	(Partial Taking)		)
28-I-1	75-77 Franklin St.	Economy Wallpaper & Paint Co. Inc., and Majestic Realty Co.	8,400.00
28-I-2	71-73 Franklin St.	Economy Wallpaper & Paint Co. Inc., and Majestic Realty Co.	8,200.00
28-I-3	69 Franklin St.	Goldie Punskey	6,000.00
28-I-7	67 Franklin St.	Samuel S. Punskey	5,900.00
28-I-8	63-65 Franklin St.	Milton Seavey	19,500.00
28-H-2	72 1/2 Franklin St.	Jacob S. Lamport	10,000.00
28-O-1	166-168 Newbury St.	Bertha Seavey	19,000.00
28-O-2	164 Newbury St.	Heirs of Bella Berenson and Barnet Berenson and those claiming by, through or under them	1,400.00
28-O-14	57-59 Franklin St.	Harry L. Rice Devises	12,500.00
28-O-6	55 Franklin St.	Salvatore Inc.	7,500.00
28-N-5	172 Newbury St.	Frank Mallia and Sabastian Mallia, also known as Sabastiano Mallia and John Anthony Mallia	7,000.00
28-N-13	46-54 Franklin St.	Gertrude Gordon and Casco Bank & Trust Co.	24,300.00

<u>Parcel No.</u>	<u>Address</u>	<u>Owner</u>	<u>Damages</u>
28-N-6) 28-N-16)	170-172 Newbury St.	John and Ida Panarese	\$ 8,400.00
29-E-12	253-285 Fore St. (Partial Taking)	Jacob Agger and Maine Savings Bank	5,000.00
29-E-6	96-106 Middle St. (Partial Taking)	Alton B. Warren and Maine Savings Bank	5,700.00
29-E-8	108 Middle St. (Construction Easements)	Area Development Council Project No. 2 Inc. and Maine Savings Bank	
29-K-3	59-67 Commercial St. (Partial Takings)	W. L. Blake & Co.	3,800.00
29-K-6	16-20 Rear Franklin St.	W. L. Blake & Co.	4,600.00
29-K-8	45-49 Commercial St.	W. L. Blake & Co.	10,800.00

And said Municipal Officers do hereby file with the City Clerk of the City of Portland, this written return of their proceedings in connection with the altering and widening of Franklin Street.

Dated at Portland, Maine, this fifteenth day of January A.D. 1968.

William T. MacKinnon
J. Weston Wall
Clifton M. Fish
Ronald B. Hipp
Charles W. Fisher
Daniel M. Foley

Municipal Officers of the City of Portland, Maine

City of Portland, Maine
IN THE CITY COUNCIL

Ordered, THAT THE Return of the Municipal Officers, dated January 15, 1968, altering and widening Franklin Street and awarding damages to the owners of properties involved be and hereby is accepted from Marginal Way to the northerly side of Middle Street only, with the remainder of said Return being tabled.

AND BE IT FURTHER ORDERED that the taking of the following properties and the awards of damages therefor be and hereby are deleted because said parcels have already been purchased or will be purchased through negotiation:

24-D-9	194-196 Franklin Street
28-N-6) 28-N-16)	170-172 Newbury Street
29-E-12	253-285 Fore Street
28-O-1	166-168 Newbury Street

ORDER

70

ACCEPTING RETURN OF MUNICIPAL OFFICERS
RE FRANKLIN STREET
(City Manager)

IN THE CITY COUNCIL

Read twice and passed, 8 Yeas.
FEBRUARY 5, 1968

Yeas

Nays

Attest

City Clerk

STATE OF MAINE

CUMBERLAND, ME.

REGISTRY OF DEEDS

Received at 1 H 40 M P. M on FEB 15 1968 and recorded in
Book 3029 Page 547

Attest

Register

QUITCLAIM DEED WITHOUT COVENANT

KNOW ALL MEN BY THESE PRESENTS

That I, George W. Beals, of Portland, County of Cumberland, State of Maine, for consideration paid hereby release to the City of Portland, State of Maine, the following described property,

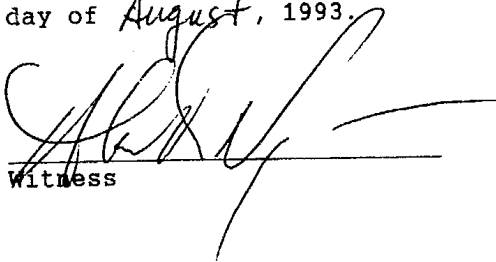
Beginning at the most northwesterly corner of land of George W. Beals at an iron rod (5/8" rebar) w/cap, thence by the following courses and distances:

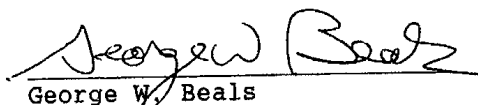
S 87-21-30 E about 11.06' feet to a point;
S 1-17-28 E about 19.17' feet to a point;
N 85-27-26 W about 11.04' feet to an iron (5/8" rebar) rod;
N 1-17-28 W about 18.81' feet to the point of beginning.

Said lot or parcel of land to contain about 204.0 square feet.

Meaning and intending to release a portion of the premises conveyed to George W. Beals by deed of Resolution Trust Corporation, dated July 10, 1992 and recorded in the Cumberland County Registry of Deeds in Book 10178, Page 29.

IN WITNESS WHEREOF, I, the said George W. Beals, relinquishing and conveying all rights by descent and all other rights in the above described premises, have hereunto set my hand and seal this 20th day of August, 1993.

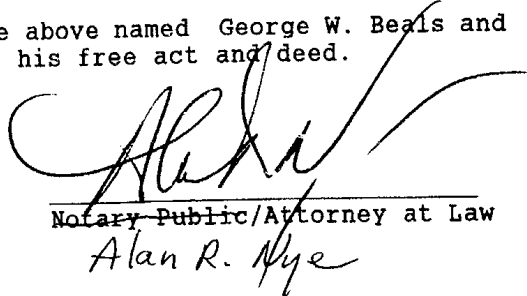

Witness


George W. Beals

STATE OF MAINE
Cumberland County, ss

August 20, 1993

Personally appeared before me the above named George W. Beals and acknowledged the foregoing to be his free act and deed.


Notary Public/Attorney at Law
Alan R. Nye

Recorded
Cumberland County
Registry of Deeds
09/29/93 01:50:57PM
John B. O'Brien
Register

OPTION TO LEASE AGREEMENT

This Option to Lease Agreement ("Agreement") dated this 14th day of September, 2019, is entered into by and between **CITY OF PORTLAND**, a public body corporate and politic having a mailing address of 389 Congress St., Portland, ME 04101 ("Landlord" or "City"), and **COMMUNITY HOUSING OF MAINE, INC.**, a Maine nonprofit corporation having a mailing address of 1 City Center, 4th floor, Portland, ME 04101 ("Tenant").

RECITALS

WHEREAS, Landlord is the owner of certain land (hereinafter, the "Premises," as further defined below) located at 83 Middle Street, Portland, Maine, which land is generally depicted on the plan entitled "Boundary & Topographic Survey at #83 Middle Street, Portland, Maine" made for Community Housing of Maine dated May 22, 2019 prepared by Owen Haskell, Inc., a reduced copy of which is attached hereto as Exhibit A (the "Plan"); and

WHEREAS, Tenant has requested from Landlord, and Landlord has agreed to grant to Tenant, an option to lease the Premises under a ground lease in order to allow the Tenant to construct and operate a 49-unit residential affordable housing project, with commercial space, thereon (the "Project"), on the terms and conditions set forth in this Agreement.

NOW, THEREFORE, in consideration of one dollar (\$1.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties agree as follows:

1. Grant of Option; Option Period. The Landlord hereby grants to the Tenant the exclusive right and option to lease the Premises from Landlord on the terms and conditions described herein, and subject to the terms and conditions in the Ground Lease (the "Option"), from the date first set forth above (the "Effective Date") through June 30, 2021 (the "Option Period").
2. Option Payment. At the time of execution of this Agreement by both parties, in consideration of the Option granted herein, Tenant shall pay to Landlord the sum of \$1.00 (the "Option Payment"), which shall be non-refundable, and which shall not be credited to rental payments under the Ground Lease as defined in section 4 hereof.
3. Exercise of Option. Tenant may exercise the Option at any time during the Option Period by delivering written notice to Landlord of its intent to exercise the Option (the "Option Notice"), provided, however, that in no event shall the Ground Lease commence prior to the closing of all financing required for Tenant's construction of the Project as is more fully described in the Ground Lease.
4. Execution of Ground Lease. If Tenant exercises the Option, the parties shall enter into a Ground Lease Agreement substantially in the form attached hereto as Exhibit B within fourteen (14) days after the date of the Option Notice (the "Ground Lease"). The parties acknowledge and agree that the specific provisions of the Ground Lease may be

modified by agreement of the parties prior to the execution thereof, but that notwithstanding the foregoing, the Ground Lease will have a term of 99 years, with an aggregate lease payment of \$99.00 for the entirety of such term, due and payable upon the execution thereof, and shall permit Tenant to assign the Ground Lease to an entity formed for the purpose of developing the Project, and to assign the Ground Lease to third parties as security for Project financing. Additionally, the Ground Lease shall permit Tenant to establish a two (2) unit condominium for the Project, with one condominium unit being the residential space and the other unit being the commercial space, and shall contain such other terms and conditions as will satisfy the requirements of the Maine Condominium Act, the Low Income Housing Tax Credit Program, 26 U.S.C. § 42, and the related regulations and the rules of the Maine State Housing Authority ("MSHA") implementing such program and other Project financing, and will transfer substantially all of the benefits and burdens of ownership of the Premises to Tenant for federal tax purposes, while legal title remains vested in the Landlord, and the terms of such Ground Lease shall be reasonably satisfactory to Tenant's investor limited partner, MSHA, and any other financing sources for the Project.

5. Condition of Premises; Premises Description, Title.

- a. Tenant acknowledges that Tenant will have an opportunity to inspect the Premises, and to hire professionals to do so, and that the Premises will be leased "as is, where is" and "with all faults." City, and its agents, make no representations or warranties with respect to the accuracy of any statement as to boundaries or acreage, or as to any other matters contained in any description of the Premises, or as to the fitness of the Premises for a particular purpose, or as to development rights, merchantability, habitability, or as to any other matter, including without limitation, land use, zoning and subdivision issues or the environmental, mechanical, or structural condition of the Premises.
- b. The survey attached hereto as Exhibit A only generally depicts the Premises to be leased to Tenant. The property description contained in the lease will be a survey description (the "Premises Description") based upon a revised version of the Plan to be obtained by the Tenant at the Tenant's expense (the "Survey"), which will more specifically depict and describe the property shown on Exhibit A hereto and be in form and substance reasonably acceptable to the City and Tenant.
- c. The Premises shall be leased to Tenant free and clear of all encroachments, liens and encumbrances except (i) easements consented to by Tenant; (ii) utilities on or servicing the property, whether or not by virtue of existing easements (iii) City ordinances, and (iv) real estate taxes not yet due and payable.
- d. On or before the day that is 90 days after the Effective Date, Tenant will provide the City with (1) Tenant's proposed Survey and Premises

Description, and (2) Tenant's written objections to the condition of the Premises or any title or survey matters that Tenant determines materially affect its use, cost, or feasibility of the Premises for the Project ("Tenant's Objections"). The City will have the option, but in no event will have the obligation, to cure any of Tenant's Objections. The City acknowledges that Tenant's current plans for the project require relocating (i) the two walk signals located on the Premises, both shown on the Plan as "Walk Signal on Conc." and (ii) the traffic box shown on the Plan as "Traffic Box on Conc" in order to minimize disruption to the Project and the patio to be located in such area. Although the City cannot commit to relocating the equipment at this time, the City agrees to consider and discuss such relocation with Tenant in its review of the Survey. Any such relocation, if agreed to by the City, shall be at Tenant's sole cost and expense.

- e. Within 60 days after receipt of the proposed Survey, the Premises Description, and Tenant's Objections, if any, the City will notify Tenant (1) if it has any objections to the Survey or Premises Description and its proposed revisions to the same; and (2) whether the City will attempt to cure any or all of Tenant's Objections. In the event that the City does not elect to cure any of Tenant's Objections, or is unable to do so to Tenant's reasonable satisfaction, Tenant will have the option to undertake the curing of the objections at Tenant's own expense. The City will cooperate with Tenant to the extent reasonably necessary to assist Tenant in curing such objections.
- f. If Tenant and City are unable to reach an agreement on a final Survey and Premises Description, or if the City or Tenant are unable to cure Tenant's Objections to Tenant's reasonable satisfaction prior to the expiration of the Option Period, then this Agreement will terminate and neither party will have any further obligation or liability to the other.

6. Landlord's Representations and Warranties. Landlord represents, covenants and warrants to Tenant that the execution and delivery of this Agreement and the performance by Landlord of the obligations hereunder have been duly authorized by all requisite action.

7. Tenant's Representations and Warranties. Tenant represents, covenants and warrants to Landlord that Tenant has the legal right, power and authority to enter into this Agreement and to perform all of its obligations hereunder, and the execution and delivery of this Agreement and the performance by Tenant of its obligations hereunder (i) have been duly authorized by all requisite action; and (ii) will not conflict with, or result in a breach of, any law or any regulation, order, judgment, writ, injunction or decree of any court or governmental authority, or any agreement or instrument to which Tenant is a party or by which Tenant is bound. The representations and warranties set forth in this Section shall survive the exercise of the Option.

8. Tenant's Right of Termination. Tenant may, in its sole discretion, terminate this Agreement in the event that (i) it is not given an award of low income housing tax credits by MSHA pursuant to its Qualified Allocation Plan or (ii) Tenant does not obtain approval of entry into the Ground Lease from MSHA and/or the U.S. Department of Housing and Urban Development following environmental assessment of the Premises. Such right to terminate may be exercised by Tenant delivering written notice of such termination to the Landlord, and upon such termination, this Agreement shall be null and void, and no party shall have any further obligation hereunder.

9. Default. In the event of a default by either party hereunder, the other party may employ all remedies available at law or in equity, including without limitation specific performance.

10. Broker Commissions. Landlord and Tenant each represent to the other that they have not had any dealings regarding the Premises through any real estate broker or other person who can claim a right to commission or finder's fee in connection with this Agreement or the Ground Lease. If any broker or finder claims that they are owed a commission or finder's fee in connection with this Agreement or the Ground Lease through the Tenant, the Tenant shall indemnify, hold harmless and defend the Landlord against such claim and all costs and expenses (including reasonable attorney's fees and costs) incurred in defending against such claim.

11. Notice. Whenever notice is given or required to be given by either of the parties hereto to the other hereunder, including the Option Notice, it shall be deemed to have been given if in writing and hand delivered or mailed by certified or registered mail, return receipt requested, postage prepaid, or by overnight courier, addressed to the parties at their respective addresses set forth in the first paragraph herein or to such other address(es) as either party shall have last designated by notice in compliance with this Section. All notices shall be effective upon mailing or when hand delivered, whichever occurs first.

12. Memorandum. This Option shall not be recorded but at the Tenant's request the parties shall execute and acknowledge a Memorandum of Option in recordable form, and in substance satisfactory to the parties, to be recorded at Tenant's expense. If such a Memorandum of Option is recorded and Tenant does not exercise the Option within the term of this Agreement, Tenant shall, at Landlord's request and at Tenant's expense, record an instrument evidencing the termination of the Option. In the event Tenant refuses or fails to record such instrument, Tenant acknowledges and agrees that the City may execute and record an affidavit stating that Tenant failed to timely exercise its option to lease the Premises and that this Agreement is terminated and all of Tenant's rights under this Agreement are therefore terminated and released.

13. Further Assurances. The parties agree to take such actions and execute, acknowledge and deliver any and all additional instruments, documents and materials as the other party hereto may reasonably request to fully effectuate the purposes of this Agreement.

14. Tenant's Access, Inspections.

- a. Tenant and others whom Tenant may designate shall have the right, at all reasonable times, at Tenant's sole cost and expense, risk and hazard, to enter upon the Premises to examine and/or show the same and make, or cause to be made, engineering or other studies and inspections of the Premises, including, without limitation, surveying, conducting test borings in order to determine sub-soil conditions, and in general conducting all other tests, analysis and studies of the Premises which Tenant deems prudent in connection with Tenant's intended development or use of the Premises. Tenant shall restore the Premises following any testing substantially to its prior condition, unless otherwise agreed by Landlord.
- b. Tenant agrees to defend, indemnify and hold harmless the Landlord against any mechanics liens that may arise from the activities of Tenant and its employees, consultants, contractors and agents on the Premises.
- c. Tenant shall exercise the access and inspection rights granted hereunder at its sole risk and expense, and Tenant hereby releases the City from, and agrees to indemnify, defend, and hold the City harmless against, any and all losses, costs, claims, expenses and liabilities (including without limitation reasonable attorney fees and costs) (collectively, "Damages") suffered by the City on account of any injury to any person or damage to property arising out of the exercise by Tenant of its rights hereunder.

Tenant shall cause any contractors, consultants or any other party conducting the inspections to procure automobile insurance and general public liability insurance coverage in amounts of not less than Four Hundred Thousand Dollars (\$400,000.00) per occurrence for bodily injury, death and property damage, listing the City as an additional insured thereon, and also Workers' Compensation Insurance coverage to the extent required by law; the forms of all such insurance to be subject to City's Corporation Counsel's reasonable satisfaction.

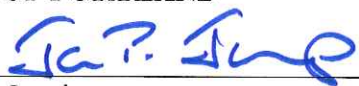
15. Assignment. Tenant shall have the right to assign its rights and obligations hereunder to a limited partnership formed for the purpose of developing the Project, without further consent of the Landlord.

16. Miscellaneous. This Agreement shall be governed by the laws of the State of Maine and shall be binding upon, and shall inure to the benefit of, the parties hereto and their respective successors and assigns. This Agreement may be canceled, modified or amended only by a written instrument executed by both the Landlord and Tenant. This Agreement, including the exhibits referred to herein, constitutes the entire agreement of the parties with respect to the transactions contemplated hereby and supersedes all other agreements between the parties, whether written or oral. Any provision or part of this Agreement held to be void or unenforceable shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon the parties. This Agreement may be

executed by the parties hereto in counterparts, both of which when delivered shall constitute one and the same Agreement. In the event that any signature is delivered via fax or pdf, such signature shall create a binding obligation of the party executing with the same force and effect as if such signature page were an original thereof. Headings used herein are for convenience only and are not to be considered a part of this Agreement or to be used in determining the intent of the parties to it. Time is of the essence with respect to this Agreement. No waiver of any breach of any one or more of the conditions of this Agreement or its attachments by either party shall be deemed to imply or constitute a waiver of any succeeding or other breach hereunder.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their undersigned representatives, thereunto duly authorized, as of the date first above written.

CITY OF PORTLAND

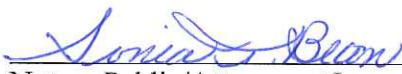
By: 
Jon P. Jennings
Title: City Manager

STATE OF MAINE
COUNTY OF CUMBERLAND, ss.

Date: September 10, 2019

Personally appeared the above-named, Jon P. Jennings, the City Manager of the City of Portland, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said City of Portland.

Before me,


Notary Public/Attorney at Law
Printed name: _____
My commission expires: _____

SONIA T. BEAN
NOTARY PUBLIC
State of Maine
My Commission Expires
April 8, 2024

COMMUNITY HOUSING OF MAINE, INC.

By: [Signature]
Printed name: Cullen Ryan
Title: EXECUTIVE DIRECTOR

STATE OF MAINE
COUNTY OF CUMBERLAND, ss.

Date: Sept. 6, 2019

Personally appeared the above-named, Cullen Ryan, the Executive Director of Community Housing of Maine, Inc. and acknowledged the foregoing instrument to be his/her free act and deed in his/her said capacity and the free act and deed of Community Housing of Maine, Inc.

Before me,

[Signature]
Notary Public/Attorney at Law

Printed name: Kyra Walker

My commission expires: 5/31/2023

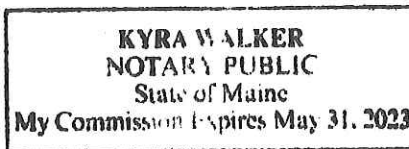
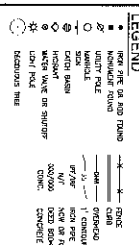
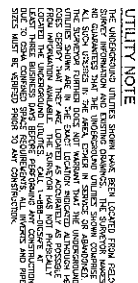
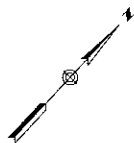


EXHIBIT A

[Insert copy of plan entitled "Boundary & Topographic Survey at #83 Middle Street, Portland, Maine" made for Community Housing of Maine dated May 22, 2019 prepared by Owen Haskell, Inc.]



1. STANDING ALTIMETER SURVEY PLAN OF PROPERTY AT 777 MIDLAND STREET, PORTLAND, MAINE FOR GEORGE W. BEALS DATED NOVEMBER 23, 1932 BY LEONARD A. WINTHROP LOCATED IN THE CITY OF PORTLAND'S ENGINEERING ARCHIVES AS PLAN 566/1.
2. CITY OF PORTLAND PUBLIC WORKS DEPARTMENT CONTRACT DRAWINGS NUMBERING STREET RECONSTRUCTION GRATEE STREET RECONSTRUCTION PROJECT NO. 310-3-100-AND DATED 11/15/67, ON FILE AT THE CITY OF PORTLAND.

1. NAMES OF RECORD: DRY OF PERMAN, 2A MAY 28 BLOCK 5, LOT 12 C.E.D., BOX 2029 PAGE 547 C.E.D. BOX 10895 PAGE 260
2. RECORDS AND COORDINATES ARE BASED ON LAMBE STATE PLANNING COMMISSION, 1962 ZONE AND 1963 ELEVATIONS ARE BASED ON THE 1962 ZONE, 1963 ELEVATIONS, AND VERTICAL CONTROL DATA FROM THE 1962 ZONE AND 1963 DATA FROM THE 1963 ZONE.
3. OUTCROPS SHOWN ARE SHOWN FROM PLAN REFERENCE 12.
4. THE LOCATION OF MAY LANE SHOWN ALONG PARKWAY STREET 3 A PROPERTY LINE, THE DESIGNED RIGHT OF WAY LINE IS THE CORRESPONDING PROPERTY LINES ALONG LINES 28-0-3, 28-0-8, 28-0-9, 5 & 28-0-11.

OWEN HASKELL, INC. HEREBY CERTIFIES THAT THIS PLAN IS BASED ON, AND THE RESULT OF, AN ON THE GROUND FIELD SURVEY AND THAT TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, IT CONFORMS TO THE STANDARDS OF PRACTICE FOR PROFESSIONAL LAND SURVEYORS CURRENT STANDARDS OF PRACTICE.

DATE _____

Boundary & Topographic Survey

#63 Middle Street, Portland, Maine

Made for

Community Housing of Maine

One City Center, 4th Floor Portland, ME 04101

 **OWEN HASKELL, INC.**

PROFESSIONAL LAND SURVEYORS

390 U.S. ROUTE ONE, BOX 111, ALBANY, MAINE 04402

SHOWN BY	REV./JMS	SCALE	DATE	JOB NO.	DATE
ENCLERED	REV./JMS	SCALE	DATE	308-00	3/28/82
		1" = 20'			

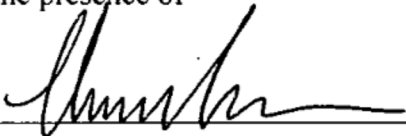
WARRANTY DEED

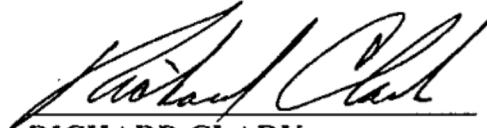
RICHARD CLARK and **SUSAN L. COX**, of Wells, York County, State of Maine, for consideration paid, **GRANT** to **160 NEWBURY STREET, LLC**, a Maine limited liability company, whose mailing address is 217 Commercial Street, 5th Floor, Portland, Maine 04101, **with Warranty Covenants**, a certain lot or parcel of land situated in the City of Portland, County of Cumberland and State of Maine, and more particularly described as follows:

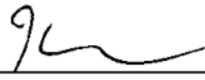
SEE SCHEDULE A ATTACHED HERETO

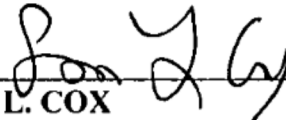
Dated this 2nd day of ^{March}~~February~~, 2012.

Signed, Sealed and Delivered
in the presence of


Witness


RICHARD CLARK


Witness **Keith Fletcher**


SUSAN L. COX

State of Maine
County of York

^{March}
February 2, 2012

Personally appeared the above named **RICHARD CLARK** and **SUSAN L. COX** and acknowledged the foregoing instrument to be their free act and deed.

Before me,


Notary Public/Attorney at Law
Printed Name: **Keith Fletcher**
Commission Expires: **April 3, 2014**

MAINE REAL ESTATE TAX PAID

SCHEDULE A

A certain lot or parcel of land with the buildings thereon situated at 160 Newbury Street in the City of Portland, County of Cumberland and State of Maine, more particularly described as follows:

BEGINNING at a stake standing on the southerly sideline of said Newbury Street and distant 48.10 feet westerly from Hampshire Street; thence South $32^{\circ} 10'$ East by land formerly of J. Westcott and B.A. Donahue, 60.44 feet to a stake; thence South $54^{\circ} 03'$ West by land formerly of J.M. Carleton 43 feet to an iron hub; thence North $36^{\circ} 38'$ West by land formerly of R.C. Baker and F. Joseph 70.9 feet to a post in the southerly sideline of said Newbury Street; thence North $66^{\circ} 50'$ East by said Newbury Street 48.7 feet to the point of beginning.

Reference may be had to a deed from William W. Clark to Richard Clark and Susan L. Cox recorded May 9, 1985 in the Cumberland County Registry of Deeds at Book 6753, Page 74.

Received
Recorded Register of Deeds
Mar 16, 2012 08:16:24A
Cumberland County
Pamela E. Lovley

**COMMUNITY HOUSING OF MAINE
DONATION AGREEMENT**

This Donation Agreement (“Agreement”), dated this 14th day of May, 2020, is by and between 160 Newbury Street, LLC, a Maine limited liability company (“Donor”) and Community Housing of Maine, Inc., (“CHOM”), a Maine not-for-profit corporation.

WHEREAS, Donor owns a parcel of land located at 160 Newbury Street in Portland, Maine as more particularly described on **Schedule A** herein (the “Property”);

WHEREAS, CHOM and its affiliates develop, own, and maintain high-quality affordable housing in the State of Maine and intend to develop an affordable housing project in Portland, Maine to be located at 83 Middle Street and also on the Property (the “Project”);

WHEREAS, Donor desires to donate the Property to CHOM in support of CHOM’s charitable purpose and specifically the Project.

THEREFORE, the parties do hereby agree as follows:

1. The Recitals to this Agreement are true and correct and are incorporated herein.
2. Subject to paragraph 26, Donor irrevocably promises, upon the satisfaction or waiver of the conditions in paragraphs 3(a) and 3(b), to make a donation to CHOM of the Property, and CHOM agrees to accept the Property, on an “as-is”, “where is” and “with all faults” basis, together with all of Donor’s rights, easements, licenses, privileges in or appurtenant to the Property. Donor will convey the Property by a Quitclaim Deed in its “as-is” condition with no covenants of title and no other representations or warranties as to the title or condition of the Property. The original Quitclaim Deed will be delivered, to the offices of Drummond Woodsum, 84 Marginal Way, Suite 600, Portland, Maine 04101, along with the Transfer Tax Declaration, the LLC Certificate (as defined herein) and an underground oil storage disclosure, as required by Maine law, with electronic copies sent simultaneously to Lmagnacca@dwmlaw.com in time for CHOM to record said deed simultaneous with the closing of the Project financing described in paragraph 3(b) below.
3. The obligation of Donor to donate the Property, and the obligation of CHOM to accept the Property, are subject to the satisfaction of each of the following conditions, unless such condition has been waived by both parties:
 - a. Receipt of (i) approval of the City of Portland, Maine Planning Board for the Project, (ii) a low income housing tax credit commitment from Maine State Housing Authority, and (iii) such financing commitments as CHOM or its affiliate(s) shall require, each to be on terms and conditions satisfactory to CHOM and such affiliate(s) in their sole discretion;
 - b. The closing of the financing for the Project by CHOM or its affiliates in accordance with the financing commitments referenced in subclause (a) (the “Construction Loan Closing”); and
 - c. The Property shall be delivered to CHOM free of all tenants and occupants upon delivery of the deed the Property to be then in the same condition as it is now, reasonable wear and tear excepted.
4. CHOM acknowledges and agrees that Donor has not made and hereby specifically disclaims any warranty, guaranty, or representation, oral or written, past, present, or future, of, as to, or concerning the Property

including, but not limited to, (i) the nature, square footage, condition, value, or quality of the geology, the presence of environmental hazards, or the suitability of the Property for any and all activities and uses which CHOM may elect to conduct thereon; (ii) the manner, construction, condition, quality, the state of repair or lack of repair of the Property; (iii) the nature and extent of any right of way, lease, possession, lien, encumbrance, license, reservation, condition, or otherwise; (iv) the compliance of the Property, its operation, or use with any laws, rules, ordinances, or regulations of any government or other body; and (v) the income to be derived from the Property.

5. CHOM hereby expressly acknowledges and agrees that it has, or will have, prior to the date of delivery of the deed from the Donor, thoroughly inspected and examined the Property to the extent it has deemed necessary and that CHOM has been and will be given a full and complete opportunity to conduct its own investigation as to any matter, fact or issue that might influence its decision to accept the Property from Donor. Accordingly, CHOM acknowledges that it is accepting the Property solely in reliance on its own investigation, and the Property is in “as is”, “where is” condition with all faults and defects, latent or otherwise, and not on any information provided or to be provided by Donor. CHOM acknowledges that it has sufficient information regarding the Property, is relying on its own experts and not Donor or any information provided by Donor, if any; and is not looking to Donor for any additional information with respect to condition of the Property. CHOM expressly acknowledges that, in consideration of the agreement of Donor herein, Donor makes, and has made, no representations or warranties, express or implied, or arising by operation of law, including, but not limited to, any warranty as to condition, merchantability or fitness for a particular use or purpose, with respect to the Property or any matter related thereto. CHOM and its affiliates (at their sole cost and expense) shall have the right, prior to the date of delivery of the deed and other transfer documents, to enter upon the Property for purposes of conducting due diligence and for purposes related to the planning board approval process, provided that CHOM will be responsible for, and, upon request of Donor, shall promptly pay for, any damage to, and the restoration of, the Property resulting from any such due diligence activities (this provision shall survive the termination of this Agreement).
6. CHOM and Donor acknowledge and agree that fair market value of the Property is \$485,000 as reflected in the Appraisal Report dated May 5, 2020 from Mainland Appraisal Consultants attached hereto as **Exhibit A** (the “Appraisal Report”), which the parties agree shall be used on the Transfer Tax Declaration for purposes of calculating transfer tax owed on the conveyance; provided, however, that if the consummation of the donation of the Property has not occurred within sixty (60) days of the date of the Appraisal Report (or any subsequent appraisal report obtained in accordance with this paragraph 6), Donor may in its sole discretion, and at its cost and expense, obtain a new appraisal report which shall replace the Appraisal Report attached as Exhibit A, and CHOM and Donor acknowledge and agree that the fair market value in such new report will be will be the fair market value of the Property in connection with this Agreement and for purposes of the Transfer Tax Declaration. The parties acknowledge and agree that the donation of the Property must occur on the same date as the Construction Loan Closing. CHOM shall provide Donor with at least thirty (30) days’ prior written notice of the anticipated date of the Construction Loan Closing, and Donor shall thereafter use best efforts to obtain such new appraisal report (if Donor elects to obtain one, in its sole discretion) prior to the Construction Loan Closing. Notwithstanding anything herein to the contrary, Donor will not be obligated to deliver the deed until any such new appraisal report has been obtained.
7. CHOM represents and warrants that it has the power and authority to execute and deliver this Agreement, to perform the obligations hereunder and to consummate the transactions contemplated hereby and that this Agreement constitutes the valid and legally binding obligation of CHOM, enforceable against it in accordance with its terms and conditions, except as enforceability may be limited by applicable equitable principles (whether applied in a proceeding at law or in equity) or by bankruptcy, insolvency, reorganization, moratorium or similar laws affecting creditors’ rights generally.

8. Donor represents and warrants that it has the power and authority to execute and deliver this Agreement, to perform the obligations hereunder and to consummate the transactions contemplated hereby and that this Agreement constitutes the valid and legally binding obligation of Donor, enforceable against it in accordance with its terms and conditions, except as enforceability may be limited by applicable equitable principles (whether applied in a proceeding at law or in equity) or by bankruptcy, insolvency, reorganization, moratorium or similar laws affecting creditors' rights generally. Donor shall provide, simultaneous with the delivery of the deed, a certificate of the manager or member of the Donor (the "LLC Certificate") attaching a copy of the Donor's Articles of Formation and operating agreement, together with any amendments thereto, and an LLC resolution evidencing Donor's authority to enter into this Agreement and consummate the transactions contemplated hereby and authorizing an individual to execute and deliver this Agreement, the deed and any other transaction documents.
9. Donor shall not execute any easements, leases, mortgages or other security instruments, contracts, or other liens and encumbrances affecting the Property in any way. Until the date of the deed transferring title to CHOM, risk or loss or damage to the Property by fire or otherwise shall be on Donor.
10. The parties each represent and warrant to the other that no brokers or agents have been employed with respect to the transaction contemplated in this Agreement, and each party agrees to indemnify and hold the other harmless from any claim by any broker or agent claiming compensation in respect of the respect to the transaction contemplated in this Agreement, alleging an agreement with Donor or CHOM, as the case may be.
11. CHOM FOR ITSELF AND ANY OTHER PARTIES CLAIMING, BY, THROUGH, OR UNDER CHOM, HEREBY WAIVES AND FULLY RELEASES, REMISES, ACQUITS, DISCHARGES AND COVENANTS NOT TO SUE, OR BRING ANY CLAIM WHATSOEVER AGAINST, DONOR FROM AND AGAINST ANY AND ALL LOSSES, CLAIMS, DEMANDS, LIABILITIES, COSTS, DAMAGES AND EXPENSES (INCLUDING ATTORNEY'S FEES AND COSTS) FROM AND AGAINST ANY AND ALL CLAIMS, CAUSES OF ACTION, WHETHER ADMINISTRATIVE, JUDICIAL OR OTHERWISE, LOSSES, COSTS (INCLUDING ANY AND ALL REASONABLE ATTORNEYS' FEES, COURT COSTS, AND REASONABLE COSTS OF INVESTIGATION, LITIGATION, AND SETTLEMENT), EXPENSES, SANCTIONS, CURTAILMENTS, INTEREST, LIABILITIES, PENALTIES, FINES, DEMANDS, LIENS, JUDGMENTS, COMPENSATION, FEES, LOSS OF PROFITS, INJURIES, DEATH, AND/OR DAMAGES, OF ANY KIND WHATSOEVER, WHETHER KNOWN OR UNKNOWN, FIXED OR CONTINGENT, JOINT OR SEVERAL, DIRECT OR INDIRECT, LATENT OR PATENT, VESTED OR CONTINGENT, SUSPECTED OR UNSUSPECTED, CRIMINAL OR CIVIL, OR IN LAW OR IN EQUITY ARISING FROM, IN CONNECTION WITH, OR IN ANY WAY CONNECTED WITH, THE PROPERTY, INCLUDING BUT NOT LIMITED TO, (A) THE PRESENCE OF HAZARDOUS MATERIALS ON, UNDER OR ABOUT THE PROPERTY (INCLUDING BUT NOT LIMITED TO ANY UNDISCOVERED HAZARDOUS MATERIALS LOCATED BENEATH THE SURFACE OF THE PROPERTY) AND (B) VIOLATIONS OF ANY HAZARDOUS MATERIALS LAWS PERTAINING TO THE PROPERTY OR THE ACTIVITIES THEREON. THIS RELEASE APPLIES TO ALL DESCRIBED RIGHTS, CLAIMS AND ACTIONS, WHETHER KNOWN OR UNKNOWN, FORESEEN OR UNFORESEEN, PRESENT OR FUTURE. CHOM HEREBY WAIVES ANY RIGHTS AFFORDED BY ANY STATUTE OR COMMON LAW PRINCIPLE THAT PROVIDES THAT A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH A RELEASING PARTY DOES NOT KNOW OF OR SUSPECT TO EXIST IN ITS FAVOR AT THE TIME OF EXECUTION OF THE RELEASE, WHICH IF KNOWN WOULD HAVE AFFECTED ITS RELEASE AGREEMENT WITH THE RELEASED PARTY, OR THAT WOULD OTHERWISE LIMIT THE SCOPE AND BREADTH OF THIS RELEASE IN ANY

WAY. CHOM SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS DONOR, FROM ANY AND ALL CLAIMS, DEMANDS, ACTIONS, CAUSES OF ACTION, SUITS, PROCEEDINGS, DAMAGES, LIABILITIES, COSTS AND EXPENSES OF EVERY NATURE WHATSOEVER, INCLUDING ATTORNEYS' FEES, WHICH ARISE FROM OR RELATE TO THE PROPERTY ON OR AFTER THE DATE OF THE DEED TRANSFERRING TITLE OF THE PROPERTY TO CHOM. FOR PURPOSES OF THIS PARAGRAPH 11, ALL REFERENCES TO "DONOR" SHALL INCLUDE DONOR AND ITS AFFILIATES AND THEIR RESPECTIVE OFFICERS, DIRECTORS, MANAGERS, MEMBERS, EQUITYHOLDERS, EMPLOYEES, AGENTS, AND (B) THE HEIRS, SUCCESSORS, PERSONAL REPRESENTATIVES AND ASSIGNS OF SUCH PERSONS AND ENTITIES IN CLAUSE (A). THE TERM "AFFILIATES" MEANS, ANY INDIVIDUAL, FIRM, CORPORATION, ASSOCIATION, TRUST, ENTITY OR ORGANIZATION THAT, DIRECTLY OR INDIRECTLY, CONTROLS, IS CONTROLLED BY, OR IS UNDER COMMON CONTROL WITH, SUCH ENTITY. THE TERM "CONTROL" MEANS THE POSSESSION, DIRECTLY OR INDIRECTLY, OF THE POWER TO DIRECT OR CAUSE THE DIRECTION OF THE MANAGEMENT AND POLICIES OF AN ENTITY, WHETHER THROUGH OWNERSHIP OF VOTING SECURITIES, BY CONTRACT, OR OTHERWISE. OWNERSHIP OF MORE THAN TWENTY PERCENT (20%) OF THE BENEFICIAL INTERESTS OF AN ENTITY SHALL BE CONCLUSIVE EVIDENCE (BUT SHALL NOT BE REQUIRED TO ESTABLISH) THAT CONTROL OF SUCH ENTITY EXISTS.

12. CHOM shall pay for all conveyance costs including, but not limited to, any surveys, commitment search and examination fees and owner's title policy which may be obtained by CHOM in its sole discretion; recording fees, transfer taxes, and recording fees. Donor shall only be responsible for payment of real property taxes and other municipal assessments through the date of the deed transferring title to CHOM and CHOM shall be responsible for any all taxes and assessments from and after such date. Real property taxes shall be prorated on a per diem basis. Each party shall be responsible for its own expenses of counsel in connection with this Agreement and the donation of the Property contemplated herein.
13. Both parties acknowledge and agree that CHOM will publicize the donation of the Property by Donor and its ultimate beneficial owner and that such publicity including the form, contents, timing, and the manner of presentation will be mutually agreed to by the parties.
14. CHOM agrees that the Property and all amounts that may be earned from the Property shall be used by CHOM or its affiliates solely in connection with CHOM's charitable purpose of developing, owning, and maintaining high-quality affordable housing in the State of Maine (the "Specified Purpose").
15. CHOM hereby represents and certifies that it is a Maine not-for-profit corporation, publicly supported and tax-exempt, which can solicit, receive, and administer gifts and bequests and that it is exempt from federal income tax under section 501(a) of the Internal Revenue Code of 1986, as amended (the "Code"), as an organization described in section 501(c)(3) of the Code and as a public charity described in section 509(a)(1) of the Code.
16. It is Donor's intention to legally bind itself, its successors, trustees, executors, administrators, personal representatives, heirs, and assigns to the terms of this Agreement. CHOM acknowledges and agrees that Donor, its successors, trustees, executors, administrators, personal representatives, heirs, and assigns have the power to enforce the terms and provisions of this Agreement and each shall have standing to bring an action in the appropriate court of competent jurisdiction to enforce the terms and provisions of this Agreement.

17. If, in the reasonable written opinion of CHOM's legal counsel, the Project cannot be developed, CHOM will promptly notify Donor (or its successors, trustees, executors, administrators, personal representatives, heirs, and assigns to this Agreement, as applicable) and the parties will mutually agree to a related purpose that will most nearly accomplish the wishes of Donor as expressed herein. Notwithstanding anything else in this Agreement, this condition shall automatically terminate upon completion of construction of the Project.
18. This Agreement, including its formation, performance, or enforcement, and the parties' relationship in connection therewith and all transactions contemplated by this Agreement together with any related claims whether sounding in contract, tort, or otherwise, shall be governed by, and construed and enforced in accordance with, the internal laws of the State of Maine without regard to principals of conflict of laws, including all matters of construction, validity, and performance. Each party irrevocably and unconditionally consents to submit to the exclusive jurisdiction of (a) the courts of the State of Maine, Cumberland County, and (b) the United States District Court for the District of Maine, for the purposes of any suit, action or other proceeding arising out of this Agreement. Each party agrees to commence any such action, suit or proceeding either in the United States District Court for the District of Maine or if such suit, action or other proceeding may not be brought in such court for jurisdictional reasons, in the state courts of the State of Maine, Cumberland County.
19. It is the intent of the parties that this Agreement and the donation of the Property contemplated herein shall for all purposes be treated as a charitable contribution made to an organization that it is exempt from federal income tax under section 501(a) of the Code, as an organization described in section 501(c)(3) of the Code and as a public charity described in section 509(a)(1) of the Code. It is intended that the charitable contribution made by this Agreement be used for charitable, educational, or scientific purposes as permitted to an organization that it is exempt from federal income tax under section 501(a) of the Code, as an organization described in section 501(c)(3) of the Code and as a public charity described in section 509(a)(1) of the Code.
20. The parties acknowledge and agree that this Agreement shall serve as the contemporaneous written acknowledgment by CHOM of the Property required by section 170(f)(8) of the Code. CHOM agrees to promptly provide Donor with the written acknowledgment required by section 170(f)(8) of the Code for any future donations to CHOM. CHOM acknowledges and agrees that it did not provide any goods or services to Donor in consideration for the donation of the Property.
21. Any notice relating in any way to this Agreement shall be in writing and shall be delivered to the other party by (a) registered or certified mail, return receipt requested, (b) overnight by a nationally recognized courier, (c) hand delivery obtaining a receipt therefor, or (d) email with proof of receipt, addressed to the parties as follows,:

To Donor: 160 Newbury Street, LLC
888 East Las Olas Blvd., Suite 710
Fort Lauderdale, FL 33301
ophir@caremipartners.com

To CHOM: Community Housing of Maine, Inc.
Attn: Brian Kilgallen
1 City Center, 4th Floor
Portland, ME 04101
brian@chomhousing.org

With copy to: Lisa R. Magnacca, Esq.
Drummond Woodsum
84 Marginal Way, Suite 600
Portland, ME 04101
Lmagnacca@dwmlaw.com

and such notice shall be deemed delivered the business day when delivered in the case of notice by registered or certified mail, overnight courier, or hand delivery. Notice by email shall be deemed delivered upon proof of receipt. Either party may, by such manner of notice, substitute persons or addresses for notice other than those listed above.

22. This Agreement together with the exhibits referenced herein represents the entire understanding and agreement between the parties with respect to the subject matter hereof, and supersedes all other negotiations, understandings and representations, if any, made by and between the parties. This Agreement shall not be amended or modified except in writing, executed by all parties to this Agreement.
23. No waiver by any party of any of the provisions hereof shall be effective unless explicitly set forth in writing and signed by the party so waiving. No waiver by any party shall operate or be construed as a waiver in respect of any failure, breach or default not expressly identified by such written waiver, whether of a similar or different character, and whether occurring before or after that waiver. No failure to exercise, or delay in exercising, any right, remedy, power or privilege arising from this Agreement shall operate or be construed as a waiver thereof; nor shall any single or partial exercise of any right, remedy, power, or privilege hereunder preclude any other or further exercise thereof or the exercise of any other right, remedy, power, or privilege.
24. Each party shall do and perform, or cause to be done and performed, all such further acts and things, and shall execute and deliver all such other agreements, certificates, instruments and documents, as the other party may reasonably request in order to carry out the intent and accomplish the purposes of this Agreement and the consummation of the transactions contemplated hereby.
25. This Agreement may be executed and delivered in counterparts, each of which shall be deemed to be an original and which together shall constitute one and the same instrument. The electronic signature of any party hereto shall be as binding as the original signature of such party for all purposes; and the copy of any parties' signature to this Agreement delivered by facsimile, e-mail, or such other electronic means shall be as binding and enforceable as the parties' original signature to this Agreement.
26. Each of Donor or CHOM may by written notice to the other terminate this Agreement if the satisfaction or waiver of the conditions in paragraph 3, have not occurred on or before December 31, 2021.
27. EACH PARTY HEREBY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY IN ANY JUDICIAL PROCEEDING INVOLVING DIRECTLY OR INDIRECTLY, ANY MATTERS (WHETHER SOUNDING IN TORT, CONTRACT OR OTHERWISE) IN ANY WAY ARISING OUT OF, RELATED TO, OR CONNECTED WITH THIS AGREEMENT, ANY ANCILLARY AGREEMENT OR ANY TRANSACTION CONTEMPLATED HEREBY OR THEREBY. EACH PARTY (A) CERTIFIES THAT NO REPRESENTATIVE, AGENT OR ATTORNEY OF ANY OTHER PARTY HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PARTY WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE THAT FOREGOING WAIVER AND (B) ACKNOWLEDGES THAT IT AND THE OTHER PARTY HERETO HAVE BEEN INDUCED TO ENTER INTO THIS

AGREEMENT AND THE ANCILLARY AGREEMENTS, AS APPLICABLE, BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS AND CERTIFICATIONS IN THIS PARAGRAPH 27.

(signature page follows)

IN WITNESS WHEREOF, the parties hereto, intending to be legally bound, have executed this agreement as of the date first written above.

DONOR:

160 NEWBURY STREET, LLC

By: ReBeCo, LLC, its sole member

By: 

Ophir Barone
Manager

CHOM:

COMMUNITY HOUSING OF MAINE, INC.

By: 

Name: Brian Kilgallen

Title: Development Officer

SCHEDULE A

A certain lot or parcel of land with the buildings thereon situated at 160 Newbury Street in the City of Portland, County of Cumberland and State of Maine, more particularly described as follows:

BEGINNING at a stake standing on the southerly sideline of said Newbury Street and distant 48.10 feet westerly from Hampshire Street; thence South 32° 10' East by land formerly of J. Westcott and B.A. Donahue, 60.44 feet to a stake; thence South 54° 03' West by land formerly of J.M. Carleton 43 feet to an iron hub; thence North 36° 38' West by land formerly of R.C. Baker and F. Joseph 70.9 feet to a post in the southerly sideline of said Newbury Street; thence North 66° 50' East by said Newbury Street 48.7 feet to the point of beginning.

Reference may be had to a deed from Richard Clark and Susan L. Cox to 160 Newbury Street, LLC dated March 2, 2012 and recorded in the Cumberland County Registry of Deeds at Book 29426, Page 8. Further reference may be had to a deed from William W. Clark to Richard Clark and Susan L. Cox recorded May 9, 1985 in the Cumberland County Registry of Deeds at Book 6753, Page 74.

**Pineland**

Cumberland Hall
41 Campus Drive, Suite 101
New Gloucester, ME 04260

Portland

565 Congress Street, Suite 201
Portland, ME 04101

June 17, 2020

1926

Caitlin Cameron, Urban Designer
City of Portland
389 Congress Street
Portland, ME 04101

**Subject: 83 Middle Street
Response to Staff Review Comments**

Dear Caitlin:

Our office received review comments for the above referenced project from Jeff Tarling, Tom Errico, Mike Tremblay, Lauren Swett and Ben Pearson, dated May 2020. We have reviewed the comments and have prepared the responses presented below. For clarity, each comment is repeated in italics, followed by our response.

Comment 1: Missing items:

- *Evidence of Right, Title, and Interest*
- *Stormwater/sewer capacity application*
- *Level III Subdivision application + plat*
- *Neighborhood meeting submittal*

Response: Evidence of Title, Right, and Interest has been uploaded to E-Plan for review. A stormwater/sewer capacity application has been sent directly to Brad Roland at DPW and has been uploaded to E-Plan.

A Level III Subdivision application has been submitted through CSS. The project surveyor is working on the Recording Plat. It will be uploaded to E-Plan when it is ready for review.

A neighborhood meeting was held on June 10, 2020. Information regarding the meeting, including copies of the invitation, certification, and meeting notes have been uploaded to E-Plan.

Site Plan (Planning Board)

Comment 2: Right, Title and Interest: this is an application requirement

Response: Evidence of Title, Right, and Interest has been uploaded to E-Plan for review.

Comment 3: Newbury Street is under moratorium. Street repairs must meet the requirements for moratorium streets if work is being completed prior to 2023.

Response: Street repairs within Newbury Street will be completed in accordance with applicable street restoration requirements for moratorium streets. Additional detail has been added to the project drawings.

Comment 4: Sidewalk: See attached comments from Mike Tremblay. Tree well should be 5" curb reveal

Response: The tree well detail on Sheet C-8.0 has been revised to indicate a 5" curb reveal.

Comment 5: Transit Access: Project is exempt from providing transit stop (nearest stop <.25 miles away)

Response: No Response Necessary.

Off-Street Parking

Comment 6: The parking will require approval from Planning Board (47 spaces required, 11 provided)

Response: A parking assessment prepared for the project by Bill Bray, P.E. supports the proposed number of on-site parking spaces provided for the project. The parking assessment has been submitted to E-Plan.

Comment 7: Consider how parking requirement will be met if commercial ground floor becomes an office or restaurant requiring parking.

Response: The applicant anticipates that the first floor retail space will be leased by a coffee shop or similar use that does not require parking under the Land Use Ordinance.

Comment 8: What are the details of the carshare?

Response: The applicant is seeking providers for a carshare, and will provide a space in the garage for a shared vehicle. There are currently no known companies providing a carshare service in Portland.

The applicant has been in touch with Portland based RTP transport, who provides low-cost transportation to the elderly, social service agency clients, the economically disadvantaged and persons with disabilities throughout Cumberland County. All residents of the building will qualify for free on-call transportation with RTP. This service is expected to serve a similar role as an on-site shared vehicle would. A loading and unloading space is proposed along the Middle Street site frontage for RTP or other ride services.

Comment 9: Is a second curb cut needed for the Middle Street loading area? This will require a waiver. How is that space intended to be accesses, used?

Response: The vehicle access from Middle Street is intended to be a loading and service area for the commercial tenant who occupies the first floor Middle Street space and for those accessing the building's mechanical room.

Lighting

Comment 10: Illumination levels meet Technical Manual

Response: No Response Necessary

Comment 11: Fixtures may not exceed 3000K

Response: Fixtures previously shown were 4000K color temperature. The light specifications shown on the Photometric Plan (C-7.0) have been changed to 3,000K.

Comment 12: Fixtures are full cut-off

Response: No Response Necessary

Comment 13: At least one decorative light fixture should be provided on Middle and Newbury streets per Technical Manual fixture and spacing requirements

Response: A decorative street light will be provided on Middle Street, and is shown on the revised plans. In accordance with further DPW recommendations, a new cobrahead fixture will be added on Franklin Street at the Newbury Street intersection, and no new light is proposed on Newbury Street because there is an existing cobrahead fixture on the north side of the street.

Comment 14: Bike Parking: 20 spaces required, 15 provided indoors and 6 at hitches at Newbury and Middle streets.

Response: No Response Necessary

Comment 15: 50 street trees required, 6 provided, fee-in-lieu required for 44 at \$17,600

Response: The applicant requests relief from the fee-in-lieu given the nature of the project. The applicant is a non-profit developer of affordable housing, and the City of Portland is participating in the funding of this project. The six new proposed trees are the most that are feasible on this project, given the site constraints.

Comment 16: Fire: No comment

Response: No Response Necessary

Zoning

Comment 17: Please show how height maximums are being met with average grade shown

Response: Building height relative to the average grade around the building is shown on the revised building elevations.

Comment 18: Provide fence detail

Response: A fence detail has been added to Sheet C-8.0.

Subdivision (Planning Board)

Comment 19: Plat – please submit plat for review

Response: The project surveyor is preparing the recording plat. It will be submitted for review when available.

IZ Conditional Use (Planning Board)

Comment 20: 5 units required, provided on-site

Response: No Response Necessary

Comment 21: Indicate which units will be used to meet the IZ requirement so we may evaluate them

Response: All units in the building will be rented to households at or below 60% of the area median income (AMI) and will therefore comply with the IZ requirements.

Comment 22: Work with Victoria Volent on the Affordable Housing Agreement (CoO)

Response: The applicant is currently working on the agreement with Victoria Volent.

Jeff Tarling – City Arborist

Comment 23: The landscape plan looks good.

Response: No Response Necessary

Mike Tremblay: Department of Public Works

Comment 24: The applicant should specify whether the retail space is intended for a restaurant. If this is the case, then a grease trap will likely be required. This will also affect the required number of parking spaces. The semi-enclosed outdoor area suggests that a restaurant may be proposed.

Response: The applicant anticipates that the first floor retail space will be leased by a coffee shop or similar use that does not include on-site food preparation requiring grease trap or parking.

Comment 25: The effective area of the sidewalk along Middle Street is partially located within the Applicant's property. A maintenance agreement will be required.

Response: Please provide the applicant with a draft of the city's maintenance agreement.

Comment 26: Twenty-five percent (25%) of the proposed parking spaces in the garage are shown to be compact (3 of 12). A waiver will be required for the number of compact spaces.

Response: The number of compact parking spaces is being driven by the dimensions of the parking garage. Standard size parking spaces are not possible where the three

compact spaces are proposed. The applicant requests a waiver for the number of compact parking spaces.

Comment 27: A drive aisle width of less than 24 feet is proposed (20 feet). A waiver will be required. The Applicant should show vehicles maneuvering into the more difficult spaces using AutoTURN, including spaces 1, 4, and 11. It should be noted that using a narrow drive aisle has a similar impact on vehicle maneuverability as using a compact space does.

Response: The applicant requests a waiver for the drive aisle width. Vehicle movement diagrams showing how vehicles will access the parking spaces have been added to the plan set (Sheets C-9.0 and C-9.1).

Comment 28: The accessible parking space provided needs to be changed slightly to meet the requirements for a van-accessible parking space. The parking space may be as narrow as 8 feet, but an 8-foot clear area must be provided adjacent to it. The pavement markings in the garage need to be changed slightly to meet this requirement.

Response: The proposed striping has been revised as suggested.

Comment 29: The development of this property changes the streetscape on Newbury Street. These changes should be approved by Portland Fire Department. There is no turnaround provided on Newbury Street.

Response: No Response Necessary.

Comment 30: The applicant should show where solid waste will be stored.

Response: Solid waste will be stored in the trash room located in the northwest corner of the first floor. The trash room location is shown on the Site Plan (Sheet C-4.0).

Comment 31: The applicant should verify with CMP that underground service is possible from UP#10 on Middle Street, if they have not done so already. If the pole is at capacity, a new pole may be required.

Response: Electrical power will be provided from a new utility vault located in the Middle Street sidewalk, as shown on the plans. Cable and telephone service will be provided from UP#10.

Comment 32: Utility trenches should be shown. Trenches within 5ft of one another should be combined upon repair to ensure a smooth road surface.

Response: Utility trenches and pavement repair areas are shown on the Existing Conditions & Demolition Plan (Sheet C-3.0) and have been added to the Site Plan (Sheet C-4.0) and Utility Plan (Sheet C-6.0).

Lauren Swett:

Comment 33: The project has received an ability to serve confirmation from the Portland Water District. They will be providing a request for ability to serve for sewer.

Response: A Wastewater Capacity Application has been sent to Brad Roland at the Department of Public Works.

Comment 34: There are a number of new utilities proposed connecting into the street, with test pits at various crossings with existing utilities. The extent of proposed pavement repair should be shown on the plans. The underground electrical installation in Middle Street will also impact the sidewalk and curb on the opposite side of the street. Similarly, pavement impacts into the roadway due to curbing installation should also be shown (sawcut and small patch anticipated).

Response: Sawcut, utility trenches and pavement repair areas have been revised and are shown on the Site Plan (Sheet C-4.0).

Stormwater: Stormwater comments will be addressed under separate cover.

Ben Pearson – Water Resources

Comment 35: This site appears to want to send stormwater to a combined system when there is a separated system in Hampshire Street that should be considered. I will leave it to Brad for more direct comments but I wanted to put this out there

Response: The proposed storm drainage has been re-designed. A new manhole will be installed in Middle Street, and a new storm drain will connect to the existing separated storm drain at the intersection of Middle and Hampshire Streets. These changes are shown on the Grading & Drainage Plan (Sheet C-5.0).

Comment 36: Stormwater from parking lot proposed to be sent to SSGM05908 which is sanitary only. No flow equalization detention is proposed.

Response: Runoff from covered parking will flow through an oil/water separator before discharging to the sanitary sewer in Newbury Street. In the past, drains in covered parking areas have been treated as floor drains that flow to the sanitary sewer in accordance with Technical Manual Section 2.6.10. Please confirm if this policy has changed.

Comment 37: Stormwater from roof, foundation drains and sanitary proposed to connect to 18" sewer in Middle St. separate connections for sewer and stormwater. But GIS indicates the sewer in middle street is 24" brick combined (risk of pipe failure 10.92) and was recently inspected.

Response: The drainage design has been revised. The proposed roof drainage will connect to a new separated storm drain that will connect to the existing separate storm drain at the intersection of Middle and Hampshire Streets. The proposed sewer service will connect to the existing 24" brick sewer, which is correctly identified on the revised plans.

Comment 38: Opportunity to separate sewers in middle street from Franklin to Hampshire. (Hampshire is separated). it would be a short run.

Caitlin Cameron
June 17, 2020

Project #1926
Middle Street Apartments

Response: A separate storm drain will be installed within Middle Street to carry stormwater from the project site to the storm drain at the intersection of Middle and Hampshire Streets.

Comment 39: The Applicant should connect storm drains and roof drains to the storm sewer rather than sanitary sewer.

Response: See information above.

We trust that the above responses and materials provided address the comments. Please contact me directly with additional questions or concerns.

Sincerely,
TERRADYN CONSULTANTS LLC

A handwritten signature in black ink that reads "Michael E. Tadema-Wielandt". The signature is written in a cursive, flowing style.

Michael E. Tadema-Wielandt, P.E.
Vice President

Attachments:

cc. Brian Kilgallen, CHOM
Ben Walter, CWS Architects

6 TECHNICAL AND FINANCIAL CAPACITY

6.1 TECHNICAL CAPACITY

The applicant has assembled a highly qualified team of professionals to plan, permit, and develop construction documents for the project. The Team is working under the direction of Community Housing of Maine as Project Developers. Professional services will be provided by the following companies and their respective team leaders:

6.2 CONSULTANT TEAM

<i>Civil Engineer</i>	Michael Tadema-Wielandt, P.E. Terradyn Consultants, LLC 565 Congress Street Portland, ME 04101 (207) 632-9010 – Cell (207) 221-1317 – Fax mtw@terradyconsultants.com
<i>Surveyor</i>	Randy Loubier Owen Haskell, Inc. 390 US Route 1, Unit 10 Falmouth, Maine 04105 (207) 774-0424 – Work (207) 774-0511 – Fax rloubier@owenhaskell.com
<i>Architect</i>	Ben Walter CWS Architects 264 US Route One, Suite 100-2A Scarborough, ME 04074 (207) 774-4441 – Work bwalter@cwsarch.com
<i>Electrical/ Mechanical Engineer</i>	William Bennett Bennett Engineering P.O. Box 297 Freeport, ME 04032 (207) 865-9475 will@bennettengineering.net

6.3 EXPERIENCE OF PROJECT TEAM

The team of consultants retained by the developer has expertise and experience in the design of similar projects. Resumes of key personnel for the development team can be provided upon request.

The developer, Community Housing of Maine, has experience in the development and management of residential projects of this scale. A company resume is included in Attachment 6-A.

6.4 FINANCIAL CAPACITY

The applicant will make use of the Low Income Housing Tax Credit as well as subsidy and debt administered through MaineHousing. Additionally the City of Portland has pledged \$330,000 through the City's Housing Trust Fund, and \$200,000 in CDBG funds. The project will benefit from a below market ground lease from the City of Portland and 25 Project-Based Housing Vouchers from the Portland Housing Authority.

