

1. Legal Ad

Documents:

[PB LEGAL AD 10-9-18.PDF](#)

2. Agenda

Documents:

[PB AGENDA 10-9-18.PDF](#)

3. 90 Johnson Road (Memo And Attachments)

Documents:

[JOHNSON RD. - 90 \(MEMO\).PDF](#)
[JOHNSON RD. - 90 \(MEMO ATTACHMENTS\).PDF](#)
[JOHNSON RD. - 90 \(APPLICANTS SUBMITTAL\).PDF](#)
[JOHNSON RD. - 90 \(PLANS\).PDF](#)

4. IR-1 And IR-2 Text Amendment

Documents:

[IR-1 AND IR-2 TEXT AMENDMENT \(PB MEMO AND ATTACHMENTS\).PDF](#)

4.I. Additional Public Comment

Documents:

[PC1 BETSEY REMAGE-HEALEY 10-7-18.PDF](#)
[PC2 CARON CHESS 10-9-18.PDF](#)

5. Impact Fee (Report And Attachments)

Documents:

[IMPACT FEE \(REPORT\).PDF](#)
[IMPACT FEE \(ATTACHMENTS\).PDF](#)

6. 130 Bancroft Street (Report And Attachments)

Documents:

[BANCROFT ST. - 130 \(REPORT\).PDF](#)
[BANCROFT ST. - 130 \(REPORT ATTACHMENTS\).PDF](#)
[BANCROFT ST. - 130 \(APPLICANTS SUBMITTAL\).PDF](#)
[BANCROFT ST. - 130 \(PUBLIC COMMENT\).PDF](#)
[BANCROFT ST. - 130 \(PLANS\).PDF](#)

**LEGAL ADVERTISEMENT
PORTLAND PLANNING BOARD**

The Portland Planning Board will hold a meeting on Tuesday, October 9, 2018, Council Chambers, 2nd Floor, City Hall, 389 Congress Street. Public comments will be taken for each item on the agenda during the estimated allotted time and written comments should be submitted to planningboard@portlandmaine.gov

Workshop – 4:30 p.m.

- i. Level III Site Plan; 90 Johnson Road; Transport Leasing Corp., Applicant. (4:30 - 5:15 p.m. estimated time) The Board will hold a workshop to consider the redevelopment and expansion of the existing office/warehouse building. Two stories will be added to the existing 17,482 sf building for a total area of 39,546 sf for office space. Access to the 2.66 acre site will be from Johnson Road and City Line Drive and a parking area for 188 vehicles is proposed. The project is proposed in two phases with the parking area being the first phase. The site is in the B-4 Commercial Business Zone and is subject to review under Portland's Site Plan Standards.
- ii. Zoning Text Amendment to the IR-1 and IR-2 Zones; Island Accessory Dwelling Unit; City of Portland, Applicant. (5:15 – 6:00 p.m. estimated time) The Board will hold a workshop to consider a zoning text amendment that would remove a conditional use standard of the IR-1 and IR-2 zones requiring, for properties with both a principle and accessory dwelling unit (ADU), one of the dwelling units be owner-occupied. The amendment also proposes that the minimum rental period for an ADU be reduced from one year to six months, and that short-term rentals be expressly prohibited. The IR-1 and IR-2 zones can be found on Peaks Island, Cushing Island, Great Diamond Island, Little Diamond Island, House Island and Cliff Island.

Public Hearing – 7:00 p.m.

- i. Impact Fee Ordinance, Proposed Ordinance Amendment, City of Portland, Applicant. (7:00 – 8:00 estimated time) The Planning Board will hold a public hearing on a proposed Impact Fee Ordinance, based upon the City's *Impact Fee Study*, which would be incorporated into Chapter 14, Land Use Code. The draft amendments include, but are not limited, to establishing a process for collecting impact fees, setting the impact fee schedule, annual adjustments. Modifications of fees, collection and use of fees. The Board will make a recommendation to the City Council.
- ii. Level III Site Plan and Subdivision; 130 Bancroft Street; Joshua Wagner, representing WB Group, Inc., Applicant. (8:00 – 8:45 p.m. estimated time) The Board will hold a public hearing on a proposal to subdivide 117,258 sf site (approximately 2.9 acres) into seven new single family lots ranging in size from 8,787 sf to 13,575 sf. The site is in the Residential R-3 zone and is subject to review under Portland's subdivision standards.

SEAN DUNDON, CHAIR – PORTLAND PLANNING BOARD

CITY OF PORTLAND, MAINE

PLANNING BOARD



Sean Dundon, Chair
Brandon Mazer, Vice Chair
David Eaton
David Silk
Austin Smith
Maggie Stanley
Lisa Whited

AGENDA PORTLAND PLANNING BOARD MEETING

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PUBLIC HEARING – 7:00 p.m.

1. **ROLL CALL AND DECLARATION OF QUORUM**
2. **COMMUNICATIONS AND REPORTS**
3. **REPORT OF ATTENDANCE AT THE MEETING HELD ON SEPTEMBER 24, 2018:**

Workshop – Dundon, Mazer, Smith, Silk and Stanley present; Eaton and Whited absent.

Public Hearing – Dundon, Silk, Stanley, Whited, Mazer (recused from item 1) and Smith (recused from item 4) present; Eaton absent.

4. **REPORT OF DECISIONS AT THE MEETING HELD ON SEPTEMBER 25, 2018:**

- i. Level III Site Plan, 86 Newbury Street, 86 Newbury Street, LLC., Applicant. Stanley moved and Whited seconded a motion to waive the requirement for underground utilities subject to a condition that the applicant shall work with the City to attempt a comprehensive underground design during the 10 months following approval. Vote: 5-o (Mazer recused, Eaton absent). Stanley moved and Whited seconded a motion to waive the technical standard for the number of driveways to allow 4 curb cuts. Vote: 5-o (Mazer recused, Eaton absent). Stanley moved and Whited seconded a motion to waive the technical standard for driveway separation to allow less than 150 ft from the intersection. Vote: 5-o (Mazer recused, Eaton absent). Stanley moved and Whited seconded a motion to waive the technical standard to allow a driveway width of 33 ft. Vote: 5-o (Mazer recused, Eaton absent). Stanley moved and Whited seconded a motion to waive the technical standard to allow a parking aisle width of 21 feet with a recommendation of 17 feet for parking spaces. Vote: 5-o (Mazer recused, Eaton absent). Stanley moved and Whited seconded a motion for a partial waiver of the design standard to allow the office building façade to have less than one entry on Newbury St. Vote: 5-o (Mazer recused, Eaton absent). Stanley moved and Whited seconded a motion for a partial waiver of the design standard to allow the office building façade to have less than 2 entries on Mountfort St. Vote: 5-o (Mazer recused, Eaton absent). Stanley moved and Whited seconded a motion approve the IZ conditional use application with 2 conditions of approval. Vote: 5-o (Mazer recused, Eaton absent). Stanley moved and Whited seconded a motion approve the subdivision application with 3 conditions of approval. Vote: 5-o (Mazer recused, Eaton absent). Stanley moved and Whited seconded a motion approve the site plan application with 10 conditions of approval. Vote: 5-o (Mazer recused, Eaton absent).
- ii. Level III Site Plan; 300 Allen Avenue; Peter Bouchard, representing Estelle Estates, LLC., Applicant. Mazer moved and Stanley seconded a motion to approve the IZ conditional use with 1 condition of approval. Vote: 6-o (Eaton absent). Mazer moved and Stanley seconded a motion to approve the off-site parking conditional use. Vote: 6-o (Eaton absent). Mazer moved and Stanley seconded a motion to waive the technical standard to allow a 20-foot aisle width within the surface parking area. Vote: 6-o (Eaton absent). Mazer moved and Stanley seconded a motion to approve the subdivision plan with 2 conditions. Vote: 6-o (Eaton absent). Mazer moved and Stanley seconded a motion to approve the site plan with an amended 1b condition and a total of 6 conditions. Vote: 5-1 (Silk opposed, Eaton absent).
- iii. Level III Site Plan and Subdivision; 19 Libby Street; Reed School, LLC., Applicant. Mazer moved and Stanley seconded a motion to approve the conditional use for the conversion of the school to 8 residential units with 2 conditions. Vote: 6-o (Eaton absent). Mazer moved and Stanley seconded a motion to approve the subdivision application with 2 conditions. Vote: 6-o (Eaton absent). Mazer moved and Stanley seconded a motion to approve the site plan application with 8 conditions. Vote: 6-o (Eaton absent).
- iv. Level III Site Plan and Site Location of Development Act; 100 Sewall Street (Thompson's Point Connector); Langdon Street Real Estate, Applicant. Mazer moved and Stanley seconded a motion to waive the technical standards for parking lot design, planting and lighting for up to a period of 2 years. Vote: 5-o (Smith recused, Eaton absent). Mazer moved and Stanley seconded a motion to waive the technical standards for parking lot aisle widths as shown on the plan. Vote: 5-o (Smith recused, Eaton absent). Mazer moved and Stanley seconded a motion to waive the technical standards for a sidewalk along Thompson's Point Connector. Vote: 5-o (Smith recused, Eaton absent). Mazer moved and Stanley seconded a motion to approve the application under the

delegated review for Site Location of Development with 5 conditions of approval. Vote: 5-0 (Smith recused, Eaton absent). Mazer moved and Stanley seconded a motion to approve the application for the Traffic Movement Permit with 2 conditions. Vote: 5-0 (Smith recused, Eaton absent). Mazer moved and Stanley seconded a motion to approve the site plan application with 5 conditions. Vote: 5-0 (Smith recused, Eaton absent).

5. NEW BUSINESS

- i. Impact Fee Ordinance, Proposed Ordinance Amendment, City of Portland, Applicant.
(7:00 – 8:00 estimated time) The Planning Board will hold a public hearing on a proposed Impact Fee Ordinance, based upon the City's *Impact Fee Study*, which would be incorporated into Chapter 14, Land Use Code. The draft amendments include, but are not limited, to establishing a process for collecting impact fees, setting the impact fee schedule, annual adjustments. Modifications of fees, collection and use of fees. The Board will make a recommendation to the City Council.
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Memorandum
Planning and Urban Development Department
Planning Division



To: Sean Dundon, Chair, and Members of the Portland Planning Board
From: Shukria Wiar, Planner
Date: October 5, 2018
Re: Spectrum, 70 Johnson Road
Project #: 232-2018 CBLs:
Meeting Date: October 9, 2018

I. INTRODUCTION

Transport Leasing Corporation appears before the board for a preliminary workshop on the development of an addition to the Charter Communication building (Spectrum or Time Warner Cable) and associated parking lot on a 2.66-acre site at 90 Johnson Road. Under the current proposal, the existing 17,482 SF office/warehouse building would be expanded with an addition of approximately 22,000 SF. The site is in the B4 Commercial Business Zone. Currently, the building space is used for both office and warehouse functions. According to the application, Charter will shift these programs to other building space they already occupy on the City Line Drive Campus. The applicant's intention is to lease the new space to another office user. The development is proposed in two phases. This proposal is being reviewed as a final plan and subject to the Site Plan and Subdivision Ordinance of Land Use Code.

A total of 33 notices were sent to property owners within 500 feet of the site and a legal ad ran in the *Portland Press Herald* on October 1st and 2nd, 2018.

II. REQUIRED REVIEWS

<i>Waiver Requests</i>	<i>Applicable Standards</i>
<u>Public Transit Access</u> - A waiver is requested given the proximity of existing transit measures to the development. Two transit shelters are located less than ¼ mile from the site and the two transit shelters are located on the Jetport Boulevard sidewalk.	14-526 Site Plan Standards (a) Transportation Standards (3) Public Transit Access
<u>Required Number of Bicycle Parking Spaces</u> The applicant is requesting a waiver to provide only 10 bike spaces when 24 are required	14-526 Site Plan Standards (a) Transportation Standards, 4. Parking (b) Location and Required Number of Bicycle Parking Spaces

<i>Review</i>	<i>Applicable Standards</i>
Site Plan	<i>Section 14-526</i>
Subdivision	<i>Section 14-497</i>

III. PROJECT DATA

Existing Zoning	B-4
Existing Use	Office and Warehouse
Proposed Use	Office and Warehouse
Parcel Size	2.66 acres

	<i>Existing</i>	<i>Proposed</i>	<i>Net Change</i>
Impervious Area	55,329 SF	98,072 SF	42,743 SF
Building Footprint	17,842 SF	39,546 SF	21,704 SF
Building Floor Area	24,249 SF	42,511 SF	18,262 SF
Parking Spaces - Provided	99	188	97
Parking Spaces - Required	106		

Bicycle Parking Spaces	0	10	10
Estimated Cost of Project	\$3,900,000		

IV. BACKGROUND & EXISTING CONDITIONS

The project site, located at 90 Johnson Road, is approximately 2.67 acres and is comprised of two properties (1.68 and 0.99 acres respectively). The existing 20,260 SF single story building houses Charter Communications. The site has four access drives (at the two properties) with a total of forty-one (41) parking spaces. Although the site has frontage on Congress Street, access is via a driveway from Johnson Road. The adjacent property at 68 Johnson Road was historically occupied by a single-family home but has since been demolished and the property is a grassed lot. Commercial uses abut the site both to the northeast and southwest.

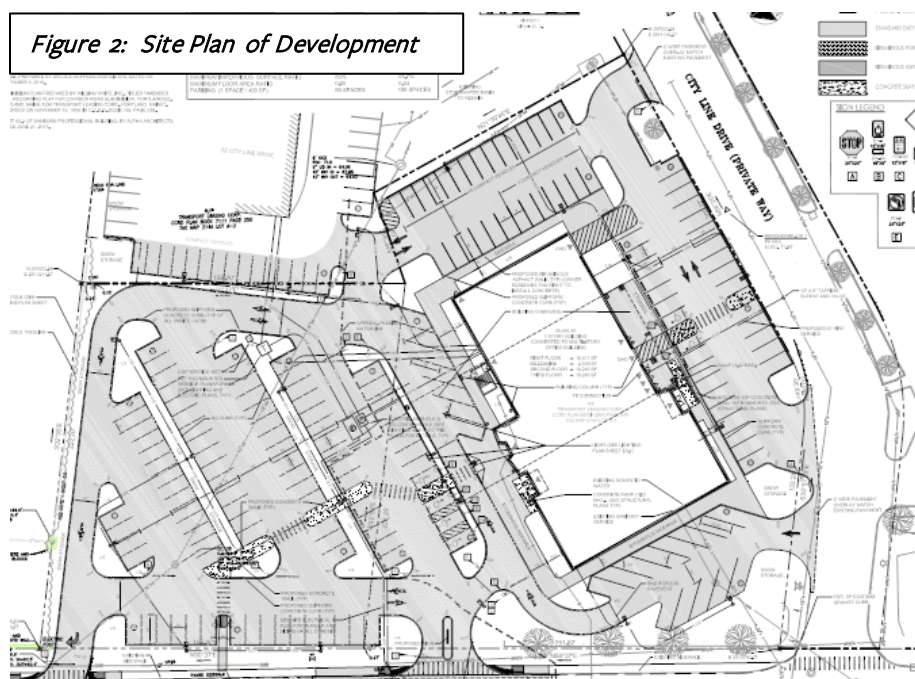


Figure 1: Aerial of Proposed Site

V. PROPOSED DEVELOPMENT

The proposed development project includes the expansion of the 17,234 SF one-story building to include a

Figure 2: Site Plan of Development



1,574 SF addition on the first floor and the construction of second and third floor with 10,245+ SF on each level for a total of 20,490 SF. Vehicular access and circulation are proposed from City Line Drive and Johnson Road. A total of 188 spaces will be provided for the project, of which six will be handicapped spaces. This will provide a ratio of 5 spaces per 1,000 SF of office space. The new parking area will be constructed to consist primarily of porous asphalt pavement.

The applicant submitted an application for the full

development scheme. During the review, plan was revised to be developed into two phases. The intent is to build the parking lot first with the opportunity of providing overflow parking capacity for the Portland Jetport. The site plan shows a right turn exit only driveway, which is located within an existing curb opening that served the former residence at the property. The parking lot will not be connected to the existing uses off City Line Drive during this Phase. The applicant has obtained a letter from Paul Bradbury outlining the Jetport's need for available parking near the Jetport.

The proposed second phase will consist of the building renovations and expansion. The applicant wants to have a tenant secured before proceeding to the second phase. The applicant is seeking to conduct the traffic impact study once the tenant is known. This would allow them to protect traffic demands, evaluate the Johnson Road access conditions, including placement of the existing medium, the City Line Drive connection/operations, and the Jetport Boulevard signalized intersection. A site plan approval can be extended up to three (3) years from the date of approval and construction of the second phase would need to commence within that time frame to retain approvals. This approach may require the applicant to return to the Board for an amendment.



Figure 3: Aerial of Proposed Development

Mr. Mark Sanborn is requesting a public hearing within the next few weeks in order to begin construction of Phase I this fall.

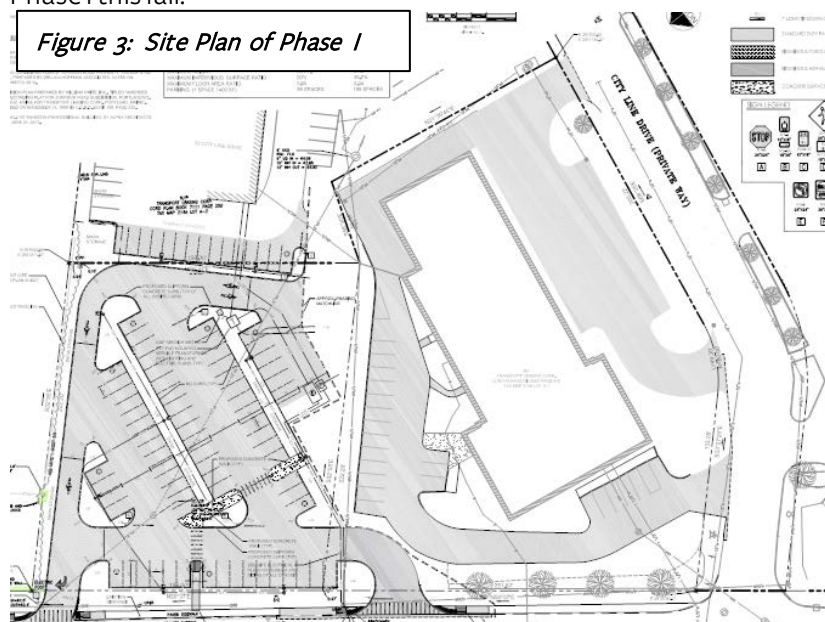


Figure 3: Site Plan of Phase I

VI. PUBLIC COMMENT

Staff has not received any public comments on the current application (*Attachments PC-1 and PC-2*).