6.5 CONSTRUCTION COST ESTIMATE

The project has an overall construction cost estimate of \$10.5 million. This construction cost value is considered preliminary and subject to change as building design and project layout is refined, etc.

6.6 ATTACHMENTS

Attachment 6-A – Community Housing of Maine Resume

ATTACHMENT 6-A

Community Housing of Maine Resume

CHOM Development Corporation Resume

CHOM Development Corporation was formed in 2003 and is the managing General Partner in eleven (11) limited partnerships. Each partnership was formed for the purpose of owning affordable rental housing created, in part, by an allocation of Low Income Housing Tax Credits.

Stevens Green



2004 / Stevens Green Associates, L.P.

4% bond financing and tax credits / 26 family units, 24,871 Sq. Ft., 5 Lovejoy Street, Rockland, Maine

New construction, \$4.1 million total development cost

Delivered on time and slightly under budget / Benchmark as General Contractor by Select Bid

Initial occupancy December 2005

Architect: Ben Walter, CWS Architects

Construction Lender: Camden National Bank

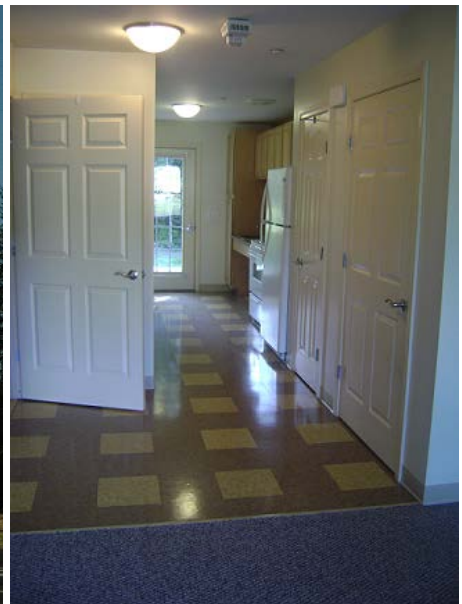
Syndicator: Michael Associates, Ltd.

Property Manager: Preservation Management, Inc.

Project Manager: Erin Cooperrider for CHOM Development Corporation

An affiliate of Community Housing of Maine, Inc.

Townhouses at Davis Island



2006 / Davis Island Housing Partners, L.P.

9% tax credits / 26 family units, 27,376 Sq. Ft., 45 US Route 1, Edgecomb, Maine

New construction, \$5.5 million total development cost

Delivered early and on budget / Portland Builders as General Contractor by Select Bid

Initial occupancy October 2007

Architect: Ben Walter, CWS Architects

Construction Lender: Camden National Bank

Syndicator: Boston Capital Corporation

Property Manager: Preservation Management, Inc.

Project Manager: Erin Cooperrider for CHOM Development Corporation

Meets MaineHousing's green design requirements

An affiliate of Community Housing of Maine, Inc.

Clearwater Bend



2007 / Reed Street Neighborhood Housing, L.P.
9% tax credits / 23 family units, 26,190 Sq. Ft., 27 Reed Street, Westbrook, Maine
New construction, \$5.5 million total development cost
Delivered early and under budget / Benchmark as Construction Manager-at-Risk
Initial occupancy July 2008
Architect: Ben Walter, CWS Architects
Construction Lender: Camden National Bank
Syndicator: Boston Capital Corporation
Property Manager: Preservation Management, Inc.
Project Manager: Erin Cooperrider for CHOM Development Corporation
Meets MaineHousing's green design requirements

An affiliate of Community Housing of Maine, Inc.

Maine Hall





2009 / Seminary Housing Partners, L.P.

9% tax credits / state and federal historic tax credits / 28 senior units, 25,350 Sq. Ft., 288 Union Street, Bangor, Maine

Acquisition and rehabilitation of historic brick building with new construction addition

\$6 million total development cost

Delivered on time and on budget / Nickerson O'Day as Construction Manager-at-Risk

Initial occupancy August 2011

Architect: Ben Walter, CWS Architects

Construction Lender: People's United Bank

Syndicator: Boston Capital Corporation

Property Manager: Preservation Management, Inc.

Project Manager: Erin Cooperrider for CHOM Development Corporation

Certified by the U.S. Green Building Council (USGBC) and achieved Leadership in Energy and Environmental Design (LEED) Silver Certification

An affiliate of Community Housing of Maine, Inc.

Elm Terrace



2010 / Children's Hospital Housing Partners, L.P.

9% tax credits / state and federal historic tax credits / 38 family units, 42,864 Sq. Ft., 68 High Street, Portland, Maine

Acquisition and rehabilitation of historic brick building with new construction addition

\$10.5 million total development cost

Delivered on time and on budget / Wright-Ryan as Construction Manager-at-Risk

Initial occupancy February 2013

Architect: Ben Walter, CWS Architects

Construction Lender: TD Bank

Syndicator: Boston Capital Corporation

Property Manager: Preservation Management, Inc.

Project Manager: Erin Cooperrider for CHOM Development Corporation

Certified by the U.S. Green Building Council (USGBC) and achieved Leadership in Energy and Environmental Design (LEED) Platinum Certification

An affiliate of Community Housing of Maine, Inc.

Danforth on High





2011 / Danforth on High, L.P.

4% bond deal / 30 senior units, 23,450 Sq. Ft., 81 Danforth Street, Portland, Maine

New construction, \$5.6 million total development cost

Delivered on time and under budget / Hebert Construction as General Contractor by Select Bid

Initial occupancy July 2013

Architect: David Lloyd, Archetype

Construction Lender: Gorham Savings Bank

Syndicator: Boston Capital Corporation

Property Manager: Preservation Management, Inc.

Project Manager: Erin Cooperrider for CHOM Development Corporation

Meets MaineHousing's green design requirements

An affiliate of Community Housing of Maine, Inc.

Campbell Creek Village (formerly Harbor Pines and West Harbor Pines)



2012 / Campbell Creek Housing Partners, L.P.

4% bond financing and tax credits / USDA Rural Development Multifamily Revitalization Program

16 family units and 20 senior units, 31,165 Sq. Ft., Andrea Lane, Boothbay Harbor, Maine

Acquisition and occupied rehabilitation; \$ 4.8 million total development cost

Delivered early and on budget / Great Falls Construction as General Contractor by Open Bid

Initial Occupancy September 2012 (occupied renovation)

Architect: Ben Walter, CWS Architects

Construction Lender: Maine State Housing Authority

Syndicator: Northern New England Housing Investment Fund

Property Manager: Preservation Management, Inc.

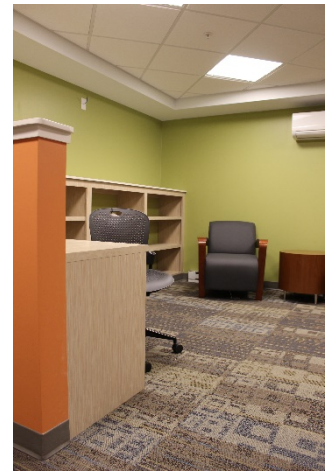
Project Manager: Erin Cooperrider for CHOM Development Corporation

Meets MaineHousing's green design requirements

An affiliate of Community Housing of Maine, Inc.

Village Centre Family Apartments





2015 / Village Centre Housing Partners, L.P.
 9% tax credits / 48 family units, 54,886 Sq. Ft., 266 Center Street, Brewer, Maine
 New construction, \$9.5 million total development budget
 Delivered on time and on budget / Wright-Ryan as Construction Manager-at-Risk
 Initial occupancy April 2016
 Architect: Ben Walter, CWS Architects
 Construction Lender: TD Bank
 Syndicator: Northern New England Housing Investment Fund
 Architect: Ben Walter, CWS Architects
 Property Manager: Preservation Management, Inc.
 Project Manager: Erin Cooperrider for CHOM Development Corporation
 Certified by the Passive House Institute US (PHIUS) achieving PHIUS+ 2015
 Passive House certification.

An affiliate of Community Housing of Maine, Inc.

Parish House



2016 / Parish House Associates, L.P.

State and federal historic tax credits / 6 units, 6,561 Sq. Ft., 27 Kennebec St., Bar Harbor, Maine

Acquisition and rehabilitation of historic brick building

\$2.03 million development cost

Delivered on time and on budget / E. L. Shea as Construction Manager-at-Risk

Initial occupancy August 2017

Architect: George Lavigne, CWS Architects

Construction Lender: Camden National Bank

Investment Limited Partner: Camden National Bank

Property Manager: Community Housing of Maine

Project Manager: Erin Cooperrider for CHOM Development Corporation

An affiliate of Community Housing of Maine, Inc.

Northfield Green



2017 / NFG Housing Partners, L.P.

4% tax credits / 201 units, 198,898 Sq. Ft., 145 Allen Ave., Portland, Maine

Occupied rehabilitation; \$30 million development cost

Anticipated on time and on budget / Zachau Construction as Construction Manager-at-Risk

Initial occupancy December 2017 (occupied rehabilitation)

Architect: Ben Walter, CWS Architects

Construction Lender: TD Bank

Syndicator: Boston Capital Corporation

Property Manager: Preservation Management, Inc.

Project Manager: Erin Cooperrider for CHOM Development Corporation

An affiliate of Community Housing of Maine, Inc.

Central Commons



2018 / Central Commons Housing Partners, L.P.

4% tax credits / state and federal historic tax credits / 29 senior units, 25,000 Sq. Ft., 6 Beech St., Hallowell, Maine

Acquisition and rehabilitation of historic brick building

\$6.53 million development cost

Anticipated on time and on budget / Wright-Ryan as Construction Manager-at-Risk

Initial occupancy targeted for February 2020

Architect: Ryan Senatore Architects

Construction Lender: Bangor Savings Bank

Syndicator: Boston Capital Corporation

Property Manager: Preservation Management, Inc.

Project Manager: Bree LaCasse for CHOM Development Corporation

3 STATE AND FEDERAL PERMITS

The development is subject to the following land use permits from the City of Portland.

- Level II Site Plan
- Level III Subdivision
- Conditional Use – Inclusionary Zoning

Building Permit(s) are also required.

No additional State or Federal Permits are required.

5 EASEMENTS OR OTHER BURDENS

5.1 OVERVIEW

Owen Haskell, Inc. completed a boundary and topographic survey of the site in March of 2020. There is an existing 4' right of way crossing the site, which has not been used in more than 100 years. The applicant's attorney will be providing title insurance for the project.

8 NATURAL FEATURES

8.1 OVERVIEW

The project site is currently entirely developed and does not contain any significant natural features including wetlands, vernal pools or other protected resources or wildlife habitats.

9 STORMWATER MANAGEMENT

The following information is provided in accordance with the City of Portland Code of Ordinances Chapter 14 Land Use, Section 14-526(b)(3).

9.1 OVERVIEW

Middle Street Housing Partners, LP intends to redevelop two parcels totaling 13,842 square feet at 83 Middle Street in Portland. The project includes removal of an existing surface parking lot and construction of a new 9,715 square foot (footprint) building with associated site and utility improvements. This narrative describes the stormwater runoff patterns and methods of stormwater management for the existing (pre-development) and proposed (post-development) conditions.

9.2 EXISTING CONDITIONS

The existing project site is entirely developed and contains approximately 7,488 square feet of impervious surface, primarily comprised of a paved parking lot. The site slopes at approximately 5% from north to south (Newbury Street to Middle Street). No formal stormwater management infrastructure exists on the site. Runoff currently drains overland following the slope of Franklin Street into the combined sewer/storm drain network within Middle Street.

9.3 PROPOSED PROJECT

The proposed project includes construction of a 5-story building with a footprint of 9,715 square feet and associated sidewalks, utilities and landscaping. In the proposed post-development condition, the site will contain 11,717 sf of impervious area, comprised of 9,715 sf of building roof and 2,002 sf of non-roof impervious area.

Because the proposed development will result in less than 5,000 square feet of non-roof impervious area, the project is not required to meet the General or Flooding Standards.

9.4 TREATMENT MEASURES

No stormwater treatment measures are required for this project.

9.5 CONCLUSIONS

The project is not expected to result in significant change in runoff volume due to the small increase in impervious surface area.

The project is not expected to cause ponding, flooding, or erosion problems on or downstream of the site. The relatively small amount of runoff entering the city's storm drain network is not expected to overburden the system.

10 CONSISTENCY WITH CITY MASTER PLANS

10.1 OVERVIEW

Our office is not aware of any applicable Master Plans created for the project site.

Standard to be Waived: Cite Ordinance or Technical Manual Standard	Cite Standard Language: Cite specific language of applicable Ordinance or Technical Manual Standard	Waiver Being Sought: Describe waiver being sought. Ex. – We are requesting a two-way parking lot drive aisle width of 20' feet.	Justification for Waiver: Address specific waiver criteria, if applicable, and document reasons for the waiver request.
Technical Manual Standard 1.14 - Parking Lot and Parking Space Design	Parking lots with greater than 10 spaces may be comprised of up to 20% compact parking spaces	To allow 3 of the 12 parking spaces (25%) to be compact spaces.	The 3 proposed compact parking spaces are in a location where smaller vehicles are preferable due to dimensional constraints. The drive aisle width would be only 19' wide if the 3 compact spaces were "standard" spaces (18' long).
Technical Manual Standard 1.14 - Parking Lot and Parking Space Design	Required 24' parking aisle width.	To allows the parking aisle widths within the parking garage to be narrower than the required 24' width, as show on Site Plan C-3.0.	The garage dimensions are constrained by the building structure. Proposed parking layout provides adequate space for maneuvering into and out of parking spaces. Parking will be for residents, not for the public.
Land Use Ordinance Sec. 14-275.7 Subdistrict Dimensional Requirements (UT subdistrict) Garage Door Setback	Min. 10' garage door setback	The proposed garage door is 4.4' from the Newbury Street Right of Way at its closest point.	



ZONING ANALYSIS Relevant Zone(s) IS-FBC / UA & UT Subdistricts

All Projects:

	Required	Proposed
Lot Size	None	13,842
Area Per Dwelling Unit	None	276 sq ft
Minimum Street Frontage	30 ft	339 ft
Front Yard Minimum	None	UA:3' UT:1'
Front Yard Maximum	UA:5' UT:10'	UA:3' UT:1'
Rear Yard	UA:10' UT:10'	N/A
Yard Right	UA:5' UT:10'	5'
Yard Left	UA:5' UT:10'	N/A
Side Street Setback	N/A	N/A
Step Back	10'	10'
Maximum Lot Coverage	90%	70%
Minimum Lot Coverage	N/A	N/A
Maximum Height	UA:50' UT:65'	UA:50' UT:61'
Open Space	N/A	N/A
Maximum Impervious Area	90%	88%
Pavement Setback	N/A	N/A
Floor Area Ratio	N/A	N/A
Off Street Parking Spaces	47	11+car share
Loading Bays	N/A	N/A
Other 1		
Other 2		
Other 3		

Planned Residential Unit Developments (PRUD) Requirements

	Required	Proposed
Minimum Lot Size		
Minimum Lot Area per Dwelling		
Maximum # Units per Building		
Maximum Building Length		
Maximum Accessory Building Length		
Minimum Setbacks		
Minimum Building Separation		
Minimum Open Space		

Affordable Housing Density Bonuses (if applicable)

	Bonus Increase or Decrease	Maximum Allowable With Bonus	Proposed
Density			
Height			
Setback Reduction			
Recreation Space			
Maximum Accessory Building Length			
Minimum Setbacks			
Minimum Building Separation			
Minimum Open Space			
Explanatory Text 1 (optional):			
Explanatory Text 2 (optional):			
Explanatory Text 3 (optional):			

11 UTILITIES

11.1 OVERVIEW

The proposed project will involve installation of new utility services to the building. All new utility services will be provided from the franchise utilities available within Middle and Newbury Streets. The proposed locations of the new utility services are shown on the Site Utility Plan (Sheet C-6.0).

11.2 WATER SUPPLY

The proposed project will receive its water supply from the Portland Water District's (PWD) public water supply system. Separate fire and domestic services will be installed to the building from PWD's existing main in Middle Street. Terradyn Consultants submitted an ability to serve request to PWD on April 2, 2020 and received confirmation from PWD on April 8, 2020. Correspondence with utilities is included in Attachment 11-A.

11.2.1 Total Project Water Usage

The total average daily water demand for the proposed project is estimated to be 6,340 gallons per day, based on design flows published in the State of Maine Subsurface Wastewater Disposal Rules.

46 x 1 Bedroom Residential Units at 120 gpd/unit	= 5,520 gpd
4 x 2 Bedroom Residential Units at 180 gpd/unit	= 720 gpd
1 x Commercial space with 4 Employees at 12 gpd/employee	= 100 gpd
Total	= 6,340 gpd

11.3 WASTEWATER DISPOSAL

The proposed project will be connected to the Portland Water District's and City of Portland's wastewater collection and conveyance systems. The City of Portland Wastewater Capacity Application has been completed and will be forwarded to Brad Roland of the City's Water Resources Department.

The overall project is anticipated to generate an average daily flow of approximately 6,340 gpd. Based on the existing sewer system in the area, there appears to be adequate capacity to handle these projected flow amounts.

11.4 ELECTRICITY SUPPLY

CMP currently maintains overhead and underground utilities in the area. Electrical power for the project will be fed from a new underground transformer vault that will be installed in the Middle Street sidewalk.

11.5 ATTACHMENTS

Attachment 11-A – Correspondence with Utilities

ATTACHMENT 11-A
Correspondence with Utilities

**Pineland**

Cumberland Hall
41 Campus Drive, Suite 101
New Gloucester, ME 04260

Portland

565 Congress Street, Suite 201
Portland, ME 04101

April 2, 2020

Project # 1926

MEANS

means@pwd.org

Portland Water District

225 Douglass Street

Portland, ME 04104

Request for Ability to Serve Letter
50-Unit Affordable Housing Development
83 Middle Street, Portland, Maine

Dear Sir or Madam:

Terradyn Consultants LLC has been retained by Community Housing of Maine to assist with site design and permitting for a proposed 50-unit affordable housing development located at 83 Middle Street in Portland, Maine. We are writing to request a letter confirming the Portland Water District's ability to serve the proposed development.

The 10,926 square foot parcel is identified as Lots 3 and 17, Block O on the City of Portland Tax Map 28. The site is located on the northeast corner of Middle and Franklin Streets. There are currently no structures on the site, which is used as a surface parking lot.

The proposed project includes the construction of a 45,000 square foot, 5-story building, including 50 affordable apartments. One commercial unit and covered parking will occupy the ground floor. Public water and sewer utilities will be installed to serve the project. It is anticipated that a new 6" fire protection water service and a new domestic water service will be installed for the new building. From the 2019 infrastructure map provided by PWD the water main in Middle Street appears to be 8" and will function as the connection to the project.

Attached are a site location figure showing the property delineated on a USGS map and a preliminary site utility plan of the project, showing how the development may be served with water. A spreadsheet showing the total number of proposed plumbing fixtures is provided in a separate document.

Please provide our office with confirmation that the Portland Water District has the ability to serve the proposed development. As the design is refined, we will provide more detailed drawings of the project for your review.

If you have any questions or need more information to make your determination on ability to serve, please contact me at mtw@terradyconsultants.com or (207) 632-9010.

Sincerely,

TERRADYN CONSULTANTS LLC

A handwritten signature in black ink that reads "Michael E. Wielandt". The signature is written in a cursive, flowing style. The first name "Michael" is written in a standard cursive, while "E." is a simple capital letter followed by a period. "Wielandt" is written with large, bold, and somewhat stylized capital letters.

Michael Tadema-Wielandt, P.E.
Vice President

Enc.



April 8, 2020

Terradyn Consultants, LLC
AATN: Michael Tadema-Wielandt
556 Congress St, Suite 201
Portland, ME 04101

Re: 83 Middle Street, PO
Ability to Serve with PWD Water

Dear Mr. Tadema-Wielandt:

The Portland Water District has received your request for an Ability to Serve Determination for the noted site submitted on April 2, 2020. Based on the information provided per plans received April 8, 2020, we can confirm that the District will be able to serve the proposed project as further described in this letter. **Please note that this letter constitutes approval of the water system as currently designed and is valid for eighteen (18) months after the date of issue. Any changes affecting the approved water system will require further review and approval by PWD.**

Conditions of Service

The following conditions of service apply:

- A new 2-inch domestic service with a 1.5-inch meter may be installed from the water main in Middle Street. The service should enter through the properties frontage on Middle Street as far away as possible from any side property lines.
- A new 6-inch fire service may be installed from the water main in Middle Street. The service should enter through the properties frontage on Middle Street as far away as possible from any side property lines.
- The Portland Water District does not have record of any other existing infrastructure in public roads and recommends a survey and test pitting be performed by the development team prior to construction. Any conflicts that arise during construction are at the risk of the developer and may result in job shutdown until new plans are submitted by the developer and reviewed and approved by PWD.
- An approved backflow prevention device must be installed on the service line directly after the meter prior to service activation. Please refer to the PWD website for more information on cross-connection control policies.

Prior to construction, the owner or contractor will need to make an appointment to complete a service application form and pay all necessary fees. The appointment shall be requested through MEANS@pwd.org or by calling 207-774-5961 ext. 3199. Please allow (3) business days to process the service application paperwork. PWD will guide the applicant through the new development process during the appointment.



Existing Site Service

According to District records, the project site does not currently have existing water service.

Water System Characteristics

According to District records, there is an 8-inch diameter ductile iron water main in Middle Street and a public fire hydrant located approximately 50 feet from the site. The most recent static pressure reading was 101 psi on March 24, 2020.

Public Fire Protection

The installation of new public hydrants to be accepted into the District water system will most likely not be required. It is your responsibility to contact the Portland Fire Department to ensure that this project is adequately served by existing and/or proposed hydrants.

Domestic Water Needs

The data noted above indicates there should be adequate pressure and volume of water to serve the domestic water needs of your proposed project. Based on the high water pressure in this area, we recommend that you consider the installation of pressure reducing devices that comply with state plumbing codes.

Private Fire Protection Water Needs

You have indicated that this project will require water service to provide private fire protection to the site. Please note that the District does not guarantee any quantity of water or pressure through a fire protection service. Please share these results with your sprinkler system designer so that they can design the fire protection system to best fit the noted conditions. If the data is out of date or insufficient for their needs, please contact MEANS to request a hydrant flow test and we will work with you to get more complete data.

Should you disagree with this determination, you may request a review by the District's Internal Review Team. Your request for review must be in writing and state the reason for your disagreement with the determination. The request must be sent to MEANS@PWD.org or mailed to 225 Douglass Street, Portland Maine, 04104 c/o MEANS. The Internal Review Team will undertake review as requested within 2 weeks of receipt of a request for review.

If the District can be of further assistance in this matter, please let us know.

Sincerely,
Portland Water District

A handwritten signature in black ink, appearing to read 'Robert A. Bartels', written in a cursive style.

Robert A. Bartels, P.E.
Senior Project Engineer

12 SOLID WASTE

12.1 OVERVIEW

The project will generate solid waste both during construction and on an on-going basis after construction is complete. Estimates of solid waste generation, recycling rates, and procedures for the transport and disposal of solid waste that will be generated by the operation of the proposed development are provided below.

The following amount of solid waste associated with the construction and operation of the development have been estimated:

- 61 cubic yards of construction debris related to the new building construction activities (excluding volume of recycled materials).
- 1,836 pounds per week of solid waste will be generated by the operation of the development. Assuming that 50% of the waste is recycled, it is estimated that the project will generate 21.7 tons of recyclable waste and 21.7 tons of non-recyclable waste per year.

12.2 SOLID WASTE GENERATED DURING THE BUILDING CONSTRUCTION

Approximately 305 cubic yards of construction debris is expected to be generated during construction. Assuming that 80% of construction debris is recycled, construction of the project will generate approximately 61 cy of non-recyclable waste.

The waste stream will be transported and disposed of at the following locations:

Hazardous Materials:	WMI Crossroads Facility in Norridgewock, Maine
Mixed Construction Material:	Riverside Recycling Facility in Portland, Maine; WMI Crossroads Facility in Norridgewock, Maine or Juniper Ridge in Old Town, Maine (Contractor option)
Separated Wood Construction Debris:	KTI Biofuels in Lewiston, Maine
Separated Metal/Ferrous Material:	One Steel Recycling Inc. in Arundel or Oakland, Maine

The collection, transfer, disposal, and payment of all fees for solid wastes shall be the responsibility of the Contractor, with all waste transferred by a licensed non-hazardous waste transporter.

12.3 SOLID WASTE GENERATED FROM THE OPERATION OF THE DEVELOPMENT

Approximately 1,377 pounds of solid waste and recyclable material is expected to be generated every week by the residents of the project. The operational solid waste and recyclable material will be collected by a private trash collector selected through a bidding process. A trash room will be located on the ground floor of the building, adjacent to Newbury Street. Residents will access the trash room through the parking garage.

12.4 ATTACHMENTS

Attachment 12-A – Computations of Types and Volumes of Solid Wastes for Construction Project

ATTACHMENT 12-A

Computations of Types of Volumes of Solid Wastes

ATTACHMENT 12-A

SOLID WASTES COMPUTATIONS AND DISPOSAL

A. NEW BUILDING CONSTRUCTION:

Basis of Estimate: 10 c.y./1,500 s.f. of finished space

Area: Approximately 45,720 square feet of finished space

Solid Waste: Approximately 305 c.y.

Other Wastes Associated with Other Site Construction: Cardboard from packaging etc.: Limited Quantity

Total: 305 c.y. before recycling

Net: 61 c.y. if 80% of the material is recycled

Disposition:

Assume 10 percent is concrete which can be sent to the approved aggregate recycling facilities operated by Shaw Bros. or R.J. Grondin and Sons for processing into recycled aggregate.

Assume 70 percent is wood or metal which can be transported to KTI Biofuels in Lewiston (for wood) or One Steel Recycling in Oakland, Maine for metals.

Approximately 61 cubic yards of mixed construction debris that will be hauled to the Riverside Recycling Facility in Portland, WMI Crossroads facility in Norridgewock, Maine or the Juniper Ridge Facility in Old Town, Maine.

The contractor should provide dumpsters designated by material type and identify recycling methods and disposal sites prior to construction. All haulers must have a current non-hazardous waste haul license.

B. OPERATIONAL SOLID WASTE:

RESIDENTIAL USE:

Basis of Estimate: 17 pounds/wk per individual. Estimate of 1 individual per efficiency unit, 2 individuals per 1-bedroom unit, and 3 individuals per 2-bedroom unit. From Table 14-1 of the CEQR Technical Manual from January 2014 Edition; Source: New York City Department of Sanitation.

Number of individuals: 81

Solid Waste: Approximately 1,377 pounds/week

CITY OF PORTLAND
Planning & Urban Development Department

LEVEL II and LEVEL III SITE PLAN
GENERAL DOCUMENT AND DRAWINGS CHECKLIST

- * Please upload each document and drawing as a separate PDF file
- * Please upload all drawings in a 24 x 36 sheet size
- * Please confirm each item by electronically checking the boxes to the left for each document/drawing
- * Please fill out and upload separately the zoning assessment table and waiver table

(At the time of application submission, please contact the Department of Public Works regarding E-911 addressing of your project)

GENERAL APPLICATION DOCUMENTS

Yes ☒	NA ☐	Project Description Cover Letter with detailed project description
Yes ☒	NA ☐	Completed Checklist – Level II and Level III Site Plan (this document)
Yes ☒	NA ☐	Right, Title and Interest Deeds, leases, or purchase and sales agreements
Yes ☒	NA ☐	Evidence of State or Federal Approvals Permits or letters of non-jurisdiction, if applicable
Yes ☒	NA ☐	Zoning Assessment Table listing required and proposed uses and dimensional standards Zoning Assessment Table
Yes ☒	NA ☐	Existing and/or Proposed Easements or Covenants, applicable. Evidence of existing easements and any proposed easements
Yes ☒	NA ☐	Waiver Requests Written request for waiver describing request and reason Waiver Table
Yes ☒	NA ☐	Financial Capability Letter or evidence from a financial institution or third party verifying financial capacity to undertake project
Yes ☒	NA ☐	Technical Capability Evidence of technical capability of applicant and consultants – resumes and/or examples of past projects

LEVEL II AND LEVEL III SITE PLAN STANDARDS AND SUBMISSION CHECKLIST

* Please provide assessment of compliance with standards and include supplemental documentation, as applicable

* Please upload each document as a separate PDF file

TRANSPORTATION

Yes ☒	NA ☐	Transportation Analysis- Traffic Impact (14-526 (a) 1) - Provisions for pedestrian, bicycle, vehicle, and loading circulation and incremental volume of traffic impacts - Traffic Impact Study (Technical Manual, Section 1) if applicable
Yes ☒	NA ☐	Access and Circulation (14-526 (a) 2 a) - Access and internal circulation, addressing ADA access - Access and egress impacts on traffic flows - Description and use of drive-up features, if applicable
Yes ☒	NA ☐	Loading and Servicing (14-526 (a) 2 b) - Loading and servicing needs, route and travel way geometrics for deliveries - Turning templates for delivery vehicles, if applicable
Yes ☒	NA ☐	Sidewalks (14-526 (a) 2 c) - Sidewalks and condition along street frontages and internal walkways - Engineered details for ADA ramps and public sidewalk details meeting sidewalk materials policy and ADA ramp construction details as applicable (Technical Manual, Section 1)
Yes ☒	NA ☐	Public Transit (14-526 (a) 3), if applicable - Existing available transit services - Proposed site plan design details, such as easement, pad base, and shelter
Yes ☒	NA ☐	Off-Street Parking: Vehicle & Motorcycle/Scooter) (14-526 (a) 4 a and c) - Expected parking demand, proposed parking supply, ADA parking, and applicable Zoning Requirements - Address Technical Manual standards (Section 1) for curb cut separation and parking lot layout and locate on site plan
Yes ☒	NA ☐	Bicycle Parking (14-526 (a) 4 b) - Address bicycle parking requirements and identify locations on-site - Construction details for bike racks (Technical Manual, Section 1)
Yes ☒	NA ☐	Snow Storage (14-526 (a) 4 d) Management plan for snow removal and locate snow storage areas on plan
Yes ☐	NA ☒	Traffic Demand Management (TDM) (14-526 (a) 5), if applicable Develop TDM with Trip Reduction Targets and Strategies

ENVIRONMENTAL AND LANDSCAPE FEATURES		
Yes ☒	NA ☐	Preservation of Significant Natural Features (14-526 (b) 1), if applicable - Trees, plants, habitats listed on State or Federal list of endangered or threatened - High and moderate value waterfowl and wading habitat - Aquifers on Casco Bay Islands - Waterbodies (including wetlands, watercourses, significant vernal pools and floodplains) - Proposed preservation areas and protection measures - Documentation from environmental consultants, determinations from applicable state agencies
Yes ☐	NA ☒	Landscaping and Landscape Preservation (14-526 (b) 2 a) - Preservation of trees and preservation within required zoning setbacks (Technical Manual, Section 4) - Protection measures of existing vegetation during construction - Protection measures within Shoreland Zone, if applicable
Yes ☒	NA ☐	Site Landscaping (14-526 (b) 2 b) - Screening and buffering of service areas and between non-residential and residential uses - Planting plans with plant schedule and sizes (Technical Manual, Section 4)
Yes ☐	NA ☒	Parking Lot Landscaping (14-526 (b) 2 b ii), if applicable Landscaped islands within parking areas (Technical Manual, Section 4)
Yes ☒	NA ☐	Street Trees (14-526 (b) 2 b iii) - Existing Heritage or Feature Trees on site and measures to preserve - Identify street trees on the plan meeting the site plan and Technical Manual standards (Section 4) or identify alternative measures, if applicable
ENVIRONMENTAL AND STORMWATER		
Yes ☒	NA ☐	Water Quality, Stormwater Management and Erosion Control (14-526 (b)3 a) - Stormwater report in compliance with Section 5 of Technical Manual and DEP Chapter 500 stormwater for basic, general and flooding standards, as applicable - Erosion control plan and measures - Evidence of compliance with Urban Impaired Stream Standards pursuant to DEP Chapter 500 stormwater, as applicable - Subsurface sanitary sewage disposal and groundwater protection

PUBLIC INFRASTRUCTURE AND SAFETY		
Yes ☒	NA ☐	Consistency with City Master Plans (14-526 (c) 1) - Identify consistency with master plans - Proposed easements, rights and improvements to connect or continue off-premises public infrastructure, as applicable
Yes ☒	NA ☐	Public Safety and Fire Prevention (14-526 (c)) - Address Crime Prevention through Environmental Design (CPTED) (Technical Manual, Section 3) - Emergency vehicle access - Address consistency with public safety standards (Technical Manual, Section 3) - Submit a code summary referring NFPA 1 and all Fire Department standards (Technical Manual, Section 3) – Fire Checklist
Yes ☒	NA ☐	Availability and Adequacy of Public Utilities (14-526 (c) 3) (Technical Manual, Sections 2 & 9) - Electrical services, including providing underground services - Identify existing and proposed connections for public utilities and required public utility upgrades - Sewer line connections are required, if there is a main within 200 feet - Proposed solid waste management facilities on-site and management for the site - Written evidence of the ability to serve from utility companies, as applicable
SITE DESIGN		
Yes ☒	NA ☐	Massing, Ventilations and Wind Impact (14-526 (d) 1) - Wind and ventilation impacts on adjoining structures and/or adjacent public spaces. Wind study, if applicable - Bulk, location or height impacts on adjoining structures - Identify and locate HVAC equipment and venting away from public spaces and residential properties - Identify screening and manufacturing specifications for noise, if applicable
Yes ☐	NA ☒	Shadows (14-526 (d) 2), if applicable Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
Yes ☒	NA ☐	Snow and Ice Loading (14-526 (d) 3) Building design to prevent snow and ice from loading or falling onto adjacent properties or public ways
Yes ☐	NA ☒	View Corridors (14-526 (d) 4), if applicable Protection of designated view corridors (Portland Design Manual, Appen. 1)

Yes ☒	NA ☐	Historic Resources (14-526 (d) 5), if applicable • Identify developments within Historic Districts or affecting Designated Landmarks • Certificate of Appropriateness or other evidence • Identify Developments within 100 feet of Historic Districts or affecting Designated Landmarks. Advisory HP review may be required • Address preservation and documentation of Archaeological Resources
Yes ☒	NA ☐	Exterior Lighting (14-526 (d) 6) • Cut sheets of on-site light fixtures and any architectural or specialty lights (Technical Manual, Section 12) • Engineered details for any lights proposed in street right-of-way (Technical Manual, Section 10)
Yes ☒	NA ☐	Noise and Vibration (14-526 (d) 7) • Evidence of noise levels for equipment, such as equipment specifications, to demonstrate consistency with zoning requirements
Yes ☐	NA ☒	Signage and Wayfinding (14-526 (d) 8), if applicable • Signage plan showing the location, dimensions, height and setback of all existing and proposed signs. Signs in Historic Districts are reviewed by Historic Preservation staff • Proposed commercial and directional signage on site
Yes ☒	NA ☐	Zone Related Design Standards (14-526 (d) 5) • Address Historic Preservation Design Review, if applicable • Address any applicable design review standards by zone • Address submission requirements from Design Manual, page 1, addressing neighborhood context • Description of exterior materials, color, finish, and samples
Construction Management Plan		
Yes ☒	NA ☐	Construction Management Plan • Construction Management Document and Plan

LEVEL II AND LEVEL III SITE PLAN DRAWINGS CHECKLIST

* Please upload the following drawings with the listed details as separate pdfs

(ALL drawings must be uploaded in a 24 x 36 sheet size)

RECENT BOUNDARY SURVEY (stamped by Maine Licensed Surveyor)

- ☒ Must be in compliance with Technical Manual, Section 13

SITE PLAN(s) (stamped by Maine Licensed Engineer) including:

Existing Conditions

- ☒ Approximate location of structures on abutting property
- ☒ Topography
- ☐ Locate water courses
- ☐ Delineate wetlands
- ☐ Zone lines

Proposed Site Plan

- ☒ Ground floor area, and grade elevations for all buildings

Access, Circulation, and Parking

- ☒ Streets and intersections adjacent to site, any proposed geometric modifications
- ☒ Location, dimensions and materials of all existing and proposed driveways, vehicle, bicycle, & pedestrian access ways with corresponding curb lines
- ☒ Engineered specifications/ cross-sections for proposed driveways, sidewalks & paved areas
- ☒ Location and dimensions of proposed loading areas
- ☐ Existing and proposed transit infrastructure with dimensions/ engineering specifications
- ☒ Location of vehicle and bicycle parking with dimensions and engineering specifications

Site Considerations

- ☒ Identify snow storage areas
- ☒ Location of fire hydrants
- ☒ Location of solid waste management facilities

UTILITY PLAN including:

- ☒ Existing utilities on site and within public streets
- ☒ Location, sizing and directional flows of all existing and proposed utilities
- ☒ Location and dimensions of off-premises public or publicly accessible infrastructure adjacent to site
- ☒ Electric utility infrastructure

GRADING AND DRAINAGE PLAN including:

- ☒ Existing grades and drainage
- ☒ Proposed grades
- ☒ Proposed stormwater management meeting Technical Manual (Section 5), standards
- ☐ Location and proposed alteration of a water course
- ☐ Preservation or alteration of wetlands

EROSION CONTROL

- ☒ Must be in compliance with Technical Manual, Section 5

LANDSCAPE PLAN including:

- ☐ Existing vegetation to be preserved and preservation measures
- ☒ Proposed landscaping and buffers
- ☒ Planting schedule

RECORDING PLAT, if applicable
☒ If Subdivision, must be in compliance with requirements of Section 14-496 (b)
ARCHITECTURAL PLANS AND RENDERINGS including:
☒ Exterior building elevations, color renderings, illustrations of all sides
☒ Location and dimensions of all existing and proposed HVAC and mechanical equipment, all proposed screening
☒ Provide context drawings, if applicable (Design Manual, page 1)
☒ Floor plans



If Subdivision, must be in compliance with requirements of Section 14-496 (b)

ARCHITECTURAL PLANS AND RENDERINGS including:
☒ Exterior building elevations, color renderings, illustrations of all sides
☒ Location and dimensions of all existing and proposed HVAC and mechanical equipment, all proposed screening
☒ Provide context drawings, if applicable (Design Manual, page 1)
☒ Floor plans



Exterior building elevations, color renderings, illustrations of all sides



Location and dimensions of all existing and proposed HVAC and mechanical equipment, all proposed screening



Provide context drawings, if applicable (Design Manual, page 1)



Floor plans

13 FIRE SAFETY

13.1 OVERVIEW

The applicant and project team will provide the Portland Fire Department with the information required in the PFD Site Review Checklist, as well as a basic review of NFPA 1 and City of Portland Technical Standards related to public safety.

The building will be accessible to fire apparatus from Franklin, Middle and Newbury Streets. Public water infrastructure by the Portland Water District currently exists in Middle and Newbury Streets. The closest fire hydrants are located on the southern side of Middle Street, directly across from the site, and at the corner of Newbury and Hampshire Streets.

The commercial unit entrance is located on Middle Street, and the primary residential entrance is on Franklin Street. The proposed building will be fully sprinkled in compliance with all applicable codes.

7 CONSTRUCTION MANAGEMENT PLAN

The following information is provided in accordance with the City of Portland Code of Ordinances Chapter 14 Land Use, Section 14-527(g)(1).

7.1 CONSTRUCTION MANAGEMENT PLAN

The applicant anticipates starting construction of the project in May of 2021 and completing construction by July of 2022. The construction will involve site work and new building construction. The attached construction plan outlines the anticipated timeline and sequence of activities.

7.2 ATTACHMENTS

Attachment 7-A – Construction Management Plan

ATTACHMENT 7-A

Construction Management Plan

**Pineland**

Cumberland Hall
41 Campus Drive, Suite 101
New Gloucester, ME 04260

Portland

565 Congress Street, Suite 201
Portland, ME 04101

CONSTRUCTION MANAGEMENT PLAN

Project:

Middle Street Apartments
83 Middle Street
Portland, Maine 04101

Applicant:

Community Housing of Maine
One City Center, 4th Floor
Portland, Maine 04101

Prepared By:

Terradyn Consultants, LLC
565 Congress Street, Suite 201
Portland, Maine 04101

Construction Manager:

AlliedCook Construction
P.O. Box 1396
Portland, Maine 04104

A. Construction Management Principles

The following narrative provides an overview of the construction management principles that the Applicant has identified to minimize impacts from the construction of the Middle Street Apartments, such as noise, vibrations, ground movement, truck traffic, and other construction related factors to the surrounding buildings and communities.

B. Performance Guarantees, Inspection Fees, Preconstruction Meeting, and Permits

Prior to scheduling a preconstruction meeting and the issuance of any city required permits, the Applicant and Contractor shall meet all of the requirements contained in Section 14-530. Development review fees and post approval requirements and 14-532. General requirements and enforcement of Portland's Land Use Code.

Other permits, as applicable, include

- 1. Street Opening and Street Occupancy Permits:** Construction activity in the public right-of-way are controlled by Chapter 25 and sewer and stormwater system connections are controlled by Chapters 24 and 32 of the Land Use Code. All required permits shall be obtained through the Department of Public Works and the requests shall conform with the approved construction management plan.
- 2. Building Code:** Employ the best practices, as applicable, of Chapter 33 Safeguards During Construction, from the 2009 International Building Code.

C. Construction Administration and Communication

The Applicant and Contractor will work diligently to implement a communication strategy as outlined below. The communication strategy is intended to ensure that all construction operations are performed in accordance with all agreements, ordinances and special permits applicable to this project. The Construction Manager will work closely with adjacent abutters, businesses and all parties informed, as far in advance as possible, of scheduled work, particularly work anticipated to cause significant noise, vibrations, or dust.

Constructin Manager: AlliedCook Construction has been selected as Construction Manager for the project.

Contact Person: This person will be available 24 hours a day.

To be determined prior to start of construction.

Construction Signage shall be posted at the site with Contact Information for the Contractor. Construction site signage shall be removed at project completion.

D. Construction Schedule

1. The contractor shall submit a schedule or time line for the construction project, including any Phasing, prior to construction.
2. Hours of Construction: Construction may occur during the daytime hours as defined in Section 17-18 of the City Code (Construction Activities) and Section 25-129 of the City Code (Noise, dust and debris).
3. Extended Hours or Night Work: Pursuant to Section 17-18, this section does not apply to emergency utility work or "Situations where the public works authority or the office of building inspections determines that the construction activity is of a unique character which cannot reasonably be completed or performed during the permitted hours and which is not of a recurring nature, provided that prior to engaging in such activity the contractor or his representatives gives notice of the time and scope of such proposed activity, the notice to be given in a manner approved by the public works authority."
4. Material Deliveries: Delivery of materials shall take place during the Hours of Construction listed above and shall be stored on the project site in the locations noted on the Construction Management Plan (Sheet C-3.1).

E. Security & Public Safety

1. The Contractor shall erect the temporary barriers and access gates shown on the Construction Management Plan (Sheet C-2.1) with the intent of separating pedestrian and vehicle circulation from the construction site.
2. The Applicant or Contractor shall purchase and install a knox padlock from the Portland Fire Department to allow access by the Portland Fire Department at the primary access gate.
3. Structures undergoing construction, alteration, or demolition operations, including those in underground locations, shall comply with NFPA 1 Chapter 16. *Safeguarding Construction, Alteration, and Demolition Operations.*
4. Fire Safety Program. An overall construction of demolition fire safety program shall be developed. Essential items to be emphasized include the following:
 - Good Housekeeping
 - On-site security
 - Installation of new fire protection systems as construction progresses
 - Preservation of existing systems during demolition
 - Organization and training of an on-site fire brigade
 - Development of a pre-fire plan with the local fire department
 - Rapid communication
 - Consideration of special hazards resulting from previous occupancies
 - Protection of existing structures and equipment from exposure fires resulting from construction, alteration, and demolition operations

5. Any temporary security lighting fixtures shall feature full cutoff optics to reduce light trespass onto abutting properties.

F. Construction Permitting and Traffic Control Plans

1. Construction Activity in Public Streets: Construction activity in the public right-of-way is controlled by Chapter 25 Article VII of the City Code of Ordinances. Required licenses and permits, restrictions on activity, and fees & area are outlined in that Chapter. Rules and Regulations for Excavation Activity are available through the Street Opening Clerk at the Department of Public Works. At no time can construction activity including delivery vehicles close or block streets or affect public safety access without prior notice and approval of the Department of Public Works.
2. Lane Closures: Underground electric, sewer and water system connections within Middle Street and gas service installation in Newbury Street are expected to result in temporary closure of one lane of traffic for up to four days. Curb and sidewalk installation on Franklin Street will also result in the closure of one lane of traffic. All work resulting in lane closures shall be scheduled and sequenced to minimize the duration of street occupancy.
3. Public Sidewalk Closures: The Franklin, Middle, and Newbury Street sidewalks in front of the site will be reconstructed as part of the proposed project. The Franklin Street sidewalk reconstruction will include the length of sidewalk between Middle and Newbury Street. The Middle and Newbury Street sidewalks reconstruction will include the areas in front of the site. These sections of sidewalk will be closed for the duration of the building construction, and signage will be posted as shown on the Construction Management Plan.
4. Sewer and Stormwater: Sewer and stormwater system connections are controlled by Chapters 24 and 32 of the City Code of Ordinance. Required permits for new connections are available through the Street Opening Clerk at the Department of Public Works. Rules and Regulations for these utility systems are available through the City Engineer's office of the Department of Public Works and in Section II of the Technical Manual.
5. Work within City Right of Way: Construction activity that impacts the existing public street system must be controlled to protect the safety of the construction workers and all modes of the traveling public.

Construction operations shall provide for the safe passage of the public through or along the construction work zone. On a case-by-case basis, the Contractor may be allowed to close a street and/or detour a mode of traffic when absolutely necessary for safety. The Contractor shall employ the appropriate techniques and devices as called for in the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD). In addition:

- Construction speed signing may be used as needed to slow traffic
- Traffic Control signs shall not be placed where they are an obstruction to bicycles or pedestrians.
- In extreme situations, flaggers may be required.
- Police detail is required at lighted intersections and may be requested by the City's transportation engineer or his designee.

All existing modes of travel in work zone area shall be accommodated if impacted by the activity. The safe passage of pedestrians, bicyclists, transit providers, and motorists are of equal importance when planning out the work zone; no pre-existing travel mode may be eliminated without the express approval of the Department of Public Works.

- Traffic control bicycle and pedestrian facilities or routes through work zones shall be maintained until the bicycle and pedestrian facilities or routes are ready for safe operation. Traffic control will not be removed to allow auto travel at the expense of bicycle and pedestrians.
- Barrier systems utilized to separate the construction activity from the public street and /or sidewalk shall not inhibit sight distances, particularly for visibility of pedestrians and bicyclists.
- ADA compliance shall be maintained.

Use of public parking spaces or the blockage of any portion of sidewalk for the purpose of construction activity shall require an occupancy permit and appropriate fee as assessed by the Department of Public Works.

G. Site Management and Controls

The contractor shall be responsible for maintaining the site in a safe condition and including the following:

1. A solid waste dumpster shall be located on site for the disposal of trash and debris.
2. The Newbury Street right of way shall be swept regularly to control the tracking of mud onto adjacent public streets.
3. Dust controls: The construction shall comply with Portland's requirements under Section 25-129 on Noise, dust and debris.
4. Noise: The construction shall comply with Portland's requirements under Section 17-18 of the City Code and Section 25-129 on Noise, dust and debris.
5. Rodent Control will be provided, if needed, by a professional exterminator and consistent with Chapter 22 of the City Code.
6. Snow Removal: Pursuant to Section 25-173 Contractors to ensure a safe means of travel within the work zone.
 - 1) Snow/ice removal or commence automatically from (1" of snow and up) or Ice
 - 2) Remove snow as needed within the work zone, including parking spaces & not to block any driveways or site lines with the piles of snow.
 - 3) Clear all walks & ramps with the work zone
 - 4) Sand or Salt as needed
 - 5) Clear all basin or drainage to help snow melt
 - 6) This would include Monday-Friday Sat/Sunday/Holidays

H. Erosion Control and Preservation of Trees

1. The Contractor shall install all erosion and sedimentation controls as depicted on the approved erosion and sedimentation control plan prior to the pre-construction meeting for inspection by the City. The Contractor shall regularly inspect the control measures, no less than weekly and after significant storm events, and maintain any installed temporary or permanent stormwater management systems in working order. The Contractor shall document all inspection activities and corrective actions and be

- prepared to provide these documents for inspection by the City, Maine Department of Environmental Protection or the U.S. Environmental Protection Agency upon request.
2. The storage of materials shall be located in the areas depicted on the Construction Management Plan (Sheet C-3.1).

I. Construction Staging and Deliveries

1. A location for material storage and lay down is shown on the Construction Management Plan (Sheet C-3.1). Additional areas may be utilized as available as long as they do not interfere with material deliveries.

J. Parking During Construction

1. Construction Parking: Construction workers shall utilize off-site parking for the duration of construction.



May, 29th 2020

Dear Neighbor,

Community Housing of Maine is pleased to invite you to a neighborhood meeting to discuss the proposed development at 83 Middle Street in Portland. The project includes the construction of a 5-story, 50-unit apartment building with a commercial storefront and covered parking garage.

Location:

Due to the Covid-19 pandemic, and in accordance with local and state requirements, **this meeting will be held remotely via Zoom**. Public viewing and participation will be available during the meeting. In order to register for the meeting please visit: <https://www.chomhousing.org/middle-street> You may also call the office (listed below) to obtain this information.

Meeting Date/Time:

Wednesday June 10th at 6:00 PM

The City of Portland requires that all property owners within 500 feet, abutters, and interested parties be invited to participate in a neighborhood meeting. A "sign-in" sheet will be taken virtually through the zoom platform and submitted to the City's planning office, along with minutes and any questions. The meeting will run similarly to the prior in-person meetings that we have already conducted with a brief overview, followed by questions. I look forward to speaking with you at the meeting.

Sincerely,

A handwritten signature in black ink, appearing to read "BKilgallen", written over a light blue horizontal line.

Brian Kilgallen
Development Officer
Community Housing of Maine

Neighborhood Meeting Certification

I, Brian Kilgallen, Development Officer for Community Housing of Maine hereby certify that a neighborhood meeting for Middle Street Apartments, located at 83 Middle Street, was held on 6/10/2020 at 6:00 PM via Zoom. Registration for the Zoom call was available at: <https://www.chomhousing.org/middle-street>, and by contacting our office by phone or email.

I also certify that on May 29th, invitations were mailed to the following:

1. All addresses on the mailing list provided by the Planning Division which includes property owners within 500 feet of the proposed development or within 1000 feet of a subdivision within an industrial zone or industrial zone change.
2. Residents on the "interested parties" list.

Signed,

A handwritten signature in blue ink, appearing to read 'BKilgallen', is written over a faint, light blue circular stamp.

Brian Kilgallen
6/11/2020

Attached to this certification are:

1. Copy of the invitation sent
2. Sign-in sheet (list of attendants included with meeting minutes)
3. Meeting minutes

Neighborhood Meeting for Middle Street Apartments

Meeting Minutes

June 10th 2020

Opening

The Neighborhood Meeting for Middle Street Apartments was called to order at 6:02 PM on June 10th 2020 via Zoom Conference Call by Brian Kilgallen.

Present

Brian Kilgallen (Host)

Cullen Ryan (Host)

Samantha Messick (Co-Host)

Derek J. Veilleux

Ellen Seidman

SC Longley

Kevin Rodel

Bethany Field

John Fischer

John Davidson

Chip Newell

Open Issues

Brian Kilgallen welcomed all the attendees and introduced the hosts of the call. Brian thanked all of the attendees for taking the time to join the call and explained how to interact through the Zoom platform. Attendees were made aware that the call was being recorded in order to produce minutes and a sign-in sheet.

Brian introduced Cullen Ryan, Executive Director of Community Housing of Maine (CHOM). Cullen spoke to the mission of CHOM, the need for more Affordable Housing, and the work that CHOM has done for the last 25 years in creating inclusive communities across the City of Portland, and the State of Maine.

Brian showed exterior images of Middle Street Apartments and discussed the progress made since the previous neighborhood meeting. Brian discussed how the building's form and design has changed due to the donation of land located at 160 Newbury Street, owned by Donald Sussman. The changes include lowering the building one floor, expanding the width of the building, and adding parking spaces. Brian showed where the entrances are to both the apartment building and the commercial space. The discussion continued to speak about changes to Franklin Arterial and how the space will be pedestrian friendly and more walkable. Brian highlighted how the building will be constructed to PassiveHouse standards.

After Brian concluded the presentation of the building, he then answered question that had been emailed to CHOM prior to the meeting. The questions came from Kevin Rodel and SC Longley.

Questions from Kevin:

What is the building elevations on Newbury Street?
Can you share a set of plans, drawings or elevations from different views?
Where will weekly delivery and trash pick-up be located?
Are there still plans for solar panels on the roof?
How many resident parking spots are planned for the new design?
What is the construction schedule?

Brian responded to each of the questions. First Brian provide the height of the building on Newbury Street, and referred Kevin to images of the building provided earlier in the presentation. Brian then showed where the interior trash room is, and how totes will be used for the disposal and recycling of the buildings waste. Brian mentioned that he would like to include solar panels on the roof of the property, but as of this time no decision has been made on whether to include or exclude them from the property. Brian mentioned there will be 12 parking spaces located in the parking garage. Brian mentioned that there has not been a formal construction schedule created yet, but that the planned construction start is for Spring 2021 and should last for 12 months.

After finishing with the questions from Kevin, Brian answered question from SC Longley that were provided via email prior to the start of the meeting. SC's first questions was about parking and what adjustments were planned as a result of the new design. Brian thanked SC and Kevin for providing the questions in advance and referenced the new parking plan for the property. Brian also referred to the parking study that CHOM commissioned from an independent third party to evaluate the parking needs of the building. The study showed that the building provides the appropriate number of parking spaces based on national averages of the populations served at the property, the location, walkability, access to public and private transportation, and the abundance of non-vehicular storage on the property.

Once Brian finished with the questions that were provided prior to the start of the meeting, he opened up the floor to the attendees. While Brian was answering the previous questions, several people had used the chat feature to ask additional questions and used the “raise hand” feature on Zoom to comment. The first question was taken through the “raise hand” feature from Derek J Veilleux who asked if there was a roof deck? Brian answered that there was not a plan for a roof deck. Brian then used the chat box and ran through each of the questions posted. A transcript of the chat box is provided below, a summary of the answers to the questions are provided below the chat box.

18:11:01	From Derek J. Veilleux : I see people on the roof. Is there a rooftop deck?
18:11:34	From Ellen Seidman : is the
18:11:52	From Ellen Seidman : how many stories is the Newbury st side?
18:12:29	From Derek J. Veilleux : Kudos to the Passive Haus standard!!!
18:12:54	From Ellen Seidman : what are they?
18:13:08	From S Longley : xou
18:13:22	From S Longley : It is solar panels on roof
18:13:38	From S Longley : They don't show the panels
18:15:05	From Derek J. Veilleux : Why is the entrance on Franklin when the address is Middle Street?
18:15:40	From S Longley : Good question, can you pull over on Franklin?
18:16:24	From Derek J. Veilleux : The franklin facade where there are the vertical elements should be a different tone or color.
18:17:49	From S Longley : Is there a view from Newbury?
18:18:18	From Derek J. Veilleux : I’m not a fan of that odd angled jut out on Middle Street. I think there can be more thoughtful ways to break up that facade.
18:18:28	From Kevin Rodel : Is there a footprint plan of the building?
18:20:02	From Derek J. Veilleux : The building has a strong presence on Franklin, but I don’t feel the facade has been given much thought..
18:21:52	From Bethany Field : How many units of parking will be available? Will this project be adding a new metro stop? If so, where will that be located?
18:22:56	From John Fischer : Can you talk about how the construction financing will affect the construction phases?
18:23:17	From John Fischer : Is it a single-phase project, or will there be multiple financing milestones?
18:24:21	From Derek J. Veilleux : Will there be a car charging station on site?
18:24:55	From Kevin Rodel : If solar panels not feasible I would push for a green roof.
18:26:11	From Derek J. Veilleux : Has CHOM worked with the city of Portland about reconnecting Newbury through Franklin?

18:27:15 From Ellen Seidman : did you get your LIHTC allocation?

18:27:42 From Bethany Field : Aside from the corner of middle/franklin, will there any additional green space?

18:28:16 From Derek J. Veilleux : Are you saying there will be a generator on the roof? Those can be noisy when exercised monthly

18:28:32 From Ellen Seidman : my question is what are the standards that people were applauding

18:28:41 From John Davidson : who qualifies as for affordable housing?

18:29:10 From Bethany Field : during construction, what's the proposed traffic pattern?

18:30:05 From John Fischer : Second that question about traffic patterns — would love to know what the overall mitigation plan looks like for noise, construction vehicle parking, etc

18:30:06 From Derek J. Veilleux : I worry about safety of people dropping off at that entrance when Franklin traffic whizzes by

18:30:42 From Ellen Seidman : I think the idea is that the residents could be dropped off on Franklin near the entrance

18:31:15 From S Longley : Could you provide elevations?

18:31:46 From John Fischer : Also: has an environmental impact statement been commissioned?

18:33:03 From Ellen Seidman : the timing of trash pickup needs to be picked up with Luminato

18:36:22 From Ellen Seidman : that's "coordinated with" Luminato

18:37:16 From Derek J. Veilleux : What exactly will be on the roof for equipment?

18:39:42 From Cullen Ryan : brian@chomhousing.org

18:40:01 From Cullen Ryan : cullen@chomhousing.org

18:43:38 From Derek J. Veilleux : Will the roof be a black or white roof?

18:48:02 From John Fischer : Follow-up question on the Environmental statement: will the results of your phase 1 study be available to the public?

18:55:41 From Ellen Seidman : thanks very much

18:55:51 From Bethany Field : thank you!

18:56:18 From Brian Kilgallen : Thank You!

18:56:24 From Bethany Field : my question is about the special need part of the housing and the elections process for those units?

18:56:33 From Brian Kilgallen : brian@chomhousing.org

18:56:49 From Bethany Field : *selection

18:56:55 From Bethany Field : sorry!

19:01:22 From John Fischer : Thank you!

Brian went through each question, thanking each attendant for their opinions, participation and suggestions. A summary of Brian's responses is below:

There is no plan to have a roof deck.

Middle Street Apartments will be 5 stories high on Newbury Street

Solar Panels are not shown on the design, because the project has not committed to adding solar panels at this time. However solar panels are being actively researched and pursued by the developer.

Cars will not be able to pullover to drop people off on Franklin Street. The changes to the road will reduce the shoulder and make it near impossible for cars to stop there. Brian mentioned that the development team has suggested a loading/unloading space on Middle Street so that residents of the building can be safely dropped off and picked up while not endangering their safety or impeding traffic.

There are floorplans available and can be provided after the meeting. The floorplans are subject to change.

Parking has been addressed in several areas of the meeting; Brian reiterated the amount of parking is on par with the needs of the residents of the property based on the independent parking study, CHOM experience in Portland, and national averages. A new Metro stop is not needed as there is currently a metro stop across the street.

The construction of the building will be completed in a single phase, while the street work will be conducted separately prior to construction. The project is predominantly funded through the use of Low-Income Housing Tax Credits (LIHTC).

The current plan does not call for a car charging station, but the Brian is looking into how this can be possible.

Solar Panels and green roofs are not currently in the plan but are welcome ideas.

CHOM has not worked with the City of Portland in the design of or any future plans for the expansion of Newbury Street. CHOM has considered the proposed changes to Franklin Street in the design of the building.

Brian spoke to the competitive competition for LIHTC, and how the property was not funded with a 2020 allocation. CHOM will be applying again this year to achieve a 2021 allocation.

There will be an additional green space along the Newbury Street side of the building. A garden is planned to make use of the additional land that was donated to the property.

There will be a generator located on the roof of the building. The generator will be exercised as recommended from the manufacturer, but the scheduled time will be appropriate to the neighborhood.

Qualifications for affordable housing are based on the Area Medium Income (AMI). Each year the IRS calculates what the AMI for each county and metropolitan area. As a rule of the LIHTC program people who make 60% or less of AMI are qualified to live in a LIHTC property.

There will be changes to the road as part of the development, but there are no proposed changes to the overall traffic pattern in the neighborhood. Construction will work to minimize the amount of disruption on the neighborhood, and traffic.

Elevations for the height of the building conforms to the code requirements of the district and were provided to all in attendance.

As part of its due diligence CHOM commissioned a Phase 1 environmental report for both the Middle Street parking lot and the donated portion of land at 160 Newbury Street. The Phase 1 report can be shared with anyone who would like to see it. There are no serious environmental issues with the site.

The Management company will work with the condo association of the Luminato building to coordinate the trash pick-up.

The roof will have HVAC equipment, a generator, and possibly solar panels.