VII. RIGHT, TITLE, & INTEREST

The applicant has provided a release deed (*Attachment I*), recorded at the Cumberland County Registry of Deeds (Book 34653 Page 201), which demonstrates their right, title and interest in the property.

The estimated cost of the development is \$3,900,000. The applicant has submitted a letter from Bangor Savings Bank, dated June 14, 2018 as demonstration of their financial and technical capacity to complete the proposed development.

VIII. ZONING ANALYSIS

The Planning staff performed a zoning review of the site development and the proposal meets the dimensional requirements of the B-4 zone. In addition to the dimensional standards, the zone also has other requirements applicable to all uses that needs to be met (Section 14-229.14) below. The applicant will have to address how the proposal meets these zoning requirements met as part of the final application:

(a) Landscaping and screening: The site shall be suitably landscaped for parking, surrounding uses and accessory site elements including storage and solid waste receptacles where required by article IV (subdivisions) and article V (site plan).

- (b) Curbs and sidewalks: Curbs and sidewalks as specified in article VI of chapter 25.*
- (c) Off-street parking and loading: Off-street parking and loading are as required by division 20 and division 21 of this article.*
- (d) Signs: Signs shall be subject to the provisions of division 22 of this article.*
- (e) Exterior storage:*
- (f) Storage of vehicles: Storage of vehicles is subject to the provisions of section 14-335.*
- (g) Shoreland and flood plain management regulations: If the lot is located in a shoreland zone or in a flood plain zone, the requirements of division 26 and/or division 26.5 apply.*

In addition, Sec. 14-229.5 of the B-4 zone (see below) has external effects standards to be addressed in the final review.

Section 14.229.5

- (a) Enclosed structure: The use shall be operated within a completely enclosed structure, except for those customarily operated in the open air.*
- (b) Noise: The volume of sound, measured by a sound level meter with frequency weighting network (manufactured according to standards prescribed by the American Standards Association), generated shall not exceed sixty-five (65) decibels on the A scale between 7:00 a.m. and 9:00 p.m. and sixty (60) decibels on the A scale between 9:00 p.m. and 7:00 a.m., on impulse (less than one (1) second), off premises at source of complaint, excepting air raid sirens and similar warning devices.*
- (c) Vibration and heat: Vibration inherently and recurrently generated and heat shall be imperceptible without instruments at lot boundaries.*
- (d) Glare, radiation or fumes: Glare, radiation or fumes shall not be emitted to an obnoxious or dangerous degree beyond lot boundaries.*
- (e) Smoke: Smoke shall not be emitted at a density in excess of thirty (30) percent opacity level as classified in Method 9 (Visible Emissions) of the Opacity Evaluation System of the U.S. Environmental Protection Agency.*

IX. AMENDED SUBDIVISION

It is not mentioned in the applicant's cover letter July 9, 2018 but the applicant is seeking an approval for a subdivision plan amendment for a lot line adjustment. The applicant will need to submit a stamped boundary survey of the site, as well as amended recording plat for the City's surveyor's review prior to the public hearing.

X. SITE PLAN STANDARDS (Section 14-526)

The proposed development has been reviewed by staff for conformance with the relevant review standards of Portland's site plan ordinance and applicable regulations. Staff comments are listed below.

1. Transportation Standards

a. Impact on Surrounding Street Systems

According to the applicant, the project is expected to have an insignificant impact on traffic in the neighborhood, based on the limited intensity of use of building. Vehicle and loading circulation to the building are shown on the plan. A full traffic impact study has not been completed at this time on the basis that the proposed trip generation and existing robust access conditions do not warrant a study. The applicant believes

"the much of the site is currently developed and, in the past, has generated traffic into the surrounding street system. The current tenant, Charter Communications, has decreased operations and staffing at the project location, thus in the more recent period, site generated traffic has decreased."

Due to the parking lot proposed use for the interim Jetport overflow parking, the applicant believes that no further traffic analysis is required for this development phase. Tom Errico, Consultant Traffic Engineer has reviewed the project and has the following comments in regard to traffic study:

The Applicant will be required to conduct a traffic impact study for the project. The key issue to be evaluated is the creation of a full movement driveway on Johnson Road, which has historically experienced safety problems. I would suggest that we schedule a meeting to identify the specific scope of the study.

Status: The Applicant is suggesting that the traffic study be conducted at the time of Phase 2 (or when a tenant for the building expansion is identified). I continue to review this suggested condition, but as noted in comments below, I am concerned about access conditions on Johnson Road.

The Applicant did provide a trip generation estimate and that projection seems inconsistent with the amount of parking provided. Trip generation methods will be discussed at the suggested scoping meeting.

Status: This issue is related to the conduct of the traffic study and I continue to review the request to postponed this work.

b. Access and Circulation

Access to the site is provided by a single two-way driveway along Johnson Road and two full driveways along City Line Drive. A single right-turn only exit drive will also be provided on Johnson Road. One of the existing curb cuts on Johnson Road will be closed as part of the development. Mr. Errico has reviewed the access and circulation on site and offers the following recommendations:

The Applicant should provide information in support of the two driveways on Johnson Road. This item would be part of the traffic study.

Status: The current driveway configuration for the Phase 1 Parking Lot is not acceptable. A restricted right-turn entry/exit driveway may be permitted, but additional review is required.

I am concerned about the internal intersection near the main Johnson Road driveway. The Study would need to confirm vehicle backups into Johnson Road will not occur.

Status: This item is likely not an issue in Phase 1 with a possible turn restriction driveway. Further review is required.

The Applicant should provide information on parking and circulation interaction with the abutting [52 City Line Drive](#) site.

Status: I continue to review this issue.

c. Public Transit Access

This standard requires that “commercial or institutional development of at least 20,000 square feet gross floor area, a transit facility shall be constructed”. The applicant has requested a waiver of this standard, under the waiver criteria:

All or some of this standard may be waived if the Reviewing Authority determines one or more of the following: (i) That some or all of the required improvements cannot reasonably be made due to site constraints and/or insufficient right of way width; or (ii) That the development is not anticipated to generate public transit usage due to particular characteristics or proposed use of the development.

The applicant states a “waiver is requested given the proximity of existing transit measures to the development. Two transit shelters are located less than ¼ mile from the site and the two transit shelters are located on the Jetport Boulevard sidewalk”.

d. *Parking*

A total of 188 spaces will be provided for the entire development, of which six will be handicapped spaces. As part of the Phase One, the eighty-five (85) spaces parking lot will be maintained by Transport Leasing and its use will be limited to only use by the Jetport until such time that the Building expansion in Phase II occurs. The parking lot will be constructed as a porous pavement surface, like the Dept of Human Services site nearby, and the drainage associated with the lot will ultimately flow into the Johnson Road storm drain system that ultimately discharges to the Stroudwater River, off Congress Street east of the site. Mr. Errico’s comments are below in regard to the parking lot and its layout:

Parking lot aisle widths do not meet City standards and the Applicant shall provide supporting documentation as part of a formal request for a waiver.

Status: It is difficult to assess waiver justification without specific tenant details. I continue to review this request.

The site plan notes back in angle parking on the north side of the building. Dimensions should be provided for these spaces and confirmation that this is the parking configuration proposed.

Status: The requested information has been provided and I have no further comment.

The required parking spaces for the office use, professional and public buildings is one (1) parking space for each four hundred (400) square feet, there zoning requires a total of 106 spaces.

e. *Transportation Demand Management (TDM)*

According to the applicant, they are open to preparing a full traffic study and if necessary a Traffic Movement Permit once a tenant user is identified and in advance of the applicant seeking a building permit. They are aware that this may require reappearing before the Planning Board and aware that the City may revisit access conditions including the drives off Johnson Road as well as site access from City Line Drive at that time.

2. Environmental Quality Standards

a. *Preservation of Significant Natural Features*

There are no known existing heritage trees or significant natural features on the site.

b. *Landscaping and Landscape Preservation*

A landscaping plan has been submitted for the parking lot landscaping, which includes thirty-four (34) trees and thirty-four (34) shrubs and various perennial planting beds. In addition, there are five street trees proposed along the Johnson Road frontage.

c. *Water Quality, Storm Water Management and Erosion Control*

The proposed development includes the renovations and expansion of the existing Spectrum office/warehouse building. The existing building will be renovated including a vertical expansion to go from one story to three stories. The existing parking area and drive will also be redeveloped into a more functional layout for the expanded use. The undeveloped grassed lot at 68 Johnson Road will include new development of a parking area and associated stormwater management and landscaping. A total of 188 parking spaces are proposed as part of the entire development. Stormwater management will primarily be in the form of porous pavement within the new parking area. The porous pavement will be similar to the porous pavement installed at the nearby State of Maine DHHS building off the Jetport Boulevard.

The proposed porous asphalt parking area will consist of materials that will provide both water quality treatment and stormwater runoff storage and control. Drainage patterns in the existing parking areas will remain basically unchanged. The new parking area will drain runoff to an existing municipal drainage system in Johnson Road, which ultimately conveys runoff northerly along Johnson Road and Congress Street to a culvert outlet located on Congress Street, opposite the cemetery entrance. From this point a natural drainage tributary conveys any water to the Stroudwater River and ultimately the Fore River.

Lauren Swett, Consultant Civil Engineer, reviewed the stormwater management study and plans and has the following to offer:

I am comfortable with the response to comments in general on 90 Johnson Road. His response references some documents that I do not see in eplan:

- *Plan sheet C-8.2 (they reference some detail edits)*
- *South Portland wastewater capacity letter*
- *Stormwater maintenance agreement draft*

3. Public Infrastructure and Community Safety Standards

a. *Consistency with Master Plans*

The project has been designed to be consistent with the City's Zoning Ordinance and off-site infrastructure plans.

b. *Public Safety and Fire Prevention*

There seems to be adequate access to all four sides of the proposed building. Chief Robert Thompson, Fire Department, is reviewing the project and his comments will be available for the public hearing.

c. *Availability and Adequate Capacity of Public Utilities*

There are existing electrical water, sewer, and gas services to the property from mains located in the abutting streets. The expansion will involve the installation of a sprinkler system to the building which involves a new fire supply water main off the PWD main in City Line drive. The existing building has a sanitary sewer service and the flows from the site ultimately discharge to the South Portland municipal wastewater collection, conveyance and treatment systems, per an inter-municipal agreement. The applicant has contacted all governing utility agencies and the ability to serve letters will need to be forwarded to the planning office upon receipt.

4. Site Design Standards

a. *Massing, Ventilation and Wind Impact*

The height of the proposed addition is 57'-5" and is within the allowed height standards of 65'. The project will not result in any significant changes to the wind environment due to the site located near an airport, therefore there are no nearby developed lots that may be negatively impacted.

According to the applicant if HVAC venting is proposed, will be directed through rooftop units and will not impact any adjacent public spaces.

b. Shadows

This standard does not apply since the building is not located near publicly accessible open space.

c. Snow and Ice Loading

The site and utility plan show designated snow and loading areas in the parking lot.

d. View Corridors

This standard does not apply since the development is not in a view corridor.

e. Historic Resources

The development is not located in a historic district, historic landscape district and is not a City designated landmark, and is not located adjacent to or within 100 feet of a designated landmark, historic district, or historic landscape district. There are no known archaeological resources on the site either.

f. Exterior Lighting

A lighting and photometric plan has been submitted for review. There is lighting trespass at the property lines onto the parcel on the north and along the Johnson Road, therefore does not meet the trespass standard. No street lighting is proposed on site.

g. Noise and Vibration

All heating, ventilation and air conditioning equipment (HVAC), air handling units (AHU), emergency generators, and similar equipment will have to be shown on the plans and meet state and federal emissions requirements. These should be located to the interior of the site, away from abutting residential properties and be screened from view from any public street and from adjacent sites by structure walls, evergreen landscaping, fencing, masonry wall or a combination thereof. This information will have to be submitted for final review. The project noise levels shall be designed to meet the permitted levels as outlined in the B4 Zone.

h. Signage and Wayfinding

The applicant will need to submit a signage and wayfinding plan for review by staff prior to a public hearing.

i. Zoning Related Design Standards

The site is located in the B4 zone and there are no specific design standards that apply to this development.

XI. NEXT STEPS

1. Applicant to address staff comments and additional comments of the Planning Board;
2. Applicant to prepare complete subdivision and site plan submission, including requirements as included in 14-527(e) and (f), for review by the Planning Authority and Planning Board; and
3. Planning Board to hold a public hearing.

XII. ATTACHMENTS

PLANNING BOARD REPORT ATTACHMENTS

1. Traffic Engineer review (memo from Thomas Errico, 10.04.2018)
2. Civil Engineer review (memo from Lauren Swett, 10.03.2018)

APPLICANT'S SUBMITTALS

- A. Cover Letter
- B. Level III Development Review Application
- C. Certification Neighborhood Meeting
- D. Construction Management Plan July 2018
- E. Environmental and Landscape Features
- F. Environmental and Stormwater
- G. Financial Capacity
- H. Public Infrastructure and Safety
- I. Right, Title, And Interest
- J. Site Design
- K. Stormwater Management Report
- L. Transportation
- M. Zoning Assessment
- N. Waiver Requests
- O. Wastewater Capacity Application
- P. Lor_1_Barhydt_20180904_Final
- Q. Lor_2_Barhydt_20180920_Final
- R. Letter from Paul Bradbury To Mark Sanborn 09.20.2018

PLANS

- Plan 1. c-1.o_cover sheet_general_notes_and_Legend City Context Plan
- Plan 2. c-2.o_3RD Amend Subdiv. 06.11.2014
- Plan 3. c-2.1_existing_conditions_and_demolition_plan_phase1
- Plan 4. c-2.2_existing_conditions_and_demolition_plan_phase2
- Plan 5. c-3.o_site_layout_and_utility_plan_phase1
- Plan 6. c-3.1_site_layout_and_utility_plan_phase2
- Plan 7. c-4.oa_grading_and_drainage_plan_phase1
- Plan 8. c-4.ob_grading_and_drainage_plan_phase2
- Plan 9. c-4.1_stormwater_management_plan
- Plan 10. c-4.2_stormwater_management_plan_2of2
- Plan 11. c-5.o_erosion_control_plan_phase1
- Plan 12. c-5.1_erosion_control_plan_phase2
- Plan 13. c-6.o_full_depth_box_cut_asphalt_plan
- Plan 14. c-7.o_landscape_plan
- Plan 15. c-8.o_details
- Plan 16. c-9.o_details
- Plan 17. c-10.o_erosion_and_sediment_control_notes
- Plan 18. c-11.o_pre-development_watershed_plan
- Plan 19. c-12.o_post-development_watershed_plan
- Plan 20. e-o.1
- Plan 21. e-o.2
- Plan 22. e-1.1
- Plan 23. e-1.2
- Plan 24. e-1.3
- Plan 25. arch plans



Shukria Wiar <shukriaw@portlandmaine.gov>

90 Johnson Road - Updated Preliminary Traffic Comments

1 message

Tom Errico <thomas.errico@tylin.com>

Wed, Oct 3, 2018 at 8:21 PM

To: Shukria Wiar <shukriaw@portlandmaine.gov>

Cc: Bruce Hyman <bhyman@portlandmaine.gov>, Barbara Barhydt <bab@portlandmaine.gov>

Hi Shukria – The following is a status update of previous preliminary traffic comments.

- The Applicant will be required to conduct a traffic impact study for the project. The key issue to be evaluated is the creation of a full movement driveway on Johnson Road, which has historically experienced safety problems. I would suggest that we schedule a meeting to identify the specific scope of the study.

Status: The Applicant is suggesting that the traffic study be conducted at the time of Phase 2 (or when a tenant for the building expansion is identified). I continue to review this suggested condition, but as noted in comments below, I am concerned about access conditions on Johnson Road.

- The Applicant should provide information in support of the two driveways on Johnson Road. This item would be part of the traffic study.

Status: The current driveway configuration for the Phase 1 Parking Lot is not acceptable. A restricted right-turn entry/exit driveway may be permitted, but additional review is required.

- I am concerned about the internal intersection near the main Johnson Road driveway. The Study would need to confirm vehicle backups into Johnson Road will not occur.

Status: This item is likely not an issue in Phase 1 with a possible turn restriction driveway. Further review is required.

- The Applicant did provide a trip generation estimate and that projection seems inconsistent with the amount of parking provided. Trip generation methods will be discussed at the suggested scoping meeting.

Status: This issue is related to the conduct of the traffic study and I continue to review the request to postponed this work.

- Parking lot aisle widths do not meet City standards and the Applicant shall provide supporting documentation as part of a formal request for a waiver.

Status: It is difficult to assess waiver justification without specific tenant details. I continue to review this request.

- Although not required by City ordinance, in my professional opinion a sidewalk on City Line Drive to Jetport Boulevard is needed to provide a safe walking connection to the sidewalk on Jetport Boulevard. I have observed pedestrians walking on City Line Drive, particularly during mid-day time periods.

Status: The Applicant does not support the installation of the suggested sidewalk. Given that City Line Drive is not a public street, the City does not appear to have a standard requiring the sidewalk. I continue to review conditions to ensure safe pedestrian conditions are provided.

- The site plan notes back in angle parking on the north side of the building. Dimensions should be provided for these spaces and confirmation that this is the parking configuration proposed.

Status: The requested information has been provided and I have no further comment.

- The Applicant should provide information on parking and circulation interaction with the abutting [52 City Line Drive](#) site.

Status: I continue to review this issue.

If you have any questions, please contact me.