The color of the roof has not been decided.

There will be units set aside for people referred to the property from the City's Department of Health and Human Services division. These individuals will still have to meet the guidelines of the property and the LIHTC program. Once these individuals enter the property they will be provided with services from the City of Portland.

Samanatha Messick, a representative from Preservation Management INC and the Regional Manager that will be responsible for the operations of the property, spoke to the demand for Affordable Housing in Portland. She additionally detailed how people can apply for the property once the building is ready for occupancy, and how they will start qualifying applicants as the building gets closer to completion.

After all of the questions were answered, Brian and Cullen closed the meeting and thanked everyone for being part of the discussion and providing great feedback. Brian and Cullen provided their contact information for anyone who had additional questions or comments

Follow up actions

John Fisher asked that Brian Kilgallen share the environmental phase 1 report. It was agreed that the report would be shared. After the meeting Brian uploaded the report via dropbox to John.

Kevin Rodel asked to be provided with exterior elevations, a ground floor plan and an image of the building looking from Newbury street. After the meeting Brian emailed the information to Kevin.

Adjournment

Meeting was adjourned at 7:20 by Brian Kilgallen.

Minutes submitted by: Brian Kilgallen

**Pineland**

Cumberland Hall
41 Campus Drive, Suite 101
New Gloucester, ME 04260

Portland

565 Congress Street, Suite 201
Portland, ME 04101

May 29, 2020

Project #1926

Bradley Roland, P.E.
Wastewater Resources Division
Department of Public Works
212 Canco Road
Portland, ME 04103

**SUBJECT: Middle Street Apartments
83 Middle Street, Portland
Wastewater Capacity Application**

Dear Brad:

Terradyn Consultants LLC has been retained by Community Housing of Maine to assist with site design and permitting for a proposed 50-unit residential development project located at 83 Middle Street in Portland. We are writing to request confirmation that the City of Portland has the ability to provide sanitary sewer service for the proposed development.

The 13,842 square foot parcel is identified as Block O, Lots 3 and 17 on the City of Portland Tax Map 28. The site is located between Franklin, Middle, and Newbury Streets. The site is currently used as a surface parking lot.

The proposed project includes the construction of a 9,692 square foot, 5-story building, including 50 residential apartments units and first floor retail space. Covered parking will also be provided on the ground level. It is expected that the first floor retail space will be occupied by a coffee shop or similar use with no on-site food preparation.

Public water and sewer utilities will be installed to serve the project. A new 6" sewer service from the existing combined sewer in Middle Street is planned to serve the new building. Additionally, floor drains inside the covered parking garage will flow to an oil-water separator before discharging into the sewer in Newbury Street, as shown on the plans.

Stormwater runoff from the building roof will be collected in roof drains, and a separate stormwater connection to the Middle Street combined sewer is proposed.

The project is expected to generate approximately 6,288 gallons of wastewater per day based on the Maine Subsurface Wastewater Disposal Rules. Wastewater generation calculations can be found on the attached application form.

Attached are a site location figure showing the property delineated on the city tax map, preliminary site, grading and utility plans for the project showing how the development may be served with sewer service, and a City of Portland Wastewater Capacity Application form.

Please provide our office with confirmation that the City of Portland has the ability to provide sanitary sewer service to the proposed development and any comments you may have on the attached drawings.

Please contact me at (207) 632-9010 or mtw@terradynconsultants.com if you have any questions or require additional information.

Sincerely,

TERRADYN CONSULTANTS, LLC

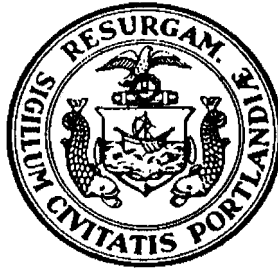
A handwritten signature in black ink, appearing to read "Michael E. W. A.", written over a light gray rectangular background.

Michael Tadema-Wielandt, P.E.
Vice President

Enc.

CITY OF PORTLAND WASTEWATER CAPACITY APPLICATION

Department of Public Services,
55 Portland Street,
Portland, Maine 04101-2991



Bradley Roland, P.E.
Water Resources Division

Date: 5/29/2020

1. Please, Submit Utility, Site, and Locus Plans.

Site Address: 83 Middle Street, Portland

Chart Block Lot Number: 54/G/1, 2 & 3

Proposed Use: 50-units residential & 1st floor commercial

Previous Use: Surface Parking Lot

Existing Sanitary Flows: 0 GPD

Existing Process Flows: 0 GPD

Description and location of City sewer that is to receive the proposed building sewer lateral.

Existing combined sewer in Middle Street. Believed to be 18" or 24" diameter brick

Site Category

Commercial (see part 4 below)	☒
Industrial (complete part 5 below)	☐
Governmental	☐
Residential	☒
Other (specify)	☐

Clearly, indicate the proposed connections, on the submitted plans.

2. Please, Submit Contact Information.

City Planner's Name: Caitlin Cameron Phone: _____

Owner/Developer Name: Middle Street Housing Partners, LP

Owner/Developer Address: One City Center, 4th Floor, Portland, ME 04101

Phone: 207-879-0347 Fax: 207-879-0348 E-mail: brian@chomhousing.org

Engineering Consultant Name: Terradyn Consultants, LLC, Michael Tadema-Wielandt, P.E.

Engineering Consultant Address: 565 Congress Street, Suite 201, Portland, ME 04101

Phone: 207-632-9010 Fax: _____ E-mail: mtw@terradyconsultants.com

Note: Consultants and Developers should allow +/- 15 days, for capacity status, prior to Planning Board Review.

3. Please, Submit Domestic Wastewater Design Flow Calculations.

Estimated Domestic Wastewater Flow Generated: 6,288 GPD

Peaking Factor/ Peak Times: x6

Specify the source of design guidelines: (i.e. "Handbook of Subsurface Wastewater Disposal in Maine," "Plumbers and Pipe Fitters Calculation Manual," Portland Water District Records, Other (specify) State of Maine Subsurface Wastewater Disposal Rules

Note: Please submit calculations showing the derivation of your design flows, either on the following page, in the space provided, or attached, as a separate sheet.

23 x 0 Bedroom Residential Units at 120 gpd/unit	= 2,760 gpd
23 x 1 Bedroom Residential Units at 120 gpd/unit	= 2,760 gpd
4 x 2 Bedroom Residential Units at 180 gpd/unit	= 720 gpd
1 x Retail Unit with 4 Employees at 12 gpd/employee	= 48 gpd
Total	= 6,288 gpd

4. Please, Submit External Grease Interceptor Calculations.

Total Drainage Fixture Unit (DFU) Values: N/A

Size of External Grease Interceptor: _____

Retention Time: _____

Peaking Factor/ Peak Times: _____

Note: In determining your restaurant process water flows, and the size of your external grease interceptor, please use The Uniform Plumbing Code. Note: In determining the retention time, sixty (60) minutes is the minimum retention time. Note: Please submit detailed calculations showing the derivation of your restaurant process water design flows, and please submit detailed calculations showing the derivation of the size of your external grease interceptor, either in the space provided below, or attached, as a separate sheet.

5. Please, Submit Industrial Process Wastewater Flow Calculations

Estimated Industrial Process Wastewater Flows Generated: N/A GPD

Do you currently hold Federal or State discharge permits? Yes _____ No _____

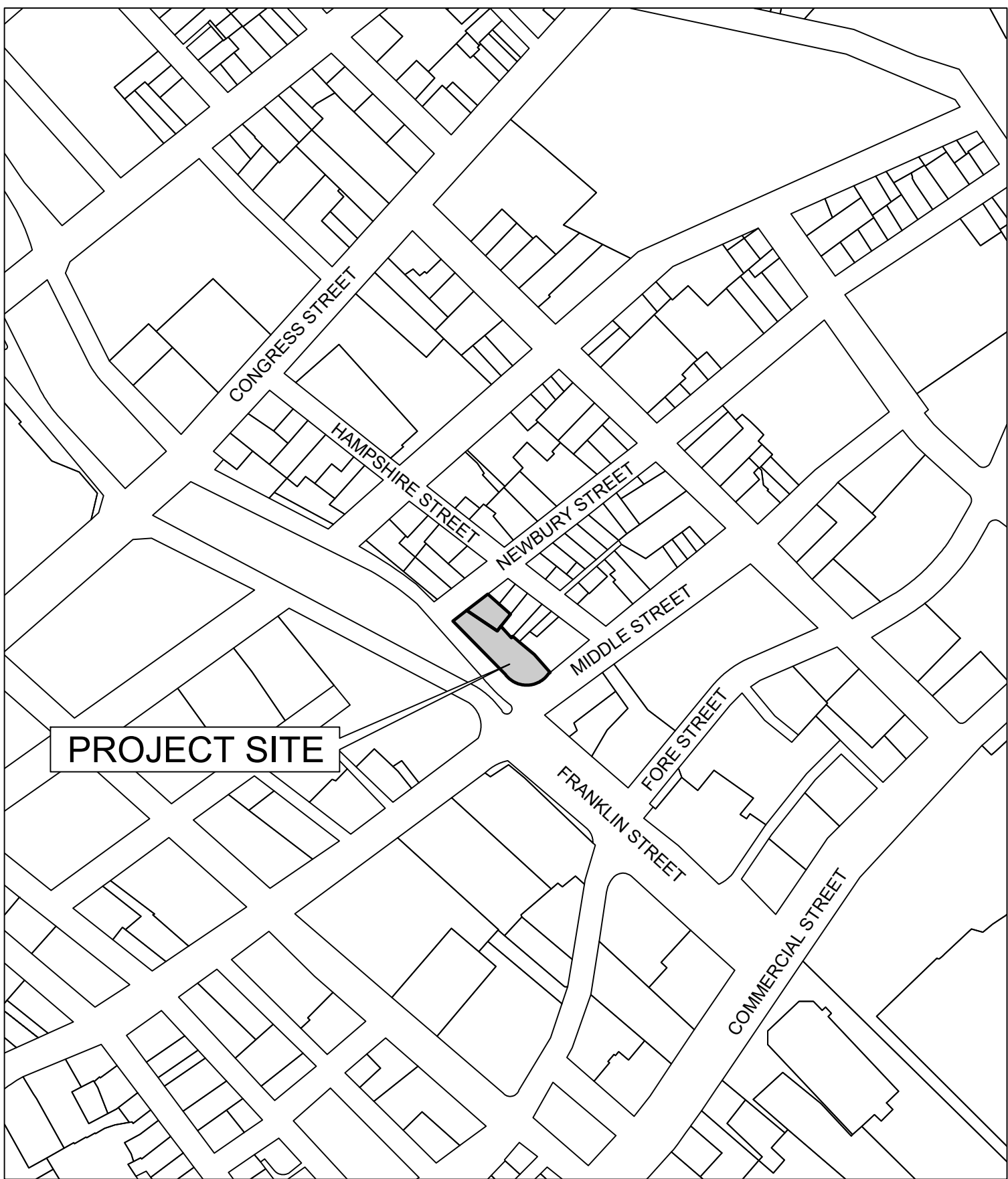
Is the process wastewater termed categorical under CFR 40? Yes _____ No _____

OSHA Standard Industrial Code (SIC): (<http://www.osha.gov/oshstats/sicser.html>)

Peaking Factor/Peak Process Times: _____

Note: On the submitted plans, please show where the building's domestic sanitary sewer laterals, as well as the building's industrial-commercial process wastewater sewer laterals exits the facility. Also, show where these building sewer laterals enter the city's sewer. Finally, show the location of the wet wells, control manholes, or other access points; and, the locations of filters, strainers, or grease traps.

Note: Please submit detailed calculations showing the derivation of your design flows, either in the space provided, or attached, as a separate sheet.



LOCATION MAP

PROJECT:
MIDDLE STREET APARTMENTS
83 MIDDLE STREET, PORTLAND, MAINE

PREPARED FOR:
COMMUNITY HOUSING OF MAINE
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101



207.926.5111 • info@terradyconsultants.com • www.terradyconsultants.com

PINELAND

41 CAMPUS DRIVE, SUITE 101
NEW GLOUCESTER, ME 04260

PORTLAND

565 CONGRESS STREET, SUITE 201
PORTLAND, ME 04101

PROJECT NO.

1926

DATE

4/2/2020

SCALE

1"=250'

SHEET

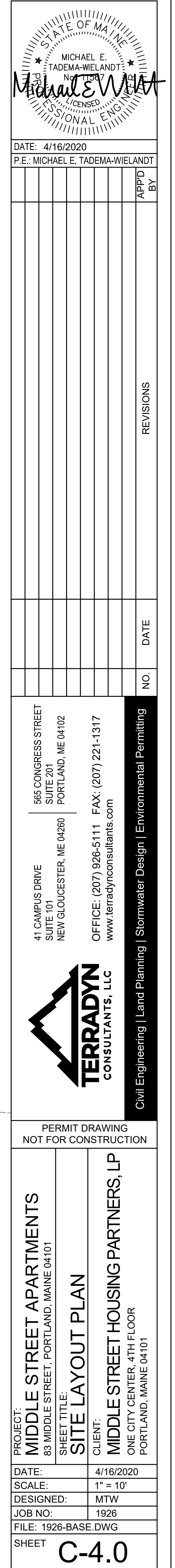
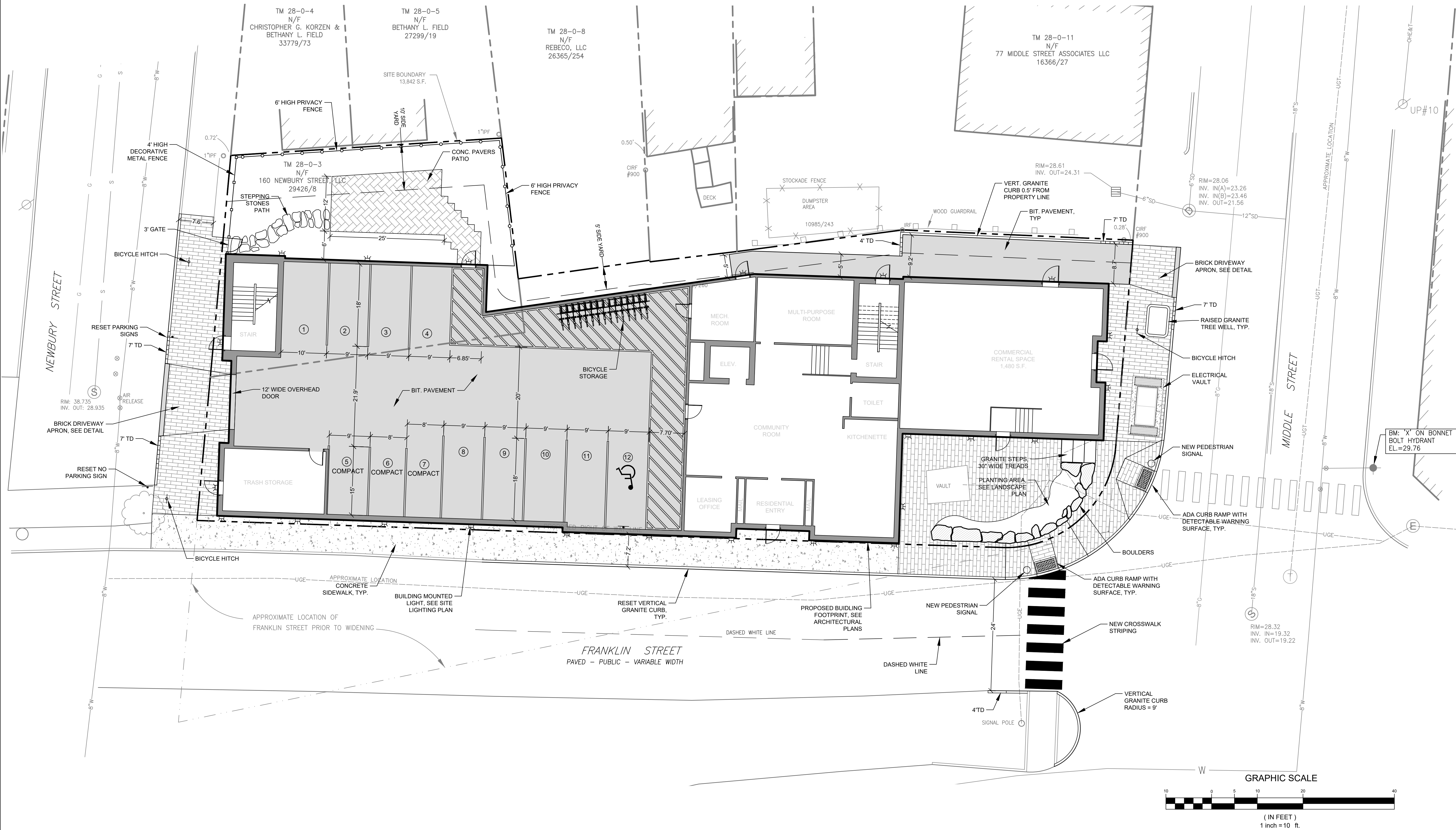
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OF

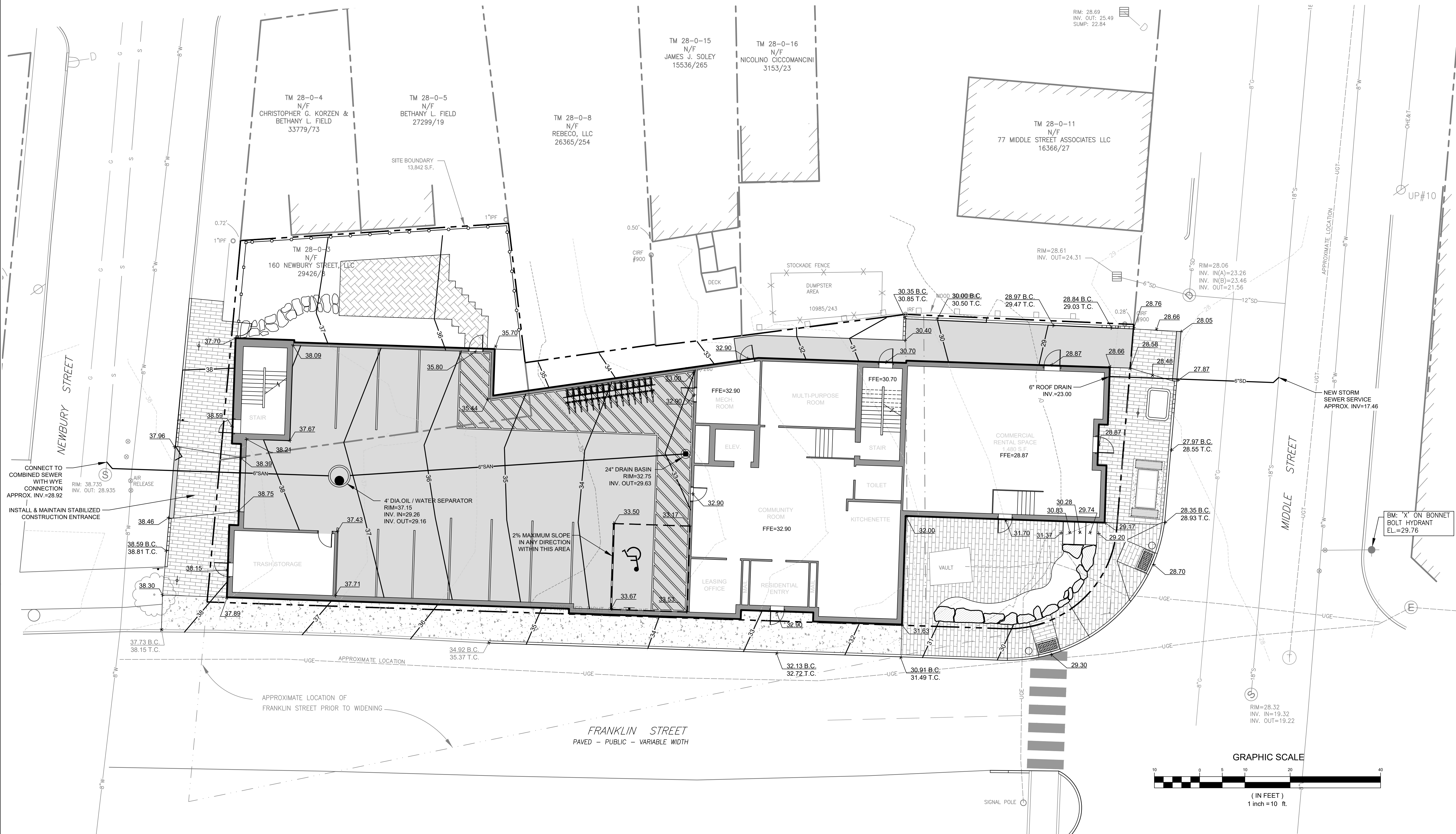
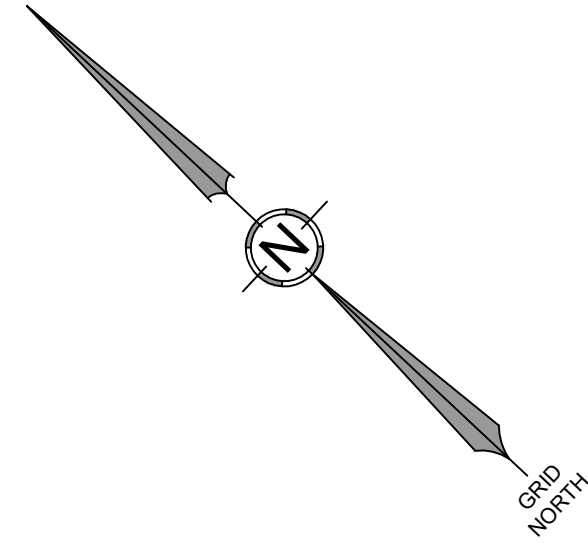
1

1. OWNERS OF RECORD:
CITY OF PORTLAND
TAX MAP 28 BLOCK O LOT 17
C.C.R.D. BOOK 3029 PAGE 547
C.C.R.D. BOOK 10895 PAGE 260
160 NEWBURY STREET LLC
TAX MAP 28 BLOCK O LOT 3
C.C.R.D. BOOK 29426 PAGE 8
2. EXISTING CONDITIONS, INCLUDING THE BOUNDING AND TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED UPON PLAN REFERENCE #3.
3. BEARINGS AND COORDINATES ARE BASED ON MAIN STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 83. ELEVATIONS ARE BASED ON CITY DATUM. NGVD 29. HORIZONTAL AND VERTICAL CONTROL DATA PROVIDED BY THE CITY OF PORTLAND AND TAKEN FROM PLAN REFERENCE 2.
4. UTILITIES SHOWN ARE TAKEN FROM PLAN REFERENCE #2.
5. THE RIGHT OF WAY LINE SHOWN ALONG FRANKLIN STREET IS A PROPOSED LOCATION. THE EXISTING RIGHT OF WAY LINE IS THE SOUTHWESTERLY PROPERTY LINES ALONG LOTS 28-0.1, 28-0.8, 28-0.15 & 28-0.11.

1. STANDARD BOUNDARY SURVEY PLAN OF PROPERTY AT 77 MIDDLE STREET, PORTLAND, MAINE, PREPARED BY GEORGE W. BEALS DATED NOVEMBER 23, 1927 BY LEROY A. WITHAM LOCATED IN THE CITY OF PORTLAND'S ENGINEERING ARCHIVES AS PLAN 8661.
2. CITY OF PORTLAND PUBLIC WORKS DEPARTMENT CONTRACT DRAWINGS HAMPSHIRE STREET RECONSTRUCTION BRATTLE STREET RECONSTRUCTION PROJECT NO. 210-3100-430 DATED 11/6/601. ON FILE AT THE CITY OF PORTLAND.
3. BOUNDARY & TOPOGRAPHIC SURVEY AT #83 MIDDLE STREET, PORTLAND, MAINE MADE FOR COMMUNITY HOUSING OF MAINE ONE CITY CENTER, PORTLAND FOR PORTLAND PROJECT #0401. PREPARED BY OWEN HASKELL, INC. AND DATED MARCH 9, 2020.



1. INSTALL STABILIZED CONSTRUCTION ENTRANCE IN LOCATION SHOWN ON PLAN. MAINTAIN UNTIL VEHICLES WILL NO LONGER ENTER THE SITE.
2. INSTALL & MAINTAIN SEDIMENT BARRIER AROUND THE PERIMETER OF THE SITE WHILE AREAS REMAIN UNSTABILIZED.
3. INSTALL & MAINTAIN SEDIMENT PROTECTION AT ALL NEW AND EXISTING CATCH BASIN RECEIVING RUNOFF FROM THE SITE DURING CONSTRUCTION.
4. SEE SHEET C-5.1 FOR THE FULL EROSION & SEDIMENTATION CONTROL NARRATIVE AND DETAILS.



DATE: 4/16/2020
BY: MICHAEL E. TADEMA-WIELANDT

[illegible]

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

41 CAMPUS DRIVE
SUITE 101
NEW GLOUCESTER, ME 04260

OFFICE: (207) 928-3111 FAX: (207) 221-1317
www.terradyndesign.com



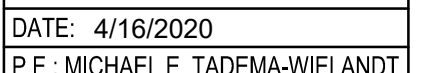
Civil Engineering II and Planning | Stormwater Design | Environmental Permitting

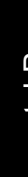
PERMIT DRAWING
NOT FOR CONSTRUCTION

MIDDLE STREET APARTMENTS 83 MIDDLE STREET, PORTLAND, MAINE 04101	
SHEET TITLE: GRADING & DRAINAGE PLAN	DATE: 4/16/2020
CLIENT: MIDDLE STREET HOUSING PARTNERS, LP ONE CITY CENTER, 4TH FLOOR	SCALE: 1" = 10'
DESIGNED: MTW	DATE: 1926
PROJECT: 1926-BASE.DWG	

C-5.0

1. THE PORTION OF THE 6" WATER SERVICE WITHIN THE RIGHT OF WAY SHALL BE DUCTILE IRON WITH RESTRAINED JOINTS IN ACCORDANCE WITH PORTLAND WATER DISTRICT STANDARDS.
2. THE 2" WATER SERVICE SHALL BE TYPE K COPPER TUBING




TERRADYN
 CONSULTANTS, LLC

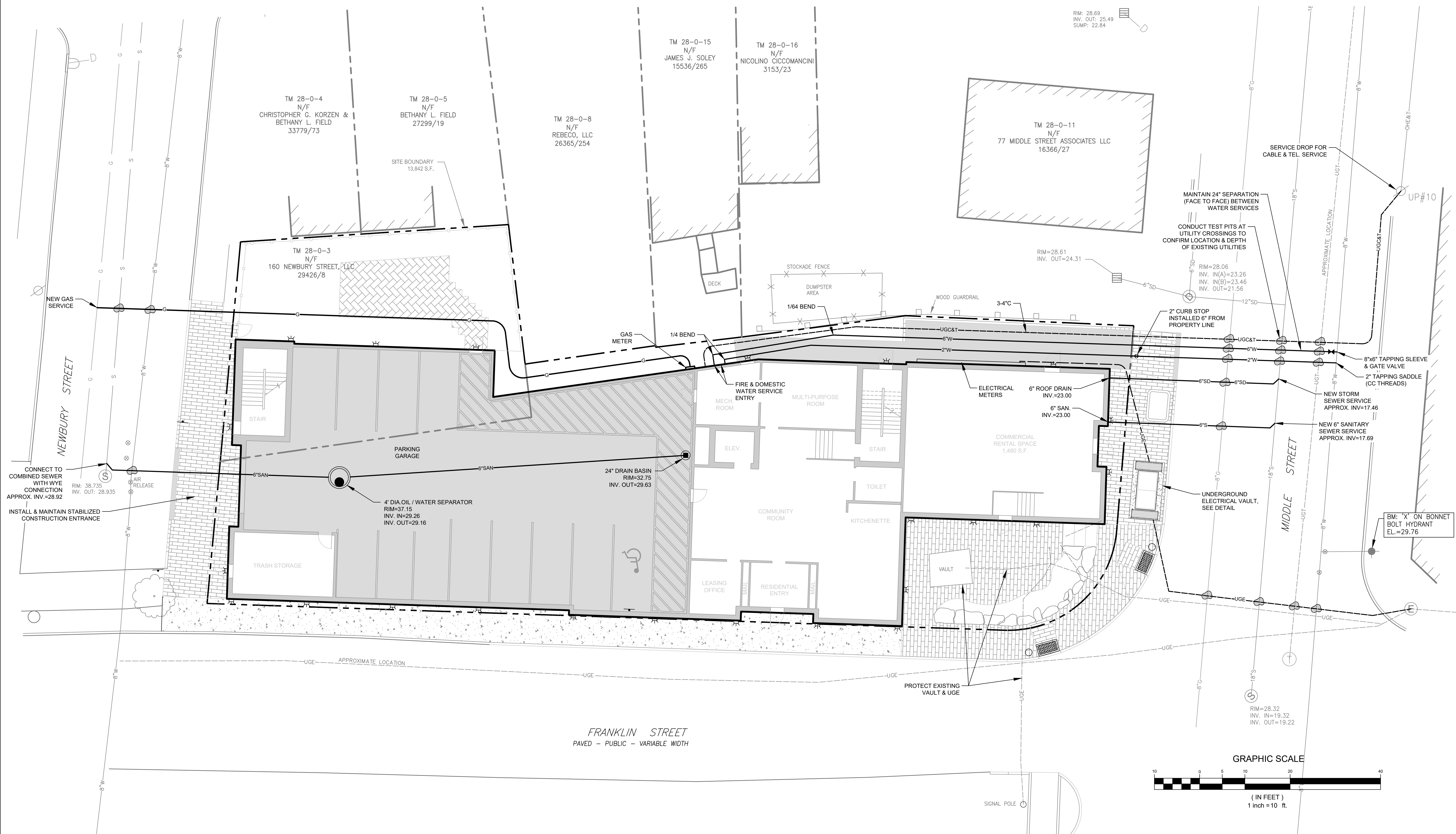
41 CAMPUS DRIVE
 SUITE 101
 NEW GLOUCESTER, ME 04260

565 CONGRESS STREET
 SUITE 201
 PORTLAND, ME 04102

OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradync consultants.com

Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PROJECT: MIDDLE STREET APARTMENTS 83 MIDDLE STREET, PORTLAND, MAINE 04101	
SHEET TITLE: SITE UTILITY PLAN	
DATE:	4/16/2020
SCALE:	1" = 10'
DESIGNED:	MTW
JOB NO:	1926
FILE: 1926-BASE.DWG	
SHEET	C-6.0
CLIENT: MIDDLE STREET HOUSING PARTNERS, LP ONE CITY CENTER, 4TH FLOOR PORTLAND, MAINE 04101	





Traffic Solutions
William J. Bray, P.E.
17 Mountview Drive
Gorham, ME 04038
(207) 400-6890
trafficsolutions@maine.rr.com

April 21, 2020

Parking Assessment

Proposed

Middle Street Apartments

INTRODUCTION

Community Housing of Maine is proposing construction of a five-story apartment building on a parcel of land located at 83 Middle Street in the City of Portland, Maine. The proposed apartment building will include 50-units of low-income housing for senior residents, 62 years of age and older with disabilities. Forty-seven (47) of the 50 apartment units are single-bedroom and three are two-bedroom units.

The City's Zoning Ordinance presently requires one parking space for each proposed residential unit on the peninsular (Sec. 14-332.1 (k) except;

"The required parking for multi-unit residential buildings may be partially met through provisions of shared use vehicles...One shared use vehicle shall be deemed to satisfy eight (8) required car spaces..."

"No parking shall be required for the first three units in the R-6 Residential Zone..."

"The planning board may establish a parking requirement that is less than the normally required number of spaces upon a finding of unique conditions that result in a lesser parking demand, such as housing for persons who cannot drive, housing that participates in a travel demand management program, availability of transit... etc."

The proposed site design provides a total of 12 on-site parking spaces, including one "car-share" space, which are located under the proposed building and are directly accessed through an overhead garage door located along the Newbury Street frontage of the site. The Applicant will secure a private vendor to provide "car share" services to the site and/or will operate an acceptable service through their property management company.

This parking study provides an analytical process that clearly demonstrates the “average” peak parking demand requirement of the proposed 83 Middle Street low income senior-adult housing project is considerably less than the city’s zoning requirement.

National parking rates published by the Institute of Transportation Engineers were averaged with local parking data collected at two similar residential properties located on the Portland Peninsular to develop a more site-specific parking demand requirement for the proposed 83 Middle Street site.

PARKING DEMAND

National parking demand data presented in the Institute of Transportation Engineers (ITE) “**PARKING GENERATION**” publication is typically the instrument used in estimating the actual average peak parking demand of a development site. The 5th edition, which was published in January 2019, represents the most current copy of the noted ITE document. The ITE manual provides “average” peak parking demand rates for more than 100 land-use categories including: residential, lodging, recreational, institutional, medical, retail, office, services, etc.

Land-use #223 Affordable Housing - Seniors A subset of the Affordable Housing land-use category was selected in estimating the average peak parking demand of the proposed project. An average peak parking demand rate of 0.42 spaces per unit is provided under this land-use category. The projected parking rate is based upon a total of three study sites with a combined number of 97 apartment units. Both study metrics are less than what is typically desirable in projecting, with a high level of confidence, the average peak parking demand rate for a specific development site. Based upon the national parking data the proposed 50-unit residential apartment project is expected to generate an average peak parking demand of 21 parking spaces.

Local parking data previously collected at two senior low-income housing sites located on the Portland Peninsular suggests the national parking rate likely over states the actual peak parking demand requirements of a low-income senior housing project. Parking utilization surveys were conducted at two existing senior-adult low-income housing facilities on the Portland Peninsular to augment the national parking demand data. The existing sites included: 1) 47 Smith Street a 20-unit site and 2) Danforth on High, a 30-unit site. A total of 20 spaces are provided at the 47 Smith Street site and 13 parking spaces are located at the Danforth on High apartment site. Parking utilization data was gathered at both sites in the early morning (prior to 6:00 a.m.) on two separate days. Table 1, as follows, presents the results of the parking surveys:

Table 1
Parking Utilization Data
Existing Portland Peninsular Senior Housing Facilities

Facility Location	Number of Apartment Units	Number of Parking Spaces	Occupied Spaces – Day 1	Occupied Spaces – Day 2
47 Smith Street	20	20	5 spaces	6 spaces
Danforth on High	30	13	4 spaces	4 spaces
TOTAL	50	33	9 spaces	10 spaces

The results of the local Portland based parking survey shows a combined average peak parking demand of **9.5** parking spaces for the two senior adult apartment sites or an average peak parking demand of 0.19 spaces per apartment unit ($9.5 \div 50 = 0.19$ spaces per apartment unit). The local parking data would suggest a total of ten spaces is adequate to meet the parking demand requirements of the proposed 83 Middle Street low-income senior apartment project.

Traffic Solutions, to conservatively project the average peak parking demand requirements of the proposed affordable senior-adult project, averages the peak parking demand requirements derived from both the national and local parking data, which provides an estimated parking demand requirement of 16 parking spaces ($21 + 10 = 31 \div 2 = 15.5$ or 16 spaces).

SUMMARY

- National parking demand rates presented in the most current publication of the Institute of Transportation Engineers “**PARKING GENERATION**” publication for an affordable housing project for seniors provides an estimated average peak parking demand rate of 0.42 spaces per unit. Local parking data gathered at two senior housing project sites located on the Portland Peninsular suggests a much lower parking demand rate of 0.19 spaces per unit is applicable for an affordable housing project for senior residents. Averaging both data points yields an average peak parking demand of 0.31 spaces per unit or a total of 16 parking spaces.
- The City’s Zoning Ordinance in Chapter 14.332.1 (k) requires residential development on the peninsular to provide one parking space per apartment unit or specific to the proposed 83 Middle Street project a total of 50 parking spaces. National parking data and local parking studies performed at similar residential housing sites on the Portland Peninsular, as documented in the preceding text, would suggest the zoning requirement of one space per residential units overstates the actual parking requirements of the proposed site. City Staff, in a January 2015 report to the Planning Board, indicated their concurrence that a reduced parking demand rate for peninsular apartment projects was appropriate.
- The City Code provides two parking space reductions; 1) an 8-space parking reduction if a “*shared-use vehicle*” is located on-site and 2) no parking is required for the first three units in the R-6 zone. The site design provides an on-site space for the “*shared-use vehicle*”. These two exceptions reduce the parking demand requirements of the proposed site based upon the City Code to a total of 39 parking spaces.
- The City Ordinance also allows the Planning Board, “*The planning board may establish a parking requirement that is less than the normally required number of spaces upon a finding of unique conditions that result in a lesser parking demand, such as housing for persons who cannot drive, housing that participates in a travel demand management program, availability of transit... etc.*”
- The Applicant respectfully requests the Planning Board in their deliberations consider the following added information in determining the parking demand requirement for the proposed site:
 1. The body of the Parking Assessment report, as summarized above, conclusively demonstrates the appropriateness of a much lower parking space requirement for the proposed apartment project. The parking study suggests a peak parking demand value of 16 spaces is appropriate for the proposed 83 Middle Street project.
 2. The location of the proposed 83 Middle Street site provides easy, direct, and convenient access to reliable and continually operating public transportation. There are several bus stops located within walking distance of the property, including one located 135-feet from the main entrance of the proposed building.
 3. Provisions for a shared car service is proposed for the project with one of the 12 parking spaces dedicated for the car shared vehicle.
 4. The proposed project provides ample, secure, and covered bicycle storage on the property exclusively for resident use.



83 Middle Street public comments

1 message

Derek J. Veilleux <dveilleux@mac.com>

Fri, Jul 3, 2020 at 9:08 PM

To: ccameron@portlandmaine.gov

Cc: dveilleux@mac.com

I am writing to provide public comment pertaining to the proposed project at [83 Middle Street](#). I also attended the neighborhood meeting pertaining to this project. I offer the following thoughts pertaining to the project as currently submitted.

I strongly support this project and the need it will fill in our community for affordable housing, but not as currently designed.

The project must think beyond its four walls and respond to the needs of the urban context. This project, as currently submitted, does not adequately respond to the importance of its place, its location. Years ago, Franklin Arterial tore apart the Portland fabric and created a scar. This project is located at an intersection that has the potential to restore a connection that Franklin disrupted. Currently, as designed, this project only reinforces the disconnect across Franklin.

This project is positioned to reinforce the continuity of Middle Street across Franklin, reinforce the fabric of Middle Street and act as a gateway building to the India St. Neighborhood and the East End. Right now, it is primarily a Franklin focused building. For example, the address of the building is 83 Middle Street, but the entrance to the building is on Franklin. This building literally turns its back on Middle Street by moving the front door and further reinforces the disconnect. In addition, it is inevitable that building occupants and visitors will either be picked up or dropped off at this entrance (especially in the rain or very cold weather) creating a safety hazard on Franklin. Finally, the entrance is also a problem relative to public safety calls and those seeking to find the building. It's confusing at every level.

The design of the Franklin and Newbury Street facing facades ignore the urban context entirely. Newbury is a blank facade without any attempt to break down the volume with changes in material, color, and texture. It also ignores the pedestrian scale of the neighborhood. We need to make Franklin more pedestrian friendly, including walking along the side way to and from Congress Street. The Franklin facing facade harkens to a building better suited along a highway, not in a pedestrian friendly city. We do not need to further reinforce the speed of traffic on Franklin. There is no pedestrian scale to the building. The plainness of the facade is striking. In addition, at the Middle Street end of the building is a very peculiar angled volume that again looks toward Franklin as if to turn itself away from Middle Street. There is absolutely no recognition of Newbury Street in the design. It is as if Newbury is treated like an alleyway, like the back of the building.

The mixed use corner of the building where there is planned outdoor seating for some sort of cafe or food service business reflects the conflicted nature of the design. Instead of finding a way to thoughtfully create a corner and address the challenges of this particular site, it leaves a gaping hole at the corner. This building is not inviting to those traveling from the Old Port to the India Street neighborhood. It does not reach out.

The building occupants, the City of Portland, the neighbors and our visitors deserve a better design, one we can be proud of and that can reinforce all that we love about living, working and recreating downtown. Please work to improve the quality of design in this city. Much needed housing and quality design do not have to be mutually exclusive.

Thank you,
Derek J. Veilleux
[167 Newbury St, Unit 306](#)
[Portland, ME 04101](#)
Email: dveilleux@mac.com
Mobile: 207.878.0187

Sent from my iPad

July 9, 2020

Information Requests/Comments
83 Middle Street PUD
Re: Plan Number PL-000132-2020

1. Height Issues

A. Contradictory Data on Sheets A3.01 and A3.02 re: height to the parapet

The height for the rear of the building (facing Newbury Street) is shown in the materials in at least two places, on Sheets A3.01 and A3.02. However, each of these sheets shows contradictory elevations.

- 1) Each sheet indicates the site elevation, at the point the new building abuts Newbury Street, as 38'.2".
- 2) However, Sheet A3.01 shows the height of the rear roof (to the top of the parapet), at the corner of the building that abuts both Newbury and Franklin Street, to be 158' 4".
- 3) And, Sheet A3.02 shows the height of the rear roof (to the top of the parapet), along and for the full length of the building as it abuts Newbury Street, to be 151' 8".

The height discrepancy depicted (158' 4" versus 151' 8") is a very large discrepancy.

Request: please reconcile this discrepancy, by providing the correct height. We have also requested but no received the height of the building from sea level to the roof (to the parapet) as it faces Newbury Street.

B. Height (Dimensions) of Items on the rear roof are not shown

Both Sheet A3.01 and Sheet A3.02 indicate there will be mechanicals or a structure of some kind on the rear of the roof, but neither sheet locates or provides the dimensions for the mechanicals or the structure(s).

Please provide the type, location and dimensions and colors/materials of any mechanicals or structures that are proposed to be located on the rear roof as follows:

- 1) The nature of the mechanical infrastructure or structure. Elevator head house? Generator? HVAC equipment? Telecommunication equipment?
- 2) The distance of each mechanical infrastructure or other structure from the rear of the roof where the roof abuts Newbury Street.
- 3) The Height, Width and Depth of each.
- 4) Will the emergency generator exceed 5'6" in height?
- 5) If the HVAC units are going to be on the roof, will they be lower than the parapet?

2. Parking/Access Issues

We understand that vehicular access to the new building will be over Newbury Street, which is already a very narrow street, and request that the plans be updated to show the following:

- A. The plans indicate that the ROW for Newbury Street is 50 feet; however, the plans should indicate what the **paved** width of the Newbury Street is and the paved width that will be available to access the building.
- B. The plans should show the width of the garage door for the project.
- C. The plans should indicate the turning radii for a vehicle turning into or out of the garage. The vehicle used should be the largest vehicle that might access the building.
- D. The plans should show how the garage on Newbury Street will be located in relation to the existing garage for the Luminato Condos. We understand that the two garage doors need to be directly opposite each other.
- E. The plans should show the turning radii for fire vehicles as they turn from Hampshire onto Newbury Street (using the fire department's largest vehicle).
- F. The plans should indicate any existing parking spaces located on Newbury Street and whether they will be eliminated as a result of the project.
- G. The plan should show whether any parking spaces on Newbury Street will be eliminated.

3. Roof Plans

- A. When will the overall roof plan be finalized for solar, green roof, white roof, etc.?
- B. If it will be a white roof, what is the material?

Timing to Close the Public Hearing.

We request that the planning board not close the public hearing process until the above information has been provided. Thank you.

Respectfully submitted,

Kevin Rodel and Katy Longley
167 Newbury Street, #501, Portland, Maine 04101
207 837-2833

kevin@kevinrodel.com
sclongley2@gmail.com

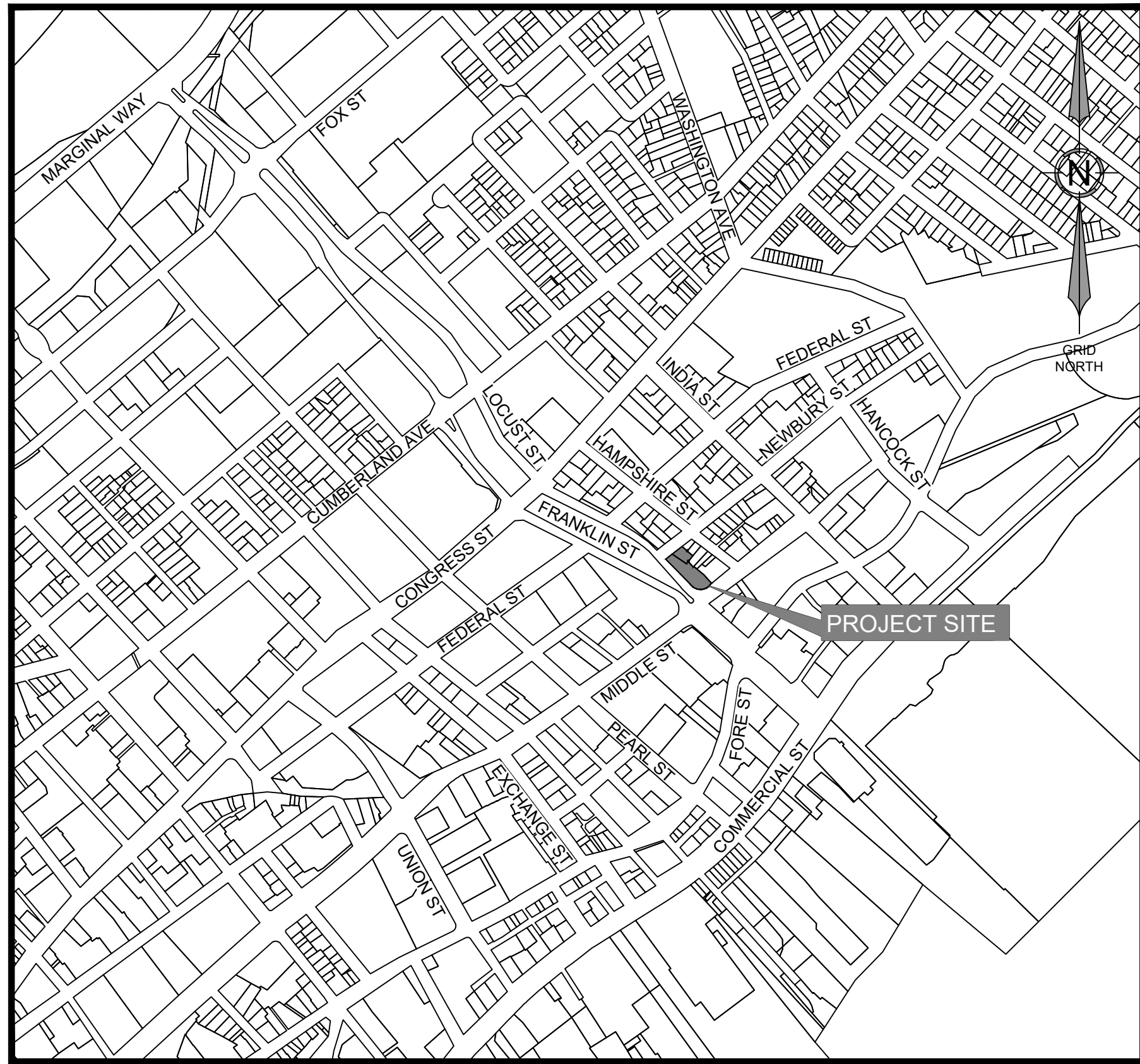
APPLICANT:
MIDDLE STREET HOUSING PARTNERS, LP
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

PROJECT PARCELS			
CITY OF PORTLAND TAX ASSESSOR'S MAP, BLOCK, & LOT NUMBERS			
MAP	BLOCK	LOT	CURRENT OWNER
28	0	17	CITY OF PORTLAND
28	0	3	160 NEWBURY STREET, LLC

SHEET INDEX

C-1.0	COVER SHEET
C-1.1	GENERAL NOTES & LEGEND
1	BOUNDARY & TOPOGRAPHIC SURVEY
C-2.0	RECORDING PLAT
C-3.0	EXISTING CONDITIONS & DEMOLITION PLAN
C-3.1	CONSTRUCTION MANAGEMENT PLAN
C-4.0	SITE LAYOUT PLAN
C-5.0	GRADING & DRAINAGE PLAN
C-5.1	EROSION & SEDIMENT CONTROL NOTES & DETAILS
C-6.0	SITE UTILITY PLAN
C-7.0	PHOTOMETRIC LIGHTING PLAN
C-8.0	SITE DETAILS
C-8.1	UTILITY & DRAINAGE DETAILS
C-8.2	STREET LIGHT DETAILS
C-9.0	VEHICLE MOVEMENT PLAN 1
C-9.1	VEHICLE MOVEMENT PLAN 2
L-1.0	LANDSCAPE PLAN & PLANTING DETAILS

SITE DEVELOPMENT PLANS FOR MIDDLE STREET APARTMENTS 83 MIDDLE STREET - PORTLAND, MAINE PERMIT DRAWINGS



LOCATION MAP

SCALE: 1"=500'

PERMITS

TYPE OF PERMIT	GOVERNING BODY	STATUS
LEVEL II SITE PLAN	CITY OF PORTLAND PLANNING AUTHORITY CITY HALL, 389 CONGRESS STREET PORTLAND, ME 04101 TEL. 207.874.8722	SUBMITTED 4/16/2020
LEVEL III SUBDIVISION CONDITIONAL USE, INCLUSIONARY ZONING	CITY OF PORTLAND PLANNING BOARD CITY HALL, 389 CONGRESS STREET PORTLAND, ME 04101 TEL. 207.874.8722	SUBMITTED 4/16/2020
BUILDING PERMIT	CITY OF PORTLAND CODE ENFORCEMENT OFFICE CITY HALL, 389 CONGRESS STREET PORTLAND, ME 04101 TEL. 207.874.8900	TO BE SUBMITTED BY BUILDING CONTRACTOR
UTILITY / STREET OPENING	CITY OF PORTLAND PUBLIC SERVICES DIVISION 55 PORTLAND STREET PORTLAND, ME 04101 TEL. 207.874.8801	TO BE FILED BY SITE CONTRACTOR

UTILITIES

SEWER/STORM
CITY OF PORTLAND
PUBLIC SERVICES DIVISION
55 PORTLAND STREET
PORTLAND, MAINE 04102
207.874.8850

WATER
PORTLAND WATER DISTRICT
22 DOUGLASS STREET
P.O. BOX 3553
PORTLAND, MAINE 04104
207.774.5961

ELECTRIC
CENTRAL MAINE POWER COMPANY
162 CANCO ROAD
PORTLAND, ME 04103
(207) 842-2367

TELEPHONE
FAIRPOINT COMMUNICATIONS
5 DAVIS FARM ROAD
P.O. BOX 11560
PORTLAND, MAINE 04103
888.984.1515

NATURAL GAS
UNITIL
376 RIVERSIDE INDUSTRIAL PARKWAY
PORTLAND, MAINE 04103
866.933.3821

DIG SAFE SYSTEM, INC.
TEL. 1-888-DIG-SAFE (344-7233)
WWW.DIGSAFE.COM

PREPARED BY:

CIVIL ENGINEER:
TERRADYN CONSULTANTS, LLC
565 CONGRESS STREET, SUITE 310
PORTLAND, MAINE 04101
207.926.5111
CONTACT: MICHAEL TADEMA-WIELANDT, P.E.

ARCHITECT:
CWS ARCHITECTS
264 US ROUTE ONE, SUIT 100-2A
SCARBOROUGH, ME 04074
207.774.4441
CONTACT: BEN WALTER, AIA

SURVEYOR:
OWEN HASKELL, INC.
309 U.S. ROUTE ONE, UNIT 10
FALMOUTH, MAINE 04105
207.774.0424
RANDY LOUBIER, PLS

ELECTRICAL/MECHANICAL ENGINEER:
BENNETT ENGINEERING
7 BENNETT ROAD
FREEPORT, MAINE 04032
207.865.9475
CONTACT: WILLIAM BENNETT

DATE: 6/17/2020 P.E.: MICHAEL E. TADEMA-WIELANDT	
MTW	BY
REVISIONS	REVISED PER STAFF REVIEW COMMENTS
NO.	DATE
1	6/17/2020
PROJECT: MIDDLE STREET APARTMENTS 83 MIDDLE STREET, PORTLAND, MAINE 04101 SHEET TITLE: COVER SHEET CLIENT: MIDDLE STREET HOUSING PARTNERS, LP ONE CITY CENTER, 4TH FLOOR PORTLAND, MAINE 04101	
DATE: 4/16/2020 SCALE: AS NOTED DESIGNED: MTW JOB NO: 1926 FILE: 1926 COVER.DWG SHEET: C-1.0	

1. THIS PROJECT IS SUBJECT TO THE TERMS AND CONDITIONS OF ALL REGULATIONS ADMINISTERED BY THE LOCAL UTILITY COMPANIES AND THE CITY OF PORTLAND.
2. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF THE ENTRANCES, EXITS, PRECISE BUILDING DIMENSIONS, AND EXACT BUILDING UTILITY ENTRANCE POINTS.
3. ALL REQUIRED AND NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL SERVICE CONNECTIONS.
4. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR THE ELEVATION OF THE EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AND DIG SAFE (1-888-DIGSAFE). IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS, AT NO EXTRA EXPENSE TO THE OWNER.
5. MAINTENANCE OF EROSION CONTROL MEASURES IS OF PARAMOUNT IMPORTANCE TO THE OWNER AND THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL EROSION CONTROL MEASURES SHOWN ON THE PLANS. ADDITIONAL EROSION CONTROL MEASURES SHALL BE INSTALLED IF DEEMED NECESSARY BY ONSITE INSPECTIONS OF THE OWNER OR THEIR REPRESENTATIVES AT NO ADDITIONAL COST TO THE OWNER.
6. ALL MATERIAL SCHEDULES SHOWN ON THE PLANS ARE FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL PREPARE HIS OWN MATERIAL SCHEDULES BASED UPON HIS PLAN REVIEW. ALL SCHEDULES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ORDERING MATERIALS OR PERFORMING WORK.
7. ALL MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO PROJECT CONTRACT SPECIFICATIONS, AND THE CITY OF PORTLAND TECHNICAL MANUAL STANDARDS, WHICHEVER IS MORE STRINGENT.
8. TOPOGRAPHIC AND BOUNDARY SURVEY INFORMATION WAS PROVIDED BY OWEN HASKELL, INC. BENCHMARK = HYDRANT BONNET BOLT ON SOUTHEASTERN CORNER OF MIDDLE AND FRANKLIN STREETS, ELEVATION 29.76, NGVD 1929 DATUM.
9. FEMA MAP COMMUNITY PANEL NUMBER 230051 0014 B. THE SITE IS LOCATED IN A C ZONE.
10. THE PROPERTY SHOWN ON THIS PLAN MAY BE DEVELOPED AND USED ONLY AS DEPICTED IN THIS APPROVED PLAN. ALL ELEMENTS AND FEATURES OF THE PLAN AND ALL THE PROPERTY WHICH APPEARS IN THE RECORD OF THE PLANNING BOARD PROCEEDINGS ARE CONDITIONS OF THE APPROVAL. NO CHANGE FROM THE CONDITIONS OF APPROVALS IS PERMITTED UNLESS AN AMENDED PLAN IS FIRST SUBMITTED TO AND APPROVED BY THE PLANNING AUTHORITY.
11. ALL SIGNAGE SHALL CONFORM TO THE STANDARDS FOR SIZE, HEIGHT, LOCATION AND REFLECTIVITY SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
12. ALL CURB SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS AS NOTED ON THE PLANS: GRANITE CURB SHALL MEET THE REQUIREMENTS OF MaineDOT SPECIFICATIONS 609.03 AND CITY OF PORTLAND TECHNICAL STANDARDS.
13. ALL DIMENSIONING UNLESS OTHERWISE NOTED IS TO THE FACE OF CURB OR FACE OF BUILDING.
14. THE FACILITY IS SERVICED BY PUBLIC WATER, SEWER, AND UNDERGROUND POWER. THE PROJECT INCLUDES UPDATES TO THE POWER SERVICE INCLUDING THE INSTALLATION OF NEW UNDERGROUND SYSTEM. SEE SITE ELECTRICAL PLANS FOR DETAILS.
15. THE CONTRACTOR IS REQUIRED TO NOTIFY THE CITY OF PORTLAND PUBLIC WORKS INSPECTION SERVICES DIVISION (874-8300 EXT. 8838), CODE ENFORCEMENT OFFICE AND DEVELOPMENT REVIEW COORDINATOR IN WRITING THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION. A PRE-CONSTRUCTION MEETING MAY BE REQUIRED TO INCLUDE THE PUBLIC WORKS AUTHORITY OR DEVELOPMENT REVIEW COORDINATOR.
16. AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE.
17. WARNING SIGNS, MARKERS, BARRICADES OR FLAGMEN MUST BE EMPLOYED ON ADJACENT STREETS AS NECESSARY. THE CONTRACTOR SHALL COORDINATE AND SEEK APPROVAL FROM THE PUBLIC SERVICE DIVISION FOR THE PLACEMENT/PARKING OF EQUIPMENT WITHIN THE PUBLIC RIGHT OF WAY.
18. CONSTRUCTION DEBRIS SHALL BE CONTAINERIZED AND DISPOSED OF IN ACCORDANCE WITH THE CITY OF PORTLAND'S SOLID WASTE ORDINANCE CHAPTER 12. ALL DEMOLITION MATERIAL FROM THE PROJECT SITES SHALL BE TAKEN TO THE RIVERSIDE RECYCLING FACILITY OR AS OTHERWISE DIRECTED PENDING THE RESULTS OF A HAZARDOUS BUILDING MATERIALS SURVEY AS AUTHORIZED AND COORDINATED BY THE OWNER. ALL SALVAGED MATERIAL WITHIN THE PUBLIC R.O.W. (SIDEWALKS, BRICKS, GRANITE CURB) NOT REUSED SHALL BE DISPOSED OF AS DIRECTED BY THE PORTLAND PUBLIC SERVICES DEPARTMENT AT NO EXTRA COST TO THE OWNER.
19. ANY DAMAGE TO PUBLIC OR PRIVATE PROPERTY RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY THE CONTRACTOR AT THEIR EXPENSE.
20. PROPERTY MARKERS AND STREET LINE MONUMENTS SHALL BE PROPERLY PROTECTED AT ALL TIMES DURING CONSTRUCTION TO INSURE INTEGRITY. IF DISTURBED THEY SHALL BE REPLACED BY A SURVEYOR REGISTERED IN THE STATE OF MAINE AT THE CONTRACTOR'S EXPENSE.
21. THE OWNER SHALL BE RESPONSIBLE TO COORDINATE THE PERFORMANCE OF A HAZARDOUS MATERIALS INSPECTION OF THE PROPERTY.
22. A STREET OPENING PERMIT MUST BE OBTAINED FROM THE CITY OF PORTLAND PUBLIC WORKS DEPARTMENT PRIOR TO BEGINNING ANY WORK WITHIN THE CITY RIGHT-OF-WAY. ALL WORK WITHIN THE PUBLIC RIGHT OF WAY SHALL BE COMPLETED IN CONFORMANCE TO THE CITY'S RULES AND REGULATIONS FOR EXCAVATION ACTIVITIES IN PUBLIC RIGHT OF WAYS.
23. CONTRACTOR MUST MAINTAIN THROUGH TRAFFIC ON ADJACENT STREETS AT ALL TIMES.
24. ALL METHODS AND MATERIALS USED IN THE CONSTRUCTION OF THE IMPROVEMENTS IDENTIFIED HEREIN SHALL CONFORM TO THE CITY OF PORTLAND CONSTRUCTION AND TECHNICAL STANDARDS AND SPECIFICATIONS AND/OR CURRENT MaineDOT STANDARDS AND SPECIFICATIONS, WHICHEVER IS MORE STRINGENT.
25. SITE WORK FOR BUILDING SHALL INCLUDE GRADING THE BUILDING PAD AREA (DEFINED AS THE BUILDING FOOTPRINT PLUS 5'-0" BEYOND THE EXTERIOR WALL) TO A GRADE 18" BELOW THE GROUND FLOOR FINISH ELEVATION. ALL WORK SHALL INCLUDE EXCAVATION (INCLUDING ROCK REMOVAL AND EXISTING FOUNDATION DEMOLITION) AND BACKFILL OF ALL FOOTINGS AND FOUNDATIONS, INSTALLATION OF PERIMETER FOUNDATION DRAINS, EXCAVATION AND BACKFILL OF ALL UNDERSLAB UTILITIES AND PLACEMENT OF ALL AGGREGATES BELOW THE FLOOR SLAB AND ADJACENT FOUNDATION WALLS IN ACCORDANCE WITH THE CONTRACT PLANS AND SPECIFICATIONS. (SEE ARCHITECTURAL AND STRUCTURAL PLANS FOR ADDITIONAL DETAILS PERTAINING TO ANY BUILDING RELATED FOUNDATION WORK).