Best regards,

Thomas A. Errico, PE
Senior Associate
Traffic Engineering Director

TYLIN INTERNATIONAL

[12 Northbrook Drive](#)

Falmouth, ME 04105

+1.207.781.4721 main

+1.207.347.4354 direct

+1.207.400.0719 mobile

+1.207.781.4753 fax

thomas.errico@tylin.com

Visit us online at www.tylin.com

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"One Vision, One Company"



Shukria Wiar <shukriaw@portlandmaine.gov>

90 Johnson Road

1 message

Lauren Swett <lswett@woodardcurran.com>

Wed, Oct 3, 2018 at 9:46 AM

To: "Shukria Wiar (shukriaw@portlandmaine.gov)" <shukriaw@portlandmaine.gov>

Hi Shukria,

I am comfortable with the response to comments in general on 90 Johnson Road. His response references some documents that I do not see in eplan:

- Plan sheet C-8.2 (they reference some detail edits)
- South Portland wastewater capacity letter
- Stormwater maintenance agreement draft

I'll review those materials when they have been submitted.

Thanks,

Lauren

Lauren Swett, P.E.*

Technical Manager

Woodard & Curran

[41 Hutchins Drive](#)[Portland, Maine 04102](#)

Phone: (207)558-3763 (direct)

(207)219-3591 (cell)

(800)426-4262 (office)

Email: lswett@woodardcurran.com

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Chair, Leader Training Committee

American Society of Civil Engineers

<http://regions.asce.org/leader-training-committee/>



Stantec Consulting Services Inc.

482 Payne Road Scarborough Court, Scarborough ME 04074-8929

July 9, 2018

Ms. Barbara Barhydt

Planning and Development Department
City of Portland, Maine
389 Congress Street
Portland, Maine 04101-3509

**Subject: Application for Level III Site Plan Application
90 Johnson Road
Tax Map 214A/Block A/Lot 1**

Dear Barbara:

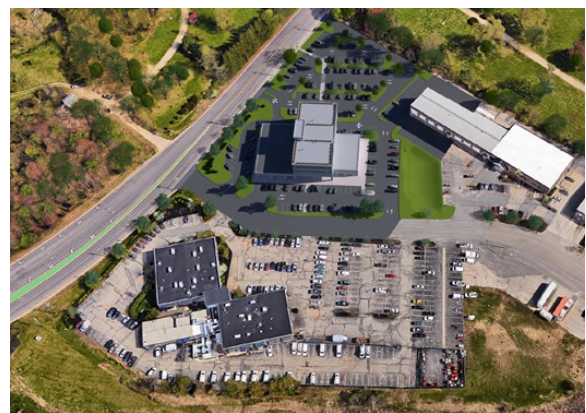
On behalf of **Transport Leasing Corp.** (Applicant), our office is pleased to provide the accompanying package of submission materials for a Level III Site Plan Application. This submission package is intended to meet the City's Level III Site Plan Submission requirements as outlined in the Level III Site Plan Checklist as well as Section 14-526 of the Code of Ordinances.

PROJECT OVERVIEW

Transport Leasing Corp. proposes to construct an expansion of their existing 17,482 SF office/warehouse building with an additional 22,064± SF to increase the building capacity for a Class A Office space within the 2.66 acres of land located at 90 Johnson Road. The site is currently in the B4 Commercial Business Zone. The building is currently occupied by Charter Communications (aka Spectrum or Time Warner Cable) and they use the space for both office and warehouse functions. Charter will shift these programs to other building space they already occupy on the City Line Drive Campus, if the applicant successfully leases the space to another office user.



Existing Site



Proposed Site



Ms. Barbara Barhydt
July 9, 2018
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The development will also include new parking lot construction and ancillary site improvements including electrical utility upgrades, drainage etc., for the site. Approximately 3,500 SF of the existing building will be demolished to make way for some parking area on the north end of the site. The following is a summary of the existing and proposed building spaces:

Description	Size (SF)
Existing Ground Level	20,135
Existing Mezzanine	4,114
Total Existing	24,249
Proposed Ground Level	17,262
Proposed Mezzanine	4,757
Proposed Second Level	10,246
Proposed Third level	10,246
Total Proposed	42,511
Net Increase	18,262

Right, Title or Interest

The project site is currently owned by Transport Leasing Corp. and consists of 2.67 acres of land that is included in the City of Portland's Tax Assessors records as Tax Map 214A/Block A/Lots A001 and A003 and included in the June 2014 Subdivision Plan Prepared by Owen Haskell, Inc. A copy of the deed is included in Attachment B. The land has been under common ownership for a long period of time and includes City Line Drive, which is a private way, also owned and maintained by the Applicant.

Zoning Assessment

The project is located in the B4 Commercial Corridor Zone and the proposed general office use identified as an allowable use.

PERMITTED USES

- *General, business and professional offices*
- The following dimensional requirements apply in the B4 Commercial Corridor Zone with the applicable as provided information for the proposed layout:

B4 Space and Bulk Dimensional Requirements		
Dimensional Requirements	Required	Provided
Minimum Lot Size	10,000 SF	202,554 SF
Minimum Street Frontage	60'	447.82'
Minimum Front Yard	20'	41'±
Minimum Side Yard	12'	77'±
Minimum Rear Yard	20'	278'±
Minimum Lot Width	60'	448'±



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B4 Space and Bulk Dimensional Requirements		
Maximum Building Height	65'	57'-5'±
Maximum Impervious Surface Ratio	80%	45.7%
Maximum Floor Area Ratio	0.65	0.34
Parking Spaces (1 spaces/400 SF) ¹	95	188

SHORELAND ZONING

The site is not located within the Shoreland Zoning District.

Existing development in the area includes the following:

- Charter Communications occupies the existing building at Lot 7.
- Lobsters Now occupies space within the existing building at 54 City Line Drive. The East Coast Christian Church also continues to control leased area within the 54 City line Drive building although they are not currently occupying the space.
- Canteen Services and SiteOne Landscape supply occupy space at 70 City Line Drive.
- The Portland Jetport and Department of Human Services are located east of the site along the Jetport Boulevard.
- Signalized access at the intersection of Johnson Road, Skyway Drive and the Jetport Boulevard is the primary connection to the Turnpike and points south in South Portland.

The Zoning Assessment table is included in Attachment C to this submission.

PROPOSED DEVELOPMENT

The development program includes the following components:

- Expansion of the remaining 17,234 SF building to include a 1,574 SF addition on the first floor; and
- Construction of a second and third floor to include 10,245 + SF of space on each level for a total of 20,490 SF.
- Vehicular access and circulation throughout the site will be from City Line Drive and Johnson Road. Left turns are prohibited from City Line Drive onto Johnson Road and there is a raised island in Johnson Road prohibiting this movement. Southbound traffic from the site or traffic to/from the Turnpike will typically flow thru the signalized intersection. Local traffic from Johnson Road will also use the signalized intersection or may turn left or right in/out of the proposed parking area, as the proposed access drives are located beyond the median island in Johnson Road.

¹ See Section 14-332 (j)



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A total of 188 spaces will be provided for the project with six ADA spaces. This will provide a ratio of 5 spaces per 1,000 SF GLA as is typically required for Class A professional office space in the Portland region.

The site improvements include new parking area construction to consist primarily of porous asphalt pavement. Most of the existing parking area along City Line Drive and near Johnson Road will be rebuilt to make slight grades adjustments and to also provide a new pavement surface. Drainage patterns in the existing parking areas will remain basically unchanged. The new parking area will drain runoff to an existing municipal drainage system in Johnson Road, which ultimately conveys runoff northerly along Johnson Road and Congress Street to a culvert outlet located on Congress Street, opposite the cemetery entrance. From this point a natural drainage tributary conveys any water to the Stroudwater River and ultimately the Fore River. The proposed porous asphalt parking area will consist of materials that will provide both water quality treatment and stormwater runoff storage and control. This approach is nearly identical to the pavement section that was constructed at the Department of Human Services site off Jetport Boulevard, in South Portland, in 2014. The design of that porous pavement section was reviewed and approved by the Maine Department of Environmental Protection and the City of South Portland.



Department of Human Services – South Portland, ME

(Porous asphalt areas appear darker in the image and regular asphalt areas, primarily in the access drives, appear lighter in color. Source – Google™)

WAIVER REQUESTS

The table is included in Attachment D.



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FINANCIAL CAPACITY

The Applicant has the means at its disposal for financing the proposed project. A letter from Bangor Savings Bank is included in Attachment E.

A breakdown of the preliminary project cost includes the following:

- Site Work <\$900,000
- Structures \$3,000,000+

These values are considered preliminary and approximate and are subject to change as actual contractor pricing is obtained. The applicant has owned and managed the property for greater than 30 years and they have maintained a tenant relationship with Charter/Time Warner Cable for greater than 15 years. The applicant should be considered as more than able to financial support the project.

TECHNICAL CAPACITY

The applicant has retained a highly-qualified team of professionals to undertake planning, permitting and design tasks on this project. Services will be provided by the following companies and their respective team leaders

<i>Civil Engineer</i>	Stephen R. Bushey, P.E. Stantec Consulting Services, Inc. 482 Payne Road Scarborough, ME 04074 (207) 887-3478 – Work (207) 756-9359– Cell stephen.bushey@stantec.com
<i>Surveyor</i>	Owen Haskell, Inc. John Swan 390 US Route 1 Falmouth, ME 04105 (207) 774-0424 – Work jswan@owenhaskell.com
<i>Architect</i>	Alpha Architects 17 Chestnut Street Portland, ME 04101 (207) 761-9500 Mark@alphaarchitects.com
<i>Lighting/Electrical</i>	Bartlett Design Inc. 942 Washington Street Bath, ME 04530 (207) 443-5447



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The team of consultants retained has expertise and experience in the design of similar commercial projects. Resumes of key personnel for development team can be provided upon request.

The Applicant also has significant experience in the development and management of commercial projects having managed Transport Leasing for many years and specifically, owned and managed all of the property off City Line Drive over the course of several decades. The applicant should be considered an exemplary landlord and landowner, who have owned and managed commercial property in the Portland region highly successfully. They also own locally, commercial properties in Scarborough at 95 Pleasant Hill Road and Muzzy Road, among others.

STATE AND FEDERAL PERMITS

The project as presented does not require any additional Federal or State level site permits.

CLOSURE

Accompanying this cover letter are the following materials to complete Tab 1 – General Application Documents:

- Attachment A: Level III Site Plan Application Completed Checklist
- Attachment B: Right, Title and Interest
- Attachment C: Zoning Assessment
- Attachment D: Waiver Requests
- Attachment E: Financial Capability

In addition to the information listed above, we are also providing the following materials with our submission:

- Tab 2 – Transportation
- Tab 3 – Environmental and Landscape Features
- Tab 4 – Environmental and Stormwater
- Tab 5 – Public Infrastructure and Safety
- Tab 6 – Site Design
- Tab 7 – Construction Management Plan
- Plan Sheets



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On behalf of the Transport Leasing Corp., we look forward to your continued assistance on the project and we look forward to the next available workshop meeting with the Planning Board. As is required, once we complete the Planning Board workshop, the applicant will be conducting a Public Informational Meeting. We anticipate this meeting will be conducted prior to the Public Hearing.

If you have any questions regarding the materials being submitted, please contact this office.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Stephen R. Bushey, P.E.
Associate
Tel: 207-887-3478
Stephen.bushey@stantec.com

Attachments

c: Mark Sanborn, Transport Leasing Corp.

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ATTACHMENT A

LEVEL III APPLICATION SUBMISSION CHECKLIST



LEVEL II and LEVEL III APPLICATION SUBMISSION CHECKLIST

Submit each Tab as one PDF file and bookmark the items as noted below

Please confirm by electronically checking the boxes to the left

Tab 1 – 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.

Submit each Tab as one PDF file and bookmark the items as noted below

Tab 2 - 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

Tab 3 - 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

Tab 4 - 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

Tab 5 - PUBLIC INFRASTRUCTURE AND SAFETY			
Check list		Assess/Provide/Document:	
Yes	NA	Plan	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	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
☒	☐	☒	
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
☒	☐	☒	
Tab 6 - SITE DESIGN			
Check list		Assess/Provide/Document:	
Yes	NA	Plan	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	Plan	Shadows (14-526 (d) 2), if applicable Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
☐	☒	☐	
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
☐	☐	☒	
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
Tab 7 - Construction Management Plan	
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	
☒	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



Stantec Consulting Services Inc.

482 Payne Road Scarborough Court, Scarborough ME 04074-8929

I, Steve Bushey, P.E. of Stantec, hereby certify that a Neighborhood Meeting was held on Thursday, August 16, 2018 at 5:00 P.M. at the development site at 90 Johnson Road, Portland, Maine for the proposed project located at 90 Johnson Road, Portland, Maine.

I also certify that on Friday, August 3, 2018 (which is at least ten (10) days prior to the Neighborhood Meeting) 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 1,000 feet of a proposed industrial subdivision or industrial zone change.
2. Residents on the "interested parties" list.

Signed,

A handwritten signature in blue ink, appearing to read "Stephen Bushey", written over a horizontal line.

Stephen Bushey, P.E.

August 17, 2018

Date

Attached to this certification are:

1. Copy of the invitation sent
2. Sign-in sheet
3. Meeting minutes



Stantec Consulting Services Inc.

482 Payne Road Scarborough Court, Scarborough ME 04074-8929

August 3, 2018

Dear Neighbor:

Please join us for a Neighborhood Meeting to discuss the proposed expansion of the existing office/warehouse building at 90 Johnson Road in Portland, Maine. The project includes interior renovations and an additional 22,064± SF of multi-story Class A Office Space.

Meeting Location: **Conference Room (look for signs)**
 90 Johnson Road
 Portland, Maine

Meeting Date: **Thursday, August 16, 2018**

Meeting Time: **5:00 PM**

The City Code requires that property owners within 500 feet (except notices must be sent to property owners within 1,000 feet for industrial zoning map amendments and industrial subdivisions) of the proposed development and residents on an "interested parties list", be invited to participate in a neighborhood meeting in advance of our appearances before the Portland Planning Board for a Workshop and Public Hearing, as they consider the Level III Site Plan Application that has been submitted. 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. The meeting will last no more than 30-45 minutes.

If you have any questions, please feel free to contact Steve Bushey, P.E. at 207-883-3355.

Sincerely,

STANTEC CONSULTING SERVICES, INC.

A handwritten signature in blue ink, appearing to read "Stephen R. Bushey", written over a horizontal line.

Stephen R. Bushey, P.E.
Associate

V:\2108\active\210801617\civil\admin\permitting\local\neighborhood meeting\notice_neighborhood-meeting.docx

Note: Under Section 14-32(C) and 14-525 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 three weeks of submitting a preliminary application or two weeks 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

ABUTTERS LIST FROM CITY OF PORTLAND - 90 JOHNSON ROAD PROPERTY - PL-000232-2018

PROPERTY OWNER	OWNER ADDRESS	CITY	STATE	ZIP
Brooklawn Memorial Pk	2002 Congress St	Portland	ME	04102
City Of Portland	389 Congress St	Portland	ME	04101
Maine Turnpike Authority	430 Riverside St	Portland	ME	04103
State Of Maine	16 State House Station	Augusta	ME	04333
Temple Beth El	400 Deering Ave	Portland	ME	04103
Transport Leasing Corp	58 Lowell Junction Rd	Andover	MA	01810

INTERESTED PARTIES LIST FROM CITY OF PORTLAND - 100 FORE STREET PROPERTY

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 Communications	521	East Morehead Street	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 Council of Governments	970	Baxter Blvd., 2nd Floor	Portland	ME	04103
Henry	Leclair		209	Range Road	Windham	ME	03087
Janice	Carpenter		9	W. Commonwealth Drive	Portland	ME	04103
Jennifer	Munson	City of Portland	389	Congress Street	Portland	ME	04101
Jesse	Thompson	Kaplan Thompson Architects	424	Fore Street	Portland	ME	04101
John	Leavitt	NE Regional Council of Carpenters	68	Bishop Street, Unit 1	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 Maine	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		1369	Hilltop Drive	Naples	FL	34103

Neighborhood Meeting Sign-In Sheet

Project: 90 Johnson Road, Portland, Maine

Date: August 16, 2018

Time: 5:00 PM

Location: Conference Room, 90 Johnson Road, Portland, Maine

[illegible]



Stantec Consulting Services Inc.

482 Payne Road Scarborough Court, Scarborough ME 04074-8929

MEETING MINUTES

Project: 90 Johnson Road, Portland, Maine

Job #: 210801617

Date: August 16, 2018 at 5:00 PM

Location: Conference Room, 90 Johnson Road, Portland, Maine

Subject: Neighborhood Meeting

Attendees: Please see attached sign-in sheet

In accordance with the City of Portland Planning Board Requirements, Transport Leasing Corp. and Stantec conducted a Neighborhood Meeting for the proposed expansion of their existing 17,482 SF office/warehouse building with an additional 22,064 SF of Class A office space. The meeting was held on Thursday, August 16, 2018 at 5:00 P.M. Please see the attached meeting sign-in sheet for a list of people who attended the meeting.

It was a brief meeting as only representatives of the Owner attended the meeting. There were zero (0) abutters or members of the public at the meeting. No questions were asked.

Prepared by Steve Bushey

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TAB 7
Construction Management Plan
90 Johnson Road Office Building
Transport Leasing Corp.

This document and its subsequent attachments comprise The Construction Management Plan being submitted to the City of Portland for the 90 Johnson Road Office Building project at 90 Johnson Road. The Construction Management Plan contains information pertaining to the overall planning and coordination of the project.

The project involves the renovations and construction of a building expansion that will add 18,262 SF of building space onto an existing 24,249 SF building. The expansion includes an increase in building height to add two levels of office space above an existing structure. A portion of the upper level expansion will extend beyond the existing building footprint and be column supported. Site improvements include new porous pavement parking, utilities, and yard work.

A. Construction Management Principles

The impact of this project on the public will be minimized via the following construction management principles:

- The construction zone for the building will be fully secured with hard barriers/fencing preventing any access into the site by the public. Barriers are not expected to extend into the Public R.O.W.
- All construction activities will occur within the construction barriers/fencing to ensure the public is never exposed to any risks caused by the activities.
- There will be an onsite staging and unloading area for all deliveries which will prevent any impacts caused by offsite staging of trucks.
- All deliveries will be coordinated and scheduled to ensure that there is no offsite queuing required in Johnson Road or City Line Drive. The Owner plans to schedule as many deliveries as possible in the early morning to limit impact on the surrounding area.
- All construction activities will occur within normal daytime working hours to minimize impacts to the surrounding area.

B. Development Review of Construction Management Plan

The Owner will use a site-specific safety program for all team members who work on the construction site. The public will not be put at risk at any point throughout this project, as all work will be completed within the fenced off jobsite. At no point of the project will the public have access to this job site. Minimizing impacts to areas surrounding the building/construction site will be a primary consideration 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.

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

All fees, permits, and guarantees will be paid/issued prior to construction commencing.

This project will require no anticipated public street openings for utility tie-ins. If found to be necessary, all required permits will be requested and granted by the Department of Public Works prior to any street openings occurring. MUTCD plans will be submitted to and approved by the City of Portland for any traffic disruptions caused by street openings or interruptions to Johnson Road or Jetport Boulevard traffic. City Line Drive is a private way owned and maintained by the applicant.

D. Construction Administration and Communication

The contact person for all construction activities for the project will be:

Mark Sanborn
207.650.9506
mark@abcorental.com

Temporary signage will be posted onsite with additional contact information for the contractor.

E. Construction Schedule

The preliminary construction schedule for the project starts in Fall 2018 and runs through Spring 2019.

All construction activities will be completed during daytime hours, there will be no need for night work. All deliveries for this project will also occur during normal daytime hours.

F. Security & Public Safety

See the Site Plans for fencing and barriers to be used to isolate the construction site from the public. All gates into the project may have Knox locking devices to allow for emergency access.

The fire safety program onsite will consist of the following:

- Fire extinguishers placed throughout the construction site for the duration of the project.

- The new fire alarm system installation will be ongoing throughout the project duration.
- All team members will be briefed on the emergency evacuation plan for the project site prior to starting work.

G. Construction Permitting and Traffic Control Plans

1. Construction Activity in Public Streets: This project will not require street openings on Johnson Road.
2. Sewer: This building will need to connect to the public sewer system via an existing on site service connection. All required permits will be submitted for and approved by the Sewer Connection Clerk at the Department of Public Works or City of South Portland Water Resource Protection Department.
3. Traffic Control Plans: There will be periods of time throughout the project where construction activity may impact the existing public street system although this is expected to be very limited. Prior to any interruptions, a MUTCD plan will be created and submitted to the City for approval. The MUTCD will ensure that traffic and safe passage for the public is maintained in a satisfactory manner.

H. Site Management and Controls

The following actions will be taken by the Owner as regular site management and control activities:

- Construction site signage will be provided, installed, and maintained by the Owner throughout the duration of the project.
- Access to the site will be controlled.
- Trash and debris will be removed from site via a construction dumpster which will be changed out as needed on a regular basis.
- Street cleaning will not be required on a regular basis, but if it is deemed necessary the Owner will coordinate the cleaning of any excess dirt that has resulted from construction activities.
- Onsite snow removal will be the Owner's responsibility.

I. Erosion Control and Preservation of Trees

Erosion control measures will be installed onsite prior to any work commencing. A complete erosion control plan will be put together and reviewed with the City at the preconstruction meeting. Some of the measures that will be taken are utilization of silt fences to protect to surrounding area from any silt run off from the site. The control measures will be maintained daily and inspected weekly or after any major rain event. The inspections will be documented for review by the City of Portland, Maine Department of Environmental Protection, or the U.S. Environmental Protection Agency.

All stored materials onsite will be located away from any trees or vegetation.

J. Construction Staging Area

All trucks will be unloaded within the construction site's footprint to avoid impacts on public traffic. An offsite marshalling area will not be required for this project. All materials will be stored onsite and, in a manner, to avoid impacts to site operations and emergency vehicle access to the property.

K. Parking During Construction

Construction parking will be provided onsite. No parking of construction vehicles will be allowed in the Johnson Road R.O.W.

L. Special Measures as Necessary

There will be no special measures necessary for this project.

Please do not hesitate to contact the applicant with any comments, questions, or concerns regarding the Johnson Road project and subsequent Construction Management Plan.

TAB 3 – ENVIRONMENTAL AND LANDSCAPE FEATURES

Section 14-526. Site Plan Standards

The following statements are provided in accordance with the submission checklist Tab 3 and Section 14-526 of the ordinance.

(b) Environmental Quality Standards

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*

1. Preservation of Significant Natural Features:

- a. The existing site retains no prominent significant natural features therefore no issue related to the preservation of these features applies.
- b. Not applicable.

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*

2. Landscaping and Landscape Prevention:

- a. Landscape Preservation.
 - (i) Landscaping has been provided for on the site plan. This include perimeter tree plantings to supplement existing landscaping, primarily along the Johnson Road frontage. Where necessary, the owners will provide grass cover to stabilize non-gravel or non-paved surfaces and add a few street trees for landscaping.
 - (ii) Not applicable.
 - (iii) Protection measures will be made for existing vegetation during construction.
 - (iv) The Applicant will request a waiver from this standard.

Landscaping and Landscape Preservation (14-526 (b) 2 b)

- a. *Screening and buffering of service areas and between non-residential and residential uses*
- b. *Planting plans with plant schedule and sizes*

2. Landscaping and Landscape Prevention:

b. Site Landscaping:

(i) Landscaped Buffers:

- (a) There are no service or loading areas observable from nearby sidewalks or residential properties.
- (b) The development is not subject to zoning setbacks or buffering requirements.
- (c) Not applicable.
- (d) Not applicable.

Parking Lot Landscaping (14-526 (b) 2 b ii), if applicable

- *Landscaped islands within parking areas (Technical Manual, Section 4)*

2. Landscaping and Landscape Preservation:

a. Site Landscaping.

(ii) Parking Lot Landscaping:

- a) thru d) Parking lot landscaping has been provided for on the site plans. Included in the landscaping are 34 trees and 34 shrubs and various perennial planting beds.

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

2. Landscaping and Landscape Preservation:

b. Site Landscaping.

(iii) Street Trees:

- (a) Five Zelkova Street trees are proposed along the Johnson Road frontage.

TAB 4 – ENVIRONMENTAL AND STORMWATER

Section 14-526. Site Plan Standards

The following statements are provided in accordance with the submission checklist Tab 4 and Section 14-526 of the ordinance.

(b) Environmental Quality Standards

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*

3. Water Quality, Stormwater Management and Erosion Control:

a. Stormwater:

- (i) The project site is currently developed with an existing building and parking area. A full stormwater management report has been prepared to address the development's pre and post development stormwater quantity and quality conditions.
- (ii) An Erosion & Sediment Control Plan has been prepared and is included with this submission.
- (iii) Not applicable
- (iv) See the Stormwater Management Report attached to this narrative for further information.



Stantec Consulting Services Inc.
482 Payne Road, Scarborough Court, Scarborough, ME 04074

July 16, 2018

Capt. Chris Pirone

City of Portland Fire Department
380 Congress Street
Portland, Maine 04101

**Subject: 90 Johnson Road
Fire Safety Checklist**

Dear Capt. Pirone:

In accordance with instructions in the City's Level III Site Plan and Subdivision Review packet, please find enclosed the drawings necessary for your review of the proposed building expansion on 90 Johnson Road this includes building renovations to the existing building to increase building capacity for Class A office space. As part of the building design, the architect will retain a third-party Fire Protection Engineer to review NFPA 101. We have listed each item in your checklist below, followed by our response.

1. *Name, address, telephone number of applicant.*

Transport Leasing Corp.
Attn: Mark Sanborn
PO Box 11054
Portland, ME 04104

2. *Name, address, telephone number of architect/contractor.*

Alpha Architects
17 Chestnut Street
Portland, ME 04101
207.761.9500
Attn: Mark Sengelmann

3. *Proposed uses of any structures (NFPA and IBC classification).*

Building	NFPA/IBC Classification	Sprinkler
Office Building - Existing	A2- Business	No Existing To be installed as part of renovations
Warehouse	S2- Storage	No Existing To be installed as part of renovations

*Systems designed to meet NFPA

4. *Square footage of all structures (total and per story).*

Building	Footprint Area (SF)
Existing 1 st Floor & Mezzanine	24,249
Proposed 1 st Floor & Mezzanine	22,019
Proposed 2 nd and 3 rd Floor (each)	10,246
Total GLA Proposed	42,511



Capt. Pirone
July 16, 2018
Page 2

5. *Elevation of all structures.*

Architectural building elevations accompany this letter and they show the various locations of door openings, etc. around the building perimeter.

6. *Proposed fire protection of all structures.*

The existing building does not have a sprinkler system. A 6" fire service line and new sprinkler system are proposed as part of the renovations and building addition mechanical system improvements.

7. *Hydrant locations.*

A hydrant is currently accessible currently in front of the site entrance at the entrance of City Line Drive.

8. *Water main(s) size and location.*

There is currently a single domestic water service to the existing building from the twelve-inch main in Johnson Road. There is also a 12" main in City Line Drive and the new Fire sprinkler service will tap off that main.

9. *Access to all structures (min. 2 sides).*

The accompanying site plan depicts the site's access conditions that include access to two or more sides of the buildings.

10. *A code summary shall be included referencing NFPA 1 and all fire department technical standards.*

NFPA 1 – Chapter 18 Fire Department Access and Water Supply

18.2 *Fire Department Access:*

The project access conditions include multiple driveways off City Line Drive and Johnson Road. The driveways will be greater than 24 feet in width which satisfies NFPA 1 18.2.3.4.1.1 that requires a minimum width of 20 ft.

Per NFPA 1 – Chapter 18.2.3.2.2.1, all first story floors shall be located not more than 450 ft. from a Fire Department access road.

City of Portland Technical Manual – Section 3 Public Safety

3.4.1 *Every dead-end roadway more than one hundred fifty (150') feet in length shall provide a turnaround at the closed end. Turnarounds shall be designed to facilitate future street connectivity and shall always be designed to the right (refer to Figure I-5).*

Supporting Evidence: Not applicable.



Capt. Pirone
July 16, 2018
Page 3

3.4.2 Where possible, developments shall provide access for Fire Department vehicles to at least two sides of all structures. Access may be from streets, access roads, emergency access lanes, or parking areas.

Supporting Evidence: As depicted on the Site Plan, the proposed building layout provides for a minimum two-sided access to the structure.

3.4.3 Building setbacks, where required by zoning, shall be adequate to allow for emergency vehicle access and related emergency response activities and shall be evaluated based on the following factors:

- *Building Height.*
- *Building Occupancy.*
- *Construction Type.*
- *Impediments to the Structures.*
- *Safety Features Provided.*

Supporting Evidence: The proposed development layout has contemplated emergency access conditions and provides for safe and efficient access along the public and private streets for emergency vehicles.

3.4.4. Fire Dept. access roads shall extend to within 50' of an exterior door providing access to the interior of the structure.

Supporting Evidence: All buildings in the Jetport Business Park will be provided with an exterior entrance door that will be within 50' of a Fire Department access route.

3.4.5. Site access shall provide a minimum of nine (9) feet clearance height to accommodate ambulance access.

Supporting Evidence: A minimum of 9 feet vertical clearance will be provided below any overhead signage or utilities entering the site. Generally speaking, all utilities will be underground.

3.4.6. Elevators shall be sized to accommodate an 80 x 24-inch stretcher.

Supporting Evidence: The proposed elevator will be designed to satisfy this requirement.

3.4.7. All structures are required to display the assigned street number. Numbers shall be clearly visible from the public right of way.

Supporting Evidence: Currently, the project location is 90 Johnson Road. The applicant will work with the City's Public Services Division to confirm that this will remain the street address to meet City standards.



Capt. Pirone
July 16, 2018
Page 4

If you need any further information regarding this review, please contact our office.

Regards,

STANTEC CONSULTING SERVICES INC.

Stephen R. Bushey, P.E.
Associate
Tel: 207-887-3478
Stephen.bushey@stantec.com

Attachments

c: Planning Authority

V:\2108\active\210801617\civil\admin\permitting\local\level 3 site plan\ltr_pirone_firedept_20180716.docx

ATTACHMENT E

FINANCIAL CAPACITY



June 14, 2018

Portland Planning Authority
4th Floor City Hall
Portland, Maine 04101

RE: Transport Leasing Corp - Financial Capability Support Letter

To Whom It May Concern:

On behalf of Bangor Savings Bank, I am pleased to provide this letter of support for Transport Leasing Corp. Based on our prior experience with Transport Leasing Corp and its principals, Mark and H. Scott Sanborn, we believe that they have the experience and wherewithal to finance the re-development of commercial real estate projects in the local market.

While this letter of support is not a commitment to lend, Bangor Savings Bank would welcome the opportunity to be a resource to Transport Leasing Corp for financing necessary in connection with new development projects. Transport Leasing Corp, Mark Sanborn and H. Scott Sanborn are highly valued clients of Bangor Savings Bank. All accounts are in good standing and being handled in a professional and satisfactory manner.

Please feel free to call me (207-571-2127) if I can be of assistance in any way.

Yours truly,

A handwritten signature in black ink that reads "Laura Huddy". The signature is written in a cursive, flowing style.

Laura Huddy
Senior Vice President
Commercial Lending Group

TAB 5 – PUBLIC INFRASTRUCTURE AND SAFETY

Section 14-526. Site Plan Standards

The following statements are provided in accordance with the submission checklist Tab 5 and Section 14-526 of the ordinance.

(c) Public Infrastructure and Community Safety Standards.

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*

1. Consistency with City Master Plans:

- a. The project has been designed to be consistent with the City's Zoning Ordinance and off-site infrastructure plans. The site benefits from existing infrastructure to the existing building. The expansion will involve the installation of a sprinkler system to the building which involves a new fire supply water main off the PWD main in City Line drive. The existing building has a sanitary sewer service and the flows from the site ultimately discharge to the South Portland municipal wastewater collection, conveyance and treatment systems, per an inter-municipal agreement.
- b. Sanitary sewer flows from the development will go to the South Portland WWTP per an intra-municipal agreement.

Public Safety and Fire Prevention (14-526 (c) 2)

- *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*

2. Public Safety and Fire Prevention:

- a. The site has been designed to promote a safe and welcoming office environment.
- b. The site provides access from Johnson Road, City Line Drive and the Jetport Boulevard for emergency vehicles.
- c. There is an existing fire hydrant located at the entrance of City Line Drive off Johnson Road. The existing office building will be fully sprinklered. The proposed expansion will also be sprinklered according to NFPA regulations.
- d. A summary letter to Chief Pirone is included at the end of this section.

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*

There are existing electrical water, sewer, and gas services to the property from mains located in the abutting streets. Our office has contacted all governing utility agencies and companies and will continue to coordinate the provision of new or updated services, as required throughout the design and construction phases of the project. The following sections outline current conditions and anticipated improvements associated with each system.

Electricity Supply/Communications

Bartlett Design has contacted Central Maine Power Company (CMP) regarding their ability to provide service to the site. Currently, there is overhead service to the existing building. The current proposal is to extend underground services to a new pad mount transformer to service the building. The applicant will continue to coordinate provision of power to the site with CMP. Similarly, communications and cable service will be coordinated with Consolidated and Charter.

Water

There is currently a single domestic water service to the existing building from the twelve-inch main in Johnson Road. The water fire service for the new office building will be run from the 12" main in City Line Drive. The size and locations of any new services will be confirmed once the detailed plumbing needs can be assessed. We are coordinating with the PWD on the service requirements. Once this has been established, a copy of the information will be submitted to the Planning Office.

Wastewater Disposal

There is an existing private sanitary sewer service from Johnson Road which the project site currently ties into.

Natural Gas

There is a gas main located within Johnson Road and City Line Drive and there is a service connection to the existing building. The applicant expects to have natural gas service into the expanded building.

Solid Waste

A solid waste collection and storage area will be provided with adequate capacity for the needs of the development. The owner will contract with a waste removal vendor as part of the onsite management of waste collection and recycling.

Ability to serve letters will be forwarded to the planning office upon receipt.

ATTACHMENT B

RIGHT, TITLE & INTEREST

A Release Deed from 68 Johnson Road, LLC to Transport Leasing Corp. was executed on February 8, 2018 for the subject property. The Release Deed included in this attachment was recorded in the Cumberland County Registry of Deeds as Book 34659; page 201. Transport Leasing Corp has owned parcel at CBL 214A A001001 since the late 1960's and the lot is identified on the Third Amended Subdivision plan CCRD Book 214, page 211.

DLN #1001840020952

RELEASE DEED

68 JOHNSON ROAD, LLC, a Maine limited liability company with a place of business in Scarborough, Maine, ("Grantor") in consideration of one dollar and other valuable consideration paid, releases to **TRANSPORT LEASING CORP.**, a Maine corporation with a mailing address of 95 Pleasant Hill Road, Scarborough, Maine 04074 ("Grantee") the land in the City of Portland, County of Cumberland and State of Maine and more specifically described as:

Beginning at the northerly corner of the within described lot on Johnson Street; thence southwesterly along Johnson Street one hundred ninety-six (196) feet to a stake; thence at right angles to Johnson Street two hundred twenty-two and two tenths (222.2) feet southeasterly to a stake; thence northeasterly at right angles to the last mentioned line and parallel to said Johnson Street one hundred ninety-six (196) feet to land now or formerly of Lewis Skillings heirs; thence along the line of land now or formerly of said Skillings heirs two hundred twenty-two and two tenths (222.2) feet to the road at the point of beginning.

The property is subject to a Notice of Layout and Taking by the State of Maine Department of Transportation recorded on October 24, 2000 in the Cumberland County Registry of Deeds in Book 15801, Page 296.

Being the same premises conveyed to the grantor herein by deed from Warren C. Weeks and Anne T. Weeks dated September 15, 2009 and recorded in the Cumberland County Registry of Deeds in Book 27253, Page 38.

Also releasing to said Grantee, all of Grantor's right, title and interest in and to all air rights, water rights and any easements, rights-of-way or other interests in, on, under or to any land, highway, alley, street or right-of-way abutting or adjoining, the above described parcel.

IN WITNESS WHEREOF, the said Mark H. Sanborn, as Vice President of Transport Leasing Corp., the sole member of 68 Johnson Road, LLC has hereunto set his hand this 8th day of February, 2018.

Elmer Ariz
Witness

68 JOHNSON ROAD, LLC,
a Maine limited liability company

By: TRANSPORT LEASING CORP.,
a Maine corporation
Its: Sole Member

By: Mark H. Sanborn
Name: MARK H. SANBORN
Its: VICE PRESIDENT

STATE OF Maine
COUNTY OF Cumberland

February 8, 2018

Then personally appeared the above-named Mark H. Sanborn, as
Vice President of Transport Leasing Corp., the sole member of 68 Johnson Road, LLC
and acknowledged the foregoing instrument to be his free act and deed in said capacity, and the
free act and deed of said company.