- RECORD DRAWINGS MUST INCLUDE ALL BURIED UTILITIES INCLUDING, BUT NOT LIMITED TO, BENDS, APPURTENANCES, AND OTHER FEATURES. TO BE LOCATED IN THE FIELD BY GIS AND RECORDED AS AN AS-BUILT PLAN BY THE CONTRACTOR AT THE END OF THE PROJECT. THIS PLAN SHALL ALSO BE PROVIDED TO THE OWNER.
27. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL DRAWINGS PREPARED BY CWS ARCHITECTS FOR EXCAVATION LOCATIONS AND DIMENSIONS OF THE ENTRANCES, EXIT PORCHES, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE POINTS.
28. ALL REQUIRED AND NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL SERVICE CONNECTIONS.
29. CONTRACTORS SHALL NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITIES IN THE AREA OF PROPOSED EXCAVATION OR BLASTING AT LEAST THREE (3) BUT NOT MORE THAN (30) DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION. CONTRACTORS SHALL BE RESPONSIBLE FOR COMPLIANCE WITH THE REQUIREMENTS OF 23 MRSA 3360-A.
- ## GRADING AND DRAINAGE NOTES:
1. ALL STORM DRAIN PIPE SHALL BE SMOOTH BORE INTERIOR PROVIDING A MANNINGS ROUGHNESS COEFFICIENT OF $n = 0.013$ OR LESS. UNLESS A SPECIFIC PIPE MATERIAL IS CALLED FOR ON THE CONTRACT DRAWINGS. PVC PIPING SHALL NOT BE USED IN AREAS OF EXPOSED SUNLIGHT.
 2. SLOPE PROTECTION IS TO BE PROVIDED PER THE DESIGN PLANS AND MAY INCLUDE RIPRAP, SOD OR MULCH.
 3. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION DURING EARTHWORK OPERATIONS TO INSURE THAT DISTURBANCE TO ANY STEEP SLOPE AREAS ARE MINIMIZED TO THE EXTENT PRACTICABLE.
 4. THE CONTRACTOR IS HEREBY CAUTIONED THAT ALL SITE FEATURES SHOWN ARE BASED ON FIELD OBSERVATIONS BY THE SURVEYOR AND BY INFORMATION PROVIDED BY OTHERS. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT DIG SAFE (1-888-DIGSAFE) AT LEAST THREE (3) BUT NOT MORE THAN THIRTY (30) DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES.
 5. ALL PAVING WITHIN THE PUBLIC R.O.W. SHALL BE PERFORMED IN ACCORDANCE WITH THE CITY OF PORTLAND RULES AND REGULATIONS FOR EXCAVATION ACTIVITIES IN THE PUBLIC R.O.W.
 6. NO HOLES, TRENCHES OR STRUCTURES SHALL BE LEFT OPEN OVERNIGHT IN ANY EXCAVATION ACCESSIBLE TO THE PUBLIC OR IN PUBLIC RIGHTS-OF-WAY.
 7. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ANY CHANGES AND DEVIATION OF APPROVED PLANS NOT AUTHORIZED BY THE ARCHITECT/ENGINEER AND/OR CLIENT/OWNER.
 8. CONTRACTOR SHALL INCORPORATE PROVISIONS AS NECESSARY IN CONSTRUCTION TO PROTECT EXISTING STRUCTURES AND PHYSICAL FEATURES THAT ARE OUTSIDE THE SCOPE OF WORK. THE CONTRACTOR SHALL MAINTAIN SITE STABILITY DURING CONSTRUCTION TO AVOID EROSION AND SEDIMENT TRANSPORT. CONTRACTOR SHALL RESTORE ALL AREAS TO A FINAL STABILIZED CONDITION AS DIRECTED BY DESIGN DRAWINGS.
 9. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
 10. EXTERIOR GRADES AROUND PROPOSED STRUCTURE SHALL BE COORDINATED WITH FINAL BUILDING PLANS AND PROVIDE FOR ALL ACCESS OPENINGS.

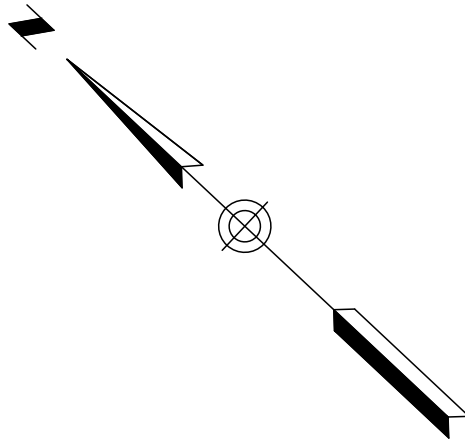
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4. THE CONTRACTOR IS HEREBY CAUTIONED THAT ALL SITE FEATURES SHOWN ARE BASED ON FIELD OBSERVATIONS BY THE SURVEYOR AND BY INFORMATION PROVIDED BY OTHERS. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT DIG SAFE (1-888-DIGSAFE) AT LEAST THREE (3) BUT NOT MORE THAN THIRTY (30) DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES.
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9. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ENGINEER.
10. EXTERIOR GRADES AROUND PROPOSED STRUCTURE SHALL BE COORDINATED WITH FINAL BUILDING PLANS AND PROVIDE FOR ALL ACCESS OPENINGS.

1. ALL REQUIRED UTILITIES SERVING THE PROJECT SHALL BE COORDINATED BETWEEN THE SITE WORK CONTRACTOR AND DIVISION 22/26 CONTRACTOR(S). THE SITE WORK CONTRACTOR SHALL BE RESPONSIBLE TO EXTEND ALL PROPOSED UTILITIES TO WITHIN FIVE (5) FEET OF THE BUILDING TO A LOCATION COORDINATED WITH THE MECHANICAL AND ELECTRICAL SUBCONTRACTORS. THE BUILDING CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UTILITIES WITHIN FIVE (5) FEET AND INSIDE THE BUILDING OR UNDER SLAB.
2. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF AND/OR RELOCATION OF OVERHEAD AND UNDERGROUND TELEPHONE WITH FAIRPOINT COMMUNICATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONDUITS, PULL WIRES, TRENCHING AND BACKFILLING NECESSARY TO COMPLETE THE WORK.
3. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRIC SERVICE WITH CENTRAL MAINE POWER, THE TELECOMMUNICATIONS SERVICE WITH FAIRPOINT COMMUNICATIONS, AND THE CABLE SERVICE WITH SPECTRUM. ALL WORK SHALL CONFORM TO THE PROJECT SPECIFICATIONS OR UTILITY COMPANY STANDARDS, WHICHEVER IS MORE STRINGENT.
4. ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE AT NO ADDITIONAL EXPENSE TO THE OWNER.
5. ALL UNDERGROUND CONDUITS SHALL HAVE NYLON PULL ROPES TO FACILITATE PULLING CABLES.
6. THE CONTRACTOR SHALL OBTAIN, PAY FOR, AND COMPLY WITH ALL REQUIRED PERMITS, ARRANGE FOR ALL INSPECTIONS, AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO THE OWNER PRIOR TO COMPLETION OF THE PROJECT.
7. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL BOXES, FITTINGS, CONNECTORS, COVER PLATES AND OTHER MISCELLANEOUS ITEMS NOT NECESSARILY DETAILED ON THE DRAWINGS TO RENDER INSTALLATION OF UTILITIES COMPLETE AND OPERATIONAL, AT NO EXTRA EXPENSE TO THE OWNER.
8. A 10 FOOT MINIMUM EDGE TO EDGE HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN ALL WATER AND SANITARY SEWER LINES. A 12 INCH OUTSIDE TO OUTSIDE VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER AND SANITARY SEWER CROSSINGS.
9. THE CONTRACTOR SHALL PROVIDE TEMPORARY SERVICES AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO THE JOBSITE. TEMPORARY SERVICES SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. COORDINATE ALL TEMPORARY SERVICES WITH UTILITY COMPANY, OWNER, AND AFFECTED BUSINESSES.
10. CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY ELECTRICAL SERVICES IN CONDUIT TO SITE LIGHTING, COMPLYING WITH APPLICABLE CODES. COORDINATE WITH OWNER, SITE ELECTRICAL, ARCHITECTURAL AND CMP PLANS.
11. ALL SANITARY SERVICES AND APPURTENANCES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF PORTLAND PUBLIC WORKS DEPARTMENT. ALL SANITARY SERVICES AND APPURTENANCES TO BE ABANDONED SHALL BE PROPERLY RECORDED WITH PORTLAND PUBLIC WORKS ENGINEERING DEPARTMENT. A DIGITAL VIDEOTAPE SHALL BE MADE OF SANITARY SEWER SYSTEMS TO BE UTILIZED PRIOR TO CONSTRUCTION; UPSTREAM PIPES INTENDED FOR ABANDONMENT SHALL BE INSPECTED TO VERIFY THAT THEY NO LONGER SERVE OTHER FACILITIES.
12. THE PORTION OF THE 6" WATER SERVICE WITHIN THE RIGHT OF WAY SHALL BE DUCTILE IRON WITH RESTRAINED JOINTS IN ACCORDANCE WITH PORTLAND WATER DISTRICT STANDARDS.
13. THE 2" WATER SERVICE SHALL BE TYPE K COPPER TUBING

1. THIS PROJECT IS SUBJECT TO THE TERMS AND CONDITIONS OF THE SITE PLAN REVIEW PERMIT FROM THE CITY OF PORTLAND WHICH WILL BE MADE A PART OF THE CONTRACT BID DOCUMENTS. THE CONSTRUCTION WILL BE GOVERNED BY THE ZONING ORDINANCES WHICH ARE AVAILABLE FOR VIEWING AT THE OFFICE OF THE ENGINEER OR THE MUNICIPAL OFFICE.

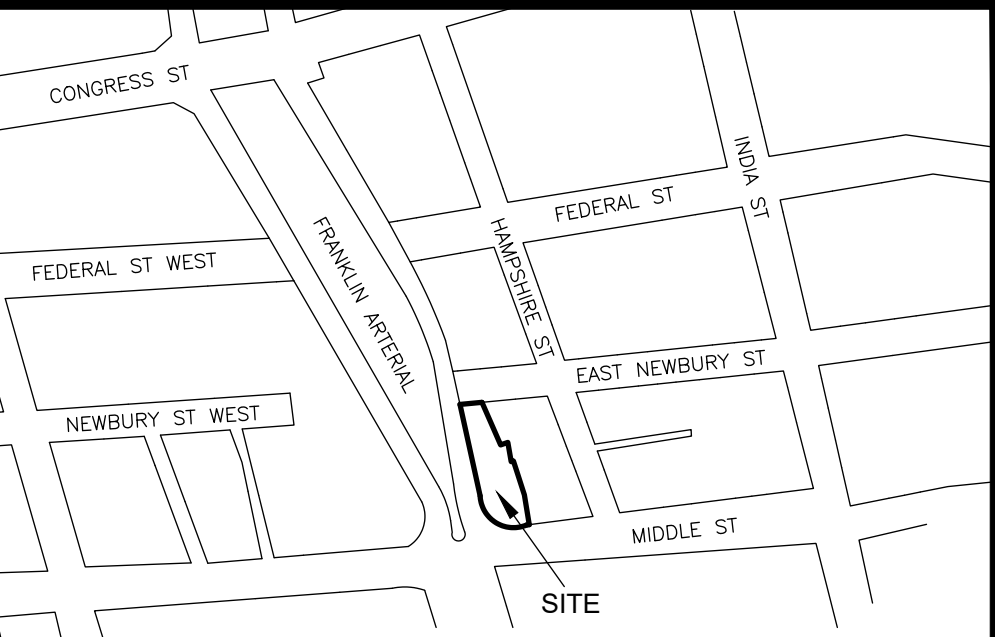
	EXISTING PROPERTY LINE
	PROJECT SITE BOUNDARY
	SETBACK LINE
	PROPOSED EASEMENT
	EXISTING MINOR CONTOUR
	EXISTING MAJOR CONTOUR
	PROPOSED CONTOUR
	EXISTING STORMDRAIN
	PROPOSED STORMDRAIN
	EXISTING SANITARY SEWER
	PROPOSED SANITARY SEWER
	EXISTING WATER LINE
	PROPOSED WATER LINE
	EXISTING GAS
	PROPOSED GAS
	EXISTING OVERHEAD ELECTRIC & TELEPHONE
	EXISTING UNDERGROUND ELECTRIC
	PROPOSED UNDERGROUND ELECTRIC
	EXISTING UNDERGROUND TELEPHONE
	PROPOSED UNDERGROUND TELEPHONE & CABLE TV
	EXISTING EDGE OF PAVEMENT
	PROPOSED EDGE OF PAVEMENT
	EXISTING EDGE OF GRAVEL
	PROPOSED EDGE OF GRAVEL
	EXISTING CURB
	PROPOSED CURB
	PROPOSED DECORATIVE METAL FENCE
	PROPOSED PRIVACY FENCE
	SILT FENCE
	TEST PIT
	EXISTING VALVE
	PROPOSED VALVE
	EXISTING HYDRANT
	EXISTING LIGHT POLE
	PROPOSED BUILDING LIGHT
	EXISTING UTILITY POLE
	EXISTING CATCH BASIN
	PROPOSED CATCH BASIN
	EXISTING DRAIN MANHOLE
	PROPOSED DRAIN MANHOLE
	EXISTING SEWER MANHOLE
	EXISTING SPOT GRADE
	PROPOSED SPOT GRADE
	SURVEY CONTROL POINT
	EXISTING MONUMENT
	EXISTING IRON PIPE
	EXISTING SIGN
	PROPOSED SIGN
	EXISTING BUILDING
	PROPOSED BUILDING
	PROPOSED CONCRETE
	PROPOSED PAVEMENT
	PROPOSED BRICK

[illegible]



UTILITY NOTE

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. CALL 1-888-DIGSAFE AT LEAST THREE BUSINESS DAYS BEFORE PERFORMING ANY CONSTRUCTION. DUE TO OSHA CONFINED SPACE REQUIREMENTS, ALL INVERTS AND PIPE SIZES MUST BE VERIFIED PRIOR TO ANY CONSTRUCTION.



LOCATION MAP

N.T.S.

LEGEND

●	IRON PIPE OR ROD FOUND	—X—X—	FENCE
■	MONUMENT FOUND	=====	CURB
○	UTILITY POLE	—OHW—	OVERHEAD WIRES
○	MANHOLE	—35—	1' CONTOUR
⊙	SIGN	—IPF/IRF—	IRON PIPE OR ROD FOUND
⊙	CATCH BASIN	—N/F—	NOW OR FORMERLY
⊙	HYDRANT	000/000	DEED BOOK / PAGE
⊙	WATER VALVE OR SHUTOFF	CONC.	CONCRETE
⊙	LIGHT POLE	—E—	UNDERGROUND POWER
⊙	DECIDUOUS TREE	—W—	WATER LINE
		—G—	GAS LINE
		—SD—	STORM DRAIN
		—SS—	SANITARY SEWER

PLAN REFERENCES

- STANDARD BOUNDARY SURVEY PLAN OF PROPERTY AT 77 MIDDLE STREET PORTLAND MAINE FOR GEORGE W. BEALS DATED NOVEMBER 23, 1992 BY LEROY A. WITHAM LOCATED IN THE CITY OF PORTLAND'S ENGINEERING ARCHIVES AS PLAN 866/1.
- CITY OF PORTLAND PUBLIC WORKS DEPARTMENT CONTRACT DRAWINGS HAMPSHIRE STREET RECONSTRUCTION BRATTLE STREET RECONSTRUCTION PROJECT NO. 210-3100-430 DATED 11/16/01. ON FILE AT THE CITY OF PORTLAND.

GENERAL NOTES

- OWNER OF RECORD: CITY OF PORTLAND
TAX MAP 28 BLOCK 0 LOT 17
C.C.R.D. BOOK 3029 PAGE 547
C.C.R.D. BOOK 10985 PAGE 260
- BEARINGS AND COORDINATES ARE BASED ON MAINE STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 83. ELEVATIONS ARE BASED ON CITY DATUM, NGVD 29. HORIZONTAL AND VERTICAL CONTROL DATA PROVIDED BY THE CITY OF PORTLAND AND TAKEN FROM PLAN REFERENCE 2.
- UTILITIES SHOWN ARE TAKEN FROM PLAN REFERENCE #2.
- THE RIGHT OF WAY LINE SHOWN ALONG FRANKLIN STREET IS A PROPOSED LOCATION. THE EXISTING RIGHT OF WAY LINE IS THE SOUTHWESTERLY PROPERTY LINES ALONG LOTS 28-0-3, 28-0-8, 28-0-15 & 28-0-11.

CERTIFICATE

OWEN HASKELL, INC. HEREBY CERTIFIES THAT THIS PLAN IS BASED ON, AND THE RESULT OF, AN ON THE GROUND FIELD SURVEY AND THAT TO THE BEST OF OUR KNOWLEDGE, INFORMATION AND BELIEF, IT CONFORMS TO THE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS CURRENT STANDARDS OF PRACTICE.

RANDY R. LOUBIER, PLS #2407

DATE

PRELIMINARY

Boundary & Topographic Survey

At
#83 Middle Street, Portland, Maine
Made for
Community Housing of Maine
One City Center, 4th Floor Portland, ME 04101



OWEN HASKELL, INC.

PROFESSIONAL LAND SURVEYORS
390 U.S. ROUTE ONE, UNIT 10, FALMOUTH, MAINE 04105

DRAWN BY:	RS / JLW	DATE:	March 9, 2020	JOB NO.	2019-026 P
CHECKED BY:	EBC / JWS	SCALE:	1" = 20'	DRWG. NO.	1



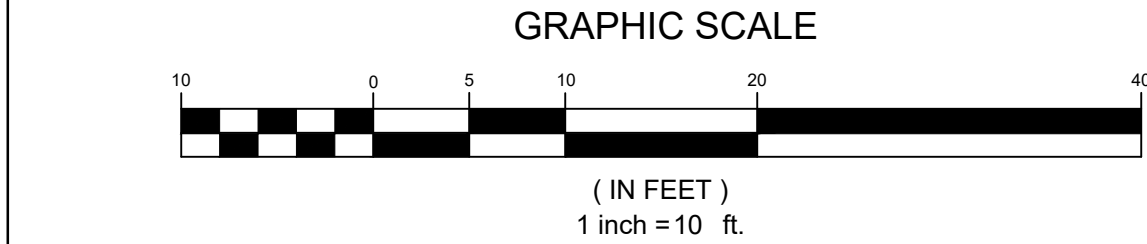


CONDITIONS OF APPROVAL:

- SUBDIVISION RECORDING PLAT A REVISED RECORDING PLAT, LISTING ALL CONDITIONS OF SUBDIVISION APPROVAL, MUST BE SUBMITTED TO THE PLANNING AND URBAN DEVELOPMENT DEPARTMENT FOR REVIEW. ONCE APPROVED, THE PLAT SHALL BE SIGNED BY THE PLANNING BOARD PRIOR TO THE ISSUANCE OF A PERFORMANCE GUARANTEE. THE PERFORMANCE GUARANTEE MUST BE ISSUED, PRIOR TO THE RELEASE OF THE RECORDING PLAT, FOR RECORDING AT THE CUMBERLAND COUNTY REGISTRY OF DEEDS.
- SUBDIVISION WAIVERS PURSUANT TO 30-A M.R.S.A. SECTION 4406(B)(1), ANY WAIVER MUST BE SPECIFIED ON THE SUBDIVISION PLAN OR OUTLINED IN A NOTICE. THE PLAN OR NOTICE MUST BE RECORDED IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS WITHIN TWO (2) YEARS OF THE FINAL SUBDIVISION APPROVAL.
- PERFORMANCE GUARANTEE AND INSPECTION FEES A PERFORMANCE GUARANTEE COVERING THE SITE IMPROVEMENTS, INSPECTION FEE PAYMENT OF 2.0% OF THE GUARANTEE AMOUNT AND THREE (3) FINAL SETS OF PLANS MUST BE SUBMITTED TO AND APPROVED BY THE PLANNING AND URBAN DEVELOPMENT DEPARTMENT AND PUBLIC WORKS DEPARTMENT PRIOR TO THE RELEASE OF A BUILDING PERMIT, STREET OPENING PERMIT OR CERTIFICATE OF OCCUPANCY FOR SITE PLANS. IF YOU NEED TO MAKE ANY MODIFICATIONS TO THE APPROVED PLANS, YOU MUST SUBMIT A REVISED SITE PLAN APPLICATION FOR STAFF REVIEW AND APPROVAL.
- DEFECT GUARANTEE A DEFECT GUARANTEE, CONSISTING OF 10% OF THE PERFORMANCE GUARANTEE, MUST BE POSTED BEFORE THE PERFORMANCE GUARANTEE WILL BE RELEASED.
- PRECONSTRUCTION MEETING PRIOR TO THE RELEASE OF A BUILDING PERMIT OR SITE CONSTRUCTION, A PRE-CONSTRUCTION MEETING SHALL BE HELD AT THE PROJECT SITE. THIS MEETING WILL BE HELD WITH THE CONTRACTOR, DEVELOPMENT REVIEW COORDINATOR, PUBLIC WORKS REPRESENTATIVE AND OWNER TO REVIEW THE CONSTRUCTION SCHEDULE AND CRITICAL ASPECTS OF THE SITE WORK. AT THAT TIME, THE DEVELOPMENT REVIEW COORDINATOR WILL CONFIRM THAT THE CONTRACTOR IS WORKING FROM THE APPROVED SITE PLAN. THE SITE/BUILDING CONTRACTOR SHALL PROVIDE THREE (3) COPIES OF A DETAILED CONSTRUCTION SCHEDULE TO THE ATTENDING CITY REPRESENTATIVES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE A MUTUALLY AGREEABLE TIME FOR THE PRE-CONSTRUCTION MEETING.
- SEPARATE BUILDING PERMITS ARE REQUIRED THIS APPROVAL DOES NOT CONSTITUTE APPROVAL OF BUILDING PLANS, WHICH MUST BE REVIEWED AND APPROVED BY THE CITY OF PORTLAND'S PERMITTING AND INSPECTIONS DEPARTMENT.
- DEPARTMENT OF PUBLIC WORKS PERMITS IF WORK OR OBSTRUCTIONS WILL OCCUR WITHIN THE PUBLIC RIGHT-OF-WAY, SUCH AS UTILITIES, CURB, SIDEWALK, DRIVEWAY CONSTRUCTION, SITE DELIVERIES AND EQUIPMENT SITING, A STREET OPENING AND/OR OCCUPANCY PERMIT (S) IS REQUIRED FOR THE SITE. CONTACT THE DEPARTMENT OF PUBLIC WORKS PERMIT CLERK AT 874-8300, EXT. 8828, (ONLY EXCAVATORS LICENSED BY THE CITY OF PORTLAND ARE ELIGIBLE.)
- CONSTRUCTION MANAGEMENT PLANS - PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY - THE APPLICANT, CONTRACTOR AND SUBCONTRACTORS ARE REQUIRED TO CONFORM TO THE APPROVED CONSTRUCTION MANAGEMENT PLAN, AND ALL CONDITIONS CONTAINED WITHIN THE PROJECT'S APPROVAL, FOR THE ENTIRE DURATION OF THE PROJECT. ANY AMENDMENTS TO THE APPROVED CONSTRUCTION MANAGEMENT PLAN SHALL BE REVIEWED AND APPROVED BY THE DEPARTMENT OF PUBLIC WORKS PRIOR TO THE EXECUTION. THE PLANNING AUTHORITY AND THE DEPARTMENT OF PUBLIC WORKS HAVE THE RIGHT TO SEEK REVISIONS TO AN APPROVED CONSTRUCTION MANAGEMENT PLAN. THE APPLICANT SHALL COORDINATE THE PROJECT'S CONSTRUCTION SCHEDULE WITH THE TIMING OF NEARBY CONSTRUCTION ACTIVITIES TO AVOID CUMULATIVE IMPACTS ON A NEIGHBORHOOD AND PREVENT UNSAFE VEHICLE AND PEDESTRIAN MOVEMENTS. ACCORDINGLY, NEARBY CONSTRUCTION ACTIVITIES COULD INVOLVE A DELAY IN THE COMMENCEMENT OF CONSTRUCTION.
- AS-BUILT FINAL PLANS - PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY - FINAL SETS OF AS-BUILT PLANS SHALL BE SUBMITTED DIGITALLY TO THE PLANNING AND URBAN DEVELOPMENT DEPARTMENT, ON A CD OR DVD, IN AUTOCAD FORMAT (.DWG), RELEASE AUTOCAD 2005 OR GREATER.
- DEVELOP SITE ACCORDING TO PLAN - ONGOING CONDITION OF APPROVAL - THE SITE SHALL BE DEVELOPED AND MAINTAINED AS DEPICTED ON THE SITE PLAN AND IN THE WRITTEN SUBMISSION OF THE APPLICANT. MODIFICATION OF ANY APPROVED SITE PLAN OR ALTERATION OF A PARCEL WHICH WAS THE SUBJECT OF SITE PLAN APPROVAL AFTER MAY 20, 1974, SHALL REQUIRE THE PRIOR APPROVAL OF A REVISED SITE PLAN BY THE PLANNING BOARD OR PLANNING AUTHORITY PURSUANT TO THE TERMS OF CHAPTER 14, LAND USE, OF THE PORTLAND CITY CODE.
- SITE PLAN EXPIRATION THE SITE PLAN APPROVAL WILL BE DEEMED TO HAVE EXPIRED UNLESS WORK HAS COMMENCED WITHIN ONE (1) YEAR OF THE APPROVAL OR WITHIN A TIME PERIOD UP TO THREE (3) YEARS FROM THE APPROVAL DATE AS AGREED UPON IN WRITING BY THE CITY AND THE APPLICANT. REQUESTS TO EXTEND APPROVALS MUST BE RECEIVED BEFORE THE ONE (1) YEAR EXPIRATION DATE.
- SUBDIVISION EXPIRATION THE SUBDIVISION APPROVAL IS VALID FOR UP TO THREE (3) YEARS FROM THE DATE OF PLANNING BOARD APPROVAL.
- MYLAR COPIES MYLAR COPIES OF THE AS-BUILT DRAWINGS FOR THE PUBLIC STREETS AND OTHER PUBLIC INFRASTRUCTURE IN THE SUBDIVISION MUST BE SUBMITTED TO PUBLIC WORKS PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.

APPROVAL- CITY OF PORTLAND
PLANNING BOARD

DATE	
CHAIRPERSON	



GENERAL NOTES:

- OWNERS OF RECORD: CITY OF PORTLAND
TAX MAP 28 BLOCK O LOT 17
C.C.R.D. BOOK 3029 PAGE 547
C.C.R.D. BOOK 10985 PAGE 260

160 NEWBURY STREET LLC
TAX MAP 28 BLOCK O LOT 3
C.C.R.D. BOOK 29426 PAGE 8
- APPLICANT: MIDDLE STREET HOUSING PARTNERS, LP
ONE CITY CENTER, 4TH FLOOR
PORTLAND, ME 04101
- CIVIL ENGINEER: TERRADYN CONSULTANTS, LLC
565 CONGRESS STREET, SUITE 201
PORTLAND, ME 04101
- ARCHITECT: CWS ARCHITECTS
264 US ROUTE ONE, SUITE 100-2A
PORTLAND, ME 04101
- SURVEYOR: OWEN HASKELL, INC.
390 US ROUTE ONE, SUITE 310
FALMOUTH, ME 04105
- ZONING DISTRICT: INDIA STREET FORM BASED CODE DISTRICT (IS-FBC)
SUBDISTRICTS: URBAN ACTIVE (UA)
URBAN TRANSITIONAL (UT)
- TOPOGRAPHIC AND BOUNDARY SURVEY INFORMATION WAS PROVIDED BY OWEN HASKELL, INC. BENCHMARK = HYDRANT BONNET BOLT ON SOUTHEASTERN SIDE OF MIDDLE STREET, ELEVATION 29.76, NGVD 1929 DATUM.
- BEARINGS AND COORDINATES ARE BASED ON MAINE STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 83. ELEVATIONS ARE BASED ON CITY DATUM. HORIZONTAL AND VERTICAL CONTROL DATA PROVIDED BY THE CITY OF PORTLAND AND TAKEN FROM PLAN REFERENCE 2.
- FEMA MAP COMMUNITY PANEL NUMBER 230051 0014 B. THE SITE IS LOCATED IN A C ZONE.
- THE FACILITY IS SERVICED BY PUBLIC WATER, SEWER, AND UNDERGROUND POWER. THE PROJECT INCLUDES UPDATES TO THE POWER SERVICE INCLUDING THE INSTALLATION OF NEW UNDERGROUND SYSTEM. SEE SITE ELECTRICAL PLANS FOR DETAILS.
- THE OWNER SHALL BE RESPONSIBLE FOR ENGAGING A PRIVATE TRASH HAULER FOR WASTE REMOVAL.
- THE ENTIRE SITE SHALL BE DEVELOPED AN/OR MAINTAINED AS DEPICTED ON THE SITE PLAN. APPROVAL OF THE PLANNING AUTHORITY OR PLANNING BOARD SHALL BE REQUIRED FOR ANY ALTERATION TO OR DEVIATION FROM THE APPROVED SITE PLAN, INCLUDING, WITHOUT LIMITATION: TOPOGRAPHY, DRAINAGE, LANDSCAPING, RETENTION OF WOODED OR LAWN AREAS, ACCESS, SIZE, LOCATION, AND SURFACING OF PARKING AREAS AND LOCATION AND SIZE OF BUILDINGS.

PLAN REFERENCES:

- STANDARD BOUNDARY SURVEY PLAN OF PROPERTY AT 77 MIDDLE STREET PORTLAND MAINE FOR GEORGE W. BEALS DATED NOVEMBER 23, 1992 BY LEROY A. WITHAM LOCATED IN THE CITY OF PORTLAND'S ENGINEERING ARCHIVES AS PLAN 866/1.
- CITY OF PORTLAND PUBLIC WORKS DEPARTMENT CONTRACT DRAWINGS HAMPSHIRE STREET RECONSTRUCTION BRATTLE STREET RECONSTRUCTION PROJECT NO. 210-3100-430 DATED 11/16/01, ON FILE AT THE CITY OF PORTLAND.
- BOUNDARY & TOPOGRAPHIC SURVEY AT #83 MIDDLE STREET, PORTLAND, MAINE MADE FOR COMMUNITY HOUSING OF MAINE ONE CITY CENTER, 4TH FLOOR PORTLAND, ME 04101, PREPARED BY OWEN HASKELL, INC. AND DATED MARCH 9, 2020.

WAIVERS:

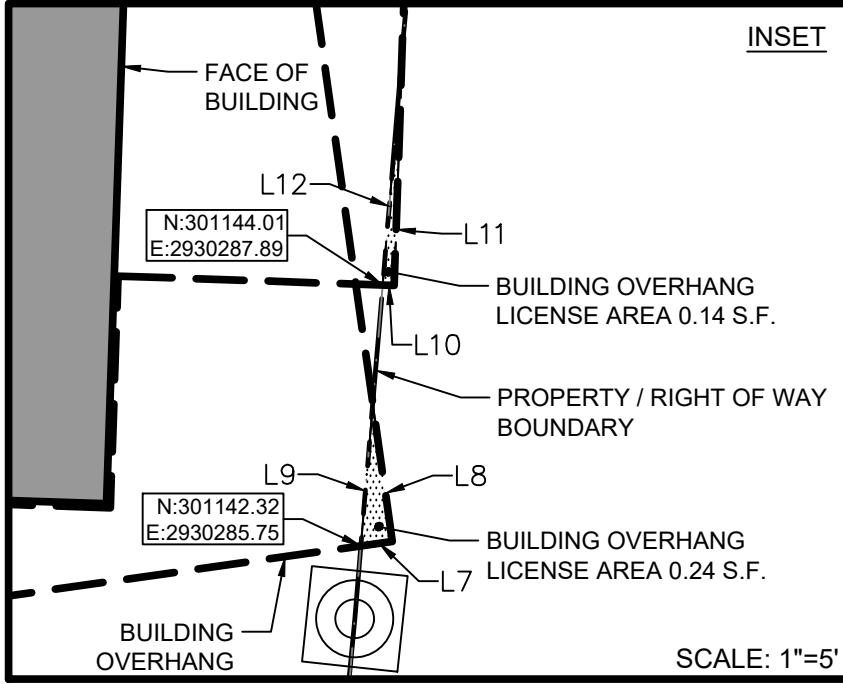
- TECHNICAL MANUAL SECTION 1.7.2.3: TO ALLOW DRIVEWAY WIDTH OF 12.0' TO SERVE THE NEW DEVELOPMENT AS SHOWN ON SITE PLAN C-4.0.
- TECHNICAL MANUAL SECTION 1.14: TO ALLOW THE PARKING AISLE WIDTHS WITHIN THE PARKING STRUCTURE TO BE NARROWER THAN THE REQUIRED 24' WIDTH, AS SHOWN ON SITE PLAN C-4.0.
- TECHNICAL MANUAL SECTION 1.14: TO ALLOW THE OFF STREET PARKING STRUCTURE TO BE COMPRISED OF 25% COMPACT PARKING SPACES, AS SHOWN ON SITE PLAN C-3.0.

EASEMENTS & LICENSES:

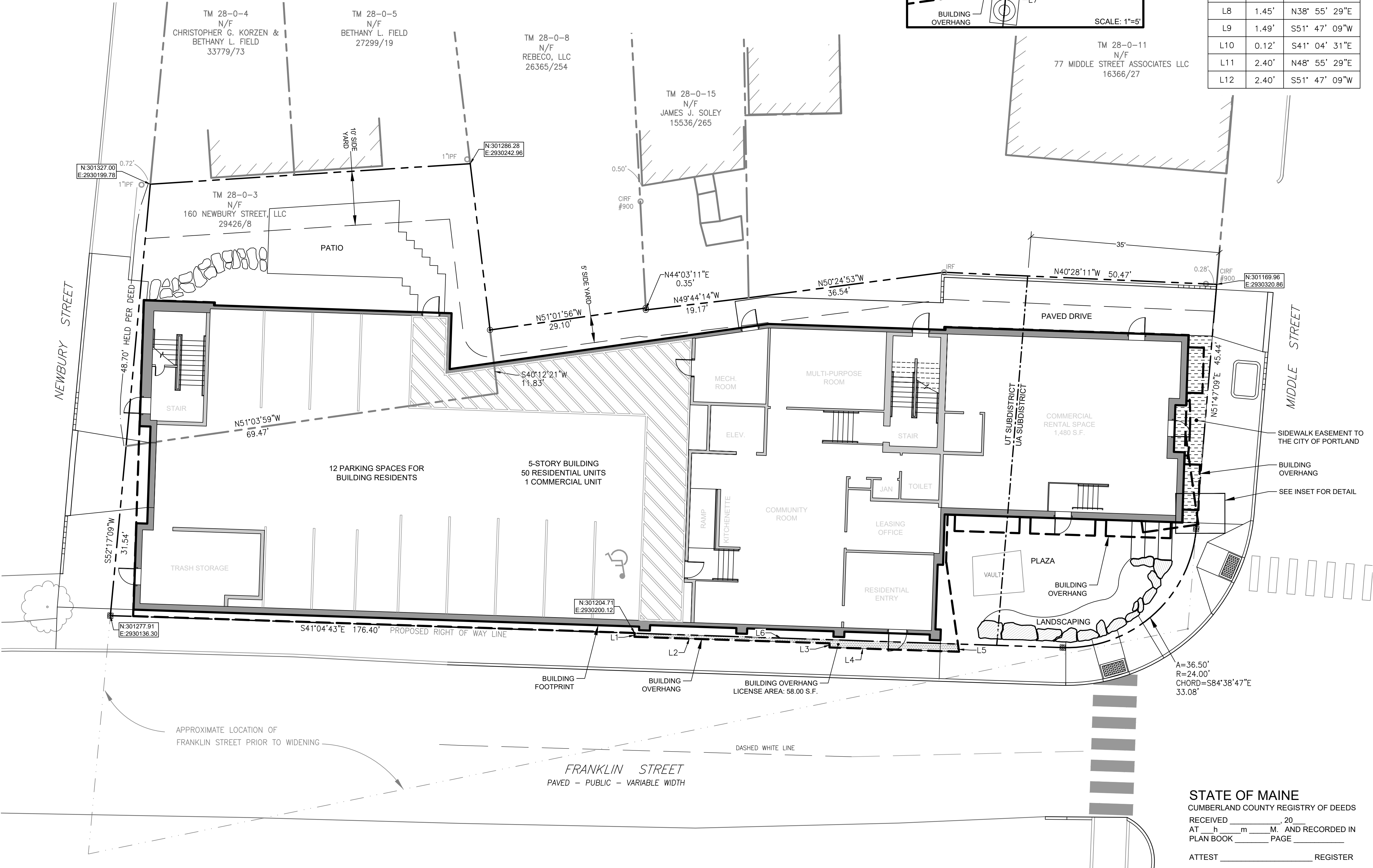
- SIDEWALK EASEMENT TO THE CITY OF PORTLAND, RECORDED IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK ___ PAGE ___.
- BUILDING OVERHANG LICENSES DEFINED IN THE LINE TABLE. RECORDED IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS IN BOOK ___ PAGE ___.

LEGEND

- EXISTING PROPERTY LINE
- PROJECT SITE BOUNDARY
- EXISTING EDGE OF PAVEMENT
- PROPOSED EDGE OF PAVEMENT
- EXISTING CURB
- PROPOSED CURB
- EXISTING IRON PIPE OR ROD
- CAPPED IRON ROD TO BE SET
- GRANITE MONUMENT TO BE SET
- EXISTING BUILDING
- PROPOSED BUILDING
- PROPOSED BUILDING OVERHANG
- PROPOSED EASEMENT
- PROPOSED BUILDING OVERHANG LICENSE AREA

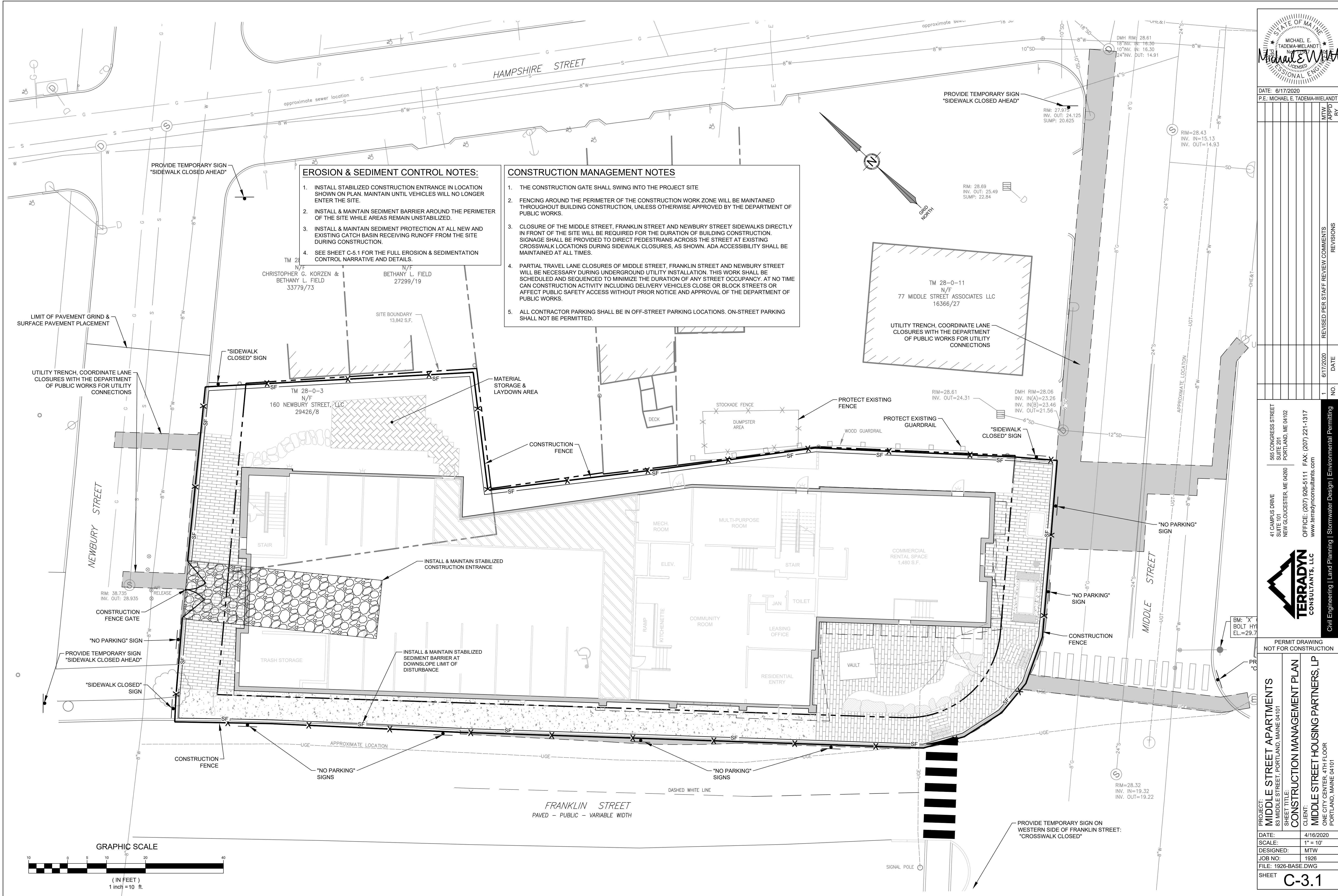


BUILDING OVERHANG LICENSE LINE TABLE		
Line #	Length	Direction
L1	0.67'	S48° 55' 35"W
L2	36.14'	S41° 04' 31"E
L3	0.75'	S48° 55' 29"W
L4	24.00'	S41° 04' 31"E
L5	1.44'	N38° 55' 29"E
L6	59.88'	N41° 04' 43"W
L7	0.33'	S51° 04' 31"E
L8	1.45'	N38° 55' 29"E
L9	1.49'	S51° 47' 09"W
L10	0.12'	S41° 04' 31"E
L11	2.40'	N48° 55' 29"E
L12	2.40'	S51° 47' 09"W



STATE OF MAINE
CUMBERLAND COUNTY REGISTRY OF DEEDS
RECEIVED _____ 20____
AT _____ h _____ m _____ M. AND RECORDED IN
PLAN BOOK _____ PAGE _____
ATTEST _____ REGISTER

TO BE REVIEWED		PLS. _____ DATE: _____	
DATE: _____		P.E.: MICHAEL E. TADEMA-MIELANDT	
		MTW APPD BY	
		REVISED PER STAFF REVIEW COMMENTS	
		DATE	
		NO.	
PROJECT: MIDDLE STREET APARTMENTS 83 MIDDLE STREET, PORTLAND, MAINE 04101		SHEET TITLE: RECORDING PLAT	
CLIENT: MIDDLE STREET HOUSING PARTNERS, LP ONE CITY CENTER, 4TH FLOOR PORTLAND, MAINE 04101		DATE: 4/16/2020 SCALE: 1" = 10' DESIGNED: MTW JOB NO: 1926 FILE: 1926-BASE.DWG SHEET C-2.0	



DATE: 6/17/2020
P.E.: MICHAEL E. TADEAMA-WIELANDT

NO.	DATE	REVISIONS	BY
1	6/17/2020	REVISED PER STAFF REVIEW COMMENTS	MTW

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com



PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:	MIDDLE STREET APARTMENTS
SHEET TITLE:	CONSTRUCTION MANAGEMENT PLAN
CLIENT:	MIDDLE STREET HOUSING PARTNERS, LP
DATE:	4/16/2020
SCALE:	1" = 10'
DESIGNED:	MTW
JOB NO.:	1926
FILE:	1926-BASE.DWG
SHEET	C-3.1

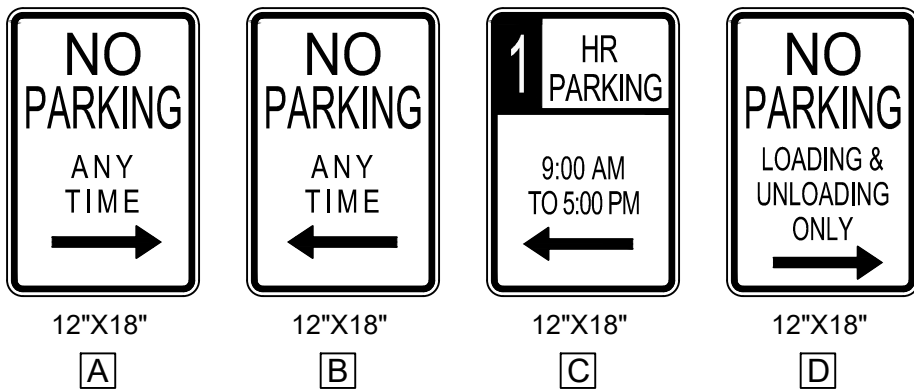
GENERAL NOTES

- OWNERS OF RECORD:
CITY OF PORTLAND
TAX MAP 28 BLOCK O LOT 17
C.C.R.D. BOOK 3029 PAGE 547
C.C.R.D. BOOK 10985 PAGE 280
- EXISTING CONDITIONS, INCLUDING THE BOUNDARY AND TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED UPON PLAN REFERENCE #3.
- BEARINGS AND COORDINATES ARE BASED ON MAINE STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 83. ELEVATIONS ARE BASED ON CITY DATUM, NGVD 29. HORIZONTAL AND VERTICAL CONTROL DATA PROVIDED BY THE CITY OF PORTLAND AND TAKEN FROM PLAN REFERENCE 2.
- UTILITIES SHOWN ARE TAKEN FROM PLAN REFERENCE #2.
- THE RIGHT OF WAY LINE SHOWN ALONG FRANKLIN STREET IS A PROPOSED LOCATION. THE EXISTING RIGHT OF WAY LINE IS THE SOUTHWESTERLY PROPERTY LINES ALONG LOTS 28-O-3, 28-O-8, 28-O-15 & 28-O-11.

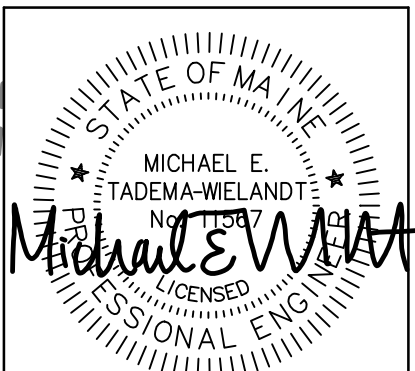
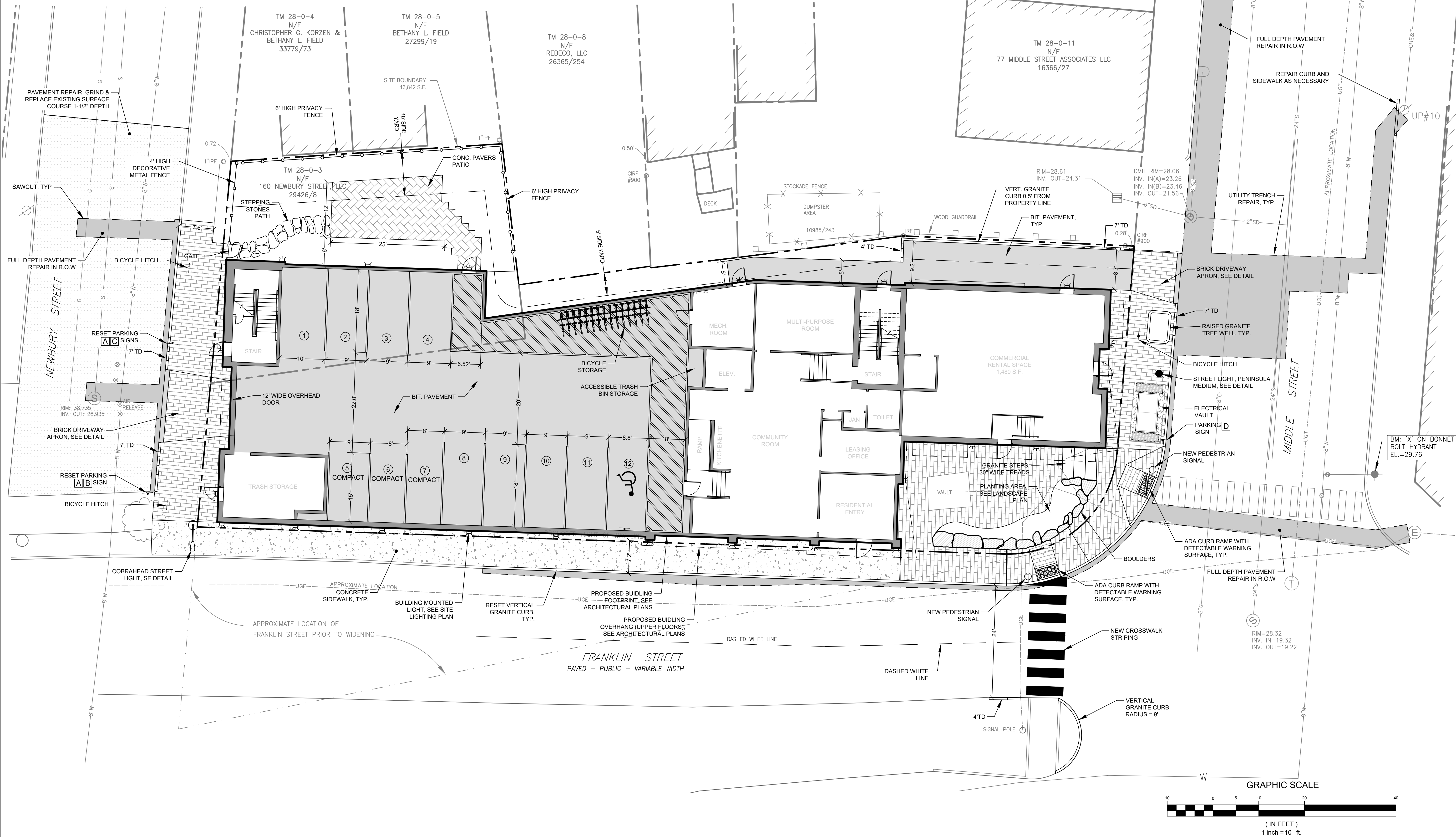
PLAN REFERENCES

- STANDARD BOUNDARY SURVEY PLAN OF PROPERTY AT 77 MIDDLE STREET PORTLAND MAINE FOR GEORGE W. BEALS DATED NOVEMBER 23, 1992 BY LEROY A. WITHAM LOCATED IN THE CITY OF PORTLAND'S ENGINEERING ARCHIVES AS PLAN 866/1.
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SIGN LEGEND:



NOTE: PARKING SIGNS TO BE APPROVED BY THE TRAFFIC DIVISION OF THE CITY OF PORTLAND PUBLIC WORKS DEPARTMENT.



DATE: 6/17/2020
P.E.: MICHAEL E. TADEAMA-WIELANDT

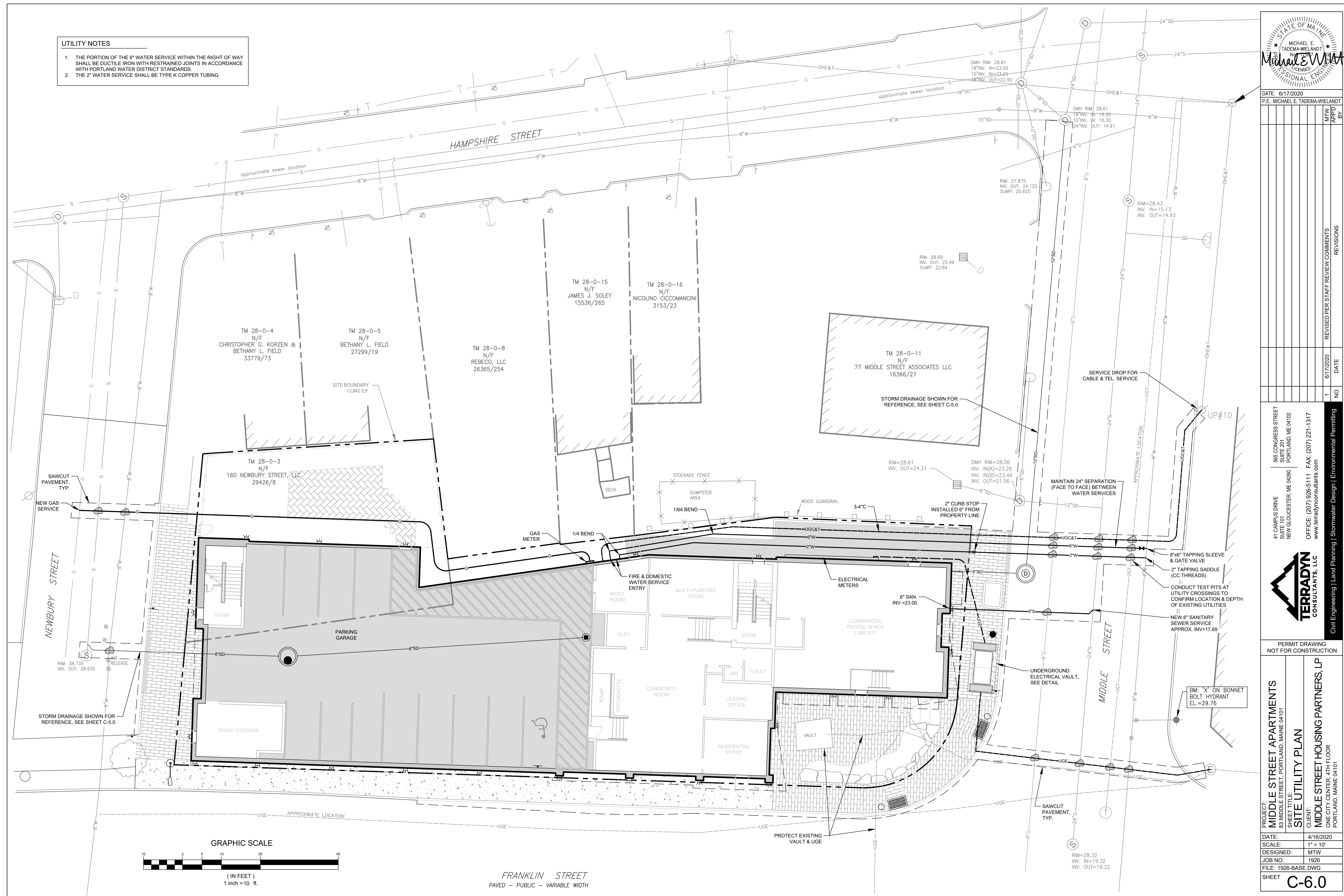
NO.	DATE	REVISIONS
1	6/17/2020	REVISED PER STAFF REVIEW COMMENTS

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com



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NOT FOR CONSTRUCTION

PROJECT: MIDDLE STREET APARTMENTS
83 MIDDLE STREET, PORTLAND, MAINE 04101
SHEET TITLE: SITE LAYOUT PLAN
CLIENT: MIDDLE STREET HOUSING PARTNERS, LP
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101
DATE: 4/16/2020
SCALE: 1" = 10'
DESIGNED: MTW
JOB NO: 1926
FILE: 1926-BASE.DWG
SHEET C-4.0



STATE OF MAINE
MICHAEL E. TADEMA-WIELANDT
No. 11587
MECHANICAL ENGINEERING
LICENSED PROFESSIONAL ENGINEER

DATE: 6/17/2020
P F : MICHAEL E TADEMA-WIELANDT

[illegible]

41 CAMPUS DRIVE
SUITE 101
NEW GLOUCESTER, ME 04260

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradyneconsultants.com

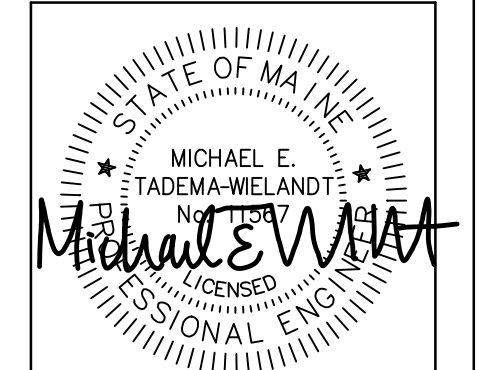
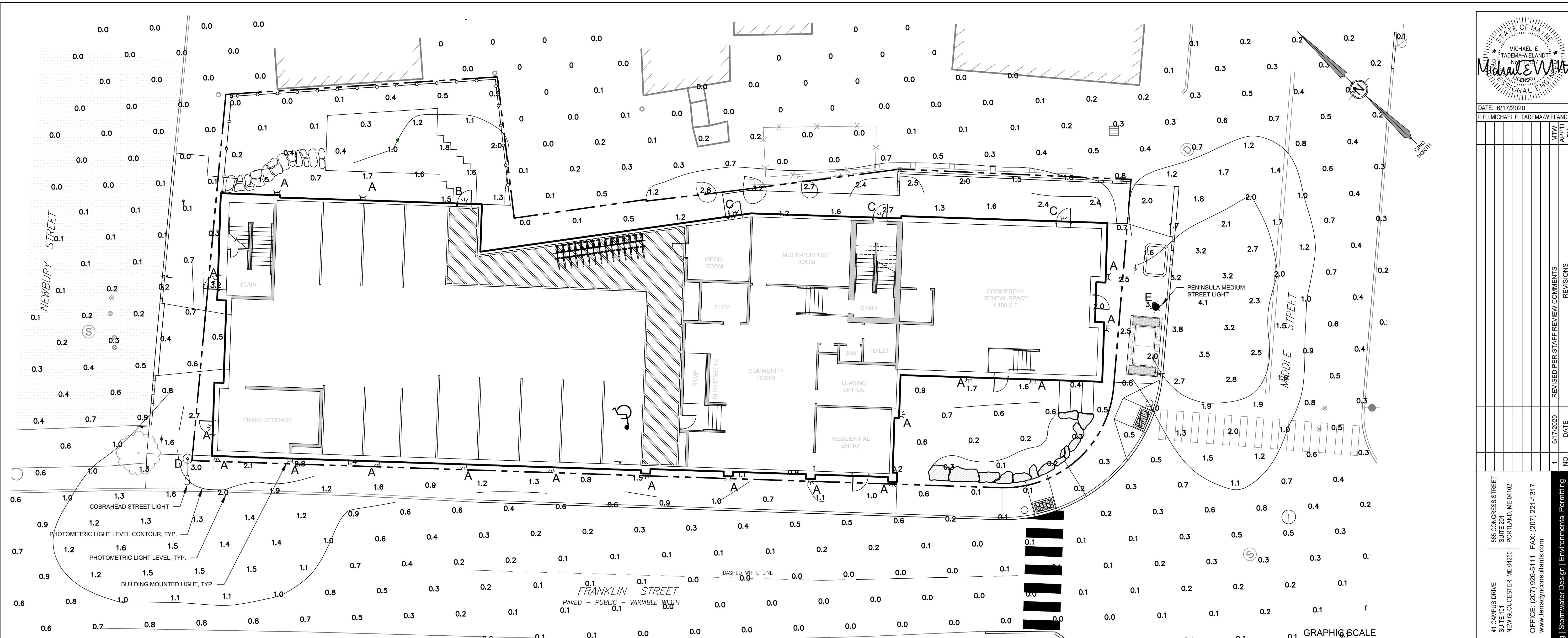
Stormwater Design | Environmental Permitting



Civil

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT:	MIDDLE STREET APARTMENTS 83 MIDDLE STREET, PORTLAND, MAINE 04101
SHEET TITLE:	SITE UTILITY PLAN
DATE:	4/16/2020
SCALE:	1" = 10'
DESIGNED:	MTW
JOB NO:	1926
FILE:	1926-BASE DWG
SHEET	C-6.0
CLIENT:	MIDDLE STREET HOUSING PARTNERS, LP ONE CITY CENTER, 4TH FLOOR PORTLAND, MAINE 04101



DATE: 6/17/2020
P.E.: MICHAEL E. TADEAMA-WIELANDT

NO.	DATE	REVISED PER STAFF REVIEW COMMENTS	MTW	APPROD	BY
1	6/17/2020				

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

41 CAMPUS DRIVE
SUITE 101
NEW GLOUCESTER, ME 04260

OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradynconsultants.com

Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: MIDDLE STREET APARTMENTS
83 MIDDLE STREET, PORTLAND, MAINE 04101

SHEET TITLE: PHOTOMETRIC LIGHTING PLAN

CLIENT: MIDDLE STREET HOUSING PARTNERS, LP
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

DATE: 4/16/2020
SCALE: 1" = 10'
DESIGNED: MTW
JOB NO: 1926
FILE: 1926-PHOTOMETRICS.DWG
SHEET C-7.0

BEGA
Wall luminaire
IP 64

Product data sheet

Application
LED wall luminaires for orientating lighting tasks.

Product description
Luminaire made of aluminum alloy, aluminum and stainless steel
Mat safety glass
Stainless steel
2 mounting holes ø 4.3 mm
Distance apart 150 mm
2 cable entries for through-wiring of connecting cable ø 11-16.5 mm
Connection terminal 2.5"

Earth conductor connection
LED power supply unit
220-240 V ~ 50/60 Hz
0/1-115-254 V
Safety class
Protection class IP 64
Dust-tight and protection against splash water
Impact strength IK07
Protection against mechanical impacts < 25 J
UL Safety mark
CE - Conformance mark
Weight: 0.7 kg

Inrush current
Inrush current 7 A / 112 µs
Maximum number of luminaires of this type per miniature circuit breaker:
B 10A: 38 luminaires
B 16A: 81 luminaires
C 10A: 64 luminaires
C 16A: 102 luminaires

Lamp
Module connected wattage 4.2 W
Luminaire connected wattage 5.3 W
Rated temperature T_{amb} = 25 °C

Article No. 22 261 K4
Module designation 2x LED-0234/040
Colour temperature 3000 K
Colour rendering index CRI > 80
Module luminous flux 360 lm
Luminaire luminous flux 360 lm
Luminaire luminous efficacy 66.1 lm/W

Service life - Ambient temperature
LED plus: > 50,000h
LED module: > 200,000h (L80B50)
100,000h (L80B50)
Ambient temperature T_{amb} = 50 °C (100 %)
LED plus: 50,000h
LED module: 167,000h (L80B50)

Light technique
Luminaire data for the light planning program DALI for outdoor lighting, street lighting and indoor lighting as well as luminaire data in ELLUMDAT and E3-format you will find on the BEGA web page www.bega.com.

Light distribution
DALI for outdoor lighting, street lighting and indoor lighting as well as luminaire data in ELLUMDAT and E3-format you will find on the BEGA web page www.bega.com.

HUBBELL Outdoor Lighting

DATE: LOCATION:
TYPE: PROJECT:
CATALOG #:

LNC COMPACT LED LITEPAK

FEATURES

- Compact LNC LED is designed for perimeter illumination and available in 3 lumen packages for safety, security and identity
- 3000K, 4000K, 5000K and Amber color temperatures
- Up to 41 spacing to mounting height ratio means fewer fixtures to install
- Acrylic diffuser included. Use for applications near entrances or locations where reduced brightness is desired. (Maximum spacing with diffuser 30ft)
- Die-cast aluminum housing with decorative Laredo styling
- Full cut-off neighbor friendly
- Listed to UL1598 for use in wet locations

RELATED PRODUCTS

SPECIFICATIONS

CONSTRUCTION

- Decorative die-cast aluminum housing and door
- Rugged design protects internal components and provides excellent thermal management for long life
- Powder paint finishes provide lasting appearance in outdoor environments
- Full cut-off distributor; Ambient diffuser included; use for applications near entrances or locations where reduced brightness is desired

OPTICS

- LNC LED is available in Type II, III and IV available, see page 2 for electrical details
- LNC LED is available in Type II, III and IV available, see page 2 for electrical details

INSTALLATION

- Quick mount bracket provides quick installation, designed for recessed box 4" square junction box
- 60,000 hours minimum LED life at L96 rating per IESNA TM-21-11
- Minimum operating temperature is -40°C/-40°F
- 0-10V dimming 120-277V only
- LNC LED - 5 LEDs, Types II, III or IV available, see page 2 for electrical details
- LNC LED - 7 LEDs, Type II, III or IV available, see page 2 for electrical details
- LNC LED - 9 LEDs, Types II, III or IV available, see page 2 for electrical details

CERTIFICATIONS

- DLP Designlight Consortium Qualified, with some Premium Qualified configurations. Please refer to the DLP website for specific product qualifications at www.designlight.org
- Listed and labeled to UL 1598 for wet locations, 25°C ambient environments

WARRANTY

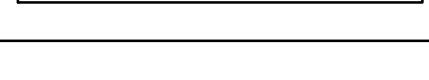
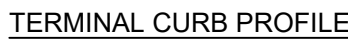
- 5 year limited warranty
- See UL Standard Warranty for additional information

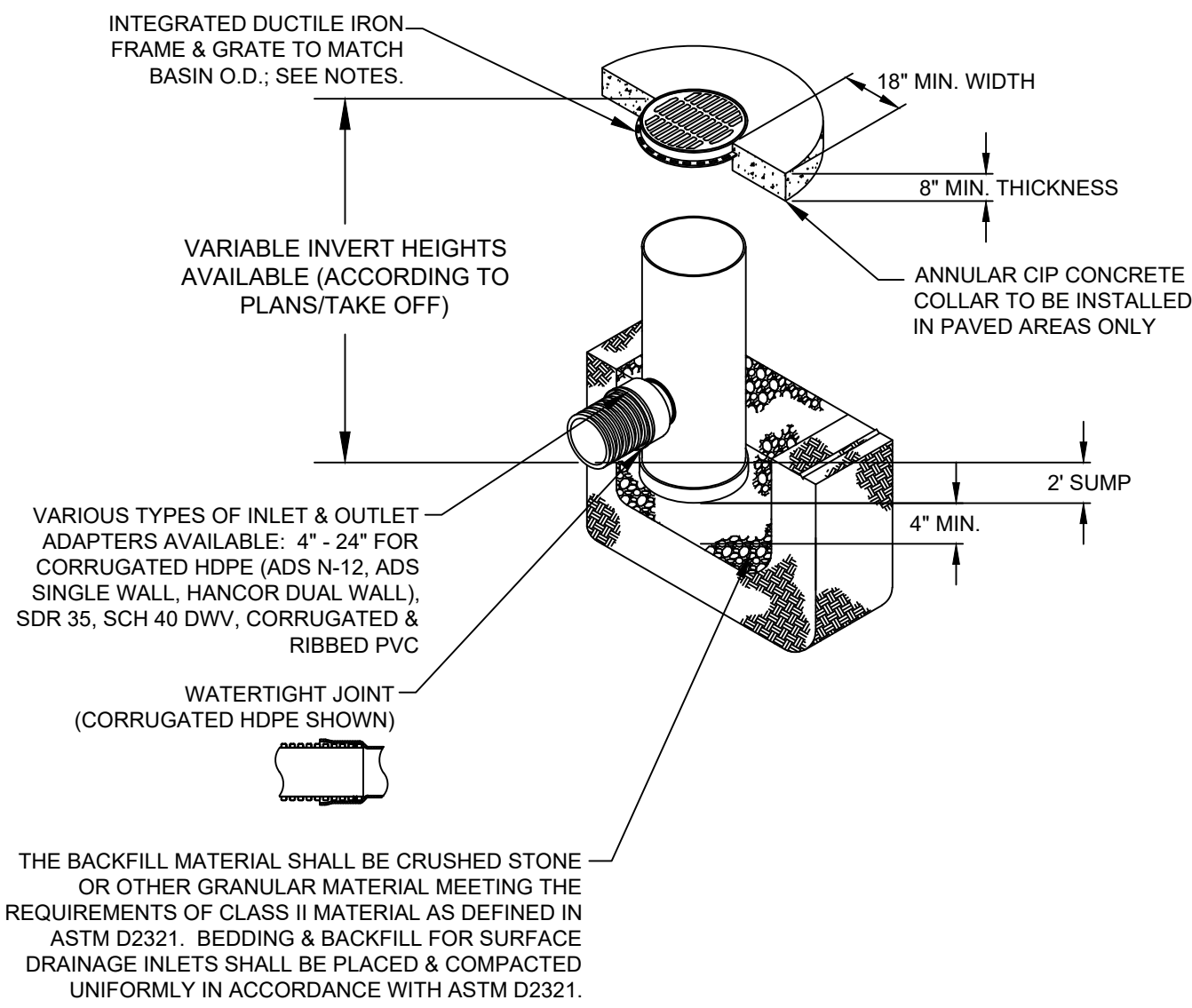
KEY DATA

Lumen Range	800-2100
Wattage Range	19-22
Efficacy Range (LPW)	64-95
Fixture Projected Life (hours)	L96-60K
Weights lbs. (kg)	9.6 (2.4)

LIGHT FIXTURE TABLE						
LABEL	LIGHT FIXTURE	MANUFACTURER	MANUFACTURERS ID	NUMBER OF LIGHTS	MOUNTING HEIGHT	MOUNTING LOCATION
A	BEGA WALL 22261	BEGA LIGHTING	BE_22261K3	18	VARIES, SEE ARCHITECTURAL PLAN	WALL
B	LNC-9L COMPACT LED LITEPAK	HUBBELL	LNC-9LU-3K-4	1	9'	WALL
C	LNC-7L COMPACT LED LITEPAK	HUBBELL	LNC-7LU-3K-2	3	9'	WALL
D	RSW LED MEDIUM TYPE III	CREE LIGHTING	RSWM-A-HT-3ME-9L-30K7-UL-GY-N-X6	1	32'	POLE
E	HOLOPHANE ESPLANADE LED II	HOLOPHANE LIGHTING	ESL2-P20S-30K-AS-CMC-TG3-S-P7-NL2X 2-BHDF13-200CMC	1	19'-3"	POLE

NOTES:
1. LIGHTING PLAN PREPARED USING DESIGN MASTER PHOTOMETRICS SOFTWARE
2. ONLY PROPOSED LIGHTING FIXTURES ARE MODELED
3. DEPRECIATION FACTOR FOR LED IS 0.90



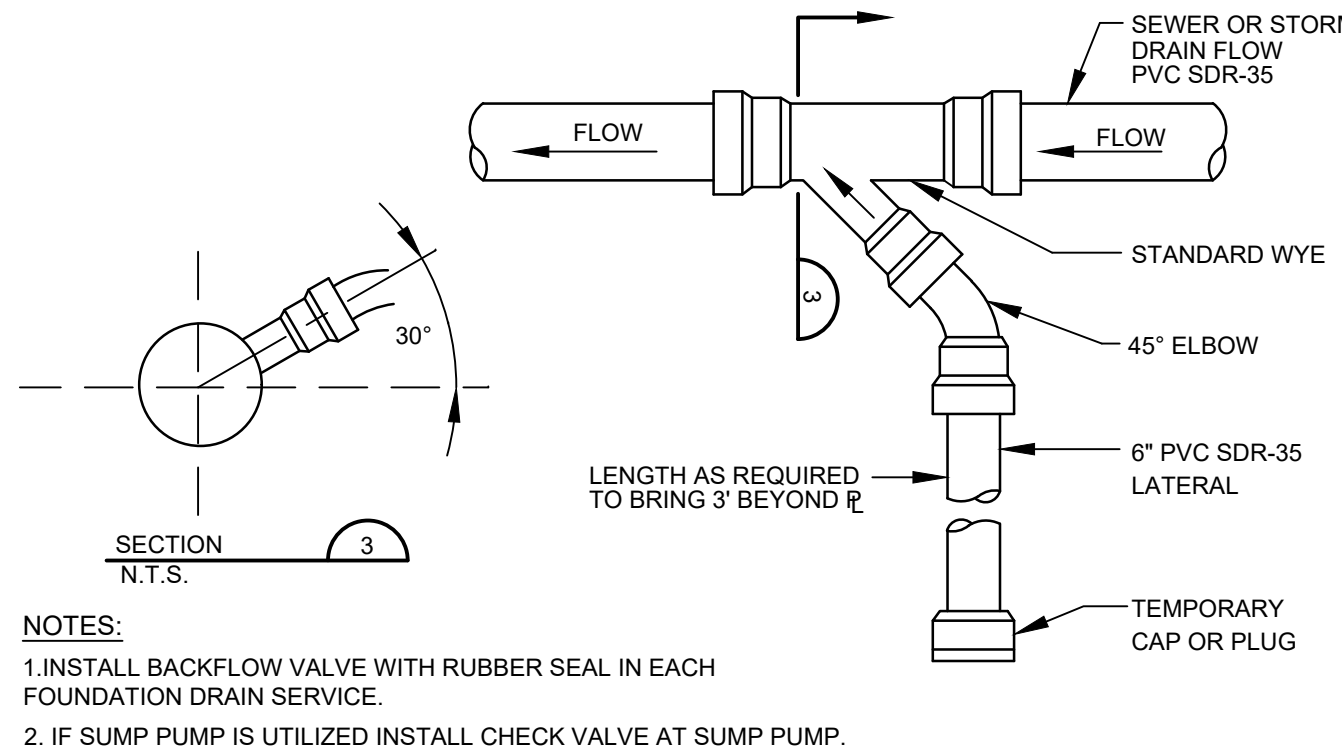


NOTES:

1. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
4. ALL CATCH BASINS SHALL HAVE STANDARD H-20 GRATES
5. ALL DRAIN MANHOLES SHALL HAVE SOLID COVER

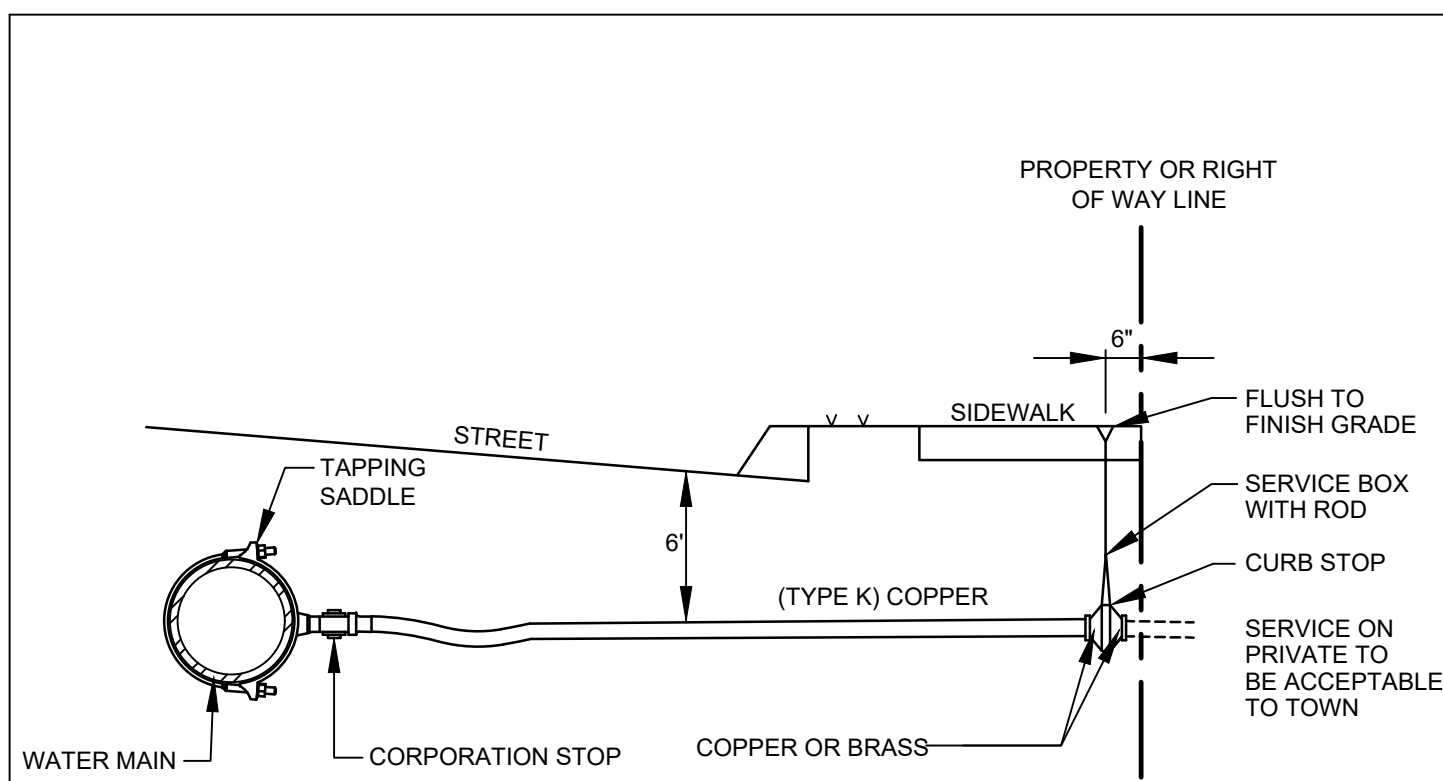
NYLOPLAST DRAIN BASIN

NOT TO SCALE



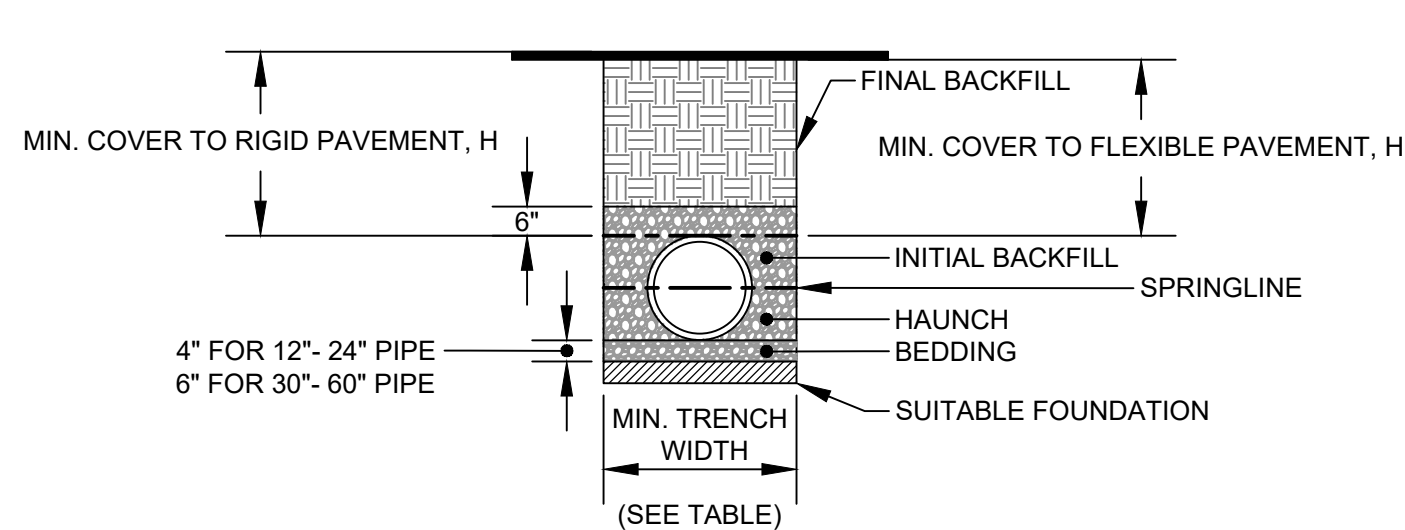
SEWER / FOUNDATION DRAIN SERVICE CONNECTION

NOT TO SCALE



TYPICAL WATER SERVICE CONNECTION

NOT TO SCALE



NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION

2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.

3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.

4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER, UNLESS OTHERWISE NOTED BY THE ENGINEER. MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm).

5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.

6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOATATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

RECOMMENDED MINIMUM TRENCH WIDTHS	
PIPE DIAM.	MIN. TRENCH WIDTH
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
54"	88"
60"	96"

MINIMUM RECOMMENDED COVER BASED ON VEHICLE LOADING CONDITIONS

SURFACE LIVE LOADING CONDITION		
PIPE DIAM.	H-25	HEAVY CONSTRUCTION (75T AXLE LOAD) *
12" - 48"	12"	48"
54" - 60"	24"	60"

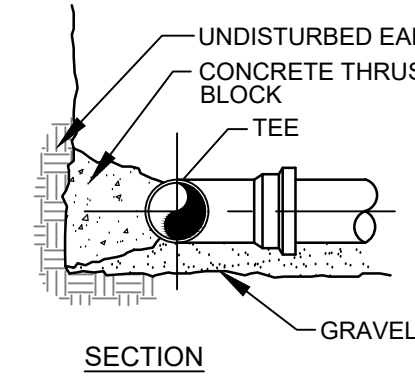
* VEHICLES IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

7. INSULATION: RIGID INSULATION SHALL BE PROVIDED FOR PIPES WITH LESS THAN 4" OF COVER IN ACCORDANCE WITH THE FOLLOWING TABLE:

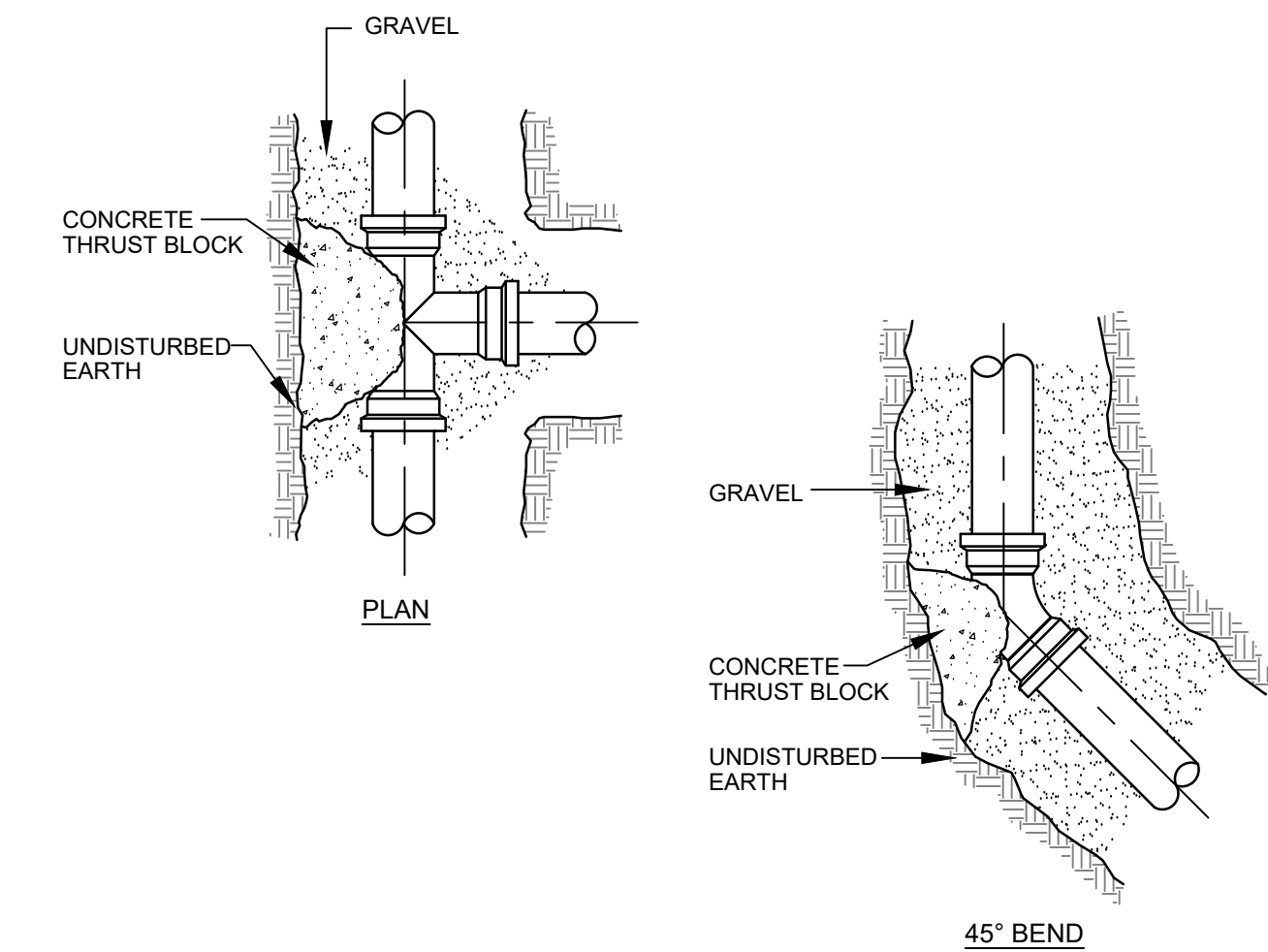
COVER OVER PIPE	INSULATION THICKNESS
12" - 24"	3"
24" - 36"	2"
36" - 48"	1"
48"+	NONE

TYPICAL TRENCH DETAIL

NOT TO SCALE

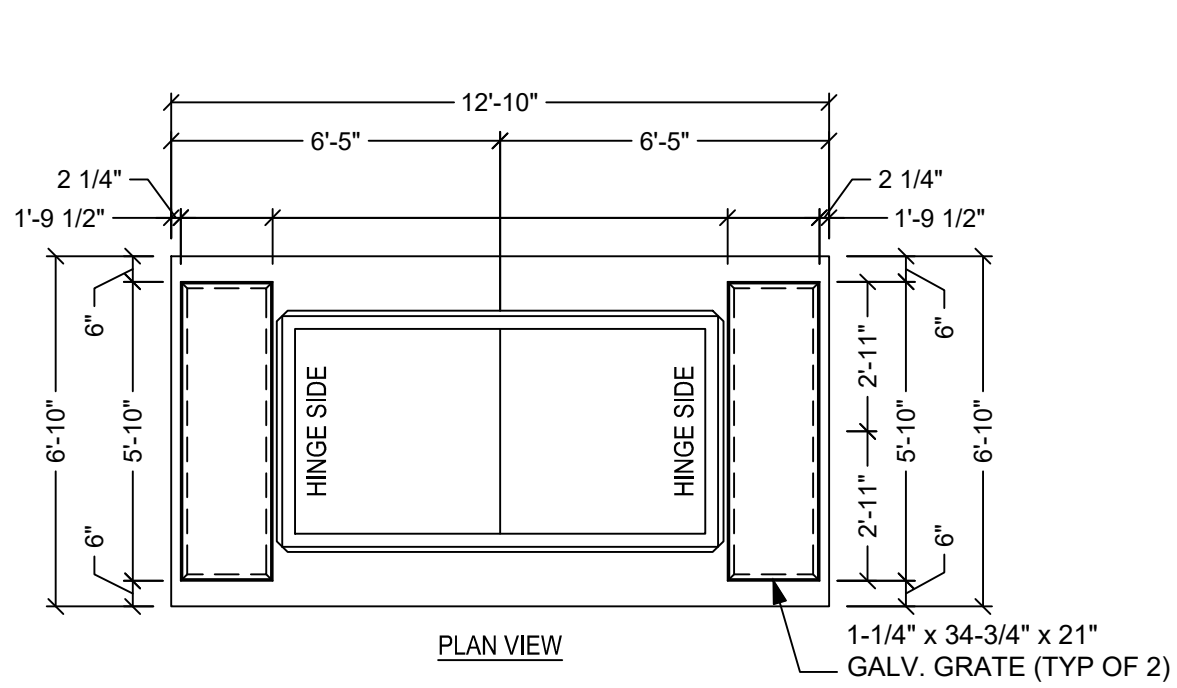


CONCRETE THRUST BLOCK SIZE REQUIREMENTS			
FITTINGS		SQ. FT. OF BEARING ON UNDISTURBED SOIL	
PIPE SIZE	90° BENDS	45° BENDS	TEES AND PLUGS
6"	4.0	2.0	3.0
8"	8.0	4.0	6.0
12"	15	10	10



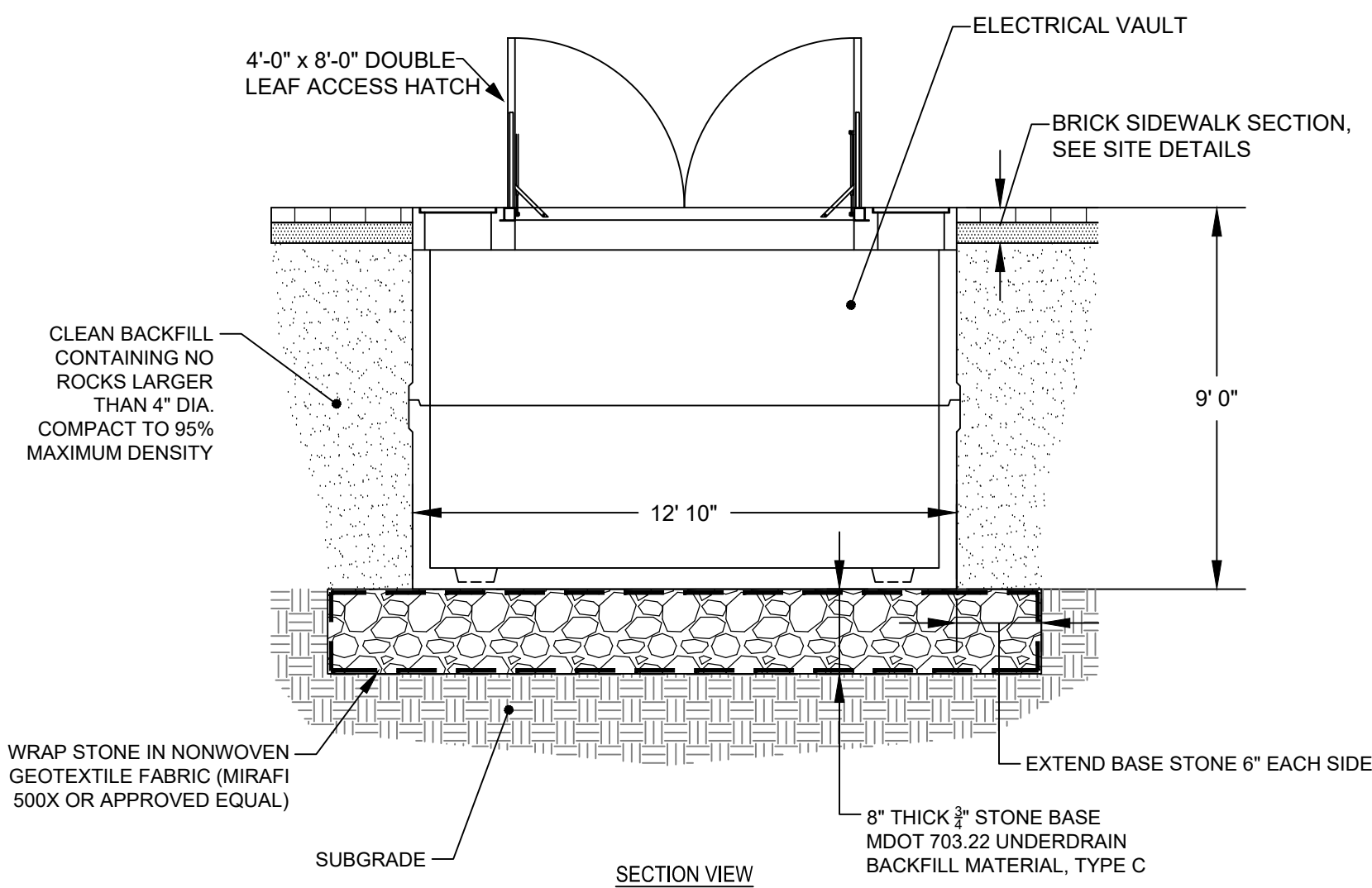
TEE & BEND DETAIL

NOT TO SCALE

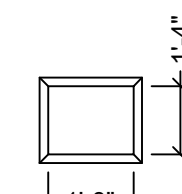


ELECTRICAL SIDEWALK VAULT DETAILS

NOT TO SCALE

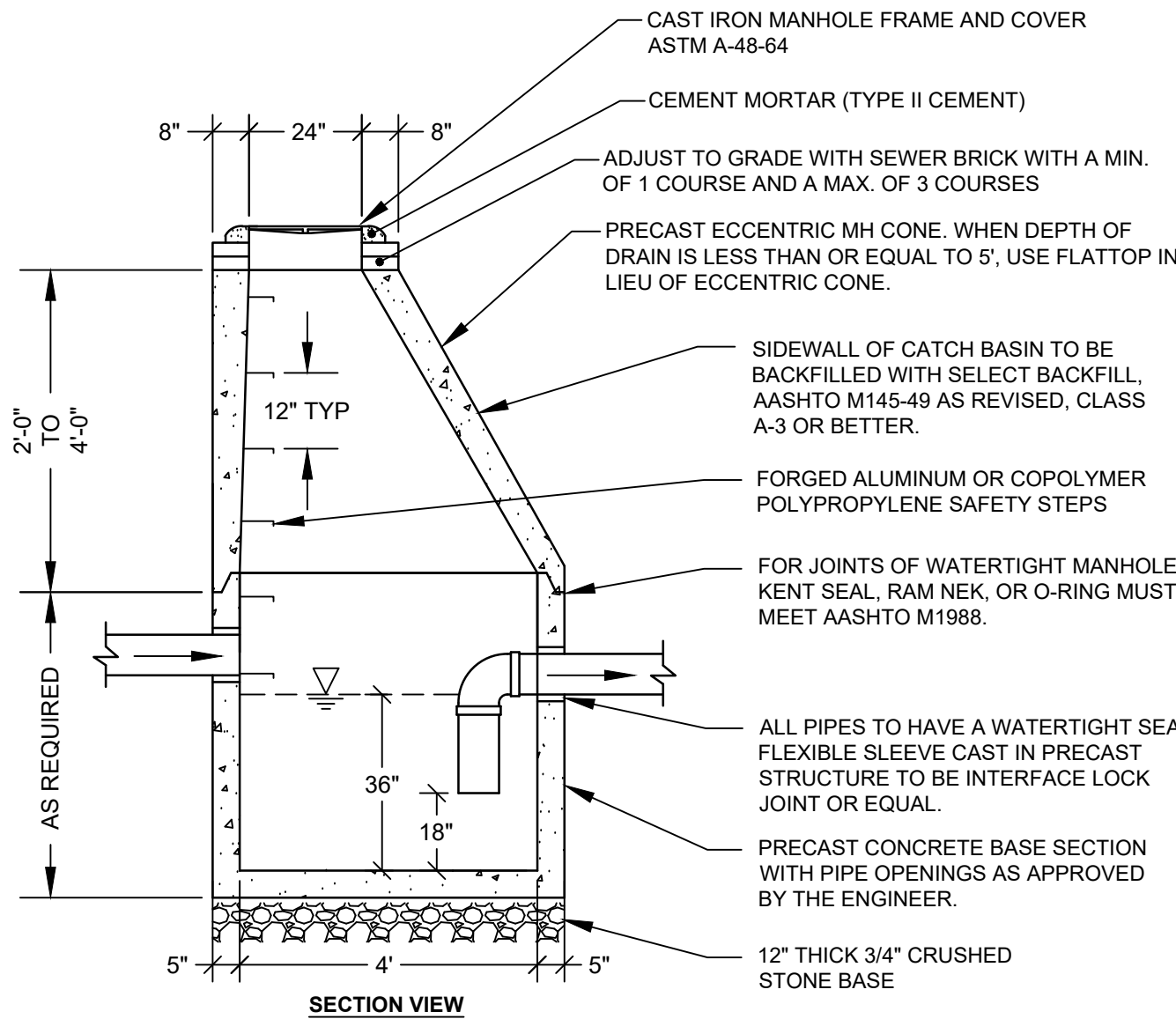


CASTING WIEGHTS:
BASE: 16,850 LBS
BARREL: 8,890 LBS
COVER: 6,750 LBS



NOTES:

1. CONCRETE: 5,000 PSI AFTER 28 DAYS
2. JOINTS TO BE SEALED WITH CONSEAL CS102 JOINT SEALANT
3. KNOCKOUTS EXTEND 4" INTO THE WALL WITH SIDES SLOPED @ 45° PROVIDING A BELL TYPE OPENING. KNOCKOUTS SHOULD BE CLEAR OF ANY REINFORCEMENTS.
4. REINFORCING: DESIGNED FOR H-20 LOADING. HATCH DOORS SHALL BE COATED WITH AN ANTI-SKID SURFACE HAVING A MINIMUM COEFFICIENT OF FRICTION OF 0.6 AND BE UL LISTED AS SLIP RESISTANT.
5. VAULT SHALL BE DESIGNED TO WITHSTAND H20 WHEEL LOADING WITH 6" OF OVERBURDEN. THE DESIGN SHALL ALSO COMPLY WITH STRENGTH REQUIREMENTS OF THE NEC SECTION 323A. PROVIDE SHOP DRAWINGS STAMPED BY A STATE OF MAINE REGISTERED ENGINEER UPON REQUEST.
6. MOUNTING FOR CABLE RACKS STC. CAST IN WALL BY FURTHER PLANS OR FIELD LOCATED. CABLES ARE TO BE RACKED ALONG ONE WALL ONLY. OPTION OF USING 8" THICK WALLS TO OFFSET ANY OTHER LOAD FACTORS, SOILS OR OTHER FACTORS SPECIFIC TO SITE.

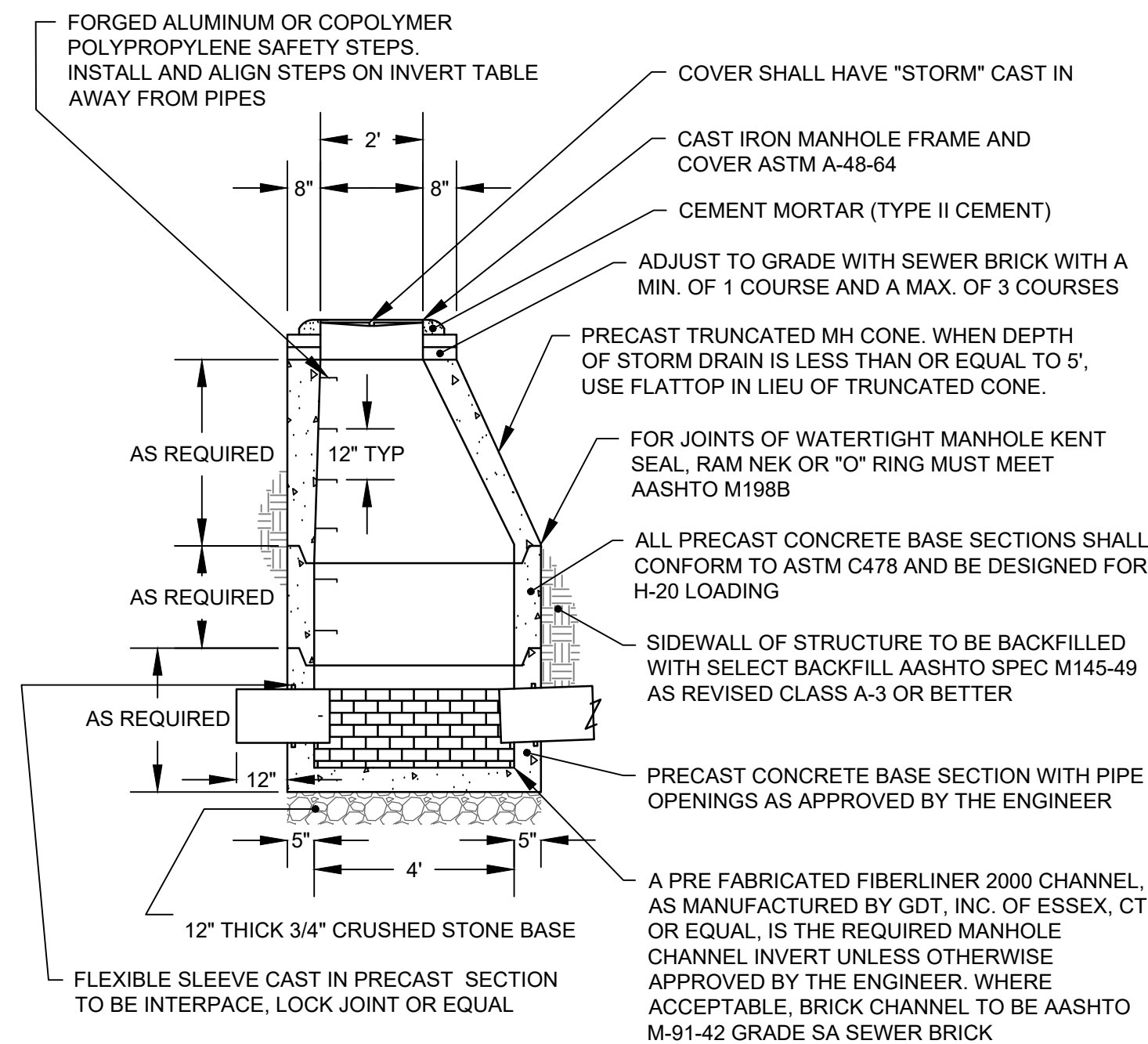


DESIGN NOTES:

1. ALL CONCRETE TO HAVE A MIN. OF 4,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
2. DESIGN LOAD FOR H-20 WHEEL LOAD.
3. EXTERIOR OF STRUCTURE SHALL BE TREATED WITH 2 COATS OF APPROVED DAMP PROOF MATERIAL
4. ALL CONCRETE SECTIONS TO CONFORM TO ASTM-C478 SPECIFICATIONS.
5. REINFORCE TO 0.12 SQ IN / LF

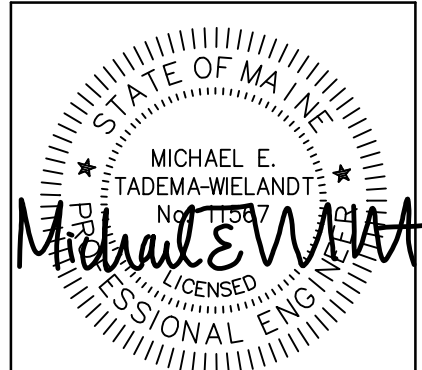
OIL/WATER SEPARATOR

NOT TO SCALE



4' DIAMETER PRECAST STORM DRAIN MANHOLE

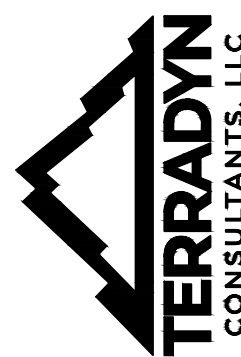
NOT TO SCALE



DATE: 6/17/2020
P.E.: MICHAEL E. TADEAMA-WIELANDT

NO.	DATE	REVISED PER STAFF REVIEW COMMENTS	APPROVED BY
1	6/17/2020		MTW

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102
OFFICE: (207) 926-5111 FAX: (207) 221-1317
www.terradync consultants.com

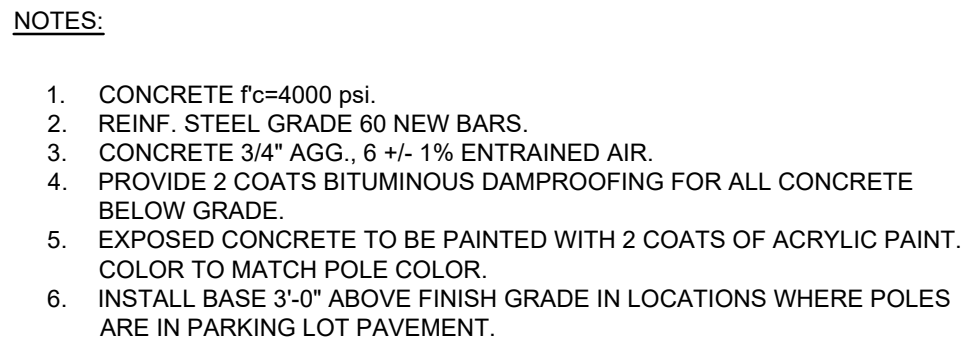


PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: MIDDLE STREET APARTMENTS
83 MIDDLE STREET, PORTLAND, MAINE 04101
SHEET TITLE: UTILITY & DRAINAGE DETAILS
CLIENT: MIDDLE STREET HOUSING PARTNERS, LP
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

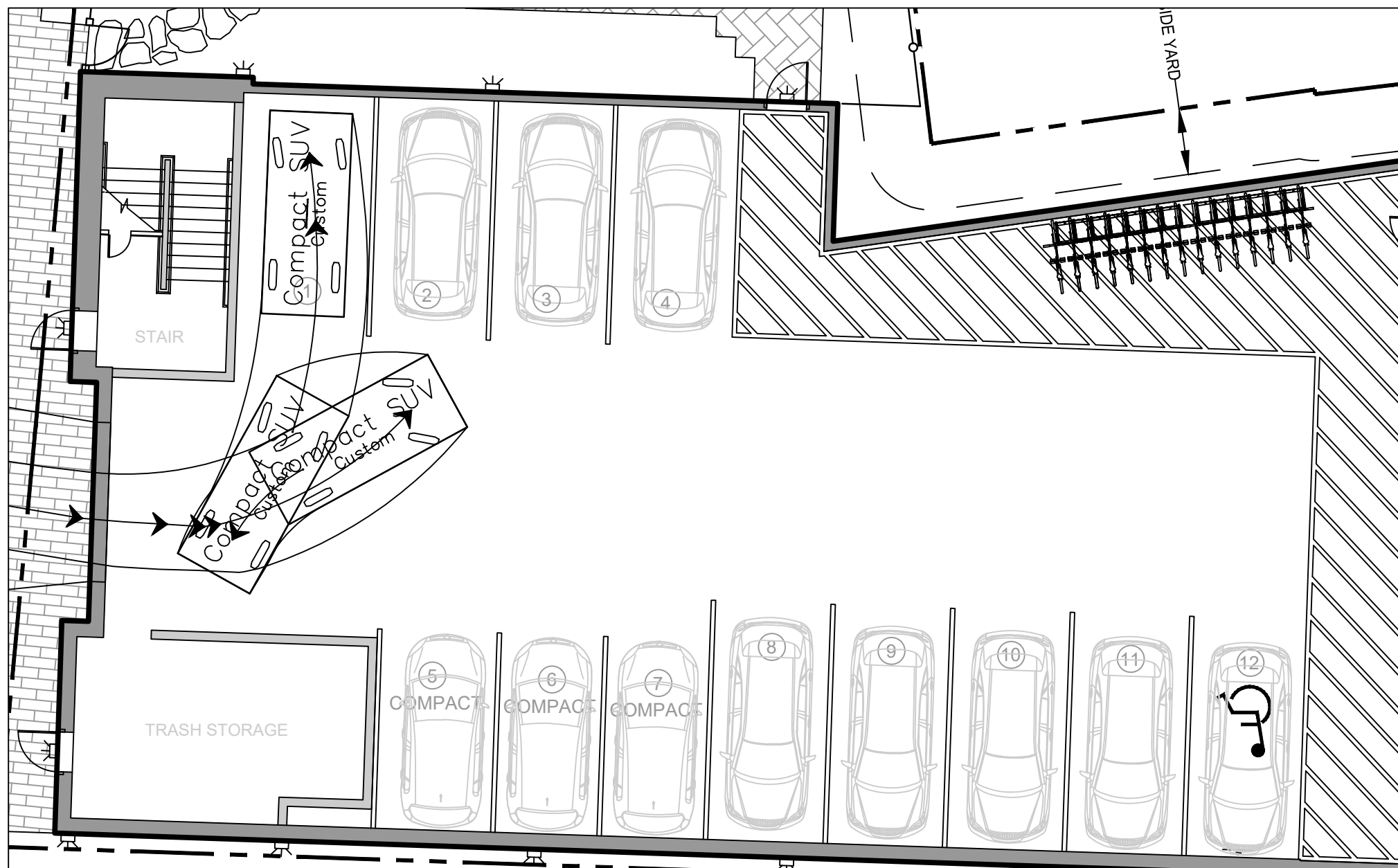
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SCALE: N.T.S.
DESIGNED: MTW
JOB NO: 1926
FILE: 1926 DETAILS.DWG
SHEET

C-8.1

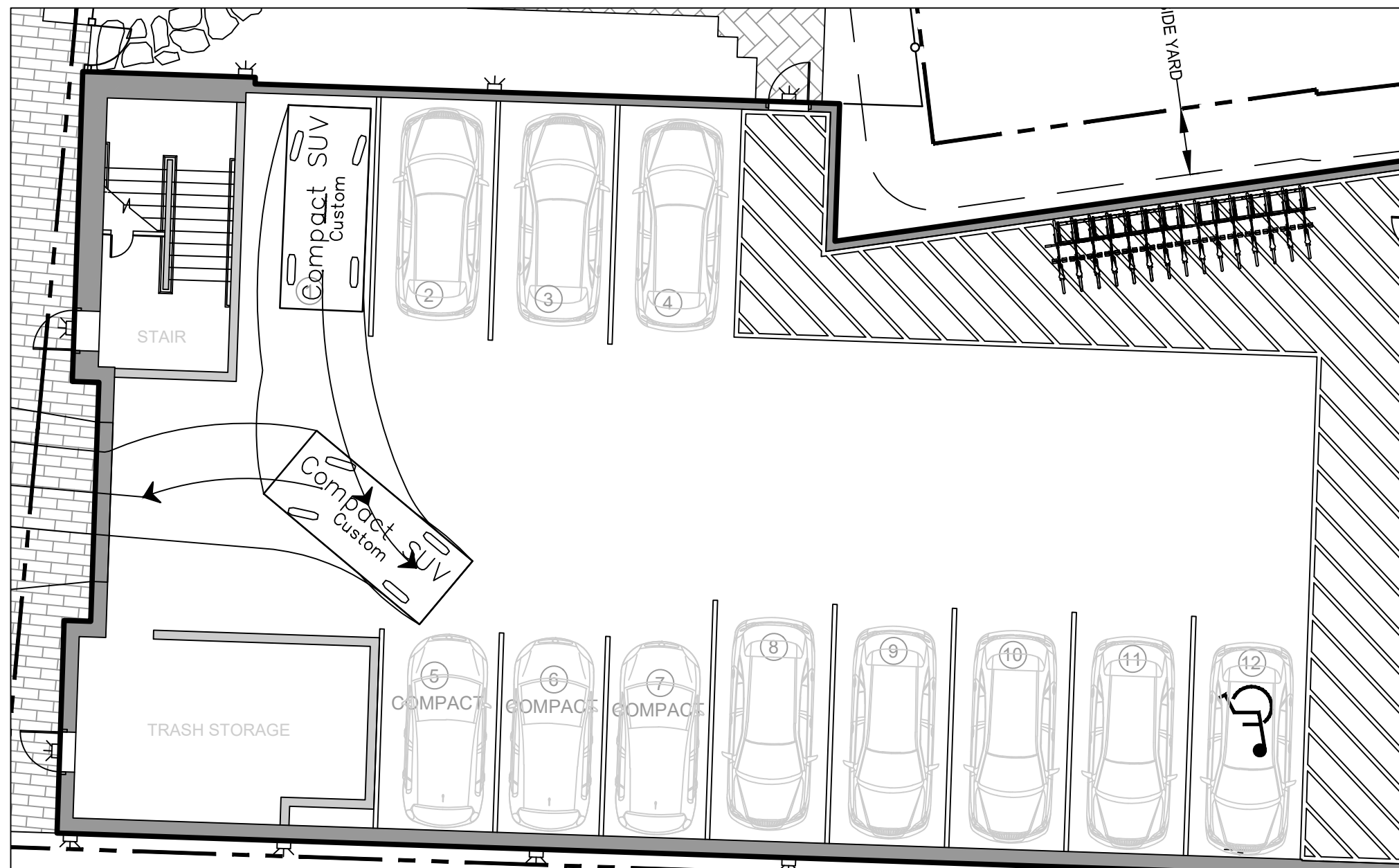


LIGHT POLE BASE
NOT TO SCALE

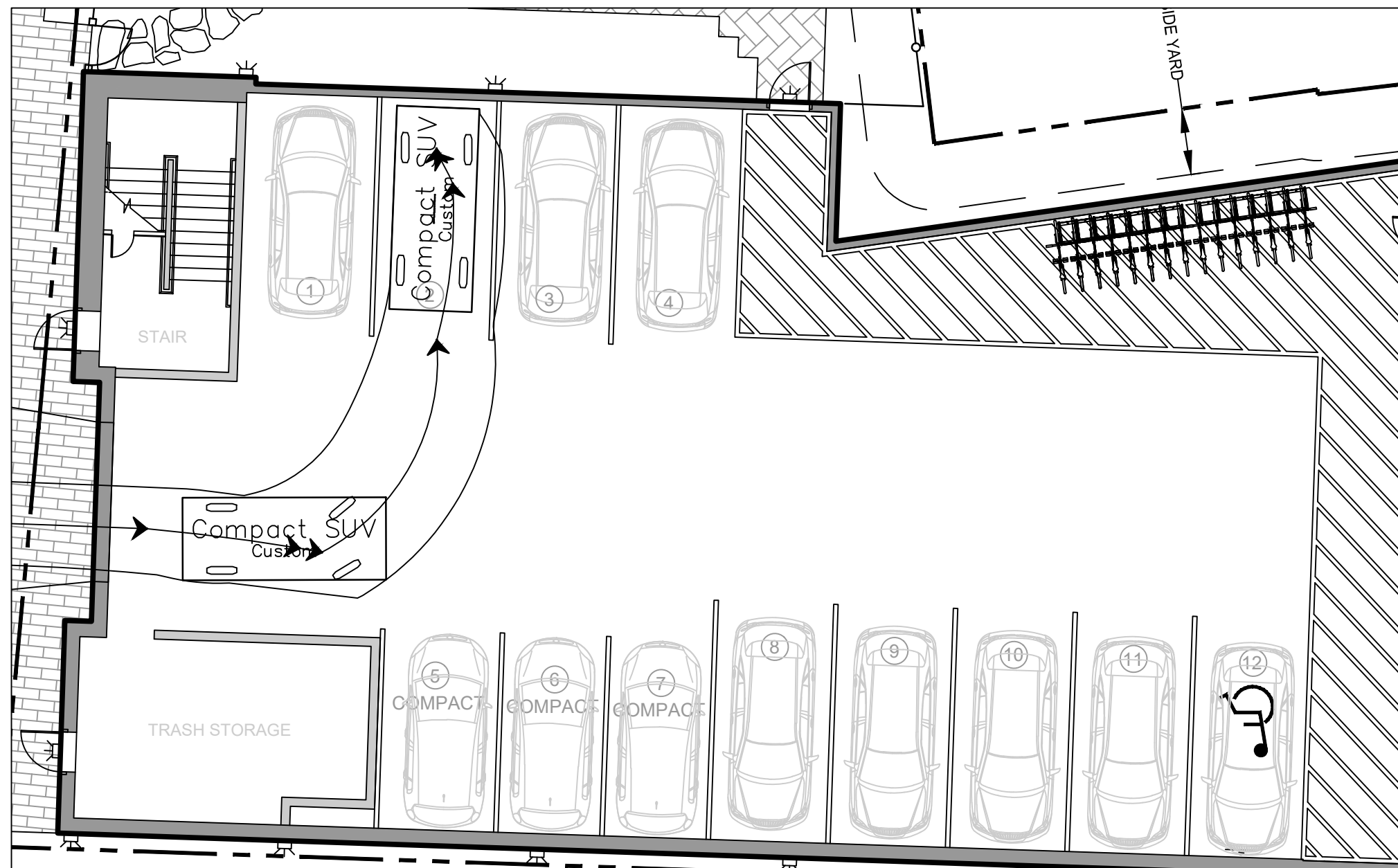
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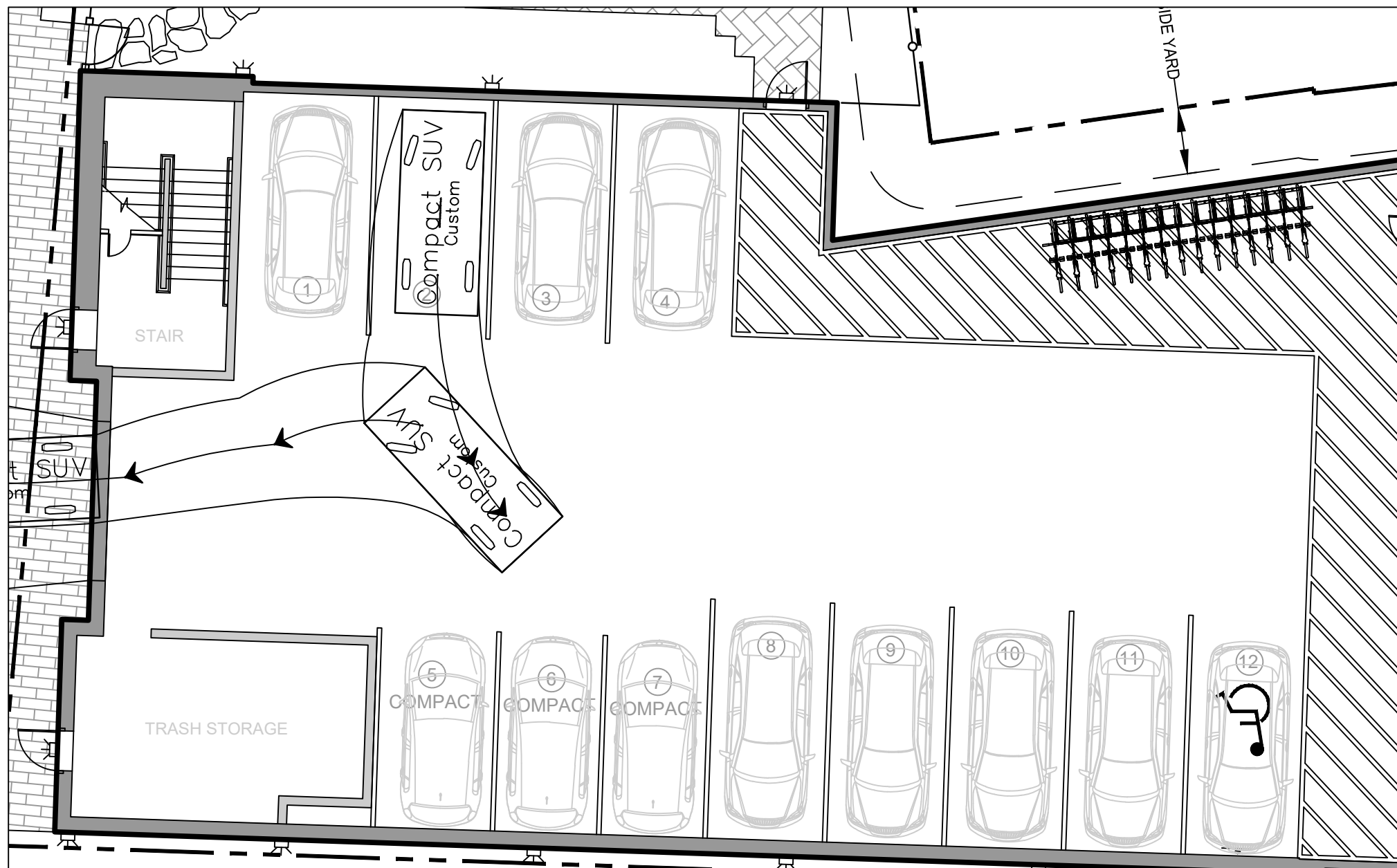
VEHICLE ENTERING PARKING SPACE 1