Before me,

Eben Adams

~~Notary Public~~ Attorney at law

Eben Adams

Typed or printed name of person
taking acknowledgment

TAB 6 – SITE DESIGN

Section 14-526. Site Plan Standards

The following statements are provided in accordance with the submission checklist Tab 6 and Section 14-526 of the ordinance.

(d) Site Design Standards.

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*

1. Massing, Ventilation and Wind Impact:

- a. The project proposes reuse of part of an existing building as office space. The 57'-5" building height will be within the allowed height standards of 65'. The project will not result in any significant changes to the wind environment proximate to the site specifically as the site is located to the airfield which is a significantly large open expanse.
- b. The bulk location and height of the proposed building expansion is consistent with the B4 requirements and there are no nearby developed lots that may be negatively impacted. The applicant owns the nearby buildings and they are seeking to improve their overall property to best and highest use, as much as possible.
- c. HVAC venting, if necessary, will be directed through rooftop units and will not impact any adjacent public spaces.

Shadows (14-526 (d) 2), if applicable

- Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)

2. Shadows:

- a. The proposed building at the site will not cast significant shadows onto neighboring properties, or block access to direct sunlight for structures utilizing solar energy. The Site Layout Plan and Grading and Drainage Plan show the proposed site improvements and their relationships to property lines. The grading plan shows the relative elevations of the building with respect to elevations along the property lines. The nearest building is located greater than 100 feet away from the site.

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.*

3. Snow and Ice Loading:

- a. The proposed building has been designed and located such that accumulated snow and ice will not fall onto adjacent properties or public ways.

View Corridors (14-526 (d) 4), if applicable

- *Protection of designated view corridors (Portland Design Manual, Appendix 1)*

4. View Corridors:

- a. The project entails reuse of the existing office building and expansion. There will be no significant changes to view corridors offered to adjacent properties. Nearby land uses include a cemetery and the airfield runway. Views from the nearby Maine DHHS Building are buffered by a forested area between the properties.

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*

5. Historic Resources:

- a. The development is not located in a historic district, historic landscape district or City designated landmark.
- b. The development is not located adjacent to or within 100 feet of a designated landmark, historic district, or historic landscape district.
- c. There are no known archaeological resources on the site

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)*

6. Exterior Lighting:

a. Site Lighting

- (i) All new exterior lighting at the site will be full cutoff LED with no light emitted above the horizontal plane, and in accordance with Section 12

of the Technical Manual. Bartlett Design has completed a site lighting plans that are contained as part of the submission drawings.

b. Architectural and Specialty Lighting

- (i) Not applicable to the project.

c. Street Lighting

- (i) There are existing street lights along Johnson Road and City Line Drive. No changes are currently contemplated to the existing street light conditions.

Noise and Vibration (14-526 (d) 7)

- *Evidence of noise levels for equipment, such as equipment specifications, to demonstrate consistency with zoning requirements*

7. *Noise and Vibration:*

The project noise levels will be designed to meet the permitted levels as outlined in the B4 Zone. All HVAC and mechanical equipment is proposed to be mounted on the roof, or otherwise ground mounted and concealed from nearby properties. The property is located adjacent the Portland International Jetport, thus noise and vibration are considered a low priority relative to the adjacent land use.

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*

8. *Signage and Wayfinding:*

- a. All street and wayfinding 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 located in a historic district or subject to Article IX.
 - (ii) Proposed commercial signage is still being designed and subject to a condition of approval.
 - (iii) All street and wayfinding signage shall meet the requirements of the Manual on Uniform Traffic Devices (MUTCD) and Division 22 of the City Code.

Zone Related Design Standards (14-526 (d) 9)

- 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

9. *Zoning Related Design Standards:*

- a. The site is located in the B4 zone and there are no specific design standards that apply as outlined in Section 14-526 d.9.

STORMWATER MANAGEMENT REPORT

**90 JOHNSON ROAD PROPERTY
90 JOHNSON ROAD
PORTLAND, MAINE**

PREPARED FOR

**TRANSPORT LEASING CORP.
58 LOWELL JUNCTION ROAD
ANDOVER, MA 01810**

PREPARED BY

**STANTEC CONSULTING SERVICES, INC.
482 PAYNE ROAD
SCARBOROUGH, MAINE 04074
(207) 883-3355**

JULY 2018

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Attachments

Attachment A – Predevelopment Watershed Plan
Attachment B – Post Development Watershed Plan
Attachment C – Predevelopment HydroCAD Computations
Attachment D – Post Development HydroCAD Computations
Attachment E – Water Quality Treatment Summary
Attachment F – Drawdown Computations
Attachment G – Redevelopment Computation
Attachment H – Stormwater Operations & Maintenance Manual

1.0 INTRODUCTION

Stantec Consulting Services, Inc. has been retained to prepare the following Stormwater Management analysis for the building and site expansion project at 90 Johnson Road in Portland, ME.

This Stormwater Management analysis has been prepared in accordance with Section 5 – Portland Stormwater Management of the City of Portland Technical Manual, last revised July 26, 2016. As required within Section 5, this project meets the Basic, General, and Flooding Standards as described in the Maine Department of Environmental Protection (MaineDEP) Chapter 500 Rules for Stormwater Management.

The purpose of this analysis is to identify what measures will be implemented to provide stormwater management for the proposed development specifically for water quality improvement, water quantity control, and erosion and sedimentation control. The analysis was prepared to ensure that the development will not result in any adverse effects to the environment, any natural resources, or to properties located downstream of the project site.

2.0 EXISTING SITE CONDITIONS

The project site, located at 90 Johnson Road, is approximately 2.67 acres and is comprised of two properties identified as Lot 1 and 3 on Map 214-A of the City of Portland Assessor's Map (1.68 and 0.99 acres respectively). The site is currently occupied by an approximately 20,260 SF single story building which houses Spectrum offices and warehouse space. The building is surrounded by parking and access drives with a total of 41 parking spaces currently provided. The adjacent property at 68 Johnson Road was historically occupied by a single-family home but has since been demolished several years ago and the property is currently a grassed lot.

The breakdown of the existing lot coverage is summarized in the table below.

Table 1		
Existing Lot Coverage Summary		
	Lot 1(90 Johnson)	Lot 3 (68 Johnson)
Roof (sf)	20,260	0
Other Impervious (sf)	34,784	285
Landscaped (sf)	18,137	38,251
Wooded (sf)	0	4,588
Total	73,181 SF (1.68 ac)	43,124 SF (0.99 ac)

A portion of the site's drainage is handled through a series of catch basins and storm drain pipes that discharge to a hydrodynamic separator and then to a vegetated underdrained soil filter. The grassed lot sheet flows towards the Brooklawn Cemetery with runoff being captured in two existing catch basins. All stormwater runoff from the site ultimately outlets to a public storm drain system within Johnson Road and Congress Street¹. The Congress Street system outfalls

¹ See Congress Street & Johnson Road of Unum HO-3 Offsite Traffic Improvement plans by Sebago Technics, City Archive 00731_003__005 date 06-22-98

opposite the Cemetery entrance on Congress Street and is tributary to the Stroudwater and the Fore River. Per the Soils Conservation Service (SCS) Medium Intensity Soils mapping the site consists of Scantic, Lyman-Tunbridge, and Woodbridge soil groups. These are classified as Hydrologic Soil Group C and D.

3.0 PROPOSED SITE CONDITIONS

The proposed development includes the renovations and expansion of the existing Spectrum office/warehouse building. Spectrum occupies other building space on City Line Drive and may consolidate their operations. The applicant is seeking to update the building at 90 Johnson Road to Class A office space. The existing building will be renovated including a vertical expansion to go from one story to three stories. The existing parking area and drive will also be redeveloped into a more functional layout for the expanded use. The undeveloped grassed lot at 68 Johnson Road will include new development of a parking area and associated stormwater management and landscaping. A total of 188 parking spaces are proposed across the properties. Stormwater management will primarily be in the form of porous pavement within the new parking area. The porous pavement is intended to be much like the porous pavement installed at the nearby State of Maine DHHS building off the Jetport Boulevard. Proposed land coverage of the two lots is summarized in the table below:

Table 2 Proposed Lot Coverage Summary		
	Lot 1	Lot 3
Roof (sf)	21,398	0
Other Impervious (sf)	41,153	35,521
Landscaped (sf)	10,630	6,785
Wooded (sf)	0	818
Total	73,181 SF	43,124 SF

Drainage patterns on site mostly remain the same in the post development condition. The portion of the project consisting of redevelopment continues to primarily drain to the existing vegetated underdrained filter adjacent to the project. The area that sheet flows to towards the cemetery property consists of the majority of the new parking area and is handled through porous pavement. This area will be drained through a series of subsurface underdrain pipes and it will discharge into the public storm drain system within Johnson Road.

The porous pavement section, as detailed in the plans, will contain the following materials section:

- 3" Porous Asphalt
- Choker Course Aggregate – Variable Thickness from 4" to 19"
- 12" Reservoir Course of 1.5" to 3" Crushed Stone
- 4" Filter Course
- 12" MDOT Type B aggregate course with collection underdrain.

4.0 REFERENCES

The following reference sources were used in preparation of the stormwater analysis:

1. Stormwater Management for Maine Volume III – BMP Technical Design Manual, MaineDEP
2. HydroCAD Stormwater Modeling Software, Version 10.00, build 20
3. MaineDEP Erosion and Sediment Maine Erosion and Sediment Control BMP's, October 2016 revision
4. MaineDEP Chapter 500 Rules for Stormwater Management, June 2014 revision
5. Section 5 of the City of Portland Technical Manual Portland Stormwater Management, July 2016 revision
6. Chapter XX and XX of the City of Portland Code of Ordinances
7. U.S. Department of Agriculture Natural Resources Conservation Service Web Soil Survey

5.0 **METHOD OF ANALYSIS**

The hydrologic analysis for predevelopment and post development conditions has been conducted based upon the methodology contained in the USDA Soil Conservation Service's Technical Releases Nos. 20 and 55 (SCS TR-20 and TR-55). For Caribou, Maine, a 24-hour SCS Type II storm distribution was used for the analysis using the following storm frequencies and rainfall amounts:

Table 3	
Hydrologic Analysis Parameters	
Storm Event	24-Hour Rainfall
2-Year Storm	3.1 inches
10-Year Storm	4.6 inches
25-Year Storm	5.8 inches

The HydroCAD computer program was used in the analysis. This program allows critical points of the watershed to be analyzed using the SCS TR-20 methodology to calculate the anticipated conditions at these points. Drainage areas are defined with runoff curve numbers, times of concentration and travel time data based on methods outlined in the USDA TR-55 Manual. To assess storage and kinematic effects of runoff, the model uses reservoirs and pipes to imitate actual conditions. Specific hydrologic characteristics including travel times, storage capacity, and the effects of hydraulic head are considered for analysis with this program.

To model the watersheds, the drainage system is represented by a network consisting of three basic components:

- **Subcatchment:** A relatively homogenous area of land that drains into a single reach or pond. Each subcatchment generates a runoff hydrograph.
- **Reach:** A uniform stream, channel, or pipe that conveys water from one point to another reach or pond. The outflow of each reach is determined by a hydrograph routing calculation.
- **Pond:** A pond, swamp, dam, or other impoundment which fills with water from one or more sources and empties in a manner determined by a weir, culvert

or other device(s) at its outlet. A pond may empty into a reach or into another pond. The outflow of each pond is also determined by a hydrograph routing calculation.

6.0 EROSION AND SEDIMENTATION CONTROL (BASIC STANDARD)

Erosion and sedimentation control (ESC) will be accomplished for this project through the application of various temporary construction and permanent ESC BMPs as described in the MaineDEP Erosion and Sediment Control BMP Manual. BMPs proposed include but are not limited to the following:

- Stabilized construction entrance
- Siltation fence
- Temporary construction inlet protection
- Slope stabilization

The contractor will also be required to employ ESC BMPs for any on site material stockpiles as well as any areas left denuded for extended periods of time during construction.

The ESC plan for this project adheres to the requirements detailed in Appendix A of MaineDEP's Chapter 500 Rules for Stormwater Management.

7.0 WATER QUALITY MEASURES (GENERAL STANDARD)

The proposed development includes Stormwater BMPs to provide water quality treatment to onsite runoff as required within the General Standard of MaineDEP's Chapter 500 Rules for Stormwater Management. A portion of the project, described as Lot 1 above, is currently developed with an existing building and associated site features. Therefore, the rules for Redevelopment Projects as described in section 4.C.(2)(d)(i) of Chapter 500 have been applied to this portion of the project. The table below summarizes the redevelopment calculation and establishes the treatment level required for redevelopment activity within the project.

Redevelopment Treatment Summary	
Total Redevelopment Area (ac)	1.68
Existing Impact Rating	4.55
Proposed Impact Rating	4.65
Existing Ranked Impact	2.71
Proposed Ranked Impact	2.77
Resultant Ranked Impact Change	0.06
Redeveloped Area Treatment Designation (Site Law Project)	60%

The area described as Lot 3 is considered undeveloped since it has not been maintained and is essentially a meadow in the predevelopment condition. All development on this portion of the project will be considered new development and section 4.C.(2)(a)(i) of Chapter 500 defines the required treatment level.

All BMPs for this project have been designed per the MaineDEP Stormwater BMP Design Manual and previously MaineDEP accepted design measures for Porous surfaces. BMPs included in this project as well as their respective design criteria used are as follows:

Vegetated Underdrained Soil Filter: The existing filter adjacent to the site was originally designed to handle 2.5 acres of impervious area. The portion of the site that has been redeveloped remains tributary to the filter, but the total impervious area to the filter from the site has been reduced. For predevelopment conditions approximately 1.16 acres of impervious area drained to the filter. Approximately 1.03 acres of impervious area will drain to the filter in post development conditions. Therefore, the original design has been determined to be adequate without any modifications.

Manmade Porous Surfaces (Porous Pavement): Four areas constructed of porous pavement have been proposed for this project. The entire area is intended to be a direct entry system in order to provide enough storage within the reservoir layer for flood control. The only run-on provided will be from landscaped areas onto porous sections. The surface and associated section have been designed to the following criteria to provide water quality treatment to runoff:

- Treatment Volume: Storage of a 1" rainfall event has been provided for in the reservoir layer which consists of 12 inches of $\frac{3}{4}$ " crushed stone with an assumed porosity of 40%.
- Minimum Surface Area: The surface area required for porous pavement is 20% of tributary impervious area.
- Drawdown Time: The WQV is required to be released over a 24-48 hour period. This criterion will be met by providing an orifice at the end of each collection pipe system.
- Storage for Flood Control: Storage for a 24 hour 25 year frequency storm event should be provided to meet flooding standards. This will be provided within the reservoir section and will be controlled through a 6" overflow pipe.

The two BMPs described above have been designed per MaineDEP's BMP Design Manual to meet all requirements established within MaineDEP's Chapter 500 Rules for Stormwater Management to meet the General Standard.

The table below summarizes the treatment levels provided for both redevelopment activities and new development for the proposed project.

Table 4 Treatment Summary		
Description	Required	Provided
Treated New Impervious (%)	95%	98.77%
Treated New Developed (%)	80%	93.83%
Treated Redeveloped Impervious (%)	N/A	90.51%
Treated Redeveloped Developed (%)	60%	85.49%

8.0 **STORMWATER MANAGEMENT FOR FLOOD CONTROL (FLOODING STANDARD)**

The stormwater system for this project, consisting of the porous pavement reservoir layer has been designed to provide detention, and in turn, reduce peak discharge rates from stormwater runoff. Specifically, the 2, 10, and 25-year storm events have been analyzed for this project. Table 1 in Section 5 above summarizes rainfall amounts for each of the storm events analyzed. Table 2 below summarizes peak discharge rates for each storm event for the predevelopment and post development conditions:

Table 5		
Comparison of Peak Discharge Rates at Point of Interest 1		
Storm Event & Condition	POI 1 (cfs)	POI 2 (cfs)
2-Yr Predevelopment	1.36	2.31
2-Yr Post Development	0.09	2.19
Change in 2-Yr Peak Discharge Rate	-1.27	-0.12
10-Yr Predevelopment	2.77	3.91
10-Yr Post Development	0.19	3.35
Change in 10-Yr Peak Discharge Rate	-2.58	-0.56
25-Yr Predevelopment	3.96	6.04
25-Yr Post Development	0.27	5.11
Change in 25-Yr Peak Discharge Rate	-3.69	-0.93

Peak discharge rates for each storm event have been decreased from predevelopment to post development conditions for this project. Therefore, the Flooding Standard has been met.

9.0 **MAINTENANCE AND GOOD HOUSEKEEPING MEASURES**

The owner or the owner's representative will be responsible for maintenance of all permanent stormwater conveyance and treatment systems constructed as part of this project. Inspection, maintenance, and housekeeping action will adhere to Appendix B of MaineDEP's Chapter 500 Rules for Stormwater Management and includes but is not limited to:

- Inspection of infrastructure at regular intervals as established within Appendix B.
- Removal and proper disposal of sediment build up in conveyance systems and BMPs. This will include regular sweeping and vacuuming of the porous pavement surfaces.
- Replacement of any BMP or portion of BMP that is not operating correctly
- Proper documentation of all maintenance activity

The erosion and sediment control plan and maintenance plan have been established to meet the Basic Standard.

10.0 **CONCLUSION**

The stormwater management system for the proposed development will mitigate negative effects due to stormwater runoff generated from the development by reducing peak discharge rates, improving water quality of stormwater runoff

discharged from the project site, and eliminating potential erosion and sedimentation due to the development. As a result there will be no adverse effects to downstream conveyance systems of properties due to stormwater runoff from this project.