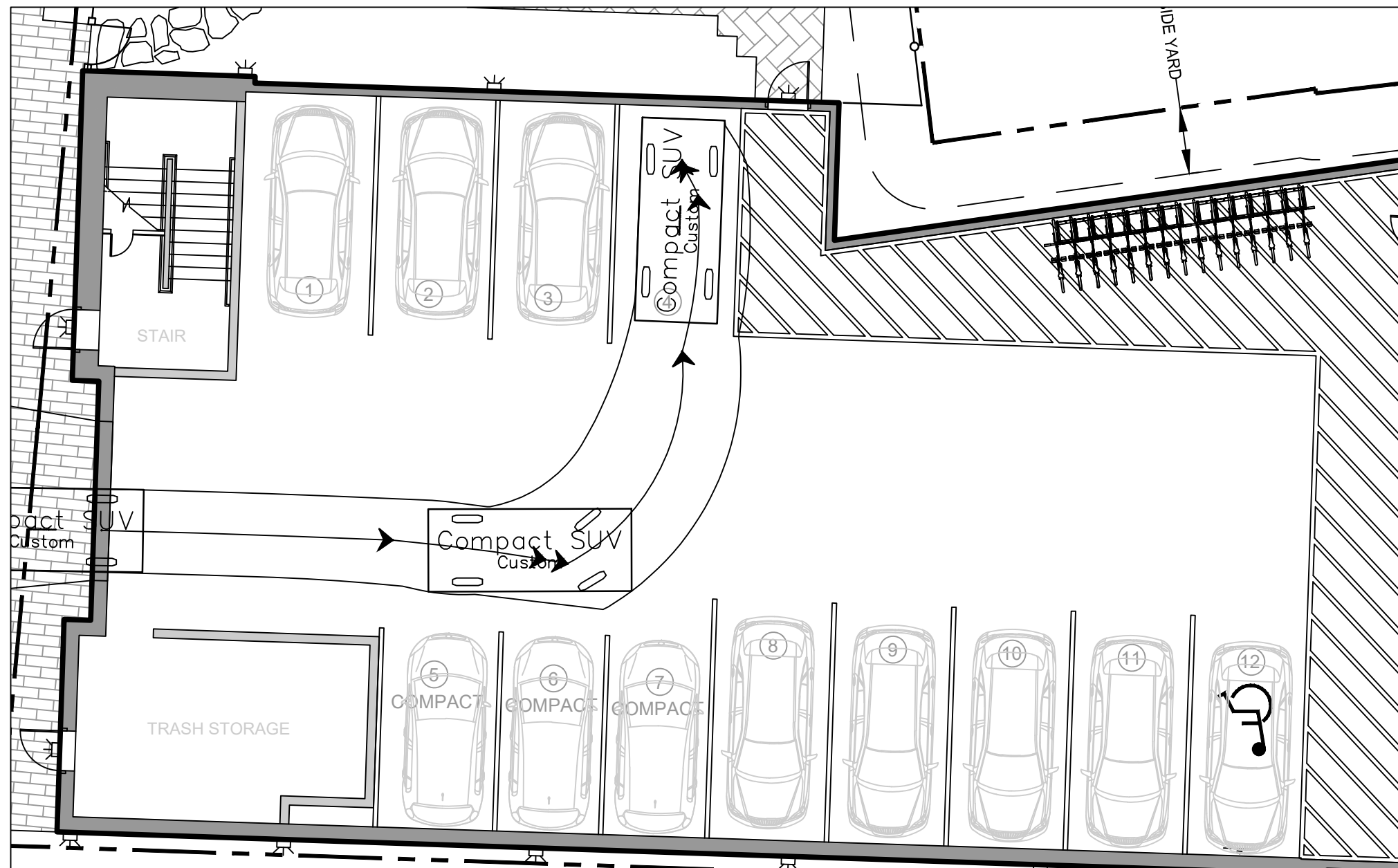
VEHICLE EXITING PARKING SPACE 1



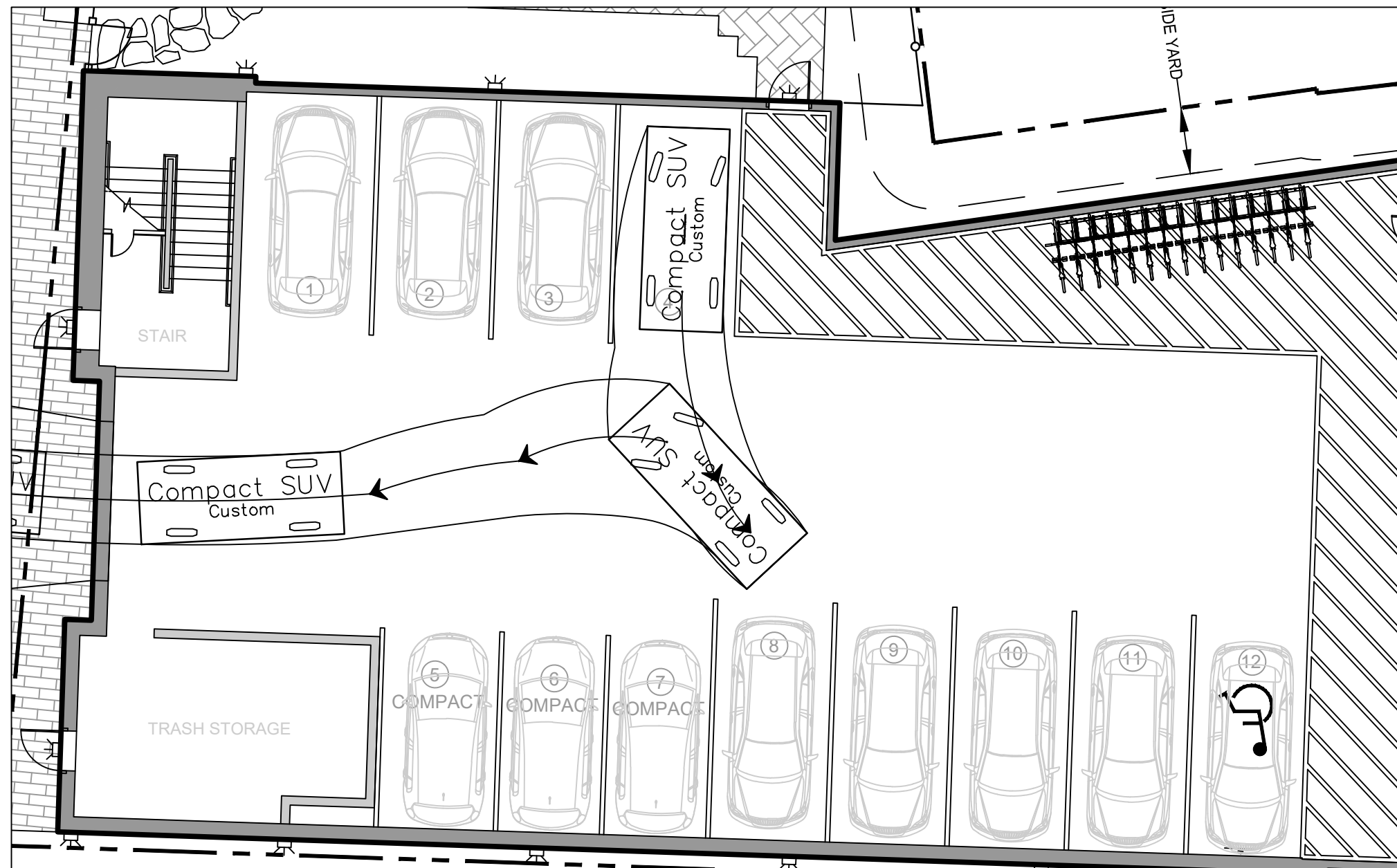
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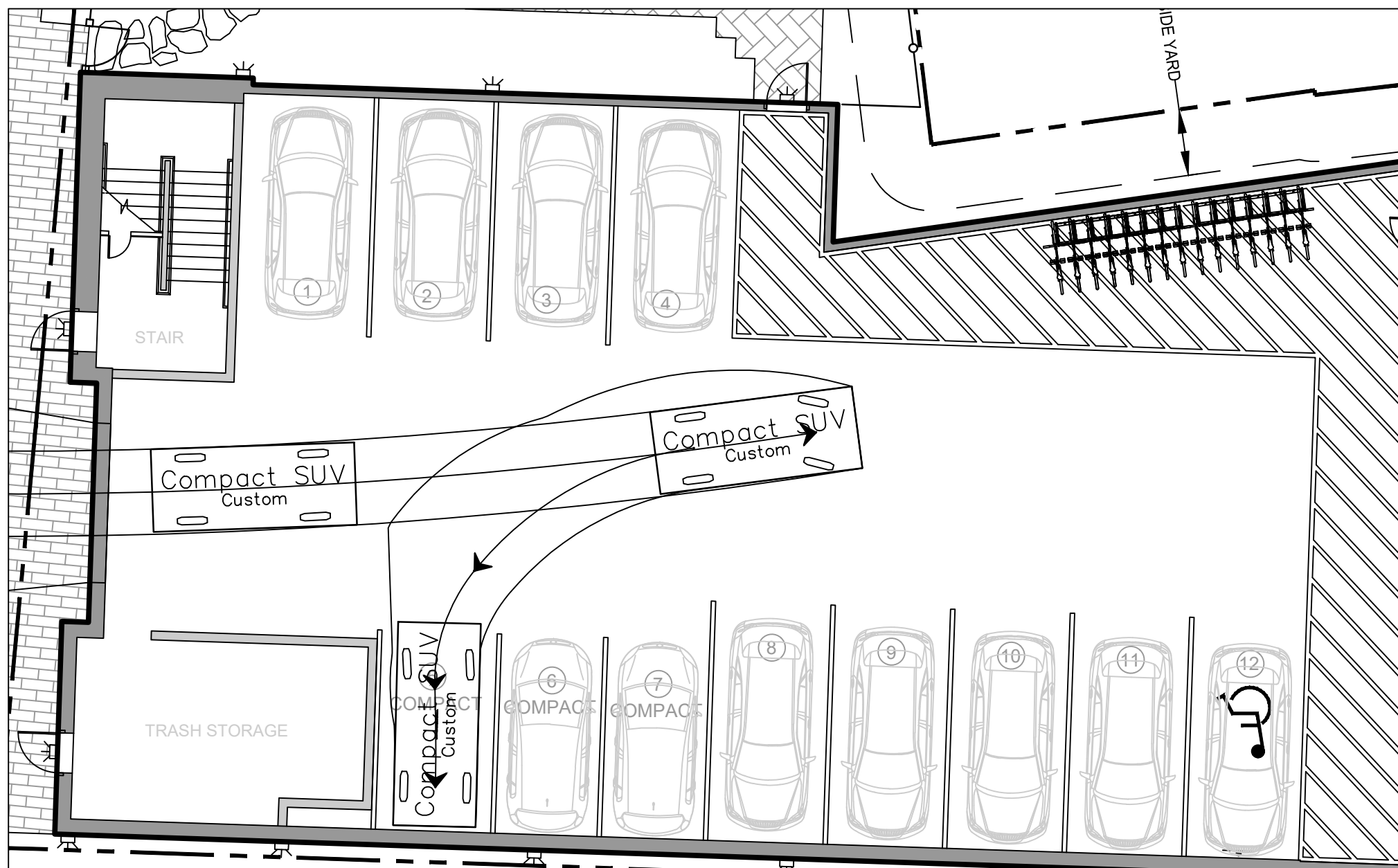
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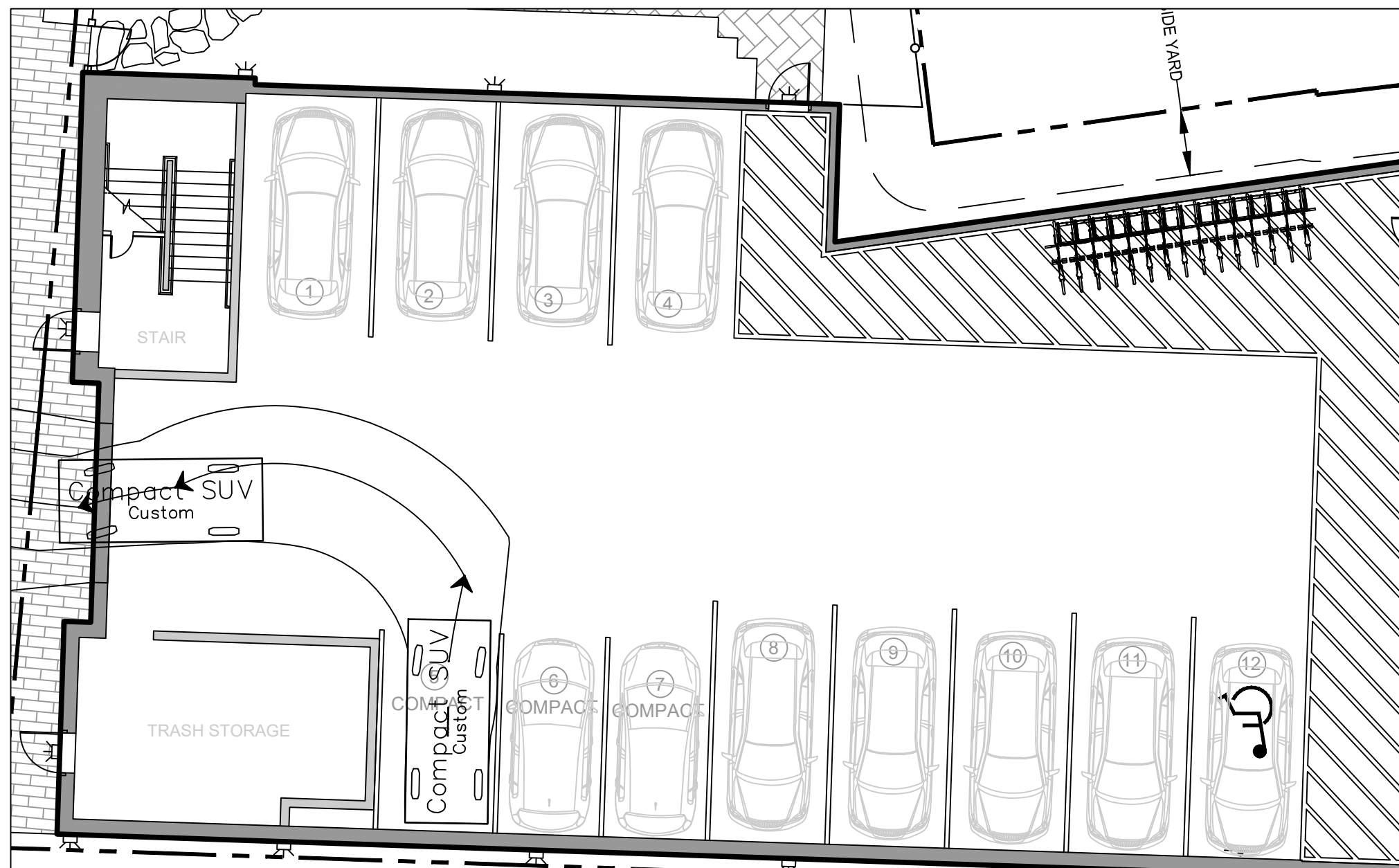
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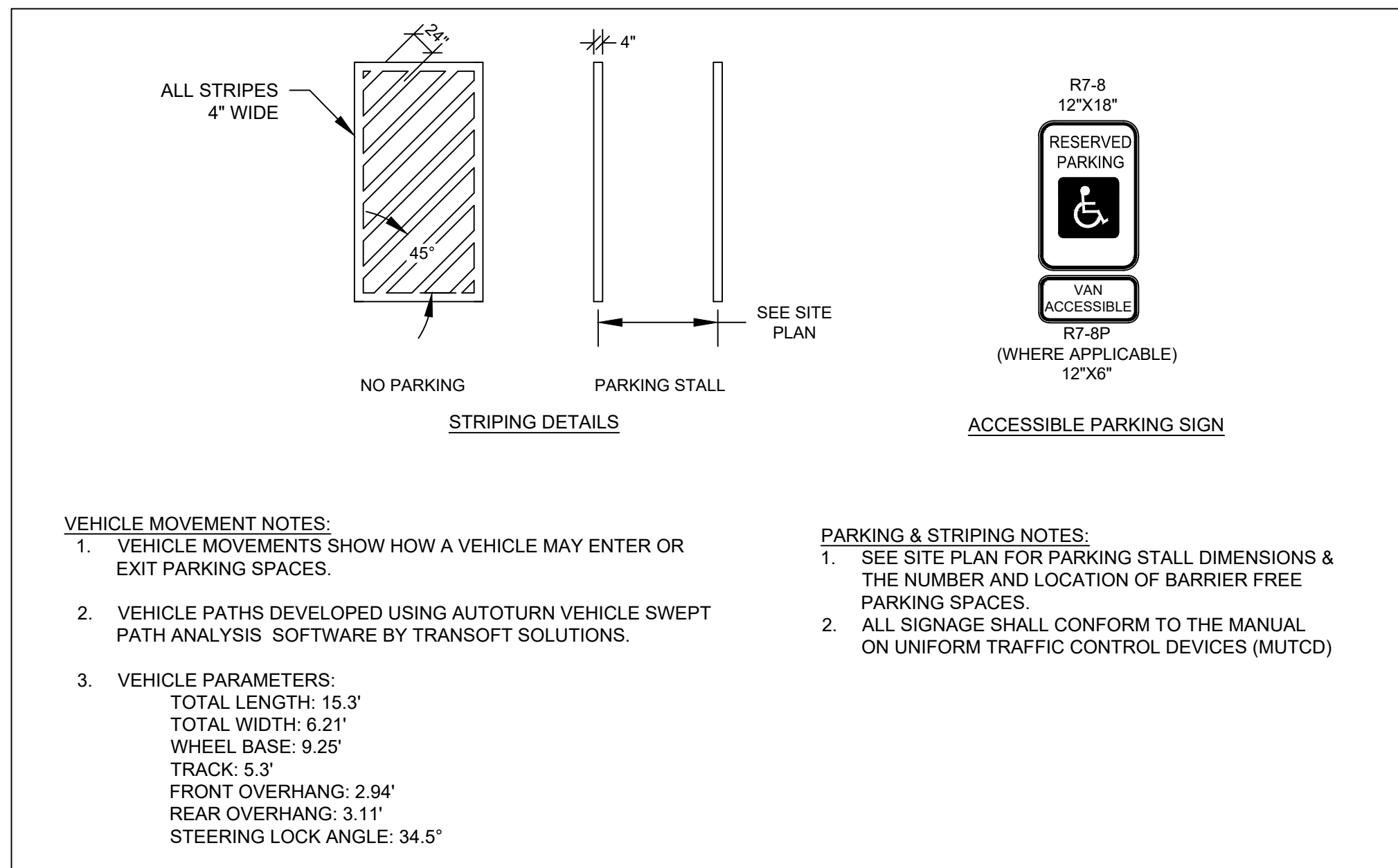
VEHICLE EXITING PARKING SPACE 4



VEHICLE ENTERING PARKING SPACE 5



VEHICLE EXITING PARKING SPACE 5



PARKING DETAILS & NOTES
NOT TO SCALE

STATE OF MAINE

MICHAEL E. TADEMA-WIELANDT

REGISTERED PROFESSIONAL ENGINEER

DATE: 6/17/2020

P.E.: MICHAEL E. TADEMA-WIELANDT

MTW

APPD

BY

REVISIONS

REVISED PER STAFF REVIEW COMMENTS

6/17/2020

DATE

NO.

565 CONGRESS STREET
SUITE 201
PORTLAND, ME 04102

41 CAMPUS DRIVE
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www.terradynconsultants.com

TERRADYN

CONSULTANTS, LLC

Civil Engineering | Land Planning | Stormwater Design | Environmental Permitting

PROJECT: MIDDLE STREET APARTMENTS
83 MIDDLE STREET, PORTLAND, MAINE 04101

SHEET TITLE: VEHICLE MOVEMENT PLAN 1

CLIENT: MIDDLE STREET HOUSING PARTNERS, LP
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

PERMIT DRAWING
NOT FOR CONSTRUCTION

DATE: 4/16/2020

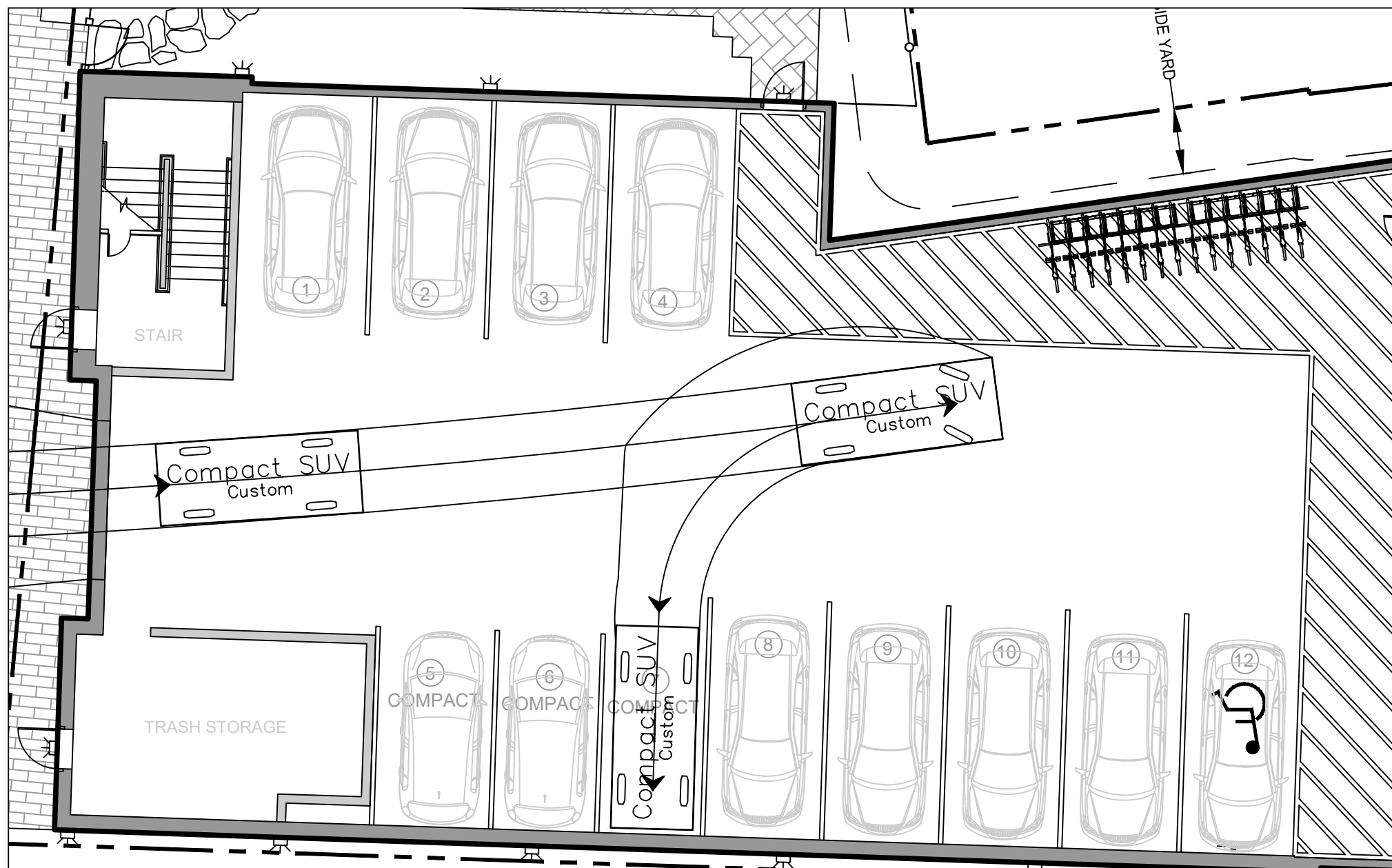
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DESIGNED: MTW

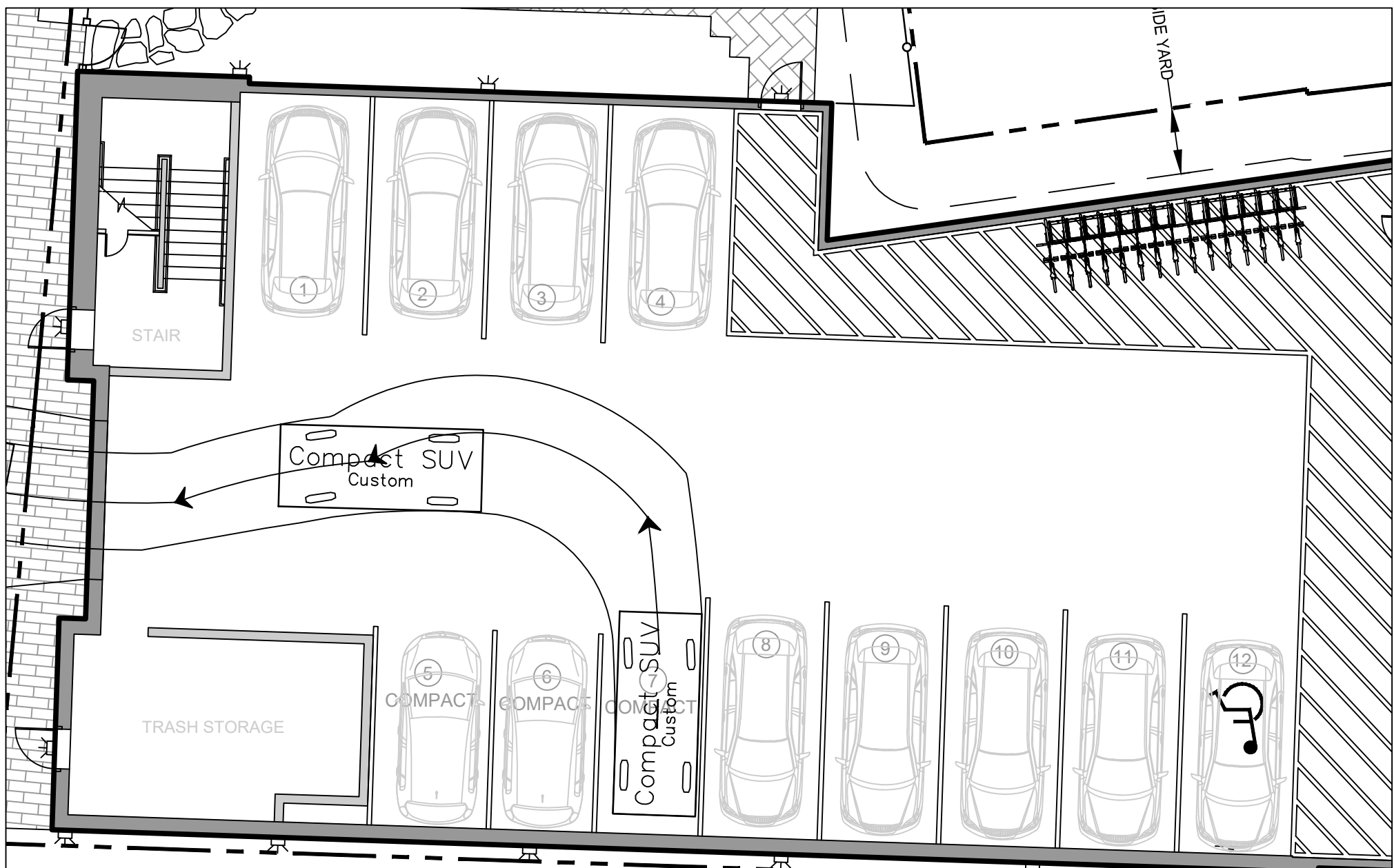
JOB NO: 1926

FILE: 1926-AUTOTURN.DWG

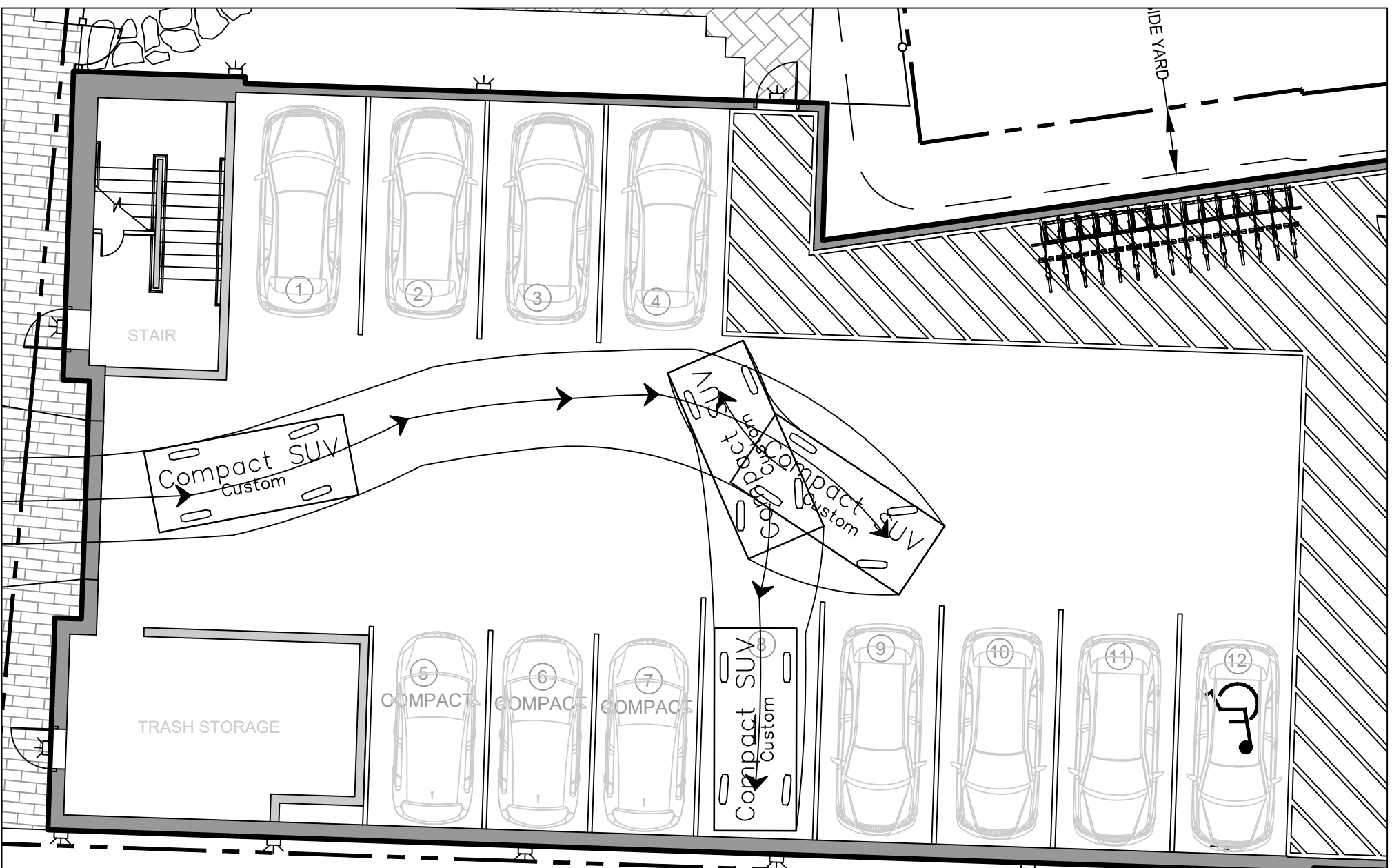
SHEET C-9.0



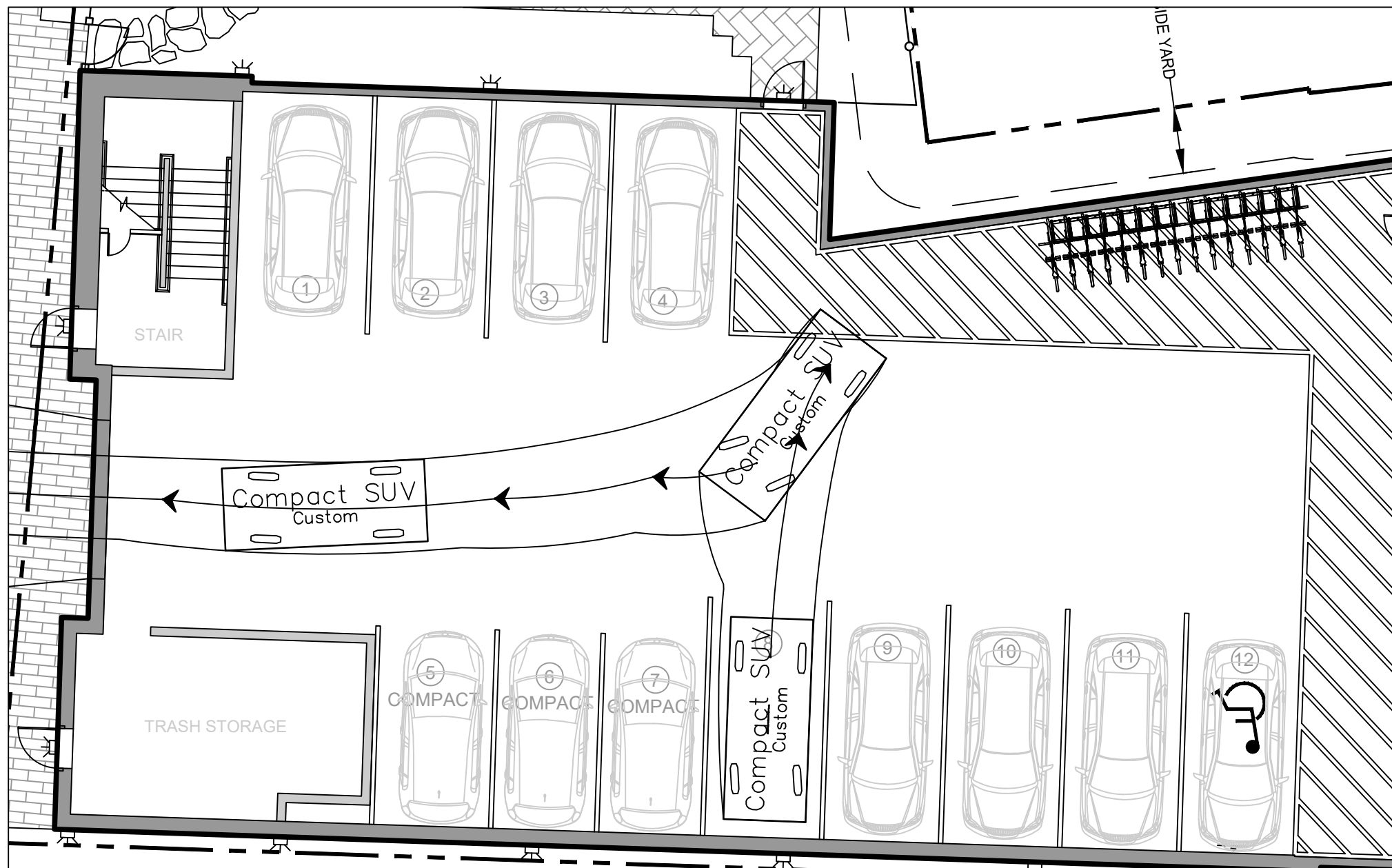
VEHICLE ENTERING PARKING SPACE 7



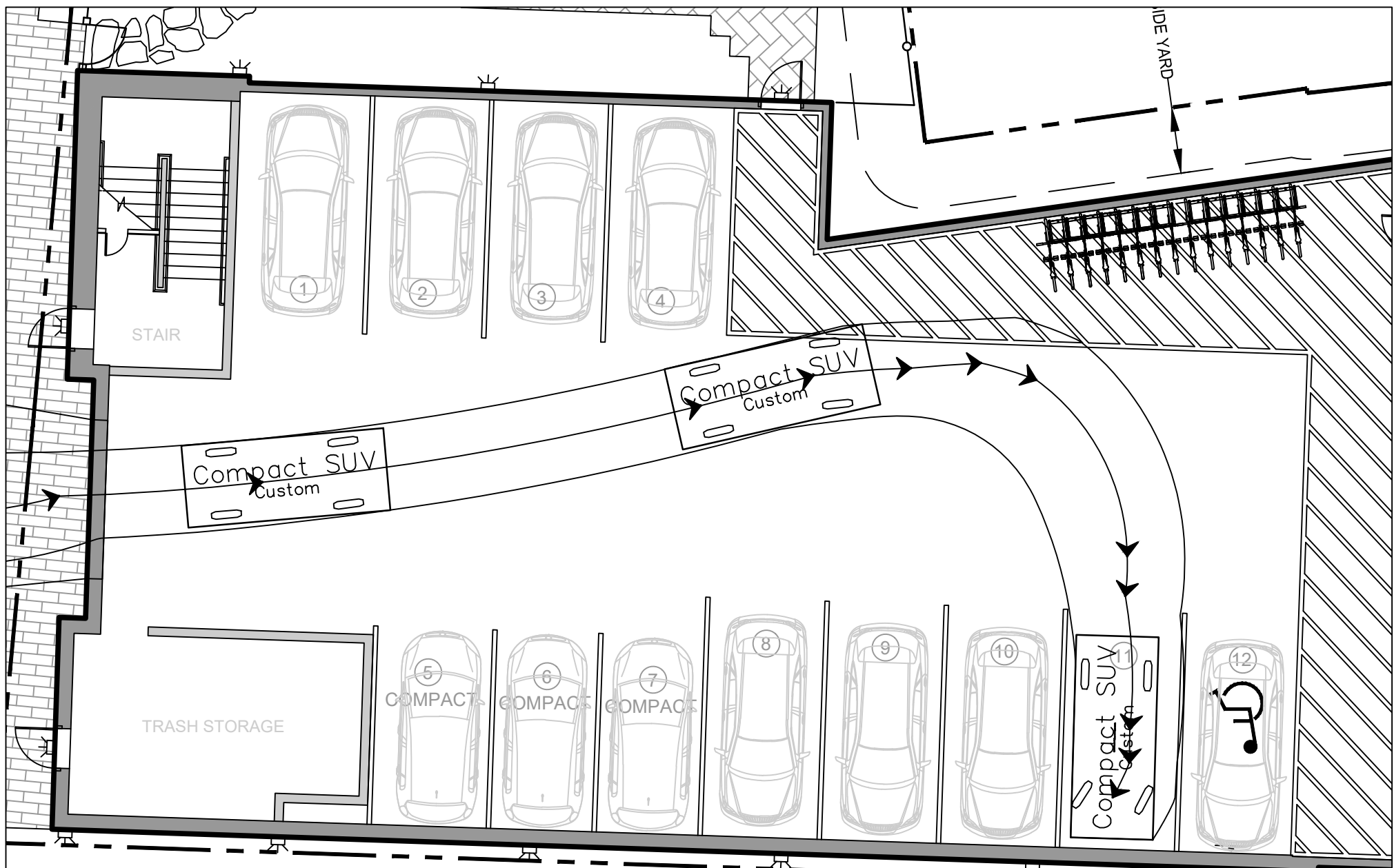
VEHICLE EXITING PARKING SPACE 7



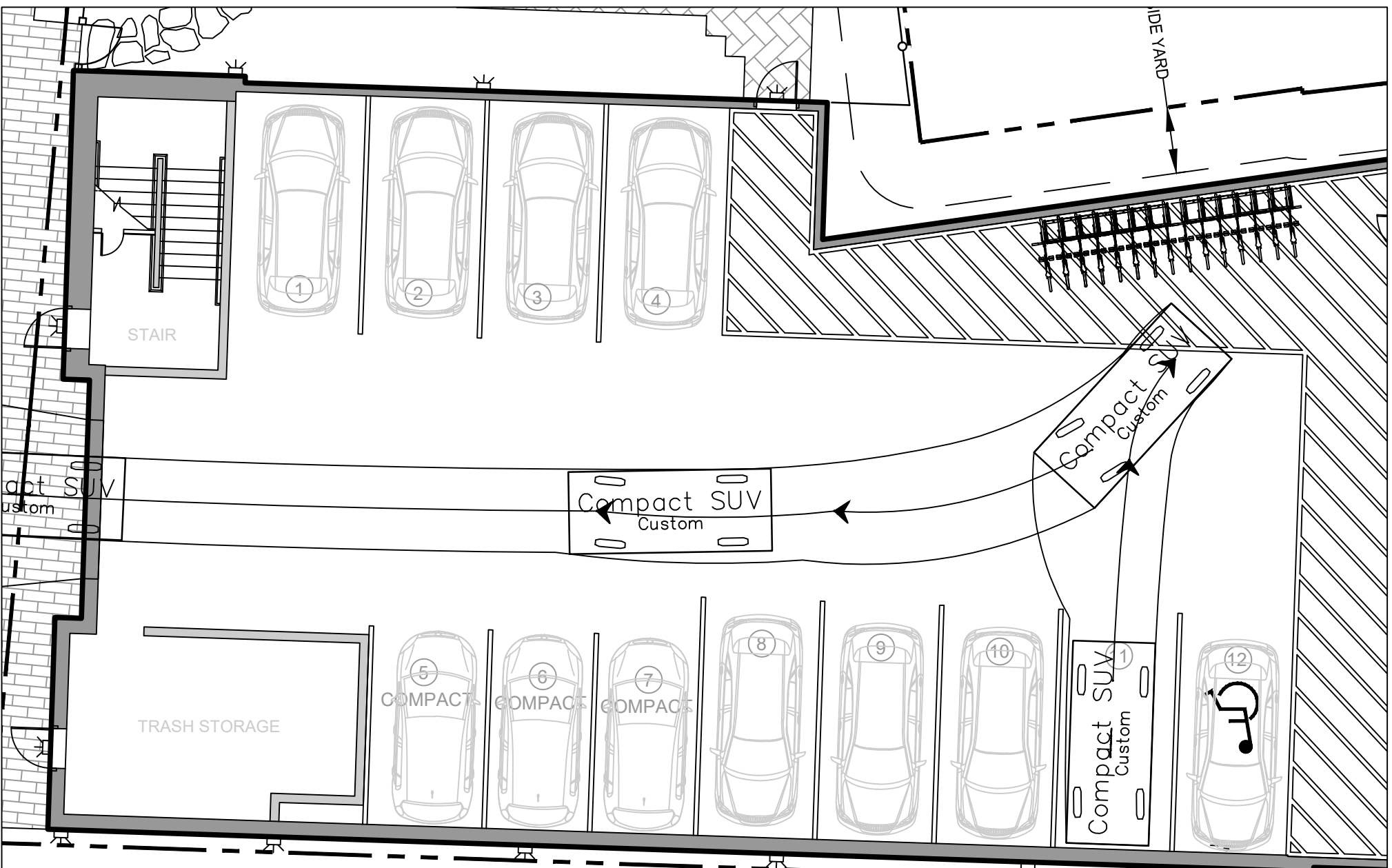
VEHICLE ENTERING PARKING SPACE 8



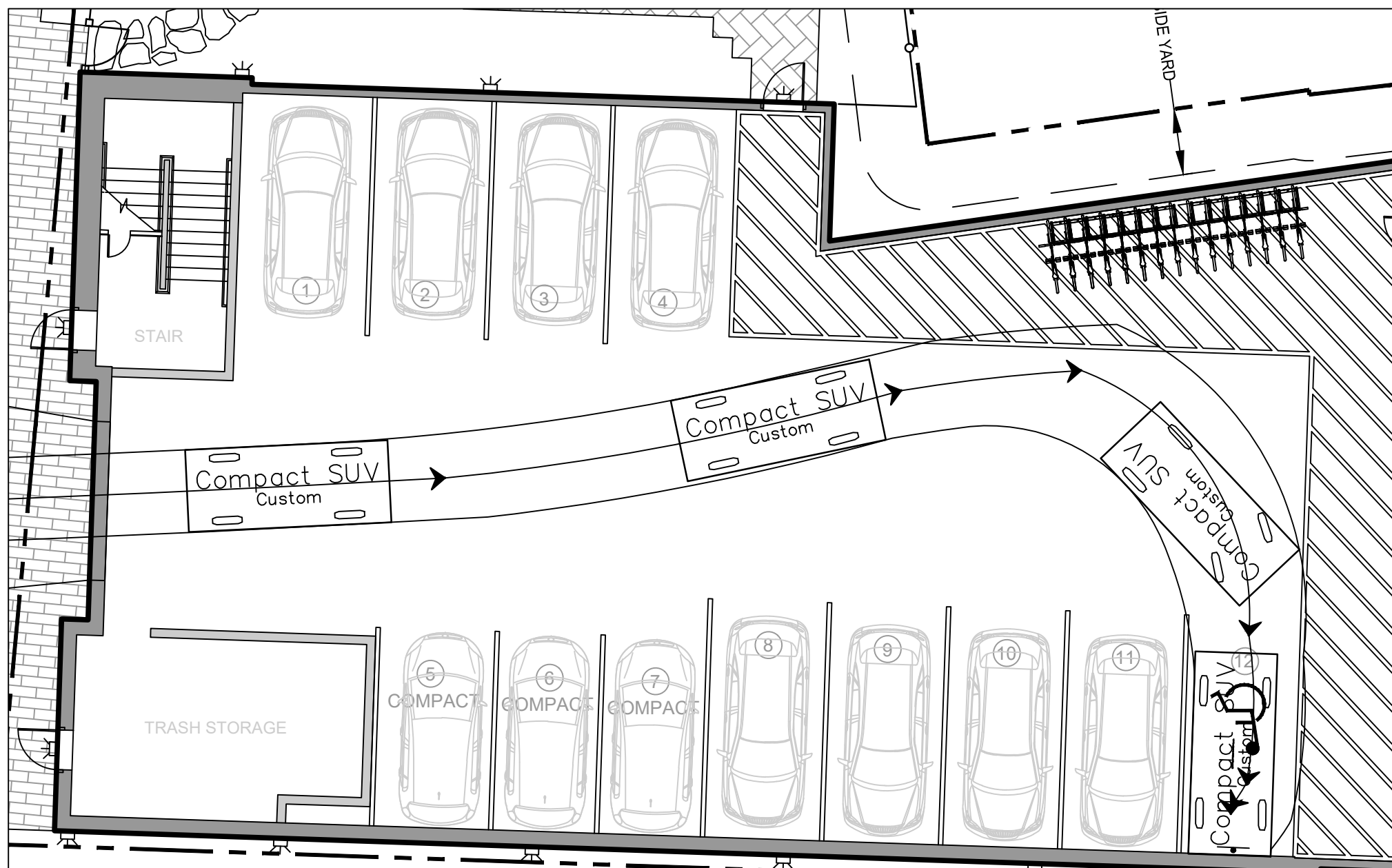
VEHICLE EXITING PARKING SPACE 8



VEHICLE ENTERING PARKING SPACE 11



VEHICLE EXITING PARKING SPACE 11



VEHICLE ENTERING PARKING SPACE 12



VEHICLE EXITING PARKING SPACE 12

STATE OF MAINE
MICHAEL E. TADEMA-WIELANDT
LICENSED PROFESSIONAL ENGINEER

DATE: 6/17/2020
P.E.: MICHAEL E. TADEMA-WIELANDT

MTW
APPD
BY

REVISIONS

NO.

DATE

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PROJECT:
MIDDLE STREET APARTMENTS
83 MIDDLE STREET, PORTLAND, MAINE 04101

SHEET TITLE:
VEHICLE MOVEMENT PLAN 2

CLIENT:
MIDDLE STREET HOUSING PARTNERS, LP
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

DATE:
4/16/2020

SCALE:
1"=10'

DESIGNED:
MTW

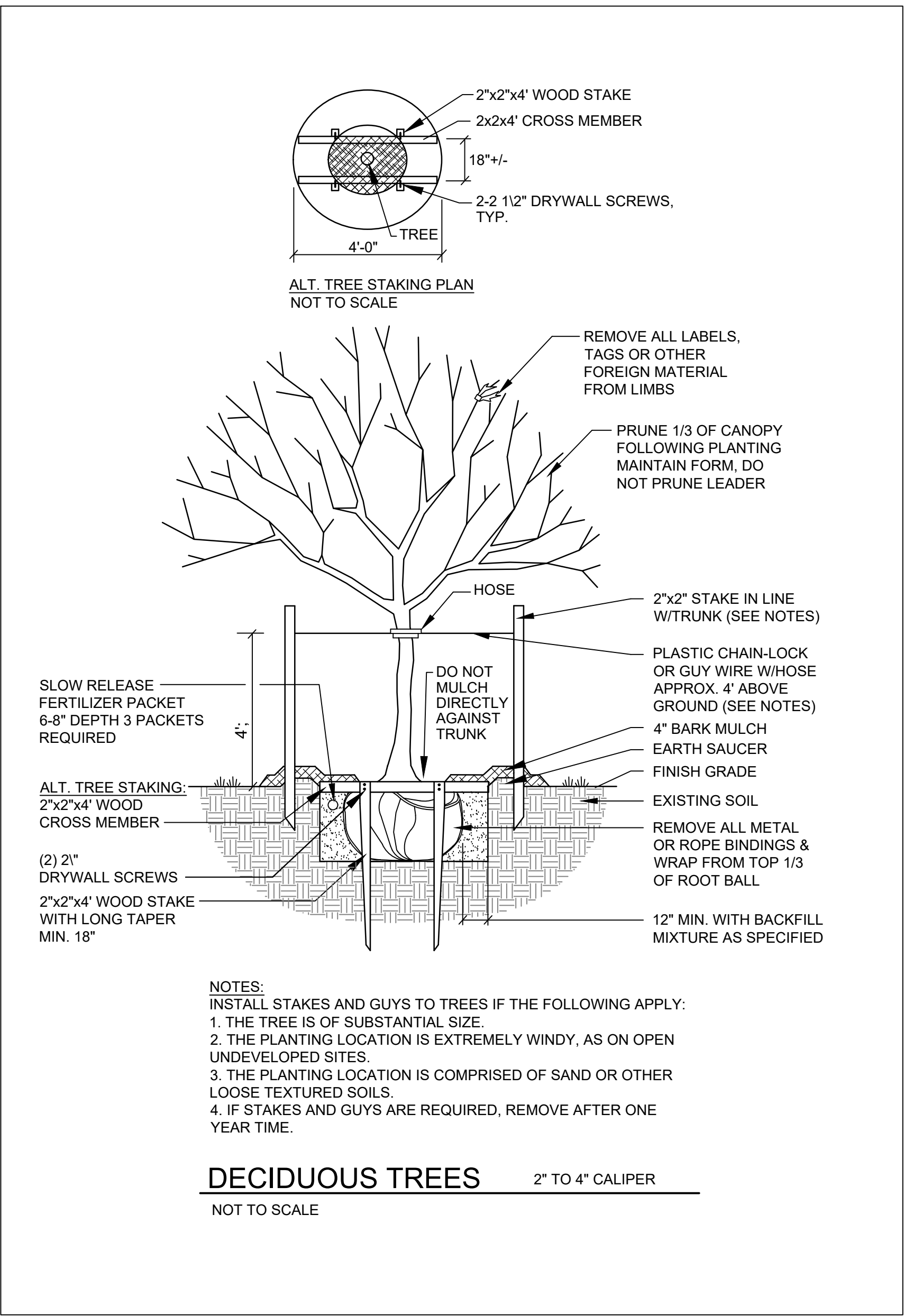
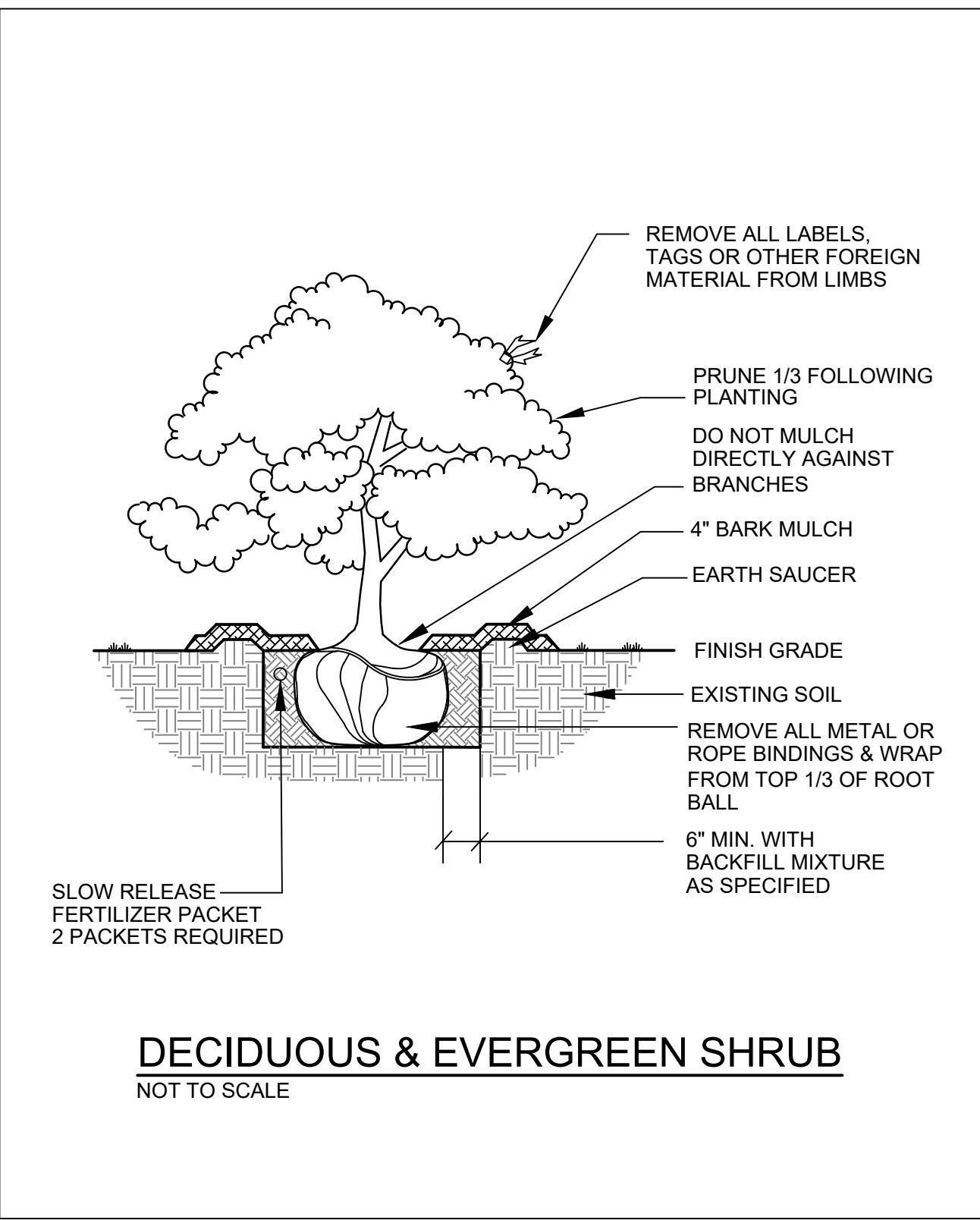
JOB NO:
1926

FILE:
1926-AUTOTURN.DWG

SHEET
C-9.1

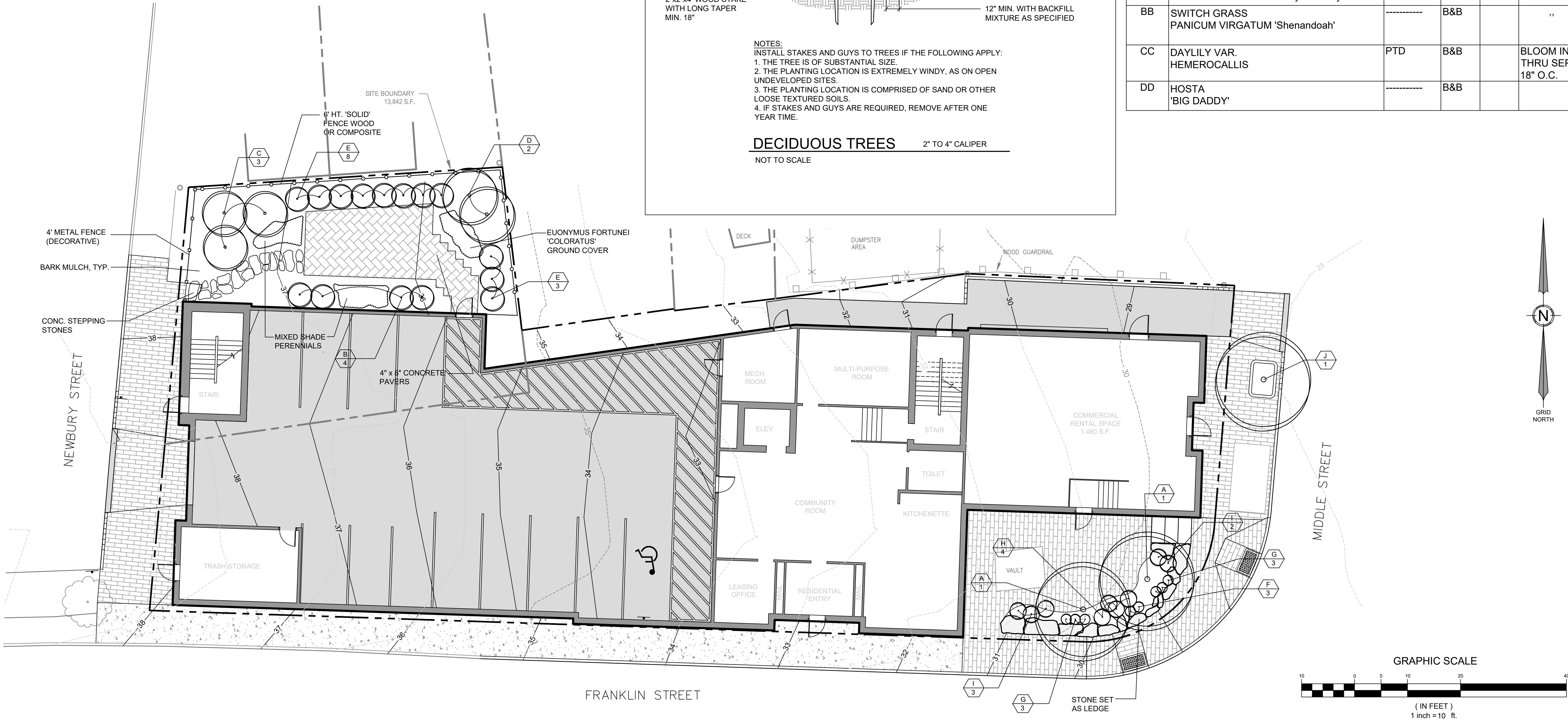
PLANTING NOTES:

1. THE CONTRACTOR SHALL SUPPLY ALL PLANTS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THE PLAN. ANY DISCREPANCIES BETWEEN QUANTITIES SHOWN ON PLANT LIST AND THOSE REQUIRED BY THIS DRAWING SHALL NOT ENTITLE CONTRACTOR TO ADDITIONAL REMUNERATION.
2. ANY PLAN SUBSTITUTIONS MUST BE APPROVED BY THE OWNER.
3. ANY TREE OR SHRUB WHICH COMES OVER OR UNDER ANY UTILITY SHALL BE RELOCATED ON THE SITE BY THE LANDSCAPE ARCHITECT.
4. ALL LAWN AREAS TO HAVE 6" OF TOPSOIL UNLESS NOTED OTHERWISE.
5. ALL TREES AND SHRUBS SHALL BE PLACED IN THE DESIGNATED AREAS AS SHOWN ON THE PLAN AND BEFORE PLANTING SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT.
6. THE CONTRACTOR SHALL RELOCATE ANY TREE OR SHRUB AS DIRECTED BY THE LANDSCAPE ARCHITECT.
7. ALL PLANT MATERIALS INSTALLED SHALL MEET THE SPECIFICATIONS OF THE AMERICAN STANDARD FOR NURSERY STOCK (LATEST EDITION) AS SET FORTH BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
8. THE LANDSCAPE CONTRACTOR SHALL REPLACE OR REPAIR TO ORIGINAL CONDITION ANY AND ALL UTILITIES, PAVING, CURBING, ETC., DAMAGED AS A RESULT OF THEIR OPERATIONS AT NO ADDITIONAL COST TO THE OWNER.
9. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO PLANTING AND WILL NOTIFY OWNER'S REPRESENTATIVE IN THE EVENT OF CONFLICTS.



TREES & SHRUBS					
KEY	COMMON & BOTANICAL NAME	SIZE	ROOT	QTY	NOTES
A	HONEYLOCUST 'SUNBURST' G. TRIACANTHOS Var. 'inermis' Sunburst	2 1/2" Cal.	B&B	2	
B	SHASTA VIBURNUM V. PLICATUM Var. TOMENTOSUM 'SHASTA'	3'-4' HT	B&B	4	
C	BLACKHAW VIBURNUM V. PRUNIFOLIUM	4"-5" HT	B&B	3	MULTI-TRUNK [3]
D	CORNELIANCHERRY C. MAS 'Golden Glory'	4' HT	B&B	2	" " " " "
E	TAXUS YEW TAXUS X MEDIA 'Hatfieldii'	24" SPR	CONT	11	
F	BAR HARBOR JUNIPER J. HORIZONTALIS	#5	CONT	2	
G	BLUE RUG JUNIPER J. HORIZONTALIS 'Blue Rug'	#3	CONT	6	
H	COMPACT PFITZER JUNIPER J. CHINENSIS PFITZERIANA 'COMPACTA'	#2	CONT	4	
I	NORTHERN BAYBERRY M. PENSYLVANCA	3'-4' HT	CONT	5	
J	'STREETKEEPER' HONEY LOCUST G. TRICANTHOS 'Streetkeeper'	2 1/2" Cal.	B&B	1	8' Clear Understory

PERENNIALS					
KEY	COMMON & BOTANICAL NAME	SIZE	ROOT	QTY	NOTES
AA	SWITCH GRASS PANICUM VIRGATUM 'Cheyenne Sky'	-----	B&B		@18" OC
BB	SWITCH GRASS PANICUM VIRGATUM 'Shenandoah'	-----	B&B		"
CC	DAYLILY VAR. HEMEROCALLIS	PTD	B&B		BLOOM IN JULY THRU SEPT 18" O.C.
DD	HOSTA 'BIG DADDY'	-----	B&B		



STATE OF MAINE
MICHAEL E. TADEMA-WIELANDT
N. 00000000
LICENSED PROFESSIONAL ENGINEER

DATE: 4/16/2020
P.E.: MICHAEL E. TADEMA-WIELANDT

APPROVED BY

REVISIONS

DATE

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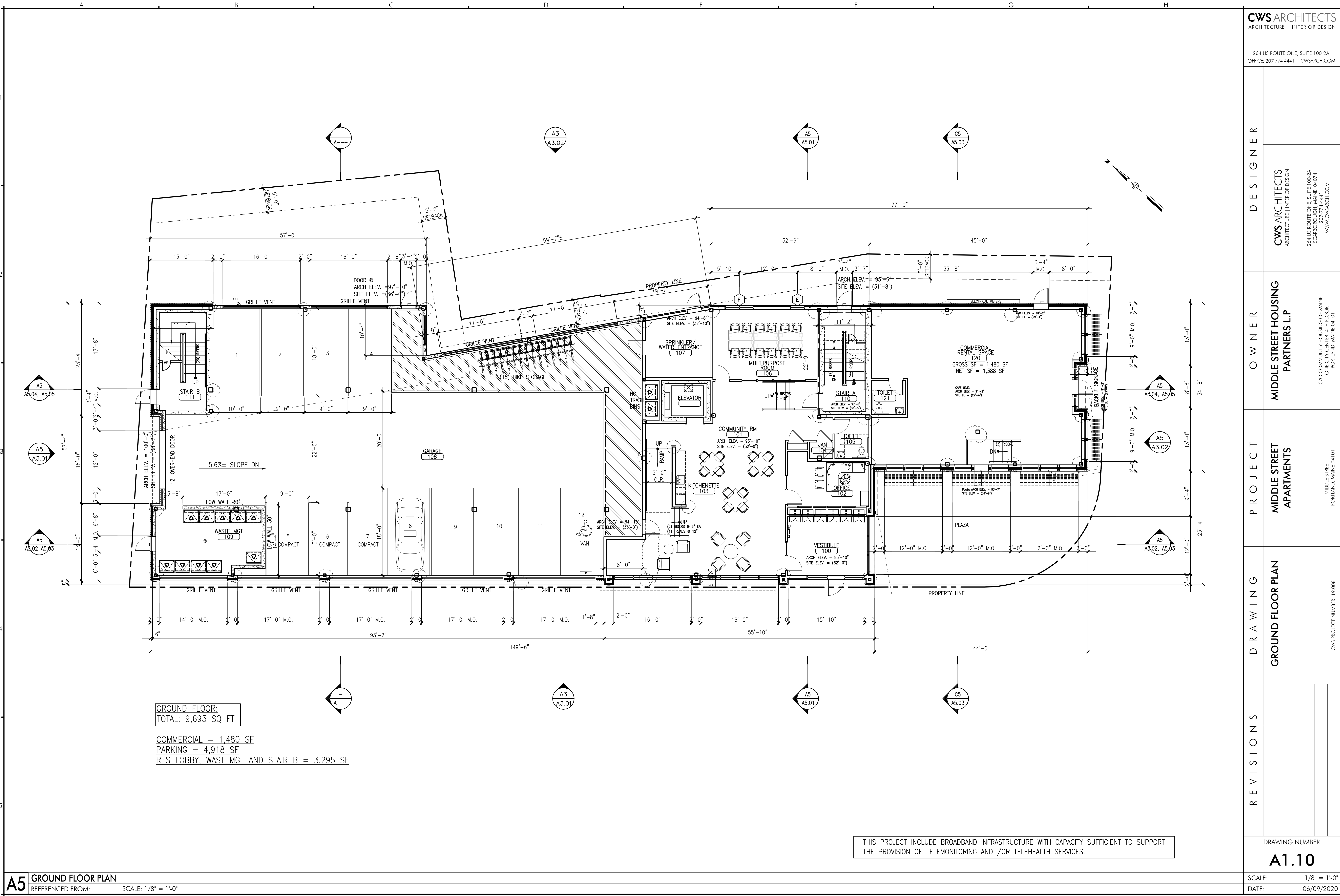
PROJECT:
MIDDLE STREET APARTMENTS
83 MIDDLE STREET, PORTLAND, MAINE 04101

SHEET TITLE:
LANDSCAPE PLAN & PLANTING DETAILS

CLIENT:
MIDDLE STREET HOUSING PARTNERS, LP
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

PERMIT DRAWING
NOT FOR CONSTRUCTION

DATE: 4/16/2020
SCALE: 1"=20'
DESIGNED: MTW
JOB NO: 1926
FILE: 1926-LANDSCAPE.DWG
SHEET L-1.0



A5 GROUND FLOOR PLAN

REFERENCED FROM: SCALE: 1/8" = 1'-0"

GROUND FLOOR:
TOTAL: 9,693 SQ FT

COMMERCIAL = 1,480 SF
PARKING = 4,918 SF
RES LOBBY, WAST MGT AND STAIR B = 3,295 SF

THIS PROJECT INCLUDE BROADBAND INFRASTRUCTURE WITH CAPACITY SUFFICIENT TO SUPPORT THE PROVISION OF TELEMONITORING AND /OR TELEHEALTH SERVICES.

CWS ARCHITECTS
ARCHITECTURE | INTERIOR DESIGN

264 US ROUTE ONE, SUITE 100-2A
OFFICE: 207.774.4441 CWSARCH.COM

DESIGNER

CWS ARCHITECTS
ARCHITECTURE | INTERIOR DESIGN
264 US ROUTE ONE, SUITE 100-2A
SCARBOROUGH, MAINE 04074
207.774.4441
WWW.CWSARCH.COM

OWNER

MIDDLE STREET HOUSING PARTNERS L.P.

C/O COMMUNITY HOUSING OF MAINE
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

PROJECT

MIDDLE STREET APARTMENTS

MIDDLE STREET
PORTLAND, MAINE 04101

DRAWING

GROUND FLOOR PLAN

CWS PROJECT NUMBER: 19-008

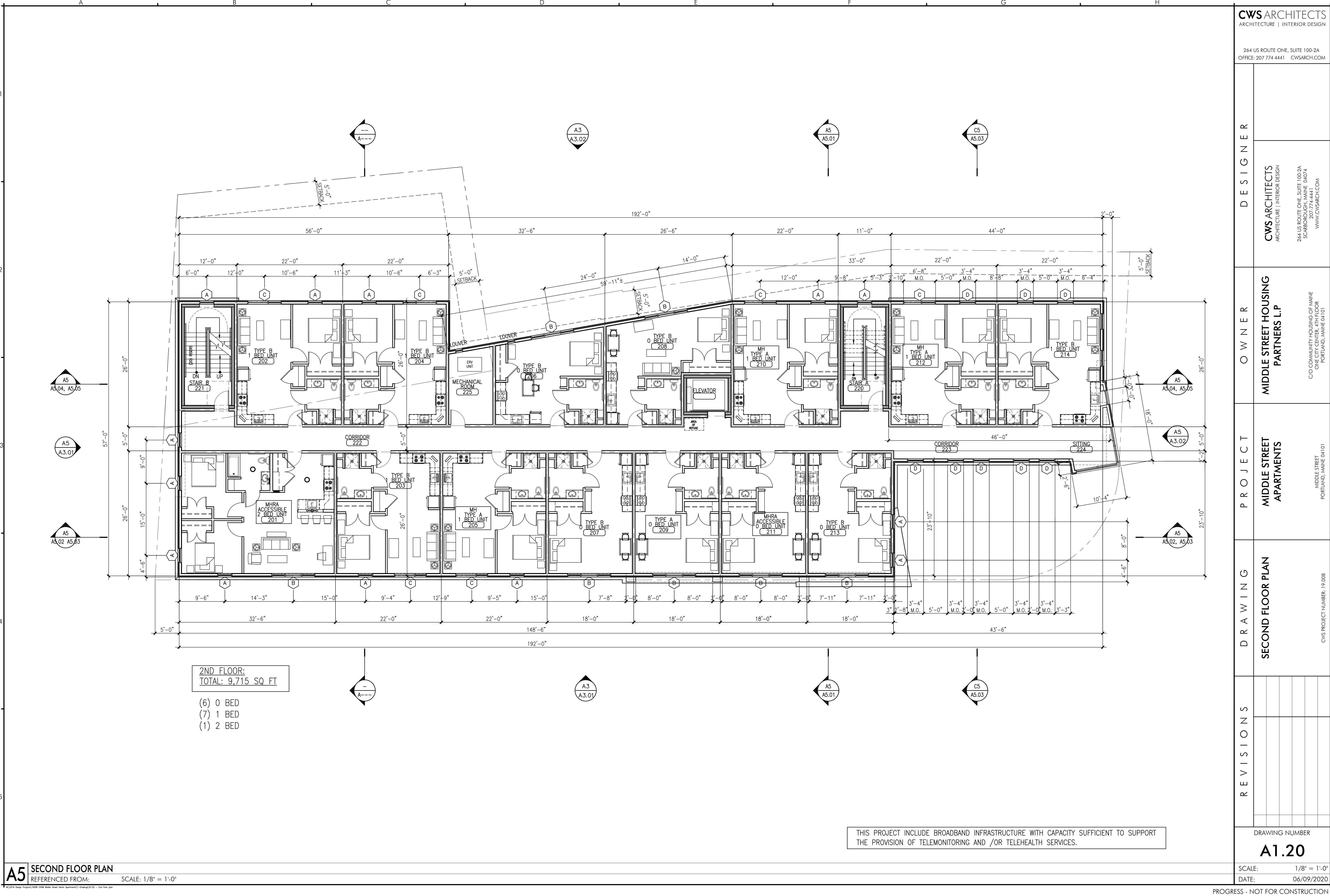
REVISIONS

DRAWING NUMBER

A1.10

SCALE: 1/8" = 1'-0"
DATE: 06/09/2020

PROGRESS - NOT FOR CONSTRUCTION



DESIGNER

CWS ARCHITECTS
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SCARBOROUGH, MAINE 04074
207.774.4441
WWW.CWSARCH.COM

OWNER

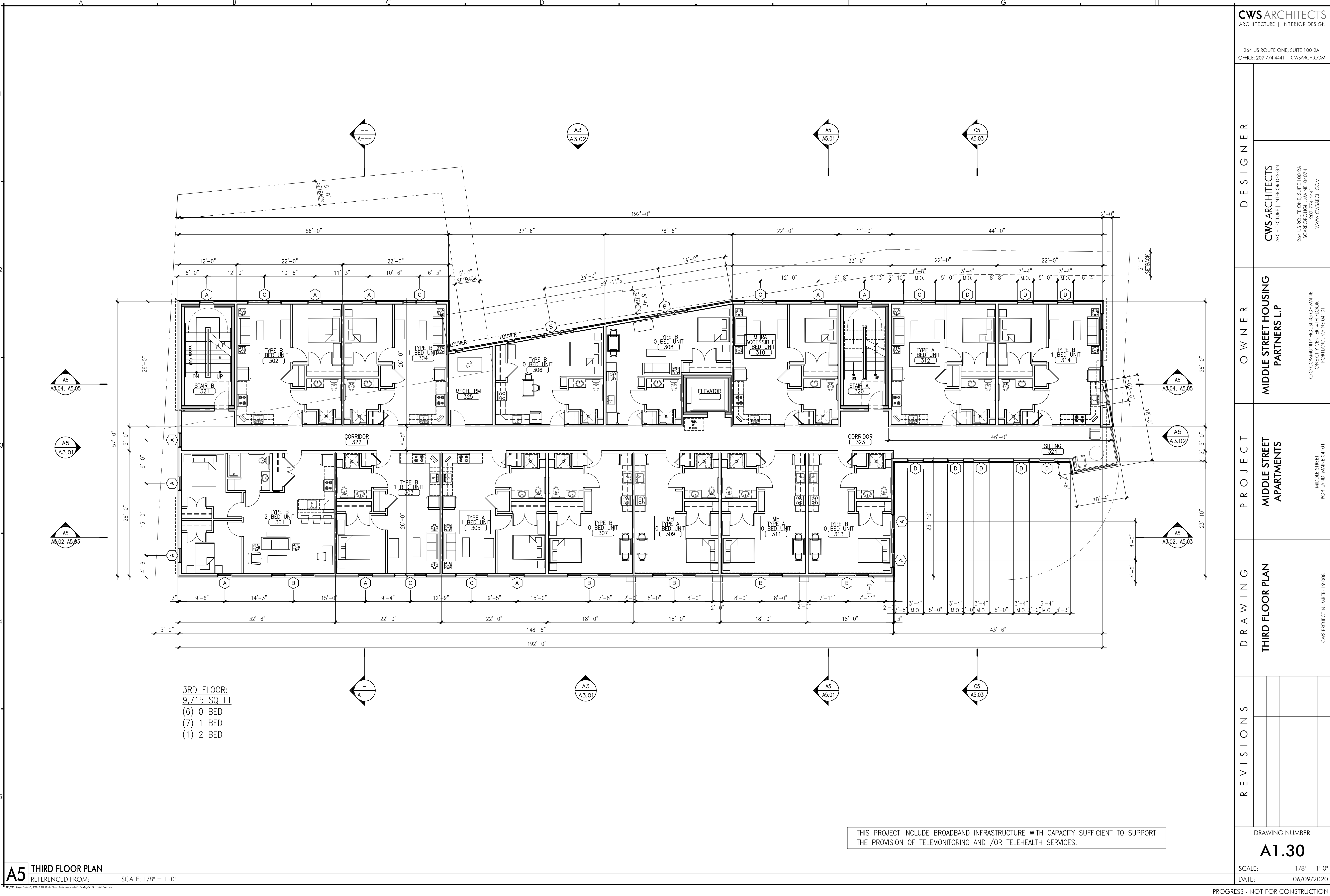
MIDDLE STREET HOUSING
PARTNERS L.P.
C/O COMMUNITY HOUSING OF MAINE
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

PROJECT

MIDDLE STREET
APARTMENTS
MIDDLE STREET
PORTLAND, MAINE 04101

DRAWING

SECOND FLOOR PLAN
CWS PROJECT NUMBER: 19-008



DESIGNER

CWS ARCHITECTS
ARCHITECTURE | INTERIOR DESIGN
264 US ROUTE ONE, SUITE 100-2A
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OWNER

MIDDLE STREET HOUSING
PARTNERS L.P.

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ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

PROJECT

MIDDLE STREET
APARTMENTS

MIDDLE STREET
PORTLAND, MAINE 04101

DRAWING

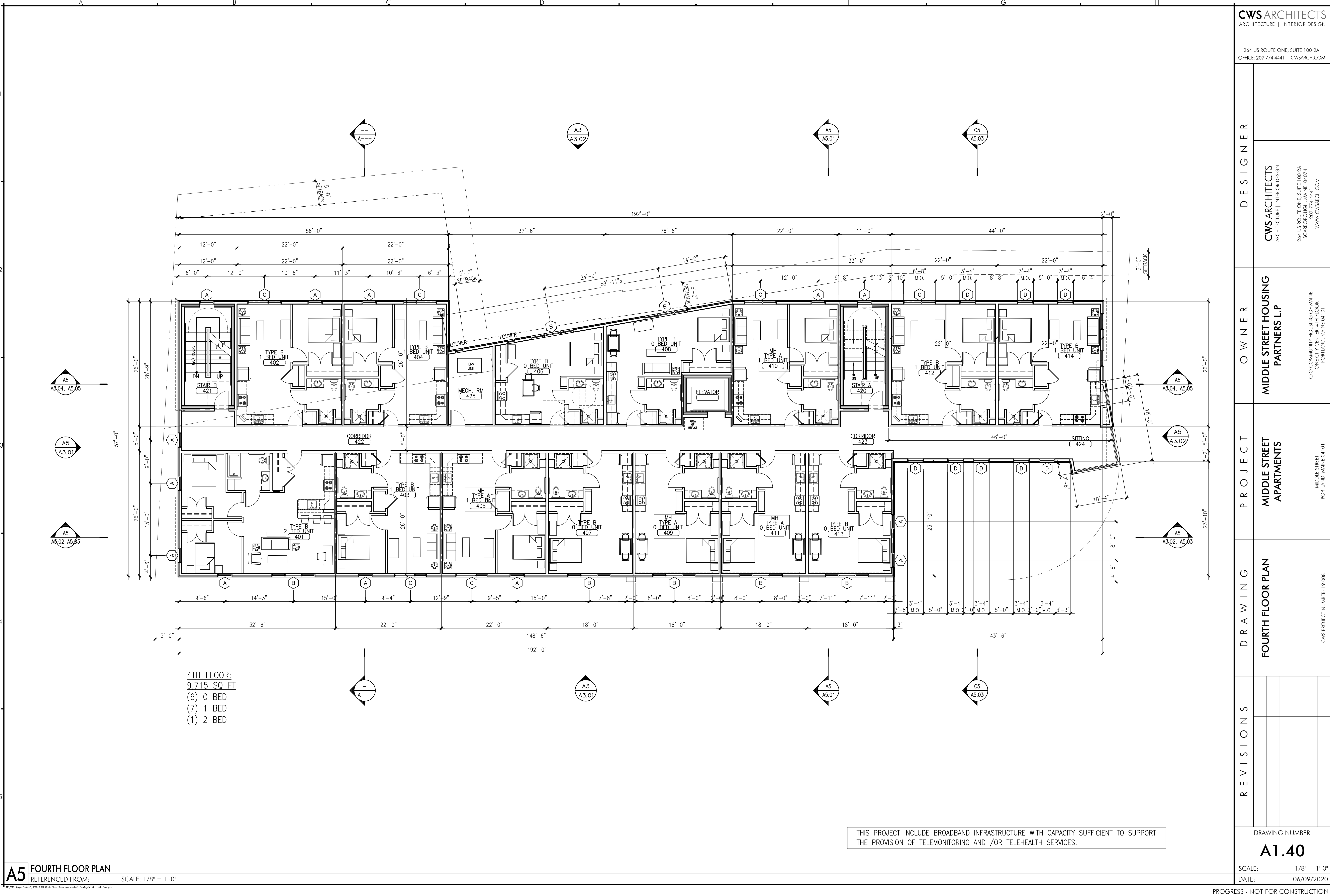
THIRD FLOOR PLAN

CWS PROJECT NUMBER: 19-008

REVISIONS

DRAWING NUMBER
A1.30
SCALE: 1/8" = 1'-0"
DATE: 06/09/2020

THIS PROJECT INCLUDE BROADBAND INFRASTRUCTURE WITH CAPACITY SUFFICIENT TO SUPPORT THE PROVISION OF TELEMONITORING AND /OR TELEHEALTH SERVICES.



4TH FLOOR:
9,715 SQ. FT.
(6) 0 BED
(7) 1 BED
(1) 2 BED

THIS PROJECT INCLUDE BROADBAND INFRASTRUCTURE WITH CAPACITY SUFFICIENT TO SUPPORT THE PROVISION OF TELEMONITORING AND /OR TELEHEALTH SERVICES.

A5 FOURTH FLOOR PLAN
REFERENCED FROM: SCALE: 1/8" = 1'-0"

CWS ARCHITECTS
ARCHITECTURE | INTERIOR DESIGN

264 US ROUTE ONE, SUITE 100-2A
OFFICE: 207.774.4441 CWSARCH.COM

DESIGNER

CWS ARCHITECTS
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207.774.4441
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OWNER

MIDDLE STREET HOUSING PARTNERS L.P.
C/O COMMUNITY HOUSING OF MAINE
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

PROJECT

MIDDLE STREET APARTMENTS
MIDDLE STREET
PORTLAND, MAINE 04101

DRAWING

FOURTH FLOOR PLAN
CWS PROJECT NUMBER: 19-008

REVISIONS

DRAWING NUMBER
A1.40
SCALE: 1/8" = 1'-0"
DATE: 06/09/2020

DESIGNER

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ARCHITECTURE | INTERIOR DESIGN
264 US ROUTE ONE, SUITE 100-2A
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OWNER

MIDDLE STREET HOUSING
PARTNERS L.P.
C/O COMMUNITY HOUSING OF MAINE
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

PROJECT

MIDDLE STREET
APARTMENTS
MIDDLE STREET
PORTLAND, MAINE 04101

DRAWING

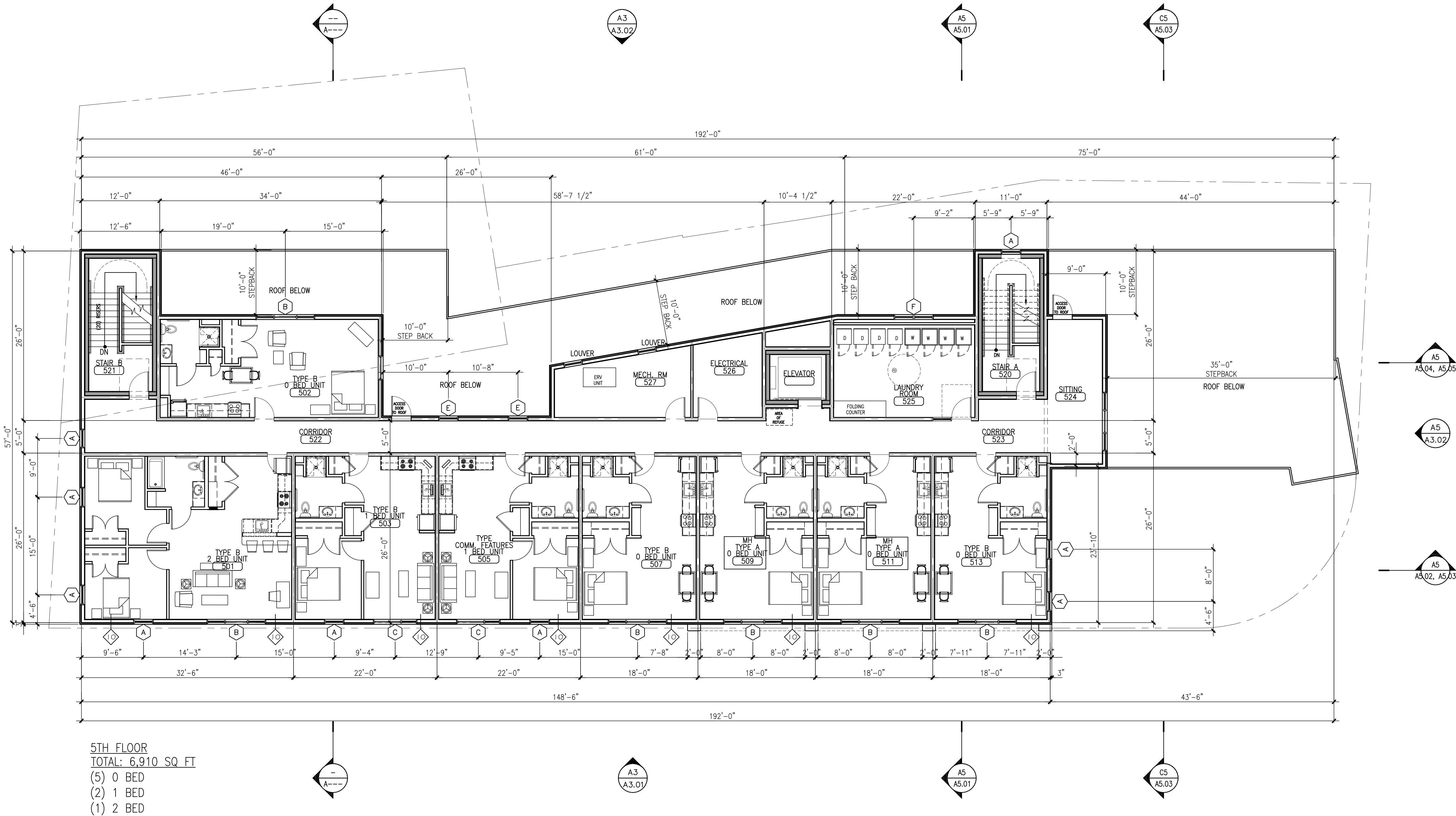
FIFTH FLOOR PLAN
CWS PROJECT NUMBER: 19-008

REVISIONS

DRAWING NUMBER

A1.50

SCALE: 1/8" = 1'-0"
DATE: 06/09/2020



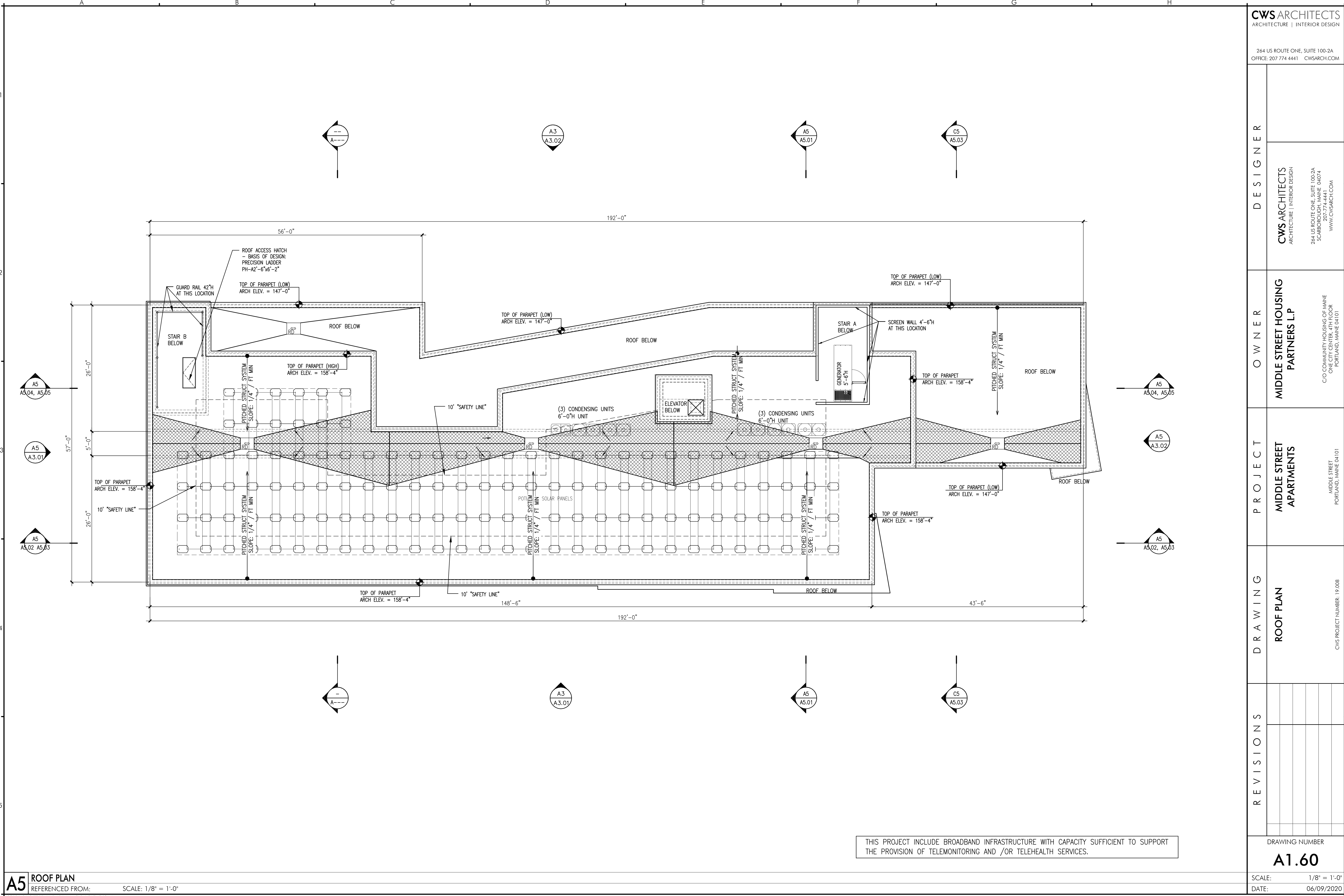
5TH FLOOR
TOTAL: 6,910 SQ. FT.
(5) 0 BED
(2) 1 BED
(1) 2 BED

THIS PROJECT INCLUDE BROADBAND INFRASTRUCTURE WITH CAPACITY SUFFICIENT TO SUPPORT THE PROVISION OF TELEMONITORING AND /OR TELEHEALTH SERVICES.

A5

FIFTH FLOOR PLAN

REFERENCED FROM: SCALE: 1/8" = 1'-0"



THIS PROJECT INCLUDE BROADBAND INFRASTRUCTURE WITH CAPACITY SUFFICIENT TO SUPPORT THE PROVISION OF TELEMONITORING AND /OR TELEHEALTH SERVICES.

CWS ARCHITECTS
ARCHITECTURE | INTERIOR DESIGN

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DESIGNER

CWS ARCHITECTS
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OWNER

MIDDLE STREET HOUSING PARTNERS L.P

C/O COMMUNITY HOUSING OF MAINE
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

PROJECT

MIDDLE STREET APARTMENTS

MIDDLE STREET
PORTLAND, MAINE 04101

DRAWING

ROOF PLAN

CWS PROJECT NUMBER: 19-008

REVISIONS

DRAWING NUMBER

A1.60

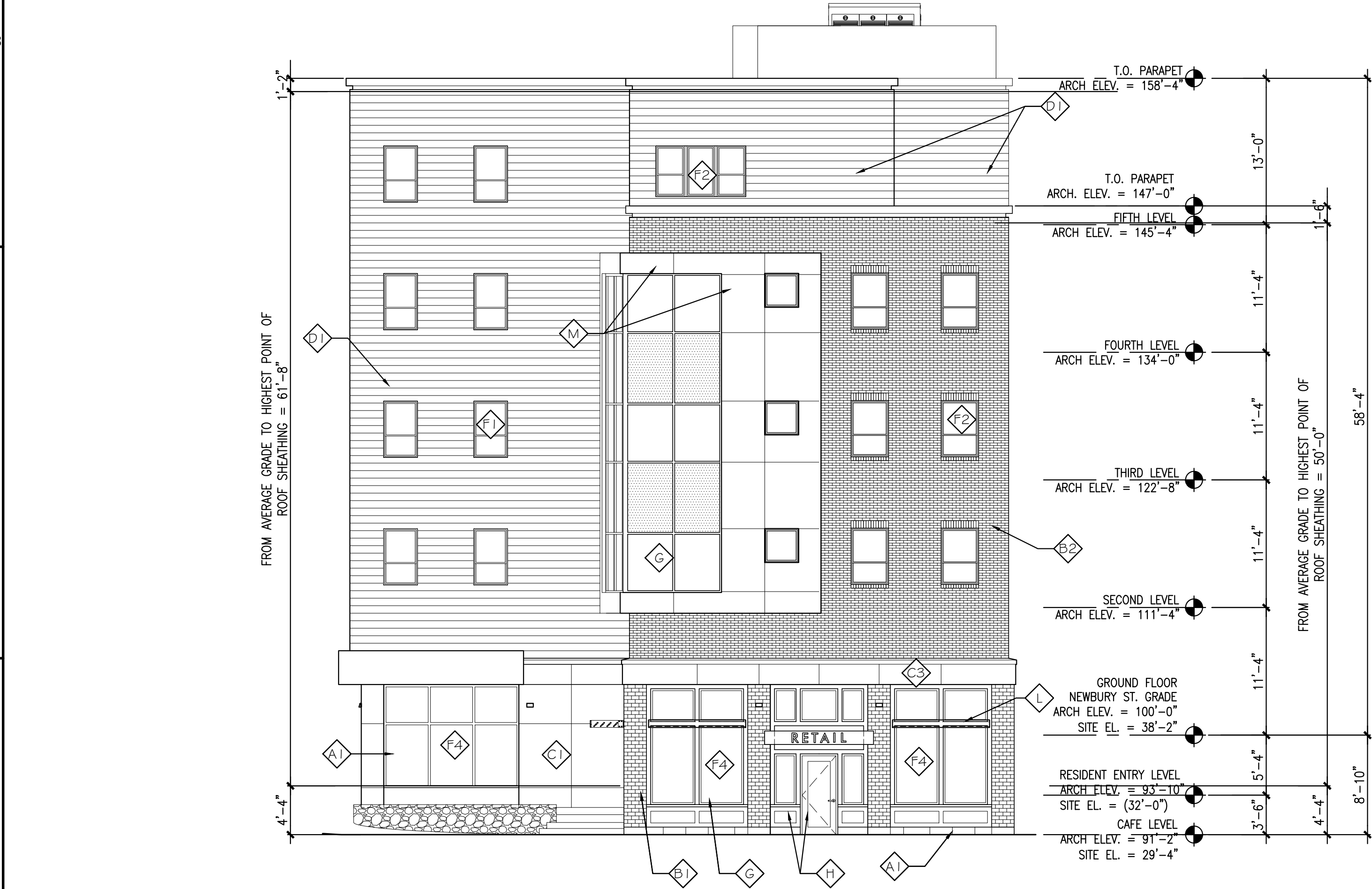
SCALE: 1/8" = 1'-0"

DATE: 06/09/2020

PROGRESS - NOT FOR CONSTRUCTION



A3 BUILDING ELEVATION
REFERENCED FROM: SCALE: 1/8" = 1'-0"



A5 BUILDING ELEVATION
REFERENCED FROM: SCALE: 1/8" = 1'-0"

EXTERIOR FINISH MATERIAL LEGEND			
CODE	MATERIAL	COLOR AND FINISH	PATTERN LEGEND
D1	WESTBROOK CONCRETE BLOCK MANUFACTURE	COLOR: GF-326, GROUND FACE TEXTURE	
D2	ECONO MODULAR SIZE BRICK - 3 5/8" x 3 5/8" x 7-5/8"	COLOR: ACADEMY SMOOTH SERIES NARROW FLASHED RANGE	
D3	MODULAR SIZE THIN BRICK - 5/8" x 2 1/4" x 7-5/8"	COLOR: ACADEMY SMOOTH SERIES, NARROW FLASHED RANGE	
C1	HARDIE REVEAL PANEL SYSTEM (SIDING SYSTEM C1) - 5/16" SMOOTH FACE W/ SURROUNDED TRIM, STACKED LAYOUT. FACTORY PRIMED AND FACTORY FINISH.	COLOR: SHERWIN WILLIAMS URBANE BRONZE, FACTORY-FINISH	
C2	HARDIE ARTISAN SHIPLAP VERTICAL SIDING (SIDING SYSTEM C2) - .625", 10.25" WIDTH WITH 9" EXPOSURE. FACTORY PRIMED AND FIELD FINISH.	COLOR: SHERWIN WILLIAMS CARNELIAN, FIELD PAINT	
C3	HARDIE REVEAL PANEL SYSTEM (SIDING SYSTEM C3) - 5/16" SMOOTH FACE W/ SURROUNDED TRIM, STACKED LAYOUT. FACTORY PRIMED AND FACTORY FINISH.	COLOR: SHERWIN WILLIAMS AMAZING GRAY, FACTORY - FINISH	
D4	FIBERCEMENT LAP SIDING (SIDING SYSTEM D1) - 5/16", 9.25" SMOOTH TEXTURED, 8" EXPOSURE FACTORY PRIMED AND FIELD FINISH	COLOR: SHERWIN WILLIAMS AMAZING GRAY, SATIN FINISH, FIELD PAINT	
F	BREAK METAL TRIM, PAINTED	PAINT: SHERWIN WILLIAMS URBANE BRONZE	
F1	SINGLE HUNG WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
F2	TRIPLE WINDOWS - SINGLE HUNG/ PICTURE WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
F3	DOUBLE WINDOWS - SINGLE HUNG/ PICTURE WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
F4	LARGE PICTURE WINDOWS ON FIRST FLOOR BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
G	ALUMINUM THERMAL STOREFRONT WINDOW SYSTEM BY KAWNEER, TRIFAB VERSAGLAZE 451/451T, PELLA 250 SERIES OR EQUAL	COLOR: TERRATONE	
H	ALUMINUM THERMAL STOREFRONT ENTRANCE DOOR WITH SIDELITES SYSTEM BY KAWNEER, TRIFAB VERSAGLAZE 451/451T, PELLA 250 SERIES OR EQUAL	COLOR: TERRATONE	
I	BREAK METAL TRIM AT FIRST FLOOR, PAINTED	PAINT: SW IN THE NAVY	
J	DECORATIVE GRILLES VENT	COLOR: TERRATONE /OPTIONS TO FOLLOW	
L1	EXTERIOR WALL MOUNT LIGHT FIXTURE	MODEL: BEGA 22-261 COLOR: BLACK	
L2	EXTERIOR WALL MOUNT LIGHT FIXTURE	MODEL: LNC2 LITEPAK BY HUBBELL LIGHTING; COLOR: BLACK	
L	36" SUNSHADE SYSTEM BY CRL ALUMINUM MANUF. - 6" TALL SQUARE OUTRIGGER WITH 1x6" RECTANULAR FASCIA AND INFILL BLADES	COLOR: TBD	
M	HARDIE REVEAL PANEL SYSTEM (SIDING SYSTEM M) - 5/16" SMOOTH FACE W/ SURROUNDED TRIM, STACKED LAYOUT. FACTORY PRIMED AND FIELD FINISH.	COLOR: SHERWIN WILLIAMS IN THE NAVY, FACTORY-FINISH	

D5 ELEVATION NOTES
REFERENCED FROM:

DESIGNER

CWS ARCHITECTS
ARCHITECTURE | INTERIOR DESIGN
264 US ROUTE ONE, SUITE 100-2A
SCARBOROUGH, MAINE 04074
207.774.4441
WWW.CWSARCH.COM

OWNER

MIDDLE STREET HOUSING
PARTNERS L.P.
C/O COMMUNITY HOUSING OF MAINE
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

PROJECT

MIDDLE STREET
APARTMENTS
MIDDLE STREET
PORTLAND, MAINE 04101

DRAWING

BUILDING ELEVATIONS

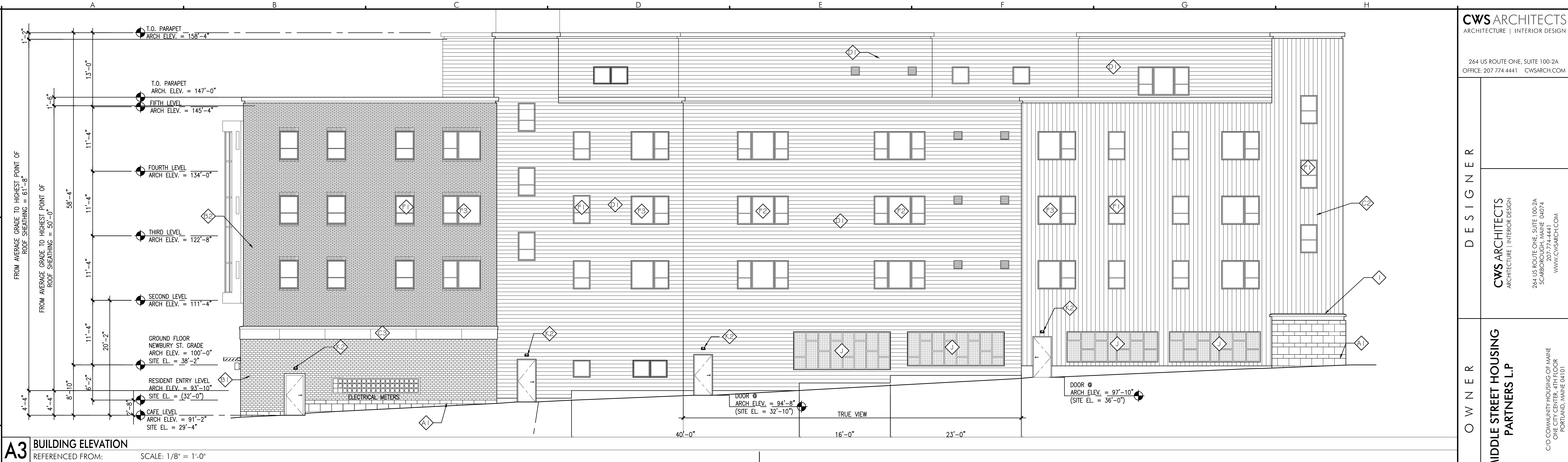
REVISIONS

NO.	DESCRIPTION	DATE

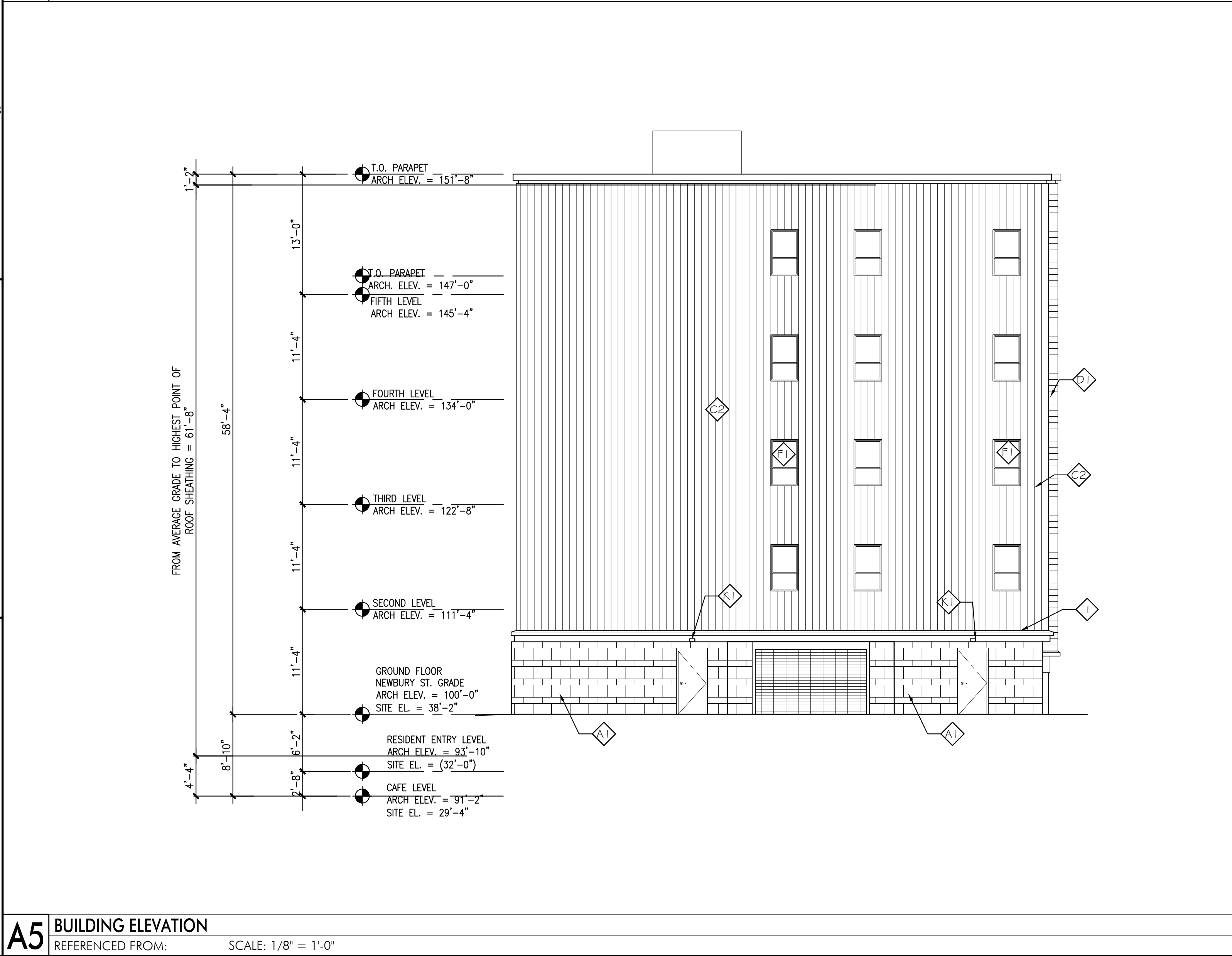
DRAWING NUMBER

A3.01

SCALE: 1/8" = 1'-0"
DATE: 06/09/2020



A3 BUILDING ELEVATION
REFERENCED FROM: SCALE: 1/8" = 1'-0"



A5 BUILDING ELEVATION
REFERENCED FROM: SCALE: 1/8" = 1'-0"

EXTERIOR FINISH MATERIAL LEGEND			
CODE	MATERIAL	COLOR AND FINISH	PATTERN LEGEND
A1	WESTBROOK CONCRETE BLOCK MANUFACTURE	COLOR: GF-326, GROUND FACE TEXTURE	
B1	ECONO MODULAR SIZE BRICK - 3 5/8" x 3 5/8" x 7-5/8"	COLOR: ACADEMY SMOOTH SERIES NARROW FLASHED RANGE	
B2	MODULAR SIZE THIN BRICK - 5/8" x 2 1/4" x 7-5/8"	COLOR: ACADEMY SMOOTH SERIES, NARROW FLASHED RANGE	
C1	HARDIE REVEAL PANEL SYSTEM (SIDING SYSTEM C1)- 5/16" SMOOTH FACE W/ SURROUNDED TRIM, STACKED LAYOUT. FACTORY PRIMED AND FACTORY FINISH.	COLOR: SHERWIN WILLIAMS URBANE BRONZE, FACTORY-FINISH	
C2	HARDIE ARTISAN SHIPLAP VERTICAL SIDING (SIDING SYSTEM C2) - .625", 10.25" WIDTH WITH 9" EXPOSURE. FACTORY PRIMED AND FIELD FINISH.	COLOR: SHERWIN WILLIAMS CARNELIAN, FIELD PAINT	
C3	HARDIE REVEAL PANEL SYSTEM (SIDING SYSTEM C3) - 5/16" SMOOTH FACE W/ SURROUNDED TRIM, STACKED LAYOUT. FACTORY PRIMED AND FACTORY FINISH.	COLOR: SHERWIN WILLIAMS AMAZING GRAY, FACTORY - FINISH	
D1	FIBERCEMENT LAP SIDING (SIDING SYSTEM D1) - 5/16", 9.25" SMOOTH TEXTURED, 8" EXPOSURE FACTORY PRIMED AND FIELD FINISH	COLOR: SHERWIN WILLIAMS AMAZING GRAY, SATIN FINISH, FIELD PAINT	
E	BREAK METAL TRIM, PAINTED	PAINT: SHERWIN WILLIAMS URBANE BRONZE	
F1	SINGLE HUNG WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
F2	TRIPLE WINDOWS - SINGLE HUNG/ PICTURE WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
F3	DOUBLE WINDOWS - SINGLE HUNG/ PICTURE WINDOWS BASED ON PELLA OR EQUAL	COLOR: TERRATONE	
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G	ALUMINUM THERMAL STOREFRONT WINDOW SYSTEM BY KAWNEER, TRIFAB VERSAGLAZE 451/451T , PELLA 250 SERIES OR EQUAL	COLOR: TERRATONE	
H	ALUMINUM THERMAL STOREFRONT ENTRANCE DOOR WITH SIDELITES SYSTEM BY KAWNEER, TRIFAB VERSAGLAZE 451/451T, PELLA 250 SERIES OR EQUAL	COLOR: TERRATONE	
I	BREAK METAL TRIM AT FIRST FLOOR, PAINTED	PAINT: SW IN THE NAVY	
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D5 ELEVATION NOTES
REFERENCED FROM:

DESIGNER

CWS ARCHITECTS
ARCHITECTURE | INTERIOR DESIGN
264 US ROUTE ONE, SUITE 100-2A
SCARBOROUGH, MAINE 04074
207.774.4441
WWW.CWSARCH.COM

OWNER

MIDDLE STREET HOUSING
PARTNERS L.P

C/O COMMUNITY HOUSING OF MAINE
ONE CITY CENTER, 4TH FLOOR
PORTLAND, MAINE 04101

PROJECT

MIDDLE STREET
APARTMENTS

MIDDLE STREET
PORTLAND, MAINE 04101

DRAWING

BUILDING ELEVATIONS

REVISIONS

DRAWING NUMBER

A3.02

SCALE: 1/8" = 1'-0"
DATE: 06/09/2020





Bangor Savings Bank

Bangor Savings Bank

COLD BEER - HOT SAUSAGE - FULL BAR - FOOD & DRINK until 1 AM

TOMAS'S CANTINE



PLANNING BOARD REPORT PORTLAND, MAINE

Zoning Map Amendment
879 Congress Street
ZN-000823-2019
879 Congress Street LLC, Applicant

Submitted to: Portland Planning Board Public Hearing Date: July 14, 2020	Prepared by: Shukria Wiar, Planner Date Prepared: July 10, 2020
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I. INTRODUCTION

879 Congress LLC proposes a zoning map amendment for the property at 879 Congress Street in the West End. The property is currently zoned R-6 Residential; the applicant proposes to rezone it to B-2b Community Business. The applicant has stated that rezoning the site to B-2b will allow them to develop a mixed-use building with commercial uses on the ground floor and residential units above.

Figure – Aerial of the Development Site



A Planning Board workshop was held on January 28, 2020 for this map amendment. In general, the Board members were in support of this rezoning and instructed staff to further examine the possibility of an extended rezoning area encompassing properties beyond the applicant-controlled site. At that workshop, it was requested that staff reach out to the owners within the potential extended rezoning area to notify them of the map amendment. Staff reached out to nine property owners, of which three responded in support of the broader zoning map amendment. No owners expressed opposition.

Applicant and Property Owner: Paul Peck, 879 Congress Street LLC

II. PROPOSED MAP AMENDMENT

Current Zoning:	R-6 (Residential)
Proposed Zoning:	B-2b (Community Business)
Current Uses:	Residential
Proposed Uses:	Mixed-use with first floor commercial (restaurant) and upper floor residential
Parcel Area:	11,889 SF

Area to be Rezoned

Under applicant's proposal:

One parcel (11,889 SF in size)

Extended Rezoning Area:

Nine parcels

III. BACKGROUND

The 879 Congress Street site, which consists of three parcels, is currently occupied by a two-story, five-unit apartment building on the eastern half of the site. The remainder of the site is dedicated to surface parking. The total area of the combined parcels is 11,889 SF. The lot is approximately 114 feet wide and 106 feet deep.

Figure 2 – Photo of the Property in 1924 and 2020.



The site lies at the intersection of several zones. The property itself is zoned R-6; as such, it is surrounded on two sides by mostly residential uses, including some large multi-family housing to the east. Most of the adjacent housing is of a scale characteristic of the city's West End. A Maine Medical Center Institutional Overlay (IOZ) zone lies to the west and across Congress Street. To the west, about a block away, is the B-2 zone. The B-2 and B-2b zones are the nearest commercial zones; B-2b is to the east of the site along on Congress Street. This B-2b zone includes restaurant, retail, office, and residential uses.

IV. PROPOSED CONCEPTUAL DEVELOPMENT

Figure 3- Proposed Conceptual Building



The applicant seeks this map amendment to allow the construction of a four to five story apartment building with twenty-seven (27) housing units, as well as ground floor restaurant and/or retail use. The applicant envisions the exterior of the building be energy efficient with architecturally appropriate mix of masonry, steel and cement board.

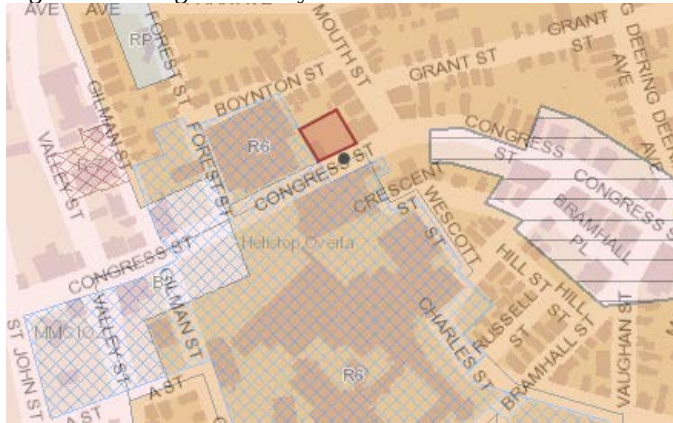
V. ZONING ANALYSIS

The existing R-6 zone precludes the above-referenced conceptual development proposal on at least two counts. R-6 allows a density of one unit/725 SF of lot area, a density that the

applicant has stated is too low to support the project. Secondly, restaurant uses are not permitted in the R-6 zone; nor are other commercial establishments, such as retail or office. For this reason, the applicant has requested a rezoning to B-2b, which allows housing at a density of one unit/435 SF and restaurant and office uses by right.

In the process of review, City staff assessed other alternatives to the B-2b that includes the B-2 Community Business zone, which is represented in the nearest business zone and has been used in similar locations around the city. Although this zone would allow the housing density desired by the applicant, B-2b in this location would be consistent with the B-2b zone located less than one block to the east of the site.

Figure 4: Zoning of Vicinity



Likewise, staff considered the R-7 Residential zone, which allows a higher residential density and has been used for other large residential projects on the peninsula. As in the R-6, however, restaurants are not allowed in the R-7.

The following chart compares the current R-6 zone and the proposed B-2b zone; the charts show the purpose statements, permitted uses, and dimensional requirements of each zone.

Purpose

The existing R-6 zoning is designed to promote dense, neighborhood-scale housing. The purpose of the R-6 zone, which can currently be found mainly in the East and West Ends of the city, is to “set aside areas...for housing characterized primarily by multi-family dwellings at a high density” and to “conserve the existing housing stock and residential character of neighborhoods by controlling the scale and external impacts of professional offices and other nonresidential uses” (*Section 14-135*).

The B-2b zone, in contrast, is written to encourage commercial development, particularly neighborhood and community retail, in a compact, urban form. The B-2 and B-2b is expressly written for “arterials and intersections with an existing urban or neighborhood oriented building pattern” (*Section 14-181*). The B-2b can be found on Congress Street east and west of downtown, Washington Avenue, St John Street, and Forest Avenue.

Table 1: Purposes

	R-6 Residential	B-2b
Purpose	To set aside areas on the peninsula for housing characterized primarily by multifamily dwellings at a high density providing a wide range of housing for differing types of households; and to conserve the existing housing stock and residential character of neighborhoods by controlling the scale and external impacts of professional offices and other nonresidential uses. In cases of qualifying small, vacant, underutilized lots located in the urban residential and business zone, to encourage new housing development consistent with the compact lot development pattern typically found on the peninsula.	The B-2b zone is intended to provide neighborhood and community retail, business and service establishments that are oriented to and built close to the street. The B-2b zone is appropriate in areas where a more compact urban development pattern exists such as on-peninsula or in areas off-peninsula where a neighborhood compatible commercial district is established which exhibits a pedestrian scale and character. Such locations may include the peninsula and other arterials and intersections with an existing urban or neighborhood oriented building pattern.

Permitted Uses

The R-6 zone clearly encourages high-density housing, and permits most housing types by right. However, the R-6 zone does not permit most non-residential uses, and commercial uses are excluded entirely. Some institutional uses are conditionally permitted. The Business B-2b zone clearly permits both the residential uses permitted in the R-6 zone as well as a host of commercial, institutional, and other establishments. The B-2b is more permissive, permitting office uses, personal services, business services, and retail establishments, as well as funeral homes, health clubs, theaters, hotels, dairies, bakeries, and veterinary hospitals, among others. Restaurants are permitted by right in the B-2b.

Table 2: Permitted and Conditional Uses – Shown with X if listed in Zone

			R-6	B-2b
Permitted	Residential	Single-family and two-family dwellings	x	x
		Multi-family dwellings	x	x ¹
		Handicapped family units	x	x
		Single-family manufactured housing	x	
		Combined living/working spaces		x
		Lodging houses	x	x
	Institutional	Schools		x
		Clinics		x
		Places of assembly		x
		Long term, extended and intermediate care facilities		x

Table 2: Permitted and Conditional Uses – Shown with X if listed in Zone

			R-6	B-2b
Conditional		Governmental buildings and uses/municipal uses	x	x
		College, university or trade schools		x
		Nursery schools, kindergartens		
		Day care facilities		x
	Business	General, business & professional offices		x
		Personal services		x
		Offices of building tradesmen		x
		Retail establishments		x
		Restaurants		x
		Drinking establishments		x
		Billiard parlors		x
		Mortuaries or funeral homes		x
		Miscellaneous repair services, excluding motor vehicle repair		x
		Communication studios or broadcast and receiving facilities		x
		Health clubs and gymnasiums		x
		Veterinary hospitals		x
		Theaters		x
		Hotels		x
		Dairies and bakeries		x
		Drive-throughs when accessory to a principal use		x
		Registered medical marijuana dispensaries		x
	Other	Accessory uses	x	x
		Cemeteries	x	
		Parks	x	
		Home occupation	x	
		Special needs independent living units	x	
		Conversion into bed and breakfast	x	
		Hostels	x	x
		Wind energy systems	x	x
		Utility substations		x
		Bed and breakfasts		x
		Studios for artists and craftspeople		x
Conditional	Residential	Sheltered care group homes	x	
		Conversion into bed and breakfast (over 5 rooms)	x	
	Institutional	Schools	x	
		Long-term and extended care facilities	x	
		Intermediate care facility	x	
		Places of assembly	x	
		Hospital	x	
		College, university, trade schools	x	
	Business	Major and minor auto service stations existing as of 1999		x

Table 2: Permitted and Conditional Uses – Shown with X if listed in Zone

			R-6	B-2b
		Car washes		x
		Drive-throughs associated with a permitted use adjacent to residential zones		x
		Automobile dealerships		x
	Other	Utility substations	x	
		Professional offices	x	
		Chancellery	x	
		Nursery school and kindergartens	x	
		Off-street parking for passenger cars for permitted uses	x	
		Day care facilities	x	
		Temporary wind anemometer towers	x	x
		Hostels	x	
		Wind energy systems	x	x
		Printing and publishing establishments		x
		Wholesale distribution establishments		x
		Research and developments and related production establishments		x

¹ If nearest residential zone is R-4, R-5, R-6, or R-7 or if first floor is used for commercial purposes.

Dimensional Requirements and Form

Though the R-6 explicitly encourages high density housing, the existing R-6 zoning provides certain density controls – minimum area per dwelling unit, maximum lot coverages, and minimum open space ratios – that limit the buildout of any given parcel. The R-6's requirement for density, 725 SF of lot area required per dwelling unit, would limit the residential buildout of the parcel to approximately 16 units. The R-6 also poses structure stepback requirements such that the *'Portions of a structure above 35 ft shall be no closer than 10 ft from the side property line and no closer than 15 feet from the rear property line when such property line abuts a residential zone'*, which guarantees that buildings will be separated both from each other and the street.

The city's business zones generally encourage a more dense, urban form. The B-2b zone has no lot coverage limits or required open space ratio, and the setbacks are considerably smaller than the R-6 zone. Further, the B-2b allows one dwelling unit for each 435 SF of lot area, allowing a greater number of units than would be permitted in the R-6 zone. The B-2b also allows a slightly taller building than R-6, 50 feet, so long as the first floor is occupied by a commercial use.

Table 3: Dimensional Requirements

	R-6 ¹	B-2b
Min. Lot Size	2,000 SF (depending on use)	None
Min. Lot Area per D.U.	725 SF (depending on use)	435 SF if active street frontage
Min. Street Frontage	20 ft.	20 ft.
Min. Lot Width	20 ft.	
Min. Front Yard	10 ft.	None
Max. Front yard	5 ft. or the average depths of adjacent front yards	10 ft., except for irregularly shaped lots or lots with < 40 ft. of frontage
Min. Rear Yard	10 ft.	10 ft.; 5 ft. for accessory structures
Min. Side Yard	5 ft. except that a side yard in the R-6 zone may be reduced to zero, provided that the cumulative side yard setbacks are not less than 10 ft.	None; 5 ft. for accessory structures
Max. Structure Height	45 ft.	45 ft., except 50 ft. if first floor is occupied by a commercial use
Max. Lot Coverage	60%	

VI. LAND USE POLICY

The applicant has submitted their analysis of the project's conformance with the Comprehensive Plan (refer to [Attachment E](#)). The staff has identified the following goals and policies which are relevant to the proposed zoning amendment and finds the proposal in conformance with both the housing and economic development goals of the Comprehensive Plan, as well as the future land use vision. As stated, the purpose of the B-2b Zone is:

The B-2b zone is intended to provide neighborhood and community retail, business and service establishments that are oriented to and built close to the street. The B-2b zone is appropriate in areas where a more compact urban development pattern exists such as on-peninsula or in areas off-peninsula where a neighborhood compatible commercial district is established which exhibits a pedestrian scale and character. Such locations may include the peninsula and other arterials and intersections with an existing urban or neighborhood-oriented building pattern.

The central vision of Portland's Plan 2030 is represented by the Venn diagram demonstrating the integral interrelation of the community's core belief that Portland is equitable, sustainable, connected, dynamic, authentic and secure. The vision conveys the message of the City's need to balance many competing needs to assure the advance of the vision as a unified concept. In this instance, that the City's goals for job growth and transforming Portland through orderly growth and development be balanced with needs for connectivity of the street grid, sustainability of infrastructure and the ability to maintain that infrastructure, and security in the sense of public safety.



Housing: A Livable City

State Goals: To encourage and promote affordable decent, housing opportunities for all Maine citizens

Local Goals:

- Increase, preserve, and modify the overall supply of housing City-wide to meet the needs, preferences and financial capabilities of all Portland households.
- Encourage additional contextually-appropriate housing density in and proximate to neighborhood centers, concentrations of services, and transit nodes and corridors as a means of supporting complete neighborhoods.
- Pursue policies to enable people who work in Portland to have the option to live in Portland.
- Encourage quality, sustainable design in new housing development.

Goals from Future Strategies:

3. Remove Housing Barriers

- Evaluate whether current zoning allows for new development consistent with historic patterns of form, density and/or use, as well as whether it allows for priority growth areas.
- Identify priority growth areas.
- Allow for a range of housing models in City codes, whether small units, co-housing, or others that may suit changing needs and demographics.

A Vibrant City

5. TARGET AREAS FOR JOB GROWTH

- Ensure that new employment can be accommodated in priority growth areas across the City.
- Evaluate zoning and the condition of existing infrastructure in priority areas - downtown, in identified neighborhood nodes, and along transit corridors – to ensure that employment and housing growth can be supported.
- Expand possibilities for live/work spaces – residential living space with integrated creative work space.
- Modify ordinances and make strategic investments to better promote business development and job creation in priority areas.