11.0 ATTACHMENTS

Attachment A – Predevelopment Watershed Plan

Attachment B – Post Development Watershed Plan

Attachment C – Predevelopment HydroCAD Computations

Attachment D – Post Development HydroCAD Computations

Attachment E – Water Quality Treatment Summary

Attachment F – Drawdown Computations

Attachment G – Redevelopment Computation

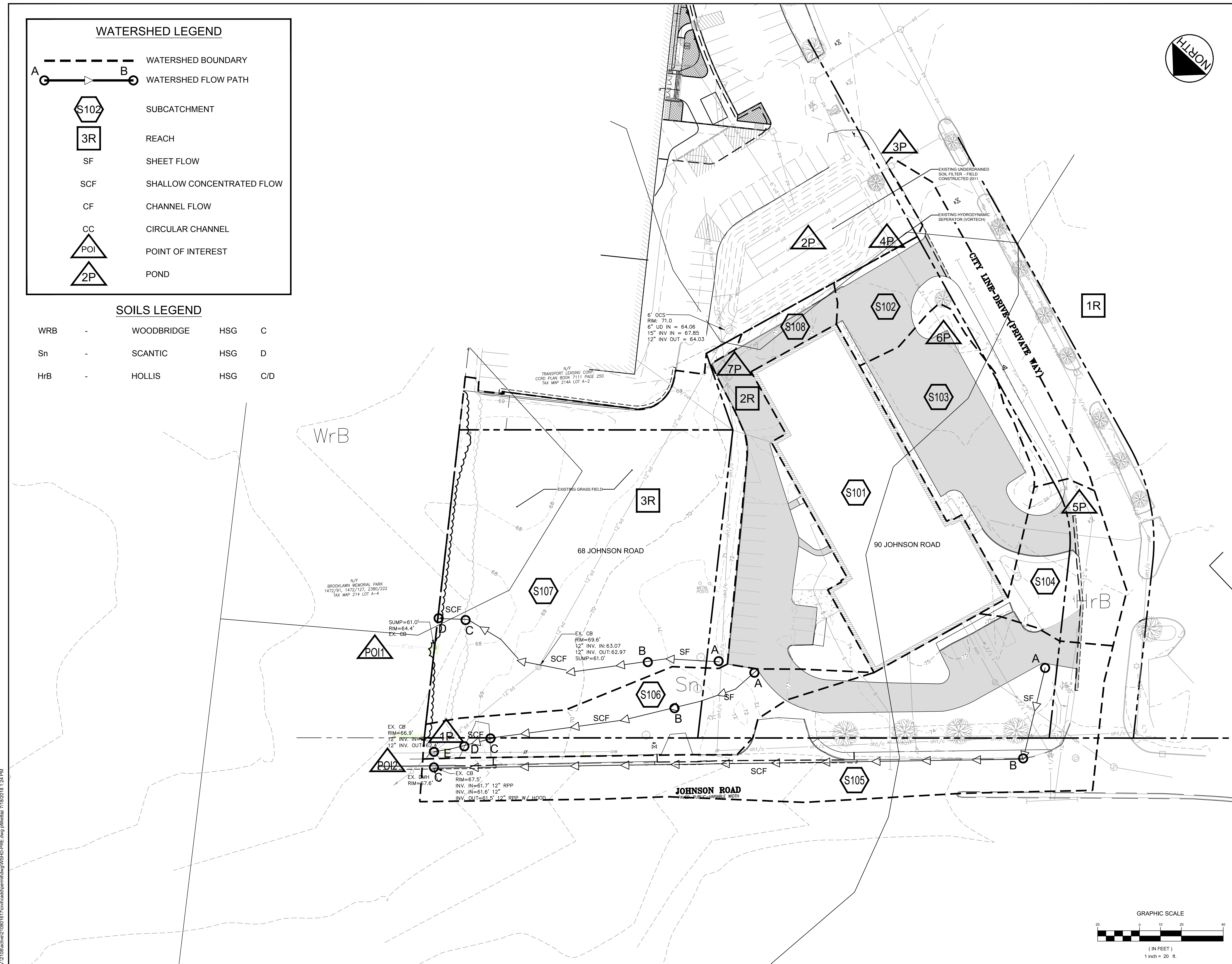
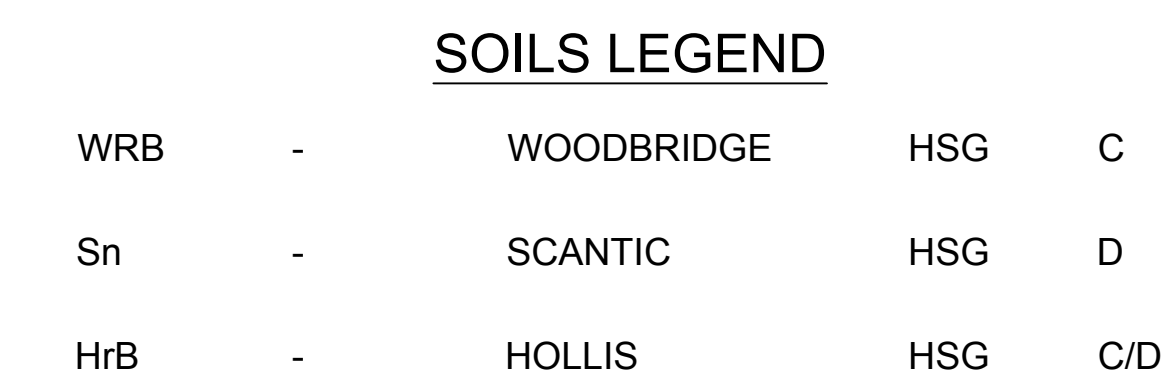
Attachment H – Stormwater Operations & Maintenance Manual

ATTACHMENT A

PREDEVELOPMENT WATERSHED PLAN



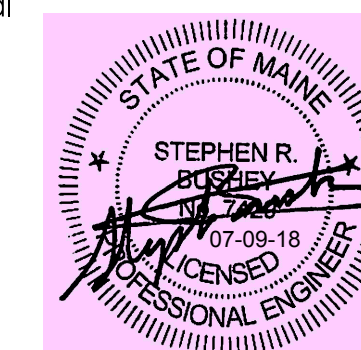
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2	SUBMITTED TO CITY FOR LEVEL III SITE PLAN REVIEW	PBF	SR8	18.07.09
1	SUBMITTED FOR OWNER REVIEW	PBF	SR8	18.05.22
Revision		By		YY.MM.DD

File Name:	PBF	SRB	SRB	18.05.22
	OWN	CHKD	DSGN	DATE

Permit-Seal



Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title
PREDEVELOPMENT WATERSHED
PLAN

Project No.	Scale
210801617	N.T.S.

Sheet

C-11.0

ATTACHMENT B

POST DEVELOPMENT WATERSHED PLAN

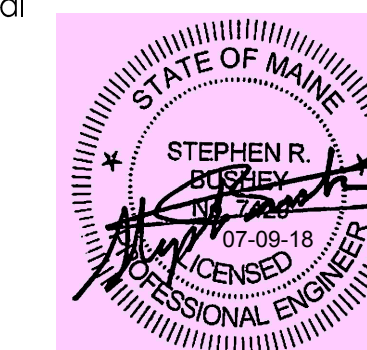
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	DWN	CHKD	DSGN	DATE

Permit-Seal



Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

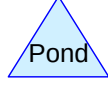
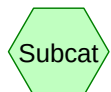
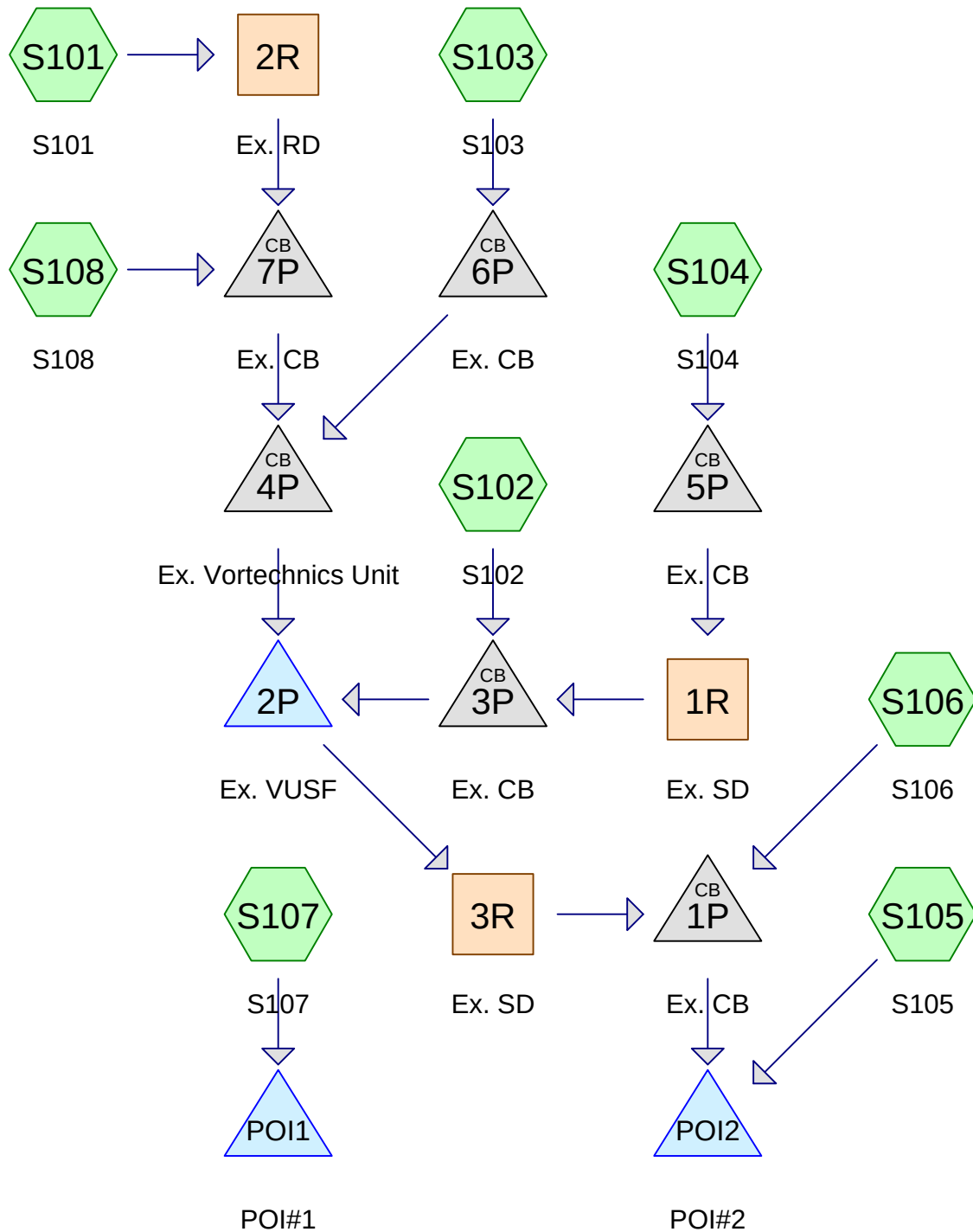
Title
POST DEVELOPMENT WATERSHED
PLAN

Project No.	Scale
210801617	1" = 30'

Sheet

ATTACHMENT C

PREDEVELOPMENT HYDROCAD COMPUTATIONS



predevelopment

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.145	79	50-75% Grass cover, Fair, HSG C (S105)
0.049	84	50-75% Grass cover, Fair, HSG D (S105)
0.248	74	>75% Grass cover, Good, HSG C (S102, S103, S104, S107, S108)
1.124	80	>75% Grass cover, Good, HSG D (S102, S103, S106, S107, S108)
0.643	98	Paved parking, HSG C (S102, S103, S104, S105, S108)
0.794	98	Paved parking, HSG D (S102, S103, S105, S106, S108)
0.192	98	Roofs, HSG C (S101)
0.273	98	Roofs, HSG D (S101)
0.066	70	Woods, Good, HSG C (S107)
0.040	77	Woods, Good, HSG D (S106, S107)
3.573	89	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.293	HSG C	S101, S102, S103, S104, S105, S107, S108
2.280	HSG D	S101, S102, S103, S105, S106, S107, S108
0.000	Other	
3.573		TOTAL AREA

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Page 4

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.145	0.049	0.000	0.194	50-75% Grass cover, Fair	S105
0.000	0.000	0.248	1.124	0.000	1.372	>75% Grass cover, Good	S102, S103, S104, S106, S107, S108
0.000	0.000	0.643	0.794	0.000	1.437	Paved parking	S102, S103, S104, S105, S106, S108
0.000	0.000	0.192	0.273	0.000	0.465	Roofs	S101
0.000	0.000	0.066	0.040	0.000	0.105	Woods, Good	S106, S107
0.000	0.000	1.293	2.280	0.000	3.573	TOTAL AREA	

predevelopment

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Type III 24-hr 2-Yr Rainfall=3.10"

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Page 5

Summary for Subcatchment S101: S101

Runoff = 1.41 cfs @ 12.07 hrs, Volume= 0.111 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
11,879	98	Roofs, HSG D
8,381	98	Roofs, HSG C
20,260	98	Weighted Average
20,260		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S102: S102

Runoff = 0.76 cfs @ 12.07 hrs, Volume= 0.056 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
5,739	98	Paved parking, HSG D
3,723	98	Paved parking, HSG C
1,258	80	>75% Grass cover, Good, HSG D
1,230	74	>75% Grass cover, Good, HSG C
11,950	94	Weighted Average
2,488		20.82% Pervious Area
9,462		79.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S103: S103

Runoff = 0.78 cfs @ 12.07 hrs, Volume= 0.058 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

predevelopment

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Type III 24-hr 2-Yr Rainfall=3.10"

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Page 6

Area (sf)	CN	Description
6,090	98	Paved parking, HSG C
4,098	98	Paved parking, HSG D
1,212	74	>75% Grass cover, Good, HSG C
897	80	>75% Grass cover, Good, HSG D
12,297	94	Weighted Average
2,109		17.15% Pervious Area
10,188		82.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S104: S104

Runoff = 0.52 cfs @ 12.07 hrs, Volume= 0.040 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
464	74	>75% Grass cover, Good, HSG C
7,115	98	Paved parking, HSG C
7,579	97	Weighted Average
464		6.12% Pervious Area
7,115		93.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S105: S105

Runoff = 1.71 cfs @ 12.14 hrs, Volume= 0.146 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
2,137	84	50-75% Grass cover, Fair, HSG D
6,297	79	50-75% Grass cover, Fair, HSG C
13,218	98	Paved parking, HSG D
10,736	98	Paved parking, HSG C
32,388	93	Weighted Average
8,434		26.04% Pervious Area
23,954		73.96% Impervious Area

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Type III 24-hr 2-Yr Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, A to B Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		Shallow Concentrated Flow, B to C Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S106: S106

Runoff = 0.41 cfs @ 12.13 hrs, Volume= 0.033 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
1,431	98	Paved parking, HSG D
210	77	Woods, Good, HSG D
10,099	80	>75% Grass cover, Good, HSG D
11,740	82	Weighted Average
10,309		87.81% Pervious Area
1,431		12.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, A to B Grass: Short n= 0.150 P2= 3.10"
3.9	165	0.0100	0.70		Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps
0.1	18	0.0400	4.06		Shallow Concentrated Flow, C to D Paved Kv= 20.3 fps
0.3	25	0.0400	1.40		Shallow Concentrated Flow, D to E Short Grass Pasture Kv= 7.0 fps
8.6	258	Total			

Summary for Subcatchment S107: S107

Runoff = 1.36 cfs @ 12.11 hrs, Volume= 0.105 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
33,773	80	>75% Grass cover, Good, HSG D
7,381	74	>75% Grass cover, Good, HSG C
2,860	70	Woods, Good, HSG C
1,518	77	Woods, Good, HSG D
45,532	78	Weighted Average
45,532		100.00% Pervious Area

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Type III 24-hr 2-Yr Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0300	0.17		Sheet Flow, A to B Grass: Short n= 0.150 P2= 3.10"
1.8	145	0.0370	1.35		Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps
0.4	20	0.0300	0.87		Shallow Concentrated Flow, C to D Woodland Kv= 5.0 fps
7.1	215	Total			

Summary for Subcatchment S108: S108

Runoff = 0.86 cfs @ 12.07 hrs, Volume= 0.063 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
10,119	98	Paved parking, HSG D
330	98	Paved parking, HSG C
2,951	80	>75% Grass cover, Good, HSG D
506	74	>75% Grass cover, Good, HSG C
13,906	93	Weighted Average
3,457		24.86% Pervious Area
10,449		75.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach 1R: Ex. SD

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 2.76" for 2-Yr event

Inflow = 0.52 cfs @ 12.07 hrs, Volume= 0.040 af

Outflow = 0.50 cfs @ 12.09 hrs, Volume= 0.040 af, Atten= 3%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Max. Velocity= 2.57 fps, Min. Travel Time= 0.6 min

Avg. Velocity = 0.84 fps, Avg. Travel Time= 1.9 min

Peak Storage= 19 cf @ 12.08 hrs

Average Depth at Peak Storage= 0.30'

Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe

n= 0.013 Corrugated PE, smooth interior

Length= 95.0' Slope= 0.0054 '/'

Inlet Invert= 67.11', Outlet Invert= 66.60'

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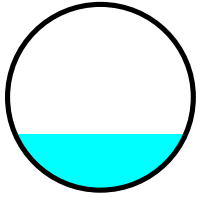
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Type III 24-hr 2-Yr Rainfall=3.10"

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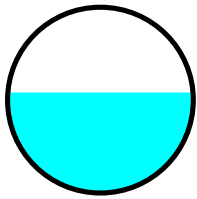
Summary for Reach 2R: Ex. RD

Inflow Area = 0.465 ac, 100.00% Impervious, Inflow Depth = 2.87" for 2-Yr event
Inflow = 1.41 cfs @ 12.07 hrs, Volume = 0.111 af
Outflow = 1.38 cfs @ 12.08 hrs, Volume = 0.111 af, Atten = 2%, Lag = 0.7 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 3.21 fps, Min. Travel Time = 0.3 min
Avg. Velocity = 1.09 fps, Avg. Travel Time = 1.0 min

Peak Storage = 27 cf @ 12.08 hrs
Average Depth at Peak Storage = 0.54'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.46 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 63.0' Slope = 0.0048 '/'
Inlet Invert = 67.20', Outlet Invert = 66.90'



Summary for Reach 3R: Ex. SD

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 2.59" for 2-Yr event
Inflow = 0.28 cfs @ 13.58 hrs, Volume = 0.327 af
Outflow = 0.28 cfs @ 13.60 hrs, Volume = 0.327 af, Atten = 0%, Lag = 1.3 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 2.11 fps, Min. Travel Time = 0.7 min
Avg. Velocity = 1.58 fps, Avg. Travel Time = 1.0 min