Future Land Use

Portland's plan for Future Land Use places emphasis on areas most important to its growth over the next ten years. It includes three maps: a map depicting current dominant land use patterns, a map showing a connected network of trails and open spaces, and a map of corridors and nodes that are poised to accommodate additional

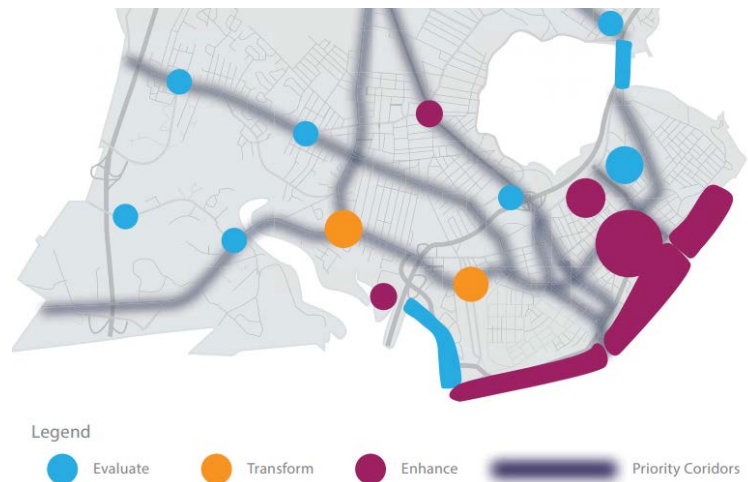
growth. These maps are best understood in the context of the plan's principles for future growth. The Libbytown area is one of the priority growth nodes identified in the plan as an area for potential future transformation.

Priority growth areas include the following elements:

1. **Priority nodes:** Nodes are areas with concentrated mixed-use activity, which can occur at varying scales and serve varying catchment areas - Portland's downtown supports a large successful node, for example, but nodes can also be found at smaller convergences and intersections throughout the City. As mapped, nodes are not meant to sharply delineate boundaries, but to indicate general areas in need of further planning or investment. The nodes identified by the map may have seen disinvestment, grown in sprawling patterns, or simply have the potential to serve as focal points for change in density or, height, streetscape, or uses to better serve neighborhood needs. These nodes are placed into three broad categories that correspond with their respective stage of planning or investigation at the present time.

- **Evaluate:** Areas as diverse as East Bayside and Allen's Corner, where the City recognizes the need to review existing conditions and develop a strategy for future change. These nodes should be assessed for their ability to address neighborhood needs and serve as centers for complete neighborhoods;
- **Transform:** Areas such as Morrill's Corner, which have been previously recognized as areas of significant potential transformation, but which need comprehensive revisioning; and
- **Enhance:** Areas such as Woodford's Corner, or the Eastern, Central and Western Waterfronts, which have been studied and are awaiting or in the midst of plan implementation.

2. **Priority corridors** The Priority Nodes & Corridors Map identifies key corridors - those that connect major nodes and neighborhoods and therefore serve as major commuter routes - as areas for additional planning and investment. Priority corridors are major arterials that often see heavy vehicular traffic, but also have the capacity to improve mobility by capitalizing on their potential for increased walking, bicycling, and transit use. Priority corridors can also serve as areas of additional mixed-use, higher density growth to take advantage of the transit benefits and services that well-designed, diverse corridors can offer. The Congress Street Corridor in Libbytown is one of Portland's priority corridor.



VII. PUBLIC COMMENT/NEIGHBORHOOD MEETING

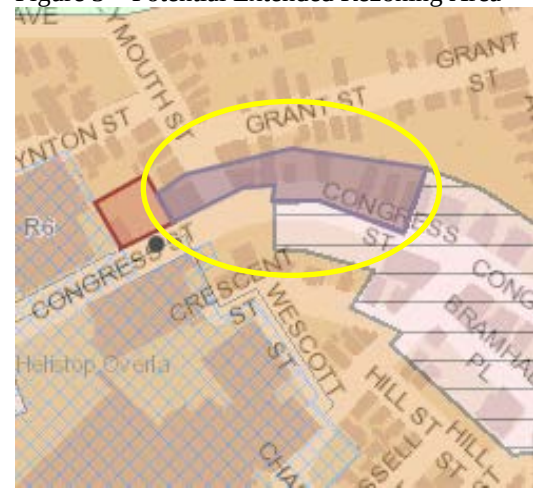
Notices were sent to one hundred and six (106) residents and the interested citizen list. The notice also appeared in the Portland Press Herald on July 5th and July 6th, 2020, as well as being posted on the City's web page. The Planning staff went a step further and noticed the owners in the potential extended rezoning area; this area is described in further detail in Section VIII below.

A neighborhood meeting was held on February 27, 2020. Seven citizens attended this meeting. The Planning Division has received three public comments, in support of this map amendment and requests their property at along Congress Street be also included in the rezoning.

VIII. CONSIDERATION OF EXTENDED REZONING AREA

Generally, when a Zoning Map Amendment is reviewed, the Planning Board examines the proposed boundaries comprehensively and considers other adjacent areas that may be appropriate candidates for a similar rezoning. This may result in the Board contemplating and noticing for a larger geographic area for the purposes of holding a public hearing, which can potentially be reduced in scope when the Board formulates its recommendation to the City Council. 879 Congress LLC requested a map amendment for their site only. However, upon further consideration, the Board may wish to extend the rezoning area to include the additional lots abutting the parcel on Congress Street in order to rationalize the zoning boundaries; please see Figure 3 for the proposed extended rezoning area. The proposed boundaries for the extended rezoning area include the remaining parcels between the

Figure 3 – Potential Extended Rezoning Area



applicant-controlled site and the B-2b zone that lies to the east along the north side of Congress Street. This area is comprised of nine parcels that include such uses as multifamily housing, a place of worship, and a general store. In this location, Congress Street is a major arterial approximately 65 feet in width with transit service. This portion of Congress street supports a mix of business, institutional, and residential uses, and has the capacity to facilitate additional density and travel by walking, bicycling, and transit modes should new development consistent with B-2b dimensional and use standards take place at these parcels.

Planning staff reached out to notify the owners of the parcels in the extended area about the potential rezoning of their properties. Several of the owners contacted the Planning Division to express that they are interested in having their properties in the area rezoned.

IX. **STAFF RECOMMENDATIONS**

Staff recommends that the Planning Board consider a positive recommendation to City Council for adoption of the map amendment to encompass the extended rezoning area as presented.

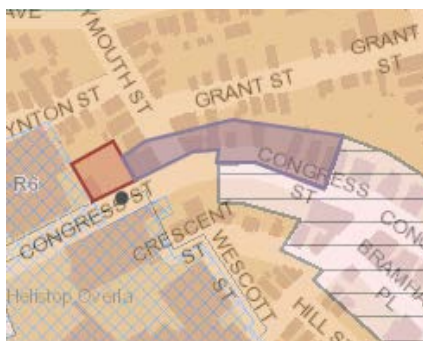
X. **MOTIONS FOR THE BOARD TO CONSIDER**

On the basis of plans and materials submitted by the applicant, the City of Portland Zoning Code, Portland's Comprehensive Plan, public comment, the information provided in public hearing on July 14, 2020 for the project # ZN-000823-2019 (879 Congress Street), and/or other findings as follows:

Option 1 (Extended Rezoning Area):

The Planning Board finds that the proposed rezoning to the Residential R-6 zone for the properties located at 837, 841, 843, 847, 857, 861, 863-865, 867, 871-873, and 879 Congress Street, as shown on the map below **[is or is not]** consistent with the Comprehensive Plan for the City of Portland; and

Therefore, the Planning Board **[recommends or does not recommend]** to the City Council adoption of the zoning map amendment for 837, 841, 843, 847, 857, 861, 863-865, 867, 871-873, and 879 Congress Street from R-6 Residential to B-2b Community Business for the area shown on the map below.

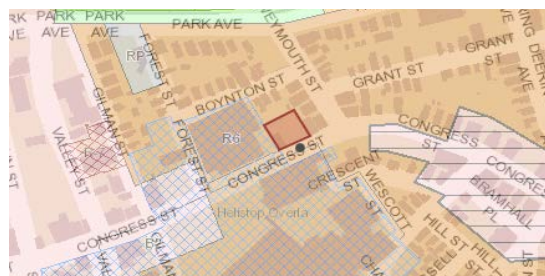


Or

Option 2 (Applicant-controlled parcel):

The Planning Board finds that the proposed rezoning to the B-2b Community Business zone for the property located at 879 Congress Street **[is or is not]** consistent with the Comprehensive Plan for the City of Portland; and

Therefore, the Planning Board **[recommends or does not recommend]** to the City Council adoption of the zoning map amendment for 879 Congress Street from R-6 Residential to B-2b Community Business for the area shown on the map below.



XI. ATTACHMENTS

A. PUBLIC COMMENTS

PC1 Aaron Duffey 11.06-.2019
PC2 Michelle Alger 01.15.2020
PC3 Eddy Ahmed 05.03.2020
PC4 Greg Johnson 07.07.2020

B. APPLICANT'S ATTACHMENTS

- A. 879 Congress LLC Cover letter
- B. 879 Congress LLC Application Comprehensive Plan
- C. 879 Congress LLC Application Project Description
- D. 879 Congress LLC Proposed Map Amendment
- E. 879 Congress Checklist
- F. 879 Congress Vicinity Map updated
- G. 879 Vicinity Map
- H. Context Google Map 873-879 Congress (1)
- I. Context Zoning 873-879 Congress final
- J. Congress Deed
- K. Congress Lease with Option
- L. Architectural Drawings
- M. Signed Certification and meeting
- N. Neighborhood meeting Sign-in Sheet 2-27-20 (1)
- O. Meeting Minutes

879 Congress LLC
PO Box 7589
Portland, Maine 04112
207-712-5891
paul@lwsdevelopment.com

RE: Map Amendment Application R6 zone to B-2b Community Business Zone
879-873 Congress Street
Lots: 053-1016, 1017, 1018

Dear Planning Board

On behalf of 879 Congress LLC, I am uploading into ePlan an application for Map Amendment for our land located at 879-873 Congress Street. The land is currently zoned R6 and we are requesting the zone be changed to B-2b, the Community Business Zone.

Along with this letter I have uploaded to ePlan the following:

- a. Completed Submission Checklist.
- b. Project Description.
- c. Elevation Plans depicting the project we would like to build.
- d. Our deed and option to purchase evidencing our right, title and interest.
- e. Consistency with Comprehensive Plan.
- f. Proposed Map Amendment.
- g. Vicinity Map.

Please advise when the application is complete so we can timely hold the required neighborhood meeting.

Thank you very much.

Paul Peck
Member 879 Congress LLC

879 Congress LLC PO Box 7589 Portland Maine 04112 207-712-5891

RE: **Map Amendment / Consistency with Comprehensive Plan**

LN-000823-2019 / 879-873 Congress Street

9/30/19

On behalf of 879 Congress LLC we respectfully request the City approve our Map Amendment Application to change our parcels zone from R6 to the B-2b Community Business Zone.

The current use of the 3 parcels is a 2 story older multi-unit apartment building with two vacant lots. A change in the zone to B-2b will allow the parcels to be used for more compact urban infill development. Our intended use of the lots is to construct a multi-unit apartment building with street level restaurant or retail.

Consistency with Comprehensive Plan: The requested map amendment will help further the goals, policies and land use plan of Portland's Comprehensive Plan for the following reasons:

- a. The B-2b zone will help to leverage our underutilized site. Activating and better utilizing underutilized sites is a goal of the Comprehensive Plan.
- b. Our goal is to build a multi-unit apartment building with street level restaurant or retail. The B-2b zone will afford us the opportunity to increase housing units next to Portland's largest employer. Our properties current R6 zoning is inconsistent with the on peninsula zoning along Congress St. and acts as a barrier to infill development and housing density. Increasing housing density in Portland's walkable on peninsula urban environment is a dominate theme of the Comprehensive Plan.
- c. If given the opportunity our multi-unit apartment building will allow for the creation of affordable housing units through the inclusionary zoning ordinance and through the developers desire to help meet the workforce housing needs of the city.
- d. The B-2b zone will allow the construction of a state of the art building that will be age friendly, safe and accessible to all which are stated goals of the Comprehensive Plan.
- e. The B-2b zone will expand the possible uses of the site which will provide the neighborhood with access to goods and services not necessarily currently offered.
- f. The B-2b zone will allow for greater density in an area well served by public transportation therefore furthering the Comprehensive Plan's goal of encouraging Transit-Oriented Development.

g. Congress Street is classified by the Comprehensive Plan as a Priority Corridor and the St. John Street area Node is the an area targeted to be transformed. The requested zone change will enhance the corridor and help transform the St. John Street Node.

h. The Comprehensive Plan calls for additional mixed use development along the identified priority corridors of which Congress Street is one. The plan also envisions higher density growth in existing high density areas. There is high density and mixed use development up and down Congress Street. Our immediate abutter to the west is the MMC garage which towers over our site and is in the MMC IOZ which allows for 100 foot plus buildings. Across the Street is also the MMC IOZ and the Crescent Heights MMC resident housing complex. Our immediate abutter to the east is an 11 unit older apartment building, then a church and then on the corner of Congress and Weymouth a mixed use building with commercial use on the street level. The Map Amendment will further the goals of the Comprehensive Plan by allowing more density in an area targeted by the plan for smart mixed use growth.

i. The Comprehensive Plan also encourages neighborhood input and engagement. We have already shared our plans with the area neighborhood association which expressed support and encouragement for our proposed map amendment and project.

In sum we believe the Map Amendment we are seeking will enhance the neighborhood and is 100% consistent with and furthers the objectives of Portland's Comprehensive Plan.

879 Congress LLC

Paul E. Peck

Its: Manager

879 Congress LLC PO Box 7589 Portland Maine 04112 207-712-5891

RE: Map Amendment Project Description

LN-000823-2019 / 879-873 Congress Street

10/14/19

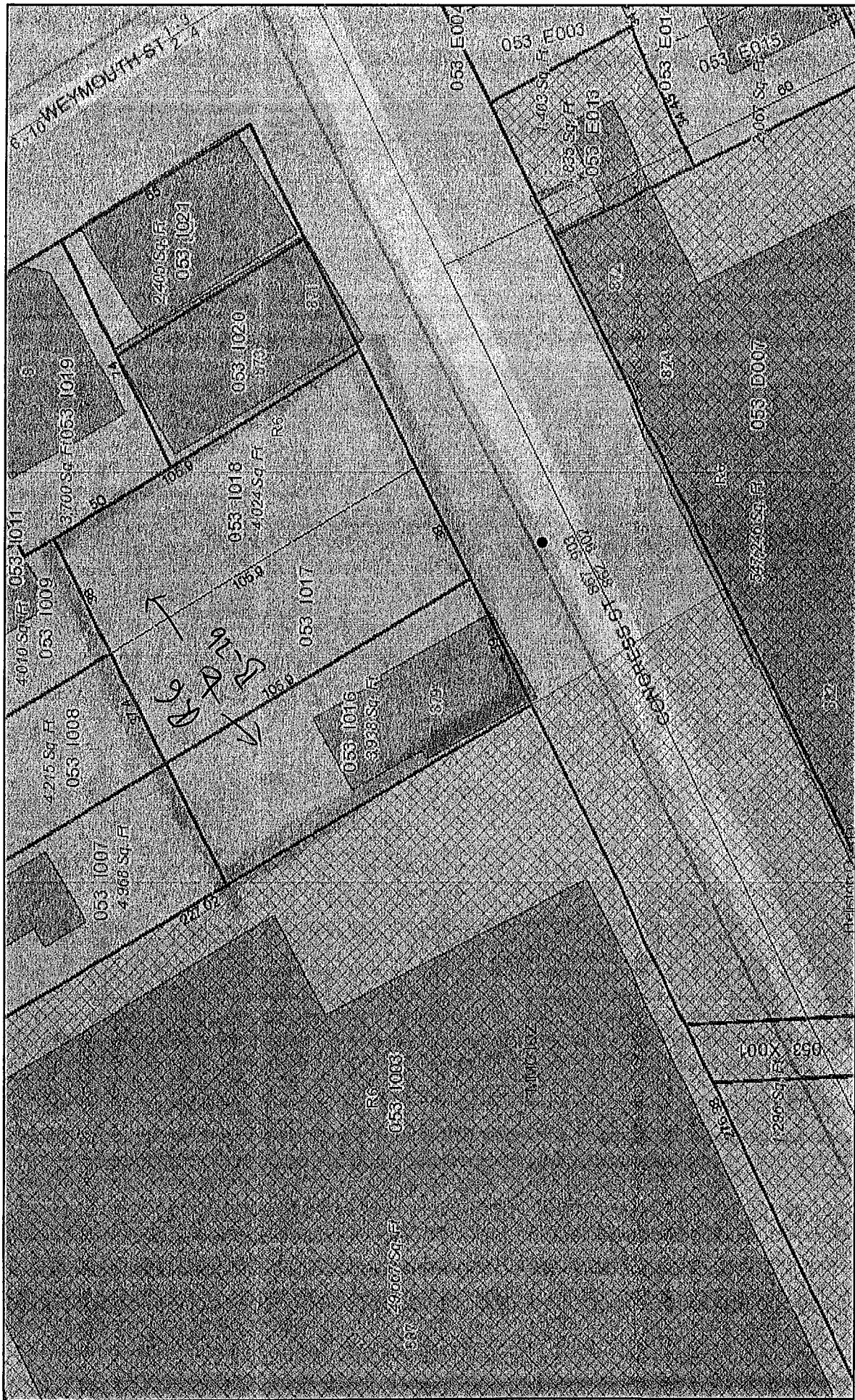
Project Description:

The B-2b Community Business Zone will afford us the opportunity to build a 4 to 5 story apartment building with 27 housing units +- and ground floor restaurant or retail use. We envision and as depicted on the submitted preliminary elevation plans, the exterior of our energy efficient building will be an architectural pleasing mix of masonry, steel and cement board. The building will comply with all city and state building codes and will be accessible to all.

The property being proposed for the Map Amendment consists of Lots 053-1016, 1017 and 1018. The total area of the combined parcels is 11,889 sqft. The lot is approximately 114 feet wide and 106 feet deep. The parcel is currently improved with an older style story 5 unit apartment building.

879 Congress LLC
Paul E. Peck
Its: Member

ArcGIS Web Map



9/26/2019 3:11:44 PM

Zoning

☐ IR-1 Island Residential

☐ IR-2 Island Residential

☐ IR-3 Island Residential

☐ I-B Island Business

☐ I-TS Island Transfer Station

☐ IR-3 Island Residential☐ I-B Island Business

☐ I-TS Island Transfer Station

☐ R1 Residential

☐ R2 Residential

☐ R2 Residential
☐ R3 Residential

☐ R1 Residential

☐ R2 Residential

☐ R2 Residential
☐ R3 Residential

R4 Residential

R5 Residential

☐ R-5 Residential

R4 Residential

R5 Residential

☐ R-5 Residential

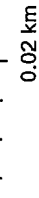
R6 Residential

R-6A Residential



R6 Residential

R-6A Residential



City of Portland, DPS

CITY OF PORTLAND
Planning & Urban Development Department

LN-000823-2 019

MAP AMENDMENT SUBMISSION CHECKLIST Please submit each document as a separate PDF file Please confirm by electronically checking the boxes to the left	
GENERAL APPLICATION DOCUMENTS	
☒	Project Description Cover Letter with detailed project description
☒	Consistency with Comprehensive Plan Analysis of the consistency of the zone change request with the goals, policies and land use plan of Portland's Comprehensive Plan.
☒	Completed Checklist – Map Amendment Application (this document)
☒	Right, Title and Interest Deeds, leases, or purchase and sales agreements
PLANS	
☒	Vicinity Map
☒	Proposed Map Amendment (please use the Portland zoning map as a reference)
☐	Site Plan (if applicable) Provide a site plan of the property showing existing and proposed improvements, including such features as buildings, parking, driveways, walkways, landscape and property boundaries.

Att. F

Google Maps



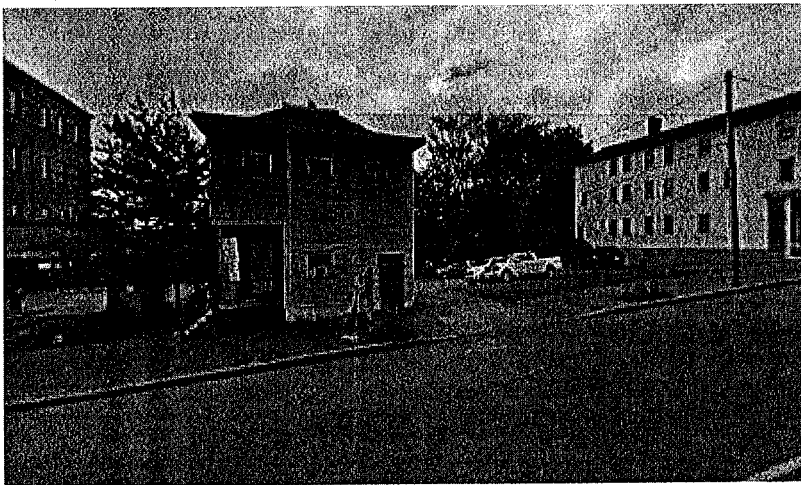
Att. G

Google Maps 879 Congress St



Imagery ©2019 Maine GeoLibrary, Maxar Technologies, U.S. Geological Survey, USDA Farm Service Agency, Map data ©2019

200 ft



879 Congress St

Portland, ME 04102



Directions



Save



Nearby



Share

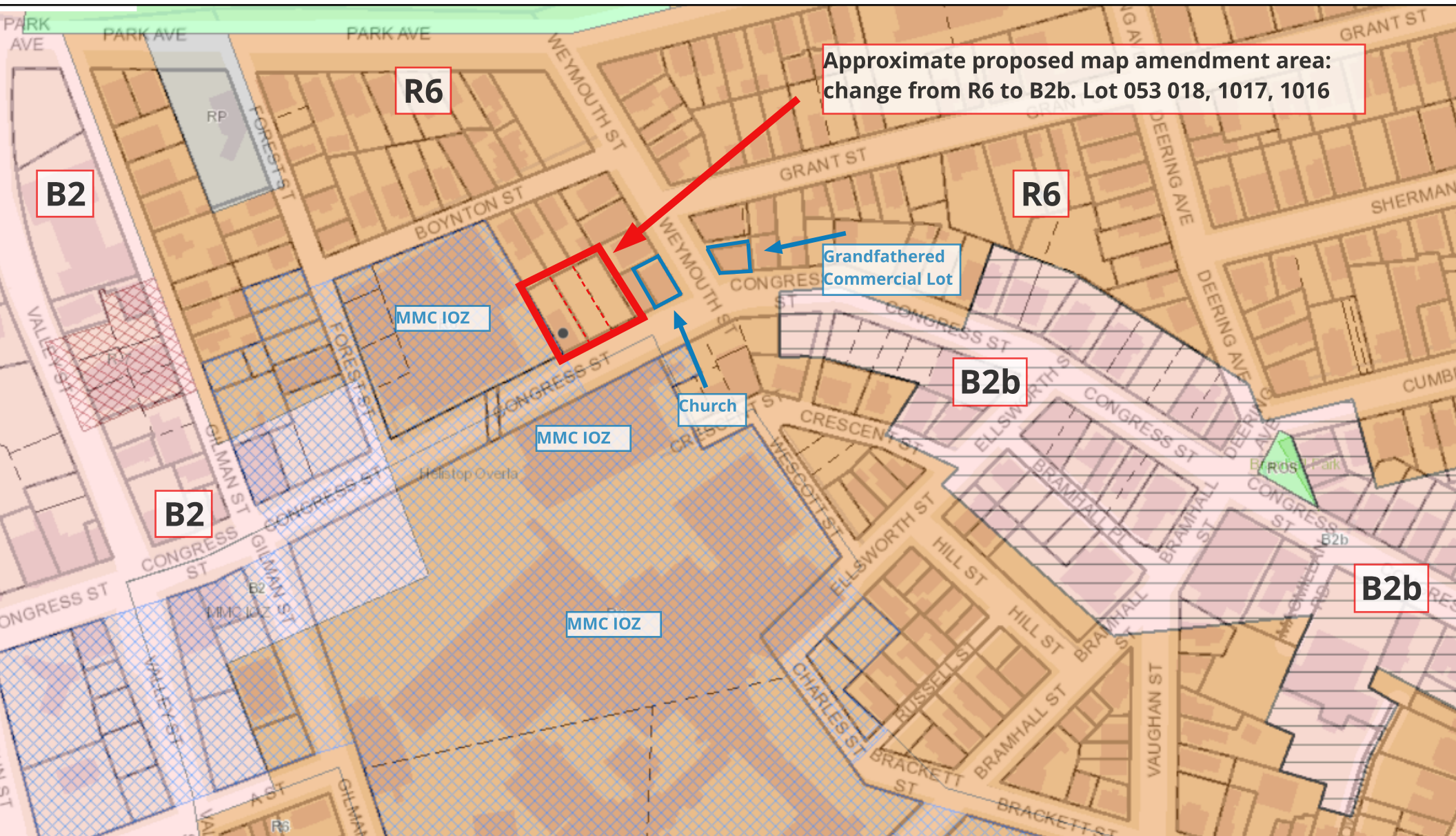
Context Google Map

Att. H



Context Zoning Map

Att. I



This lot is directly across from the Maine Med. parking garage and commercial spaces. The lot on the upper corner is grandfathered commercial.

Context Google Map



MAINE REAL ESTATE TAX-Paid

WARRANTY DEED

DLN: 1001740016141

GREGORY C. KONTOS and **CAROL A. KONTOS**, both of Windham, County of Cumberland, and State of Maine, for consideration paid, grant to **879 CONGRESS, LLC**, a Maine limited liability company with an office address of P. O. Box 7589, Portland, Maine, 04111, with Warranty Covenants, a certain lot or parcel of land, with any buildings thereon, situated in Portland, on the northerly side of Congress Street, and bounded and described as follows:

Beginning on the line of said Congress Street at the corner of land formerly of William D. Marriner; thence running northwesterly by line of said Marriner land one hundred five (105) feet; thence southwesterly on a line parallel with the line of said Congress Street thirty-six and twenty-five hundredths (36.25) feet to a point; thence southerly one hundred five (105) feet, more or less, to a point on said Congress Street a distance of thirty-nine (39) feet from the place of beginning; thence northeasterly along the line of said Congress Street thirty-nine (39) feet to the point of beginning.

Also hereby conveying the benefits of the easement described in a deed from Gertrude Bell et al to Thomas P. Blake, dated December 6, 1961 and recorded in said Registry of Deeds in Book 2649, Page 315, this conveyance is made subject to the easement described in a deed from Thomas P. Blake to Gertrude Bell, et al. Recorded in said Registry of Deeds on December 14, 1961 in Book 2649, Page 317.

Together with the following described premises:

Beginning at a point on the northerly line of Congress Street, said point being eleven feet easterly of the southeasterly corner of land described in a deed from Thomas P. Blake to George B. Frederick, Jr. recorded in the Cumberland County Registry of Deeds in Book 4555, Page 75. Thence southwesterly along the northerly line of Congress Street eleven feet to said southeasterly corner; thence northwesterly along the northerly line of said land conveyed from Blake to Frederick to the northeasterly corner of said parcel; thence southeasterly to the northerly line of Congress Street and the point of beginning.

Being the same premises described in a Warranty Deed from Kontos Associates to Gregory C. Kontos and Carol A. Kontos dated June 20, 1988, and recorded in the Cumberland County Registry of Deeds in Book 8340, Page 330.

IN WITNESS WHEREOF, the Grantors have executed this instrument on this 25th day of August, 2017.

Witness

Gregory C. Kontos

Witness

Carol A. Kontos

STATE OF MAINE
ANDROSCOGGIN, SS.

August 25, 2017

Then personally appeared the above-named Gregory C. Kontos and Carol A. Kontos and acknowledged the foregoing instrument to be their free act and deed.

Before me,

Notary Public / Attorney at Law

Print Name: James H. Stephen

My Commission Expires: _____

LEASE WITH OPTION TO PURCHASE

THIS LEASE made and entered into as of August 5, 2017, whereby **GREGORY C. KONTOS and CAROL A. KONTOS**, individuals with a mailing address of P.O. Box 1785, Windham, Maine 04062 (the "**Landlord**"), do hereby lease to **879 CONGRESS, LLC**, a Maine limited liability company with a mailing address of 306 Congress Street, Suite 3, Portland, Maine 04101 (the "**Tenant**"), the premises situated at 873-877 Congress Street, Portland, Maine (the "**Land**"), which consists of approximately 8048 Square Feet of land, depicted and described on the attached Exhibit A annexed hereto (the "**Premises**").

Section 1. TERM and RENT.

(a) The Lease term shall be for **three (3) years** (the "**Term**") commencing on the **Commencement Date** of August 25, 2017 and terminating on August 24, 2020 (the "**Termination Date**"), unless otherwise extended, renewed or sooner terminated pursuant to the terms herein. The "Commencement Date" shall be August 25, 2017.

(b) Beginning follows during the Term	shall advance	Base Rent") as each term:
<u>LEASE YEARS</u>	<u>NT</u>	<u>T</u>
1 - 3		

If the first payment of Base Rent shall fall on a day other than the first day of the month the Base Rent shall be apportioned pro rata on a per diem basis and all future payments of Base Rent and any other payments due Landlord under this Lease should be payable on the first (1st) of the month. Payment shall be made at the address of the landlord set forth above, or at such other place as Landlord may from time to time designate in writing.

(c) Late Payments. In the event any installment of Base Rent, or any other sums due from Tenant to Landlord under this Lease, is not paid as and when due, Tenant shall pay to Landlord, to defray the additional expenses incurred by Landlord in processing such late payment and to compensate Landlord for the economic consequences of such late payment, an administrative fee equal to five percent (5%) of such past due amount, together with interest on the amount past due at ten percent (10%) per year.

Section 2. CHARGES & UTILITIES. Tenant is responsible for the costs of the Premises, taxes, stormwater fees, insurance, and upkeep. Tenant shall pay all the expenses associated with the Premises directly to the taxing authorities, insurance companies and vendors. Landlord, upon receipt, shall mail to Tenant any tax and stormwater invoices and all correspondence received concerning the Premises.

Section 3. USE OF PREMISES. Tenant shall use and occupy the Premises for any legally permissible purpose.

Section 4. CONDEMNATION.

(a) If all or part of the Premises is taken or condemned for a public or quasi-public use, or if a material portion of the Premises is taken or condemned for a public or quasi-public use and the remaining portion thereof is not usable by Tenant in the reasonable opinion of Tenant, this Lease, at the option of Tenant, shall terminate as of the earlier of the date title to the condemned real estate vests in the condemnor or the date on which Tenant is deprived of possession of the Premises. In such event, the

Rent herein reserved and all charges, utilities, and other sums payable hereunder shall be apportioned and paid in full by Tenant to Landlord to that date.

(b) Landlord shall be entitled to receive the entire award in any proceeding with respect to any taking provided for in this Section 5.1, without deduction, unless Tenant exercises its option to purchase, in which case Tenant shall receive the award. Nothing herein contained shall be deemed to prohibit Tenant from making a separate claim, against the condemnor, to the extent permitted by law, for the value of Tenant's moveable trade fixtures, machinery and moving expenses, provided that the making of such claim shall not and does not adversely affect or diminish Landlord's award.

Section 5. INDEMNIFICATION AND INSURANCE.

(a) Tenant agrees to indemnify and hold harmless Landlord from any and all loss, damage, claim, suits, judgments, or liabilities which Landlord may incur, arising by reason of any injury, damage or death to persons or property or any claim on account thereof resulting from use of the Premises by the Tenant, its agents, guests, or invitees, including, without limitation, all costs of defending against such claims and in enforcing this indemnity provision, including reasonable attorneys' fees and costs for such purpose.

(b) Tenant agrees throughout the term of this Lease and any extension or renewal thereof, at its sole cost and expense, to maintain (i) comprehensive general public liability insurance naming Landlord as an additional insured.

(c) In the event that Tenant shall fail to carry and maintain the insurance coverages set forth in this Section, Landlord may upon thirty (30) days notice to Tenant (unless such coverages will lapse in which event no such notice shall be necessary) procure such policies of insurance and Tenant shall be liable to Landlord for Landlord's costs in obtaining said policies.

(d) Landlord and Tenant hereby waive any rights each may have against the other on account of any loss or damage occasioned to Landlord or Tenant, as the case may be, their respective property, the Premises, its contents or to the other portions of the Building, arising from any risk covered by all risks fire and extended coverage insurance of the type and amount required to be carried hereunder, provided that such waiver does not invalidate such policies or prohibit recovery thereunder.

Section 6. ALTERATIONS AND IMPROVEMENTS. Tenant covenants and agrees, that it will not, without the consent in writing of Landlord, which consent shall not be unreasonably withheld, conditioned or delayed, make any alterations, improvements or additions to the Premises. All alterations, improvements, additions or fixtures, whether installed before or after the execution of this Lease, shall remain upon the Premises at the expiration or sooner termination of this Lease and become the property of Landlord, unless Landlord gives written notice to Tenant prior to the termination of the Lease to remove the same, in which event Tenant will remove such alterations, improvements and additions, and restore the Premises to the same good order and condition in which it was at the Commencement Date. Should Tenant fail so to do, Landlord may do so, and the cost and expense thereof shall be treated as past due and late additional rent due Landlord. Tenant shall not suffer or permit any lien of any nature or description to be placed against the building, the leased Premises or any portion thereof, and in the case of any such lien attaching by reason of the conduct of Tenant to immediately pay and remove the same; this provision shall not be interpreted as meaning that the Tenant has any authority or power to permit any lien of any nature or description to attach or to be placed upon the Landlord's title or interest in the leased Premises, or any portion thereof.

Section 7. REPAIRS & MAINTENANCE. Tenant agrees with the Landlord that while the Tenant holds the Premises or any part thereof, and except as otherwise expressly provided herein, the Tenant will perform all maintenance, repairs and replacement for the Premises.

Section 8. SUBLETTING. Tenant shall be permitted to assign or sublet any part or the whole of the Premises or permit any other person or persons to occupy the same without obtaining permission of the Landlord.

Section 9. SIGNS. All signs placed upon the Premises by Tenant must be compliant with the City of Portland sign ordinance.

Section 10. NOTICES. Written notice from the Landlord to the Tenant and from Tenant to Landlord shall be deemed to have been properly given two (2) days after deposit in the U.S. Mail if mailed by registered or certified mail to the other party at the address set forth above, or the date delivered if hand-delivered.

Section 11. DEFAULT. (a) Tenant Default. If (i) the Premises shall be abandoned by Tenant, or the estate hereby created shall be taken by process of law, (ii) Tenant fails to make any timely payment of any installment of Rent or any other sum due under this Lease after 10 (ten) days notice from Landlord, (iii) Tenant shall default in the faithful observance or performance of any other covenant to be performed or observed by Tenant under this Lease for thirty (30) or more days after Landlord gave Tenant notice in writing of such default and a demand to cure the same provided that such cure period shall be extended while Tenant diligently and in good faith attempts to cure any such default, (iv) there shall be filed by or against Tenant a petition under any Chapter or Chapters of the Bankruptcy Code of the United States or any other insolvency proceeding relating to the debts of Tenant shall be brought by or against Tenant (in which event Tenant shall have a period of thirty (30) days to secure its dismissal), or (v) Tenant shall make an assignment for the benefit of creditors, or shall be insolvent or unable to pay its debts as they mature, or a receiver shall be appointed for Tenant or any substantial part of its property, then and in any one or more of such events, Landlord may, at Landlord's sole election, enter the Premises and expel Tenant and those claiming under it, and remove its and their effects, and/or notify Tenant that the term of this Lease has terminated, and in either case the term hereof shall terminate upon such entry or the giving of such notice, whichever shall first occur, and Tenant shall thereupon quit and surrender the Premises to Landlord. In case of termination of the term of this Lease for any such cause, and in either manner above provided, Landlord shall be deemed to have waived no rights or other remedies hereunder, at law or in equity, and shall be entitled to recover arrearages of rent, damages as for breach of contract, which shall include, without limitation, the amount of the total rent reserved under this Lease for the full term as if the same had not been terminated, less any proper credits, and Landlord's reasonable attorneys' fees and any other expenses of Landlord incurred in connection with the retaking of possession of the Premises and the removal and storage of Tenant's effects and the recovery of damages or the exercise of other rights or remedies.

(b) Landlord Default. Landlord shall in no event be in default in the performance of any of its obligations hereunder unless and until Landlord shall have failed to perform such obligations within thirty (30) days or such additional time as is reasonably required to correct any such default after written notice by Tenant to Landlord properly specifying wherein Landlord has failed to perform any such obligation. Further, if the holder of the mortgage on the building of which the leased premises are a part notifies Tenant that such holder has taken over Landlord's rights under this lease, Tenant shall not assert any right to deduct the cost of repairs or any monetary claim against Landlord from rent thereafter due and accruing, but shall look solely to the Landlord for satisfaction of such claim.

Section 12. INSPECTION. Landlord or its agents may enter to examine the Premises at reasonable times to view the Premises.

Section 13. COMPLIANCE. Tenant shall comply with any and all laws, ordinances, and regulations (federal, state, county or municipal), now or hereafter in force applicable to the Premises, relating

to the use or occupancy thereof or to the making of repairs, changes, alterations or improvements, ordinary or extraordinary, seen or unforeseen.

Section 14. NO MORTGAGE OR LIEN OF LANDLORD'S FEE INTEREST. The Landlord shall have no right to mortgage, pledge, encumber or have lien on its fee interest in the Premises. In the event Landlord allows any mortgage, lien or other encumbrance on the Premises or one is placed on the Property without Landlord's consent, (a "Lien"), then Landlord shall notify Tenant of such Lien within three (3) business days and shall cause such Lien to be paid and released within thirty (30) days thereafter. If Landlord fails to do so, Tenant shall have the right to satisfy such Lien and receive from Landlord, within thirty (30) days after notice from Tenant, the full amount paid by Tenant. In the event Landlord does not repay Tenant within said thirty (30) days, Tenant shall be entitled to interest at the highest Prime Rate reported in the Wall Street Journal plus ten (10%) percent, together with all costs of collection, including but not limited to attorney's fees. Any amounts not paid by Landlord under this provision, together with interest thereon, shall reduce the purchase price in the Option to Purchase in Section 16 herein below. Tenant may, at its sole discretion pursue the recovery of amounts due hereunder by collection action or any other remedy available at law or equity.

Section 15. SECURITY DEPOSIT. There shall be no security deposit.

Section 16. OPTION TO PURCHASE. Tenant shall have a one (1) time option to purchase the Premises at any time within (2) months of August 24, 2000.

Section 17. REPRESENTATIONS. Landlord represents and warrants to Tenant that to the best of its knowledge (a) Landlord is the owner in fee simple of the Premises and has the legal right, power and authority to enter into this Agreement and to perform all of its obligations hereunder, and the execution and delivery of this Agreement and the performance by Landlord of its obligations hereunder will not conflict with any agreement to which Landlord is a party or by which Landlord is bound; (b) Landlord has good and marketable title to the Premises, and there are no claims, lawsuits, or other proceedings threatened or currently pending by or against the Landlord or the Premises; (c) Landlord has received no notice of any eminent domain proceedings or any other adverse event affecting the Premises, nor of any special or betterment assessments contemplated against the Premises nor of any actions that would hinder or delay the development of the Premises, and Landlord has no knowledge of any of the foregoing; and (d) Landlord has not received notice and is not otherwise aware of any incident which would have required the filing of notice or notification pursuant to any Applicable Environmental Laws applicable to the Premises.

Section 18. HAZARDOUS MATERIALS. Tenant covenants and agrees that it shall not use or store in the Premises any hazardous, toxic or special wastes, materials or substances including but not limited to waste or cooking oil and petroleum products (the "Hazardous Materials") which Tenant, its agent or employees, may use, handle, store or generate in the conduct of its business at the leased Premises. Tenant covenants and agrees: (i) that Tenant will comply with all applicable laws, ordinances and regulations which relate to the treatment, storage, transportation and handling of Hazardous Materials; (ii) that Tenant will in no event permit or cause any disposal of Hazardous Materials in, on or about the leased Premises and in particular will not deposit any Hazardous Materials in, on or about the floor or in any drainage system or in the trash containers which are customarily used for the disposal of solid waste; (iii) that Tenant will with advance notice and at all reasonable times permit Landlord or its agents or employees to enter the leased Premises to inspect the same for compliance with the terms of this

paragraph and will further provide upon five (5) days notice from Landlord copies of all records which Tenant may be obligated by federal, state and/or local law to obtain and keep; (iv) that upon termination of this Lease, Tenant will, at its expense, remove all Hazardous Materials, which came to exist on, in or under the leased Premises during the term of this Lease or any extensions thereof and comply with applicable local, state and federal laws as the same may be amended from time to time; and (v) Tenant will deliver the leased Premises to Landlord at the termination of this Lease free of all Hazardous Materials which came to exist on, in or under the leased Premises during the term of this Lease or any extension thereof. Landlord covenants and agrees that they have no knowledge of any Hazardous Materials on or underneath the Premises.

Section 19. JURY TRIAL WAIVER. NOTWITHSTANDING ANYTHING IN THIS LEASE TO THE CONTRARY, TENANT AND LANDLORD, FOR THEMSELVES AND THEIR SUCCESSORS AND ASSIGNS, HEREBY KNOWINGLY, WILLINGLY, AND VOLUNTARILY WAIVE ANY AND ALL RIGHTS TENANT AND/OR LANDLORD MAY HAVE TO A TRIAL BY JURY IN ANY ACTION OR PROCEEDING BROUGHT BY LANDLORD OR TENANT BASED UPON OR RELATED TO THE PROVISIONS OF THIS LEASE.

Section 20. SEVERABILITY OF PROVISIONS. In the event that any one or more provisions contained in this Agreement should be found to be invalid, illegal, or unenforceable in any respect by any court having valid jurisdiction, the validity, legality, and enforceability of the remaining provisions contained herein shall not in any way be affected or impaired thereby and to this end, the provisions hereof shall be deemed severable. If such provision shall be deemed invalid due to its scope or breadth, such provision shall be deemed valid to the extent of the scope or breadth permitted by law.

Section 21. CHOICE OF LAW. This Agreement shall be governed by and constructed in accordance with the laws of the State of Maine.

Section 22. AMENDMENT AND WAIVER. No provision of this Agreement may be amended, modified, supplemented, changed, waived, discharged, or terminated unless each party hereto consents in writing.

Section 23. COUNTERPARTS. This Agreement may be signed on any number of identical counterparts, such as a faxed or scanned copy, with the same binding effect as if the signatures were on one instrument.

Section 24. BINDING CONTRACT. This Agreement is a binding contract when signed by all parties hereto.

Section 25. CONSTRUCTION. This Agreement and all agreements relating to the subject matter hereof is the product of drafting, negotiation and preparation by and among each party and its respective attorneys, and shall be construed accordingly. Each party expressly waives the rules of contract interpretation that interpret language based on the party who drafted the agreement.

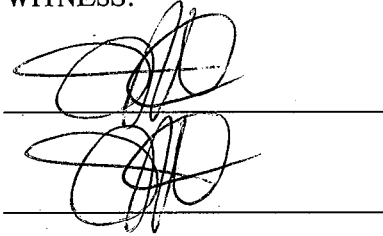
Section 26. HEADINGS. The headings contained in this Agreement are for reference purposes only and shall not affect the meaning or interpretation of any particular paragraph of this Agreement.

Section 27. ENTIRE AGREEMENT. This Agreement constitutes the entire agreement between the parties with respect to the subject matter herein, and this Agreement supersedes all previous negotiations, discussions, and agreements between the parties as to the subject matter hereof, and no parole evidence of any prior or other agreement or alleged agreements shall be permitted to contradict or vary the terms hereof.

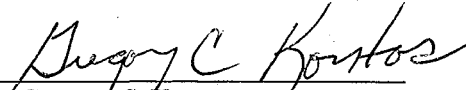
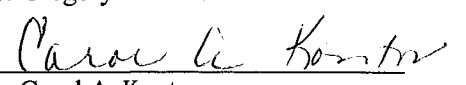
Section 28. MEMORANDUM OF LEASE. Tenant and Landlord shall sign the attached Memorandum of Lease which Tenant may record in the Cumberland County Registry of Deeds.

IN WITNESS WHEREOF, the parties to this Lease set their signatures as of the Effective Date first written above.

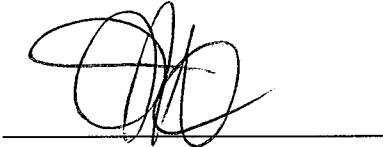
WITNESS:



LANDLORD:


By: Gregory C. Kontos

By: Carol A. Kontos

WITNESS:



TENANT:
879 CONGRESS LLC

By: 
Name: Paul Bell
Its: Mungel

SCHEDULE A

BOOK 6826 PAGE 45

Warranty Deed
George Burton Frederick, Jr.
to
Gregory C. Kontos, d/b/a
G. C. K. Group
July , 1985

FIRST

A certain lot or parcel of land situated on the northerly side of Congress Street in the City of Portland, County of Cumberland and State of Maine, and being premises No. 877 Congress Street, bounded and described as follows:

Beginning on the northerly side of Congress Street at the southerly corner of a lot of land formerly of Martha J. Tuttle; thence westerly by said Congress Street, thirty-eight (38) feet to land formerly of William J. Whitney; thence northerly by said Whitney land one hundred five and nine tenths (105.9) feet; thence easterly parallel with Congress Street thirty-eight (38) feet to the most westerly corner of said Tuttle land; thence southerly by said Tuttle land one hundred five and nine tenths (105.9) feet to said Congress Street and the point of beginning.

Excepting and reserving therefrom the following described premises:

Beginning at a point on the northerly line of Congress Street, said point being eleven feet easterly of the southeasterly corner of land described in a deed from Thomas P. Blake to George B. Frederick, Jr., recorded in the Cumberland County Registry of Deeds in Book 4555, Page 75. Thence southwesterly along the northerly line of Congress Street eleven feet to said southeasterly corner; thence northwesterly along the northerly line of said land conveyed from Blake to Frederick to the northeasterly corner of said parcel; thence southeasterly to the northerly line of Congress Street and the point of beginning.

Being a portion of the premises described in a deed from Downeast Realty, Inc., to George Buxton Frederick, Jr., dated December 5, 1980 and recorded in the Cumberland County Registry of Deeds in Book 4751, Page 173.

46
5826-115

This conveyance is made subject to and together with the rights in a common driveway as represented by an exchange of deeds between Gertrude Bell and Sam P. Reef, and Thomas P. Blake, which deeds are recorded in Cumberland County Registry of Deeds, Book 2649, Page 317 and Book 2649, Page 315.

Meaning and intending to convey and hereby conveying a portion of premises conveyed to Grantor herein by Warranty deed of Downeast Realty, Inc. dated December 15, 1980, and recorded in the Cumberland County Registry of Deeds in Book 4751, Page 173.

SECOND

Also, a certain lot or parcel of land situated on the northerly side of Congress Street, west of Weymouth Street (formerly called Alms House Street), in said Portland, and bounded and described as follows, viz:

Commencing on the northerly side of Congress Street at the southeast corner of the lot of land hereby conveyed; thence northerly in a line nearly parallel with Weymouth Street one hundred and five (105.9) and nine tenths feet; thence westerly along the northerly end of the lot hereby conveyed thirty-eight (38) feet; thence southerly to a line parallel with the first mentioned sideline, one hundred and five and nine tenths (105.9) feet to Congress Street; thence easterly along Congress Street, thirty-eight (38) feet to the point of beginning.

Meaning and intending to convey and hereby conveying the same premises conveyed to Grantor herein by Warranty deed of Downeast Realty, Inc., and recorded in the Cumberland County Registry of Deeds in Book 4751, Page 171.

RECEIVED

1985 JUL 15 PM 3:56

RECORDED REGISTRY OF DEEDS
CUMBERLAND COUNTY

James J. Walsh

MIXED USE BUILDING

879 CONGRESS STREET, PORTLAND, MAINE

JULY 19, 2019

Att. L



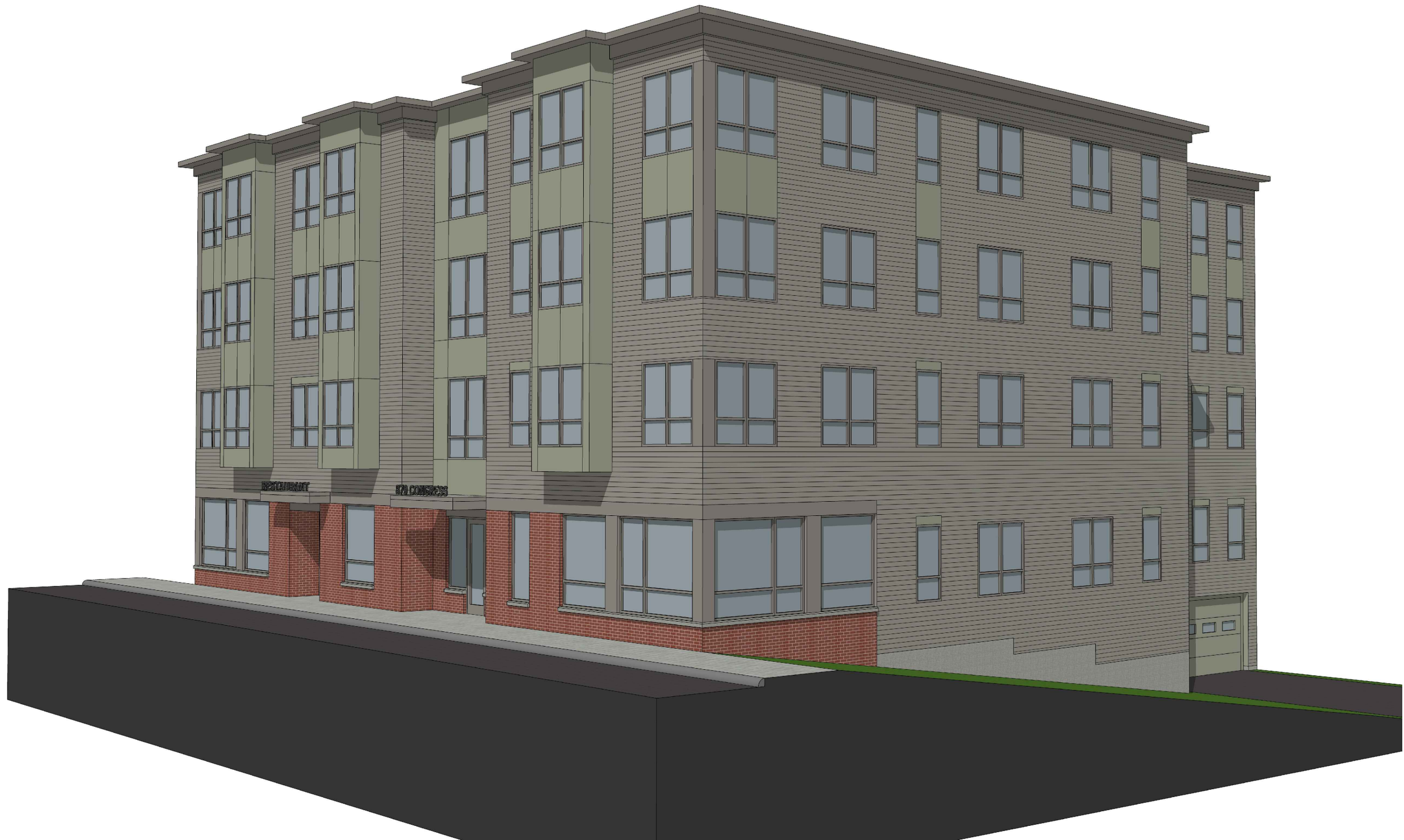
1 FRONT CONCEPT IMAGE
NTS

PROGRESS PRINT ONLY
Not for Construction

MIXED USE BUILDING

879 CONGRESS STREET, PORTLAND, MAINE

JULY 19, 2019



1 CORNER VIEW CONCEPT IMAGE
NTS

RYAN SENATORE **ARCHITECTURE**

PROGRESS PRINT ONLY
Not for Construction

MIXED USE BUILDING

879 CONGRESS STREET, PORTLAND, MAINE

JULY 19, 2019



1 VIEW LOOKING WEST ON CONGRESS STREET
NTS

RYAN SENATORE ARCHITECTURE

PROGRESS PRINT ONLY
Not for Construction

879 Congress, LLC
PO Box 7589
Portland, Maine 04112

Att. M

February 6, 2020

Dear Neighbor:

Please join us for a neighborhood meeting to discuss our map amendment request of the city to change the zoning of our land, located at 879-873 Congress Street, from R-6 to B-2b. With the zone change it is our hope to build an apartment building with ground floor retail/restaurant.

Meeting Location: Shalom House 106 Gilman St. Portland, Maine

Meeting Date: Thursday, February 27, 2020

Meeting Time: 6:30pm

The City code requires that property owners within 500 feet of the proposed development and residents on an "interested parties list", be invited to participate in a neighborhood meeting. A sign-in sheet will be circulated, and minutes of the meeting will be taken. (Both the sign-in sheet and minutes will be submitted to the Planning Board.)

If you have any questions, please call Paul Peck at 207-712-5891.

Sincerely,

879 Congress, LLC

Note: Under Section 14-32(C) and 14-524(a)d of the City Code of Ordinances, an applicant for a Level III development, subdivision of over five lots/units, or zone change is required to hold a neighborhood meeting within 30 days of submitting a preliminary application or 21 days of submitting a final site plan application, if a preliminary plan was not submitted. The neighborhood meeting must be held at least seven days prior to the Planning Board public hearing on the proposal. Should you wish to offer additional comments on this proposed development, you may contact the Planning Division at 874-8721 or send written correspondence to the Planning and Urban Development Department, Planning Division, 4th Floor, 389 Congress Street Portland, ME 04101 or by email: to bab@portlandmaine.gov

Neighborhood Meeting Certification

I, Paul E. Peck as member of 879 Congress LLC , hereby certify that a neighborhood meeting was held on Thursday, February 27, 2020 at the Shalom House 106 Gilman St. Portland, Maine at 6:30pm for the proposed zone change located at 879 Congress St.

I also certify that on February 6, 2020 , invitations were mailed to the following:

1. All addresses on the mailing list provided by the Planning Division which includes property owners within 500 feet of the proposed zone change.
2. Residents on the "interested parties" list.

Signed.

879 Congress LLC

By:



Paul Peck

Its:

member

Attached to this certification are:

1. Copy of the invitation sent
2. Sign-in sheet
3. Meeting minutes

Meeting Date: February 27, 2020 6:30PM

SIGN IN SHEET

Location of Meeting: Shalom House 106 Gilman St. Portland, Maine

Project: 879 Congress Street. Zone Change

Members of the Public in Attendance:

NAME

E-Mail

1. Jenny Mackenzie
2. Garry Bowcott
3. Channing Capuchino
4. Theresa Mercier
5. Becky Watkins
6. Sarah Martin
7. MATTHEW BARNEY
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.

gabear@msn.com
GARRYBOWCOTT@HOTMAIL.COM
sjvalleyportland@gmail.com
Theresa.merciere@trufcu.com
Becky.Watkins@trufcu.com
boccaf@hotmai2.com
M.BARNEY@MMC.ORG

Developer Team in Attendance:

NAME

E-Mail

1. Brit Vitalius
2. Paul Peck

Meeting Minutes

Meeting Date: 2/27/20

Location: Shalom House, 106 Gilman St, Portland ME

Project: 879 Congress St, Zone Change

6:40 pm - Brit opens the meeting.

Handouts showing the zone area are distributed. Brit explains the current zoning situation and how there is an R6 zone for about a block and a half that is essentially surrounded by other zones. Most of the discussion was questions about the current zone configuration, including the Maine Med zone which abuts the applicant's property.

Brit explained that while he and his partner only applied for a zone change to their property, the city has suggested that the entire R6 section should be rezoned to B2B.

Paul Peck introduced himself to the group.

Several questions were about the difference between R6 and B2B. Brit said that B2B will allow two key differences: businesses like retail and restaurants on the first floor and the potential for more residential units.

One attendee expressed her interest in seeing more "workforce" housing created.

Several questions were asked about the proposed building. We mentioned the concept we have is not final and will change as we move through the process.

Paul Peck received a call from Aaron Howard who owns 236 Park Ave. He explained he could not make the meeting but supported the zone change.

Fwd: 879 Congress St

Shukria Wiar <shukriaw@portlandmaine.gov>

Nov 6, 2019 11:29 AM

Posted in group: **Planning and Urban Development**

----- Forwarded message -----

From: **Aaron Duffey** <aduffey@gmail.com>

Date: Wed, Nov 6, 2019 at 11:15 AM

Subject: 879 Congress St

To: <shukriaw@portlandmaine.gov>

Hello Ms. Wiar,

I hope you are well.

I own an apartment building at 847-851 congress st. I just received notice that a neighbor, 879 Congress St, is applying for a zone change near our building from R6 to B2b. While I support the idea of a change there I have been hopeful that that small section of congress st that is currently R6 would change to B2B, including my lots. The B2B zone abruptly stops just a few doors down from us and then picks up again down the street near Salvage restaurant. We have been hoping to develop more market rate housing and commercial space but the R6 zone has been prohibitive. I was told a few years ago that a request for change would not be considered as a wider rezoning was being considered. If the 879 change goes through that would leave just a handful of property on that stretch of congress st left out of the B2B zone, effectively stalling any further development of housing and commercial space.

Is it possible as part of this process for 879 Congress to consider connecting the existing B2B zones to include the small left out stretch of congress st in that area? I would be grateful if this could be considered and would appreciate any guidance about how to voice this request.

Thank You!

Aaron

Aaron Duffey
207-712-6719

--

Shukria Wiar, Planner
Planning & Urban Development Department
389 Congress Street 4th Floor
Portland, ME 04101
Phone 207.756.8083
Fax 207.756.8258
<http://www.portlandmaine.gov/planning>

Public Comment About "The Longfellow"

Michelle Alger <mkalger1983@gmail.com>

Jan 15, 2020 4:59 PM

Posted in group: **Hl**istoric Preservation

To The Portland, Maine Historical Preservation Board,

I am writing to strongly oppose the Hotel project at the intersection of Congress and Neal Street called, "the Longfellow". The project might be considered an illegal attempt at Eminent Domain and a violation of federal law. The project is not in accordance with the Congress Street Historic District's connection to the foundation of The United States of America, and it might be the case that the foundation stones to consecrated structures and/or buildings with historic importance might still in place and should not be disturbed. The location at 742 Congress Street might have historical connections to the Civil War.

Also, the increased automobile traffic and congestion are not in accordance with the quiet, historic district and there are issues about consumption of parking spaces in a residential neighborhood, albedo effect, pavement and concrete, and other concerns.

Sincerely,

Michelle K. Alger
Born in Portland, Maine, The United States of America

<https://www.pressherald.com/2020/01/14/portland-planning-board-approves-4-story-hotel-on-congress-street/>

<http://www.portlandmaine.gov/1608/Congress-Street-Historic-District>

<http://www.portlandlandmarks.org/blog/2016/5/12/this-place-matters-historic-gas-stations>

<http://www.portlandmaine.gov/AgendaCenter/ViewFile/Item/6270?fileID=33804>

<https://portlandmaine.gov/AgendaCenter/ViewFile/Item/5885?fileID=29798>

[https://en.wikipedia.org/wiki/Emancipation_Proclamation#Proclamation_of_Amnesty_and_Reconstruction_\(1863\)](https://en.wikipedia.org/wiki/Emancipation_Proclamation#Proclamation_of_Amnesty_and_Reconstruction_(1863))

https://en.wikipedia.org/wiki/Freedmen%27s_Bureau

https://en.wikipedia.org/wiki/Battle_of_Portland_Harbor

--

Michelle K. Alger



Shukria Wiar <shukriaw@portlandmaine.gov>

871 Congress st Zone change request

Eddy Ahmed <nurcapital@gmail.com>

Sun, May 3, 2020 at 3:00 PM

To: shukriaw@portlandmaine.gov

Hi Shukira,

I received your letter regarding zone change for [879 Congress st. Portland](#). After talking with you and thinking over, I would like to change zone to B2B for My budding at 871 Congress street as well. Per your request, I am sending you this email for the request the change. Please confirm receipt of this email and advise if anything else is needed.

Thank you,

Eddy Ahmed
Owner for Eliza Properties
[871 Congress st. Portland](#)



Shukria Wiar <shukriaw@portlandmaine.gov>

Congress St Greg Johnson

Gregory Johnson <apartmentlocatormaine@gmail.com>

Tue, Jul 7, 2020 at 12:04 PM

To: Shukria Wiar <shukriaw@portlandmaine.gov>

Dear Shukria,

I propose that if 879 Congress street is allowed a zoning change from R-B to B-2 b my property At 857 Congress street should also be allowed equal zoning change at the same time. Please present to the planning board on July 17 meeting.

Regards

Gregory Johnson
Property Owner
[857 Congress Street](#)
Portland, Maine
207-351-5395

[Quoted text hidden]

[Quoted text hidden]

Notice: Under Maine law, documents - including e-mails - in the possession of public officials or city employees about government business may be classified as public records. There are very few exceptions. As a result, please be advised that what is written in an e-mail could be released to the public and/or the media if requested.

[Quoted text hidden]