Peak Storage = 12 cf @ 13.59 hrs
Average Depth at Peak Storage = 0.22'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.52 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 94.0' Slope = 0.0050 '/'
Inlet Invert = 62.97', Outlet Invert = 62.50'

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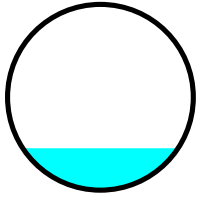
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Type III 24-hr 2-Yr Rainfall=3.10"

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**Summary for Pond 1P: Ex. CB**

Inflow Area = 1.784 ac, 75.78% Impervious, Inflow Depth = 2.42" for 2-Yr event
 Inflow = 0.60 cfs @ 12.13 hrs, Volume= 0.360 af
 Outflow = 0.60 cfs @ 12.13 hrs, Volume= 0.360 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.60 cfs @ 12.13 hrs, Volume= 0.360 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 62.84' @ 12.13 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	12.0" Round Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.59 cfs @ 12.13 hrs HW=62.84' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 0.59 cfs @ 1.78 fps)

Summary for Pond 2P: Ex. VUSF

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 2.59" for 2-Yr event
 Inflow = 4.25 cfs @ 12.08 hrs, Volume= 0.327 af
 Outflow = 0.28 cfs @ 13.58 hrs, Volume= 0.327 af, Atten= 93%, Lag= 90.3 min
 Primary = 0.28 cfs @ 13.58 hrs, Volume= 0.327 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 67.99' @ 13.58 hrs Surf.Area= 5,495 sf Storage= 6,804 cf

Plug-Flow detention time=290.7 min calculated for 0.327 af (100% of inflow)
 Center-of-Mass det. time=290.6 min (1,066.3 - 775.7)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

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Type III 24-hr 2-Yr Rainfall=3.10"

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Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	12.0" Round Culvert L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	9.5" Vert. Orifice/Grate C= 0.600
#3	Device 2	67.85'	15.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	64.06'	2.0" Vert. Orifice/Grate C= 0.600
#5	Device 4	66.50'	2.410 in/hr Exfiltration over Surface area above 64.06' Excluded Surface area = 0 sf

Primary OutFlow Max=0.28 cfs @ 13.58 hrs HW=67.99' (Free Discharge)

- 1=Culvert (Passes 0.28 cfs of 3.93 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.07 cfs @ 1.27 fps)
 3=Orifice/Grate (Passes 0.07 cfs of 0.09 cfs potential flow)
 4=Orifice/Grate (Orifice Controls 0.21 cfs @ 9.44 fps)
 5=Exfiltration (Passes 0.21 cfs of 0.31 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area = 0.448 ac, 84.88% Impervious, Inflow Depth = 2.57" for 2-Yr event
 Inflow = 1.25 cfs @ 12.08 hrs, Volume= 0.096 af
 Outflow = 1.25 cfs @ 12.08 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.25 cfs @ 12.08 hrs, Volume= 0.096 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 67.09' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.21 cfs @ 12.08 hrs HW=67.08' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 1.21 cfs @ 2.58 fps)

Summary for Pond 4P: Ex. Vortechncs Unit

Inflow Area = 1.067 ac, 88.02% Impervious, Inflow Depth = 2.60" for 2-Yr event
 Inflow = 3.00 cfs @ 12.08 hrs, Volume= 0.231 af
 Outflow = 3.00 cfs @ 12.08 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.00 cfs @ 12.08 hrs, Volume= 0.231 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 68.15' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	12.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.91 cfs @ 12.08 hrs HW=68.10' (Free Discharge)

- 1=Culvert (Barrel Controls 2.91 cfs @ 3.70 fps)

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Type III 24-hr 2-Yr Rainfall=3.10"

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Summary for Pond 5P: Ex. CB

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 2.76" for 2-Yr event
 Inflow = 0.52 cfs @ 12.07 hrs, Volume= 0.040 af
 Outflow = 0.52 cfs @ 12.07 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.52 cfs @ 12.07 hrs, Volume= 0.040 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 68.95' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	12.0" Round Culvert L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.07 hrs HW=68.94' (Free Discharge)↑**1=Culvert** (Inlet Controls 0.50 cfs @ 1.70 fps)**Summary for Pond 6P: Ex. CB**

Inflow Area = 0.282 ac, 82.85% Impervious, Inflow Depth = 2.45" for 2-Yr event
 Inflow = 0.78 cfs @ 12.07 hrs, Volume= 0.058 af
 Outflow = 0.78 cfs @ 12.07 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.78 cfs @ 12.07 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 67.40' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	12.0" Round Culvert L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.75 cfs @ 12.07 hrs HW=67.39' (Free Discharge)↑**1=Culvert** (Barrel Controls 0.75 cfs @ 2.26 fps)**Summary for Pond 7P: Ex. CB**

Inflow Area = 0.784 ac, 89.88% Impervious, Inflow Depth = 2.66" for 2-Yr event
 Inflow = 2.23 cfs @ 12.08 hrs, Volume= 0.174 af
 Outflow = 2.23 cfs @ 12.08 hrs, Volume= 0.174 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.23 cfs @ 12.08 hrs, Volume= 0.174 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 68.41' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	12.0" Round Culvert L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

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Type III 24-hr 2-Yr Rainfall=3.10"

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Primary OutFlow Max=2.16 cfs @ 12.08 hrs HW=68.35' (Free Discharge)↑**1=Culvert** (Barrel Controls 2.16 cfs @ 2.75 fps)**Summary for Pond POI1: POI#1**

Inflow Area = 1.045 ac, 0.00% Impervious, Inflow Depth = 1.20" for 2-Yr event
Inflow = 1.36 cfs @ 12.11 hrs, Volume= 0.105 af
Primary = 1.36 cfs @ 12.11 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond POI2: POI#2

Inflow Area = 2.528 ac, 75.24% Impervious, Inflow Depth = 2.40" for 2-Yr event
Inflow = 2.31 cfs @ 12.14 hrs, Volume= 0.505 af
Primary = 2.31 cfs @ 12.14 hrs, Volume= 0.505 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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Type III 24-hr 10-Yr Rainfall=4.60"

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Summary for Subcatchment S101: S101

Runoff = 2.10 cfs @ 12.07 hrs, Volume= 0.169 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
11,879	98	Roofs, HSG D
8,381	98	Roofs, HSG C
20,260	98	Weighted Average
20,260		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S102: S102

Runoff = 1.18 cfs @ 12.07 hrs, Volume= 0.089 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
5,739	98	Paved parking, HSG D
3,723	98	Paved parking, HSG C
1,258	80	>75% Grass cover, Good, HSG D
1,230	74	>75% Grass cover, Good, HSG C
11,950	94	Weighted Average
2,488		20.82% Pervious Area
9,462		79.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S103: S103

Runoff = 1.22 cfs @ 12.07 hrs, Volume= 0.092 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-Yr Rainfall=4.60"

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Type III 24-hr 10-Yr Rainfall=4.60"

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Area (sf)	CN	Description
6,090	98	Paved parking, HSG C
4,098	98	Paved parking, HSG D
1,212	74	>75% Grass cover, Good, HSG C
897	80	>75% Grass cover, Good, HSG D
12,297	94	Weighted Average
2,109		17.15% Pervious Area
10,188		82.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S104: S104

Runoff = 0.78 cfs @ 12.07 hrs, Volume= 0.062 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
464	74	>75% Grass cover, Good, HSG C
7,115	98	Paved parking, HSG C
7,579	97	Weighted Average
464		6.12% Pervious Area
7,115		93.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S105: S105

Runoff = 2.70 cfs @ 12.14 hrs, Volume= 0.236 af, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
2,137	84	50-75% Grass cover, Fair, HSG D
6,297	79	50-75% Grass cover, Fair, HSG C
13,218	98	Paved parking, HSG D
10,736	98	Paved parking, HSG C
32,388	93	Weighted Average
8,434		26.04% Pervious Area
23,954		73.96% Impervious Area

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Type III 24-hr 10-Yr Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, A to B Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		Shallow Concentrated Flow, B to C Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S106: S106

Runoff = 0.78 cfs @ 12.12 hrs, Volume= 0.061 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
1,431	98	Paved parking, HSG D
210	77	Woods, Good, HSG D
10,099	80	>75% Grass cover, Good, HSG D
11,740	82	Weighted Average
10,309		87.81% Pervious Area
1,431		12.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, A to B Grass: Short n= 0.150 P2= 3.10"
3.9	165	0.0100	0.70		Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps
0.1	18	0.0400	4.06		Shallow Concentrated Flow, C to D Paved Kv= 20.3 fps
0.3	25	0.0400	1.40		Shallow Concentrated Flow, D to E Short Grass Pasture Kv= 7.0 fps
8.6	258	Total			

Summary for Subcatchment S107: S107

Runoff = 2.77 cfs @ 12.11 hrs, Volume= 0.207 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
33,773	80	>75% Grass cover, Good, HSG D
7,381	74	>75% Grass cover, Good, HSG C
2,860	70	Woods, Good, HSG C
1,518	77	Woods, Good, HSG D
45,532	78	Weighted Average
45,532		100.00% Pervious Area

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Type III 24-hr 10-Yr Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0300	0.17		Sheet Flow, A to B Grass: Short n= 0.150 P2= 3.10"
1.8	145	0.0370	1.35		Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps
0.4	20	0.0300	0.87		Shallow Concentrated Flow, C to D Woodland Kv= 5.0 fps
7.1	215	Total			

Summary for Subcatchment S108: S108

Runoff = 1.35 cfs @ 12.07 hrs, Volume= 0.101 af, Depth= 3.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
10,119	98	Paved parking, HSG D
330	98	Paved parking, HSG C
2,951	80	>75% Grass cover, Good, HSG D
506	74	>75% Grass cover, Good, HSG C
13,906	93	Weighted Average
3,457		24.86% Pervious Area
10,449		75.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach 1R: Ex. SD

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 4.25" for 10-Yr event
 Inflow = 0.78 cfs @ 12.07 hrs, Volume= 0.062 af
 Outflow = 0.76 cfs @ 12.09 hrs, Volume= 0.062 af, Atten= 3%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.88 fps, Min. Travel Time= 0.5 min
 Avg. Velocity = 0.95 fps, Avg. Travel Time= 1.7 min

Peak Storage= 25 cf @ 12.08 hrs
 Average Depth at Peak Storage= 0.37'
 Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe
 n= 0.013 Corrugated PE, smooth interior
 Length= 95.0' Slope= 0.0054 '/'
 Inlet Invert= 67.11', Outlet Invert= 66.60'

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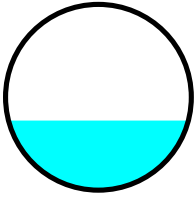
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Type III 24-hr 10-Yr Rainfall=4.60"

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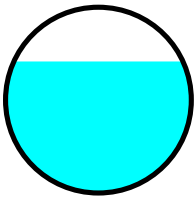
Summary for Reach 2R: Ex. RD

Inflow Area = 0.465 ac, 100.00% Impervious, Inflow Depth = 4.36" for 10-Yr event
Inflow = 2.10 cfs @ 12.07 hrs, Volume = 0.169 af
Outflow = 2.06 cfs @ 12.08 hrs, Volume = 0.169 af, Atten = 2%, Lag = 0.7 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 3.50 fps, Min. Travel Time = 0.3 min
Avg. Velocity = 1.23 fps, Avg. Travel Time = 0.9 min

Peak Storage = 37 cf @ 12.08 hrs
Average Depth at Peak Storage = 0.71'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.46 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 63.0' Slope = 0.0048 '/'
Inlet Invert = 67.20', Outlet Invert = 66.90'



Summary for Reach 3R: Ex. SD

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 4.07" for 10-Yr event
Inflow = 1.33 cfs @ 12.50 hrs, Volume = 0.514 af
Outflow = 1.33 cfs @ 12.51 hrs, Volume = 0.514 af, Atten = 0%, Lag = 0.8 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 3.25 fps, Min. Travel Time = 0.5 min
Avg. Velocity = 1.73 fps, Avg. Travel Time = 0.9 min

Peak Storage = 38 cf @ 12.51 hrs
Average Depth at Peak Storage = 0.52'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.52 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 94.0' Slope = 0.0050 '/'
Inlet Invert = 62.97', Outlet Invert = 62.50'

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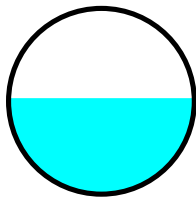
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Type III 24-hr 10-Yr Rainfall=4.60"

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**Summary for Pond 1P: Ex. CB**

Inflow Area = 1.784 ac, 75.78% Impervious, Inflow Depth = 3.86" for 10-Yr event
 Inflow = 1.59 cfs @ 12.43 hrs, Volume= 0.575 af
 Outflow = 1.59 cfs @ 12.43 hrs, Volume= 0.575 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.59 cfs @ 12.43 hrs, Volume= 0.575 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 63.19' @ 12.43 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	12.0" Round Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.59 cfs @ 12.43 hrs HW=63.19' (Free Discharge)↑**1=Culvert** (Inlet Controls 1.59 cfs @ 2.39 fps)**Summary for Pond 2P: Ex. VUSF**

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 4.07" for 10-Yr event
 Inflow = 6.53 cfs @ 12.08 hrs, Volume= 0.514 af
 Outflow = 1.33 cfs @ 12.50 hrs, Volume= 0.514 af, Atten= 80%, Lag= 25.4 min
 Primary = 1.33 cfs @ 12.50 hrs, Volume= 0.514 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 68.47' @ 12.50 hrs Surf.Area= 6,141 sf Storage= 9,611 cf

Plug-Flow detention time= 239.4 min calculated for 0.513 af (100% of inflow)

Center-of-Mass det. time= 239.6 min (1,005.1 - 765.5)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

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Type III 24-hr 10-Yr Rainfall=4.60"

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Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	12.0" Round Culvert L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	9.5" Vert. Orifice/Grate C= 0.600
#3	Device 2	67.85'	15.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	64.06'	2.0" Vert. Orifice/Grate C= 0.600
#5	Device 4	66.50'	2.410 in/hr Exfiltration over Surface area above 64.06' Excluded Surface area = 0 sf

Primary OutFlow Max=1.33 cfs @ 12.50 hrs HW=68.47' (Free Discharge)

- 1=Culvert (Passes 1.33 cfs of 4.17 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.11 cfs @ 2.68 fps)
 3=Orifice/Grate (Passes 1.11 cfs of 1.63 cfs potential flow)
 4=Orifice/Grate (Orifice Controls 0.22 cfs @ 10.02 fps)
 5=Exfiltration (Passes 0.22 cfs of 0.34 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area = 0.448 ac, 84.88% Impervious, Inflow Depth = 4.04" for 10-Yr event
 Inflow = 1.92 cfs @ 12.08 hrs, Volume= 0.151 af
 Outflow = 1.92 cfs @ 12.08 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.92 cfs @ 12.08 hrs, Volume= 0.151 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 67.27' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.86 cfs @ 12.08 hrs HW=67.25' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 1.86 cfs @ 2.95 fps)

Summary for Pond 4P: Ex. Vortechincs Unit

Inflow Area = 1.067 ac, 88.02% Impervious, Inflow Depth = 4.08" for 10-Yr event
 Inflow = 4.61 cfs @ 12.08 hrs, Volume= 0.362 af
 Outflow = 4.61 cfs @ 12.08 hrs, Volume= 0.362 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.61 cfs @ 12.08 hrs, Volume= 0.362 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 69.46' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	12.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.46 cfs @ 12.08 hrs HW=69.34' (Free Discharge)

- 1=Culvert (Inlet Controls 4.46 cfs @ 5.68 fps)

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Type III 24-hr 10-Yr Rainfall=4.60"

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Summary for Pond 5P: Ex. CB

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 4.25" for 10-Yr event
 Inflow = 0.78 cfs @ 12.07 hrs, Volume= 0.062 af
 Outflow = 0.78 cfs @ 12.07 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.78 cfs @ 12.07 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 69.05' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	12.0" Round Culvert L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.75 cfs @ 12.07 hrs HW=69.04' (Free Discharge)↑**1=Culvert** (Inlet Controls 0.75 cfs @ 1.90 fps)**Summary for Pond 6P: Ex. CB**

Inflow Area = 0.282 ac, 82.85% Impervious, Inflow Depth = 3.91" for 10-Yr event
 Inflow = 1.22 cfs @ 12.07 hrs, Volume= 0.092 af
 Outflow = 1.22 cfs @ 12.07 hrs, Volume= 0.092 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.22 cfs @ 12.07 hrs, Volume= 0.092 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 67.58' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	12.0" Round Culvert L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.17 cfs @ 12.07 hrs HW=67.56' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.17 cfs @ 2.54 fps)**Summary for Pond 7P: Ex. CB**

Inflow Area = 0.784 ac, 89.88% Impervious, Inflow Depth = 4.14" for 10-Yr event
 Inflow = 3.40 cfs @ 12.08 hrs, Volume= 0.270 af
 Outflow = 3.40 cfs @ 12.08 hrs, Volume= 0.270 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.40 cfs @ 12.08 hrs, Volume= 0.270 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 69.46' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	12.0" Round Culvert L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

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Type III 24-hr 10-Yr Rainfall=4.60"

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Primary OutFlow Max=3.29 cfs @ 12.08 hrs HW=69.35' (Free Discharge)

↑**1=Culvert** (Barrel Controls 3.29 cfs @ 4.20 fps)

Summary for Pond POI1: POI#1

Inflow Area = 1.045 ac, 0.00% Impervious, Inflow Depth = 2.38" for 10-Yr event
Inflow = 2.77 cfs @ 12.11 hrs, Volume= 0.207 af
Primary = 2.77 cfs @ 12.11 hrs, Volume= 0.207 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond POI2: POI#2

Inflow Area = 2.528 ac, 75.24% Impervious, Inflow Depth = 3.85" for 10-Yr event
Inflow = 3.91 cfs @ 12.16 hrs, Volume= 0.811 af
Primary = 3.91 cfs @ 12.16 hrs, Volume= 0.811 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25-Yr Rainfall=5.80"

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Summary for Subcatchment S101: S101

Runoff = 2.66 cfs @ 12.07 hrs, Volume= 0.216 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
11,879	98	Roofs, HSG D
8,381	98	Roofs, HSG C
20,260	98	Weighted Average
20,260		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S102: S102

Runoff = 1.52 cfs @ 12.07 hrs, Volume= 0.117 af, Depth= 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
5,739	98	Paved parking, HSG D
3,723	98	Paved parking, HSG C
1,258	80	>75% Grass cover, Good, HSG D
1,230	74	>75% Grass cover, Good, HSG C
11,950	94	Weighted Average
2,488		20.82% Pervious Area
9,462		79.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S103: S103

Runoff = 1.56 cfs @ 12.07 hrs, Volume= 0.120 af, Depth= 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-Yr Rainfall=5.80"

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Type III 24-hr 25-Yr Rainfall=5.80"

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Area (sf)	CN	Description
6,090	98	Paved parking, HSG C
4,098	98	Paved parking, HSG D
1,212	74	>75% Grass cover, Good, HSG C
897	80	>75% Grass cover, Good, HSG D
12,297	94	Weighted Average
2,109		17.15% Pervious Area
10,188		82.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S104: S104

Runoff = 0.99 cfs @ 12.07 hrs, Volume= 0.079 af, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
464	74	>75% Grass cover, Good, HSG C
7,115	98	Paved parking, HSG C
7,579	97	Weighted Average
464		6.12% Pervious Area
7,115		93.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S105: S105

Runoff = 3.48 cfs @ 12.14 hrs, Volume= 0.309 af, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
2,137	84	50-75% Grass cover, Fair, HSG D
6,297	79	50-75% Grass cover, Fair, HSG C
13,218	98	Paved parking, HSG D
10,736	98	Paved parking, HSG C
32,388	93	Weighted Average
8,434		26.04% Pervious Area
23,954		73.96% Impervious Area

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Type III 24-hr 25-Yr Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, A to B Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		Shallow Concentrated Flow, B to C Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S106: S106

Runoff = 1.08 cfs @ 12.12 hrs, Volume= 0.085 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
1,431	98	Paved parking, HSG D
210	77	Woods, Good, HSG D
10,099	80	>75% Grass cover, Good, HSG D
11,740	82	Weighted Average
10,309		87.81% Pervious Area
1,431		12.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.19		Sheet Flow, A to B Grass: Short n= 0.150 P2= 3.10"
3.9	165	0.0100	0.70		Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps
0.1	18	0.0400	4.06		Shallow Concentrated Flow, C to D Paved Kv= 20.3 fps
0.3	25	0.0400	1.40		Shallow Concentrated Flow, D to E Short Grass Pasture Kv= 7.0 fps
8.6	258	Total			

Summary for Subcatchment S107: S107

Runoff = 3.96 cfs @ 12.10 hrs, Volume= 0.296 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
33,773	80	>75% Grass cover, Good, HSG D
7,381	74	>75% Grass cover, Good, HSG C
2,860	70	Woods, Good, HSG C
1,518	77	Woods, Good, HSG D
45,532	78	Weighted Average
45,532		100.00% Pervious Area

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Type III 24-hr 25-Yr Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	50	0.0300	0.17		Sheet Flow, A to B Grass: Short n= 0.150 P2= 3.10"
1.8	145	0.0370	1.35		Shallow Concentrated Flow, B to C Short Grass Pasture Kv= 7.0 fps
0.4	20	0.0300	0.87		Shallow Concentrated Flow, C to D Woodland Kv= 5.0 fps
7.1	215	Total			

Summary for Subcatchment S108: S108

Runoff = 1.75 cfs @ 12.07 hrs, Volume= 0.133 af, Depth= 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
10,119	98	Paved parking, HSG D
330	98	Paved parking, HSG C
2,951	80	>75% Grass cover, Good, HSG D
506	74	>75% Grass cover, Good, HSG C
13,906	93	Weighted Average
3,457		24.86% Pervious Area
10,449		75.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach 1R: Ex. SD

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 5.44" for 25-Yr event
 Inflow = 0.99 cfs @ 12.07 hrs, Volume= 0.079 af
 Outflow = 0.96 cfs @ 12.09 hrs, Volume= 0.079 af, Atten= 3%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 3.07 fps, Min. Travel Time= 0.5 min
 Avg. Velocity = 1.02 fps, Avg. Travel Time= 1.5 min

Peak Storage= 30 cf @ 12.08 hrs
 Average Depth at Peak Storage= 0.43'
 Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe
 n= 0.013 Corrugated PE, smooth interior
 Length= 95.0' Slope= 0.0054 '/'
 Inlet Invert= 67.11', Outlet Invert= 66.60'

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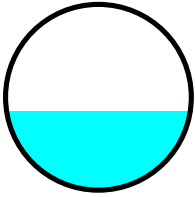
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Type III 24-hr 25-Yr Rainfall=5.80"

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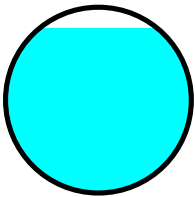
Summary for Reach 2R: Ex. RD

Inflow Area = 0.465 ac, 100.00% Impervious, Inflow Depth = 5.56" for 25-Yr event
Inflow = 2.66 cfs @ 12.07 hrs, Volume = 0.216 af
Outflow = 2.61 cfs @ 12.08 hrs, Volume = 0.216 af, Atten = 2%, Lag = 0.7 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 3.56 fps, Min. Travel Time = 0.3 min
Avg. Velocity = 1.33 fps, Avg. Travel Time = 0.8 min

Peak Storage = 47 cf @ 12.08 hrs
Average Depth at Peak Storage = 0.89'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.46 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 63.0' Slope = 0.0048 '/'
Inlet Invert = 67.20', Outlet Invert = 66.90'



Summary for Reach 3R: Ex. SD

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 5.26" for 25-Yr event
Inflow = 2.06 cfs @ 12.45 hrs, Volume = 0.664 af
Outflow = 2.06 cfs @ 12.46 hrs, Volume = 0.664 af, Atten = 0%, Lag = 0.8 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 3.58 fps, Min. Travel Time = 0.4 min
Avg. Velocity = 1.81 fps, Avg. Travel Time = 0.9 min

Peak Storage = 54 cf @ 12.46 hrs
Average Depth at Peak Storage = 0.69'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.52 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 94.0' Slope = 0.0050 '/'
Inlet Invert = 62.97', Outlet Invert = 62.50'

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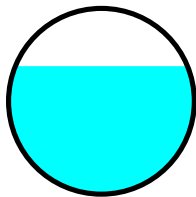
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Type III 24-hr 25-Yr Rainfall=5.80"

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**Summary for Pond 1P: Ex. CB**

Inflow Area = 1.784 ac, 75.78% Impervious, Inflow Depth = 5.04" for 25-Yr event
 Inflow = 2.62 cfs @ 12.20 hrs, Volume= 0.749 af
 Outflow = 2.62 cfs @ 12.20 hrs, Volume= 0.749 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.62 cfs @ 12.20 hrs, Volume= 0.749 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 63.67' @ 12.20 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	12.0" Round Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.62 cfs @ 12.20 hrs HW=63.67' (Free Discharge)↑**1=Culvert** (Inlet Controls 2.62 cfs @ 3.33 fps)**Summary for Pond 2P: Ex. VUSF**

Inflow Area = 1.515 ac, 87.09% Impervious, Inflow Depth = 5.26" for 25-Yr event
 Inflow = 8.34 cfs @ 12.08 hrs, Volume= 0.664 af
 Outflow = 2.06 cfs @ 12.45 hrs, Volume= 0.664 af, Atten= 75%, Lag= 22.4 min
 Primary = 2.06 cfs @ 12.45 hrs, Volume= 0.664 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 68.85' @ 12.45 hrs Surf.Area= 6,645 sf Storage= 12,013 cf

Plug-Flow detention time=213.0 min calculated for 0.663 af (100% of inflow)

Center-of-Mass det. time=213.3 min (973.4 - 760.2)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

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Type III 24-hr 25-Yr Rainfall=5.80"

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Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	12.0" Round Culvert L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	9.5" Vert. Orifice/Grate C= 0.600
#3	Device 2	67.85'	15.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	64.06'	2.0" Vert. Orifice/Grate C= 0.600
#5	Device 4	66.50'	2.410 in/hr Exfiltration over Surface area above 64.06' Excluded Surface area = 0 sf

Primary OutFlow Max=2.06 cfs @ 12.45 hrs HW=68.85' (Free Discharge)

- 1=Culvert (Passes 2.06 cfs of 4.34 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.84 cfs @ 3.73 fps)
 3=Orifice/Grate (Passes 1.84 cfs of 3.56 cfs potential flow)
 4=Orifice/Grate (Orifice Controls 0.23 cfs @ 10.44 fps)
 5=Exfiltration (Passes 0.23 cfs of 0.37 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area = 0.448 ac, 84.88% Impervious, Inflow Depth = 5.23" for 25-Yr event
 Inflow = 2.46 cfs @ 12.08 hrs, Volume= 0.196 af
 Outflow = 2.46 cfs @ 12.08 hrs, Volume= 0.196 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.46 cfs @ 12.08 hrs, Volume= 0.196 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 67.41' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=2.38 cfs @ 12.08 hrs HW=67.39' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 2.38 cfs @ 3.22 fps)

Summary for Pond 4P: Ex. Vortechincs Unit

Inflow Area = 1.067 ac, 88.02% Impervious, Inflow Depth = 5.27" for 25-Yr event
 Inflow = 5.88 cfs @ 12.08 hrs, Volume= 0.468 af
 Outflow = 5.88 cfs @ 12.08 hrs, Volume= 0.468 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.88 cfs @ 12.08 hrs, Volume= 0.468 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 70.95' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	12.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.70 cfs @ 12.08 hrs HW=70.74' (Free Discharge)

- 1=Culvert (Inlet Controls 5.70 cfs @ 7.25 fps)

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Summary for Pond 5P: Ex. CB

Inflow Area = 0.174 ac, 93.88% Impervious, Inflow Depth = 5.44" for 25-Yr event
 Inflow = 0.99 cfs @ 12.07 hrs, Volume= 0.079 af
 Outflow = 0.99 cfs @ 12.07 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.99 cfs @ 12.07 hrs, Volume= 0.079 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 69.13' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	12.0" Round Culvert L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.95 cfs @ 12.07 hrs HW=69.12' (Free Discharge)**1=Culvert** (Inlet Controls 0.95 cfs @ 2.04 fps)**Summary for Pond 6P: Ex. CB**

Inflow Area = 0.282 ac, 82.85% Impervious, Inflow Depth = 5.10" for 25-Yr event
 Inflow = 1.56 cfs @ 12.07 hrs, Volume= 0.120 af
 Outflow = 1.56 cfs @ 12.07 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.56 cfs @ 12.07 hrs, Volume= 0.120 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 67.71' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	12.0" Round Culvert L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.51 cfs @ 12.07 hrs HW=67.69' (Free Discharge)**1=Culvert** (Barrel Controls 1.51 cfs @ 2.70 fps)**Summary for Pond 7P: Ex. CB**

Inflow Area = 0.784 ac, 89.88% Impervious, Inflow Depth = 5.33" for 25-Yr event
 Inflow = 4.33 cfs @ 12.08 hrs, Volume= 0.348 af
 Outflow = 4.33 cfs @ 12.08 hrs, Volume= 0.348 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.33 cfs @ 12.08 hrs, Volume= 0.348 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 70.61' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	12.0" Round Culvert L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

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Primary OutFlow Max=4.20 cfs @ 12.08 hrs HW=70.45' (Free Discharge)

↑**1=Culvert** (Barrel Controls 4.20 cfs @ 5.34 fps)

Summary for Pond POI1: POI#1

Inflow Area = 1.045 ac, 0.00% Impervious, Inflow Depth = 3.40" for 25-Yr event
Inflow = 3.96 cfs @ 12.10 hrs, Volume= 0.296 af
Primary = 3.96 cfs @ 12.10 hrs, Volume= 0.296 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

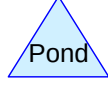
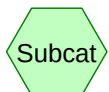
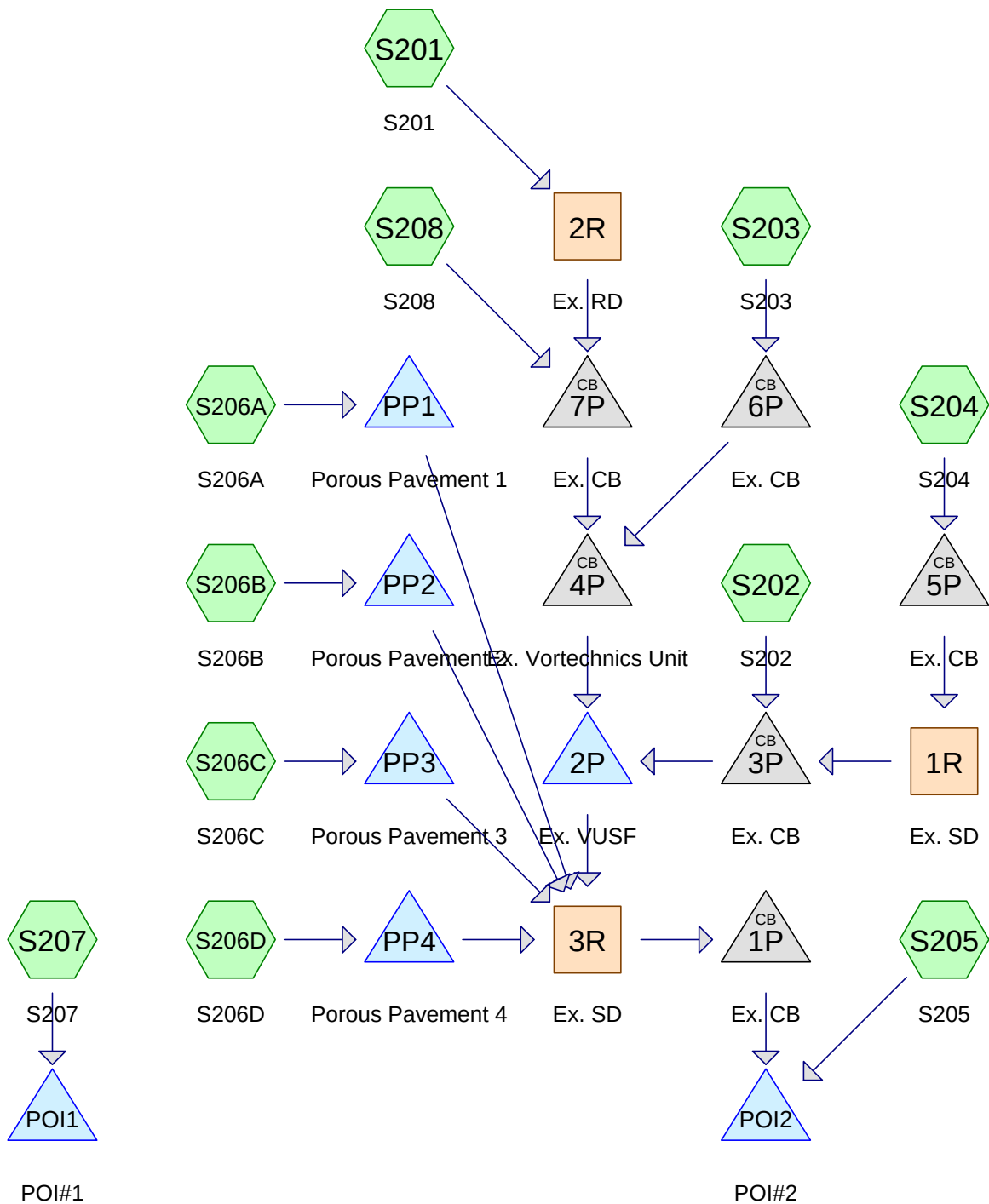
Summary for Pond POI2: POI#2

Inflow Area = 2.528 ac, 75.24% Impervious, Inflow Depth = 5.02" for 25-Yr event
Inflow = 6.04 cfs @ 12.16 hrs, Volume= 1.058 af
Primary = 6.04 cfs @ 12.16 hrs, Volume= 1.058 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

ATTACHMENT D

POST DEVELOPMENT HYDROCAD COMPUTATIONS



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.254	74	>75% Grass cover, Good, HSG C (S202, S203, S204, S205, S206A, S206D, S207, S208)
0.366	80	>75% Grass cover, Good, HSG D (S202, S203, S205, S206A, S206B, S206C, S206D, S207, S208)
0.802	98	Paved parking, HSG C (S202, S203, S204, S205, S206A, S206D, S208)
1.640	98	Paved parking, HSG D (S202, S203, S205, S206A, S206B, S206C, S206D, S208)
0.210	98	Roofs, HSG C (S201)
0.282	98	Roofs, HSG D (S201)
0.014	70	Woods, Good, HSG C (S207)
0.005	77	Woods, Good, HSG D (S207)
3.573	94	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.280	HSG C	S201, S202, S203, S204, S205, S206A, S206D, S207, S208
2.294	HSG D	S201, S202, S203, S205, S206A, S206B, S206C, S206D, S207, S208
0.000	Other	
3.573		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.254	0.366	0.000	0.621	>75% Grass cover, Good	S202, S203, S204, S205, S206A, S206B, S206C, S206D, S207, S208
0.000	0.000	0.802	1.640	0.000	2.442	Paved parking	S202, S203, S204, S205, S206A, S206B, S206C, S206D, S208
0.000	0.000	0.210	0.282	0.000	0.491	Roofs	S201
0.000	0.000	0.014	0.005	0.000	0.019	Woods, Good	S207
0.000	0.000	1.280	2.294	0.000	3.573	TOTAL AREA	

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Type III 24-hr 2-Yr Rainfall=3.10"

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Summary for Subcatchment S201: S201

Runoff = 1.49 cfs @ 12.07 hrs, Volume= 0.117 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
12,271	98	Roofs, HSG D
9,127	98	Roofs, HSG C
21,398	98	Weighted Average
21,398		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S202: S202

Runoff = 0.56 cfs @ 12.07 hrs, Volume= 0.040 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
3,185	98	Paved parking, HSG D
3,505	98	Paved parking, HSG C
1,579	80	>75% Grass cover, Good, HSG D
1,053	74	>75% Grass cover, Good, HSG C
9,322	92	Weighted Average
2,632		28.23% Pervious Area
6,690		71.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S203: S203

Runoff = 0.86 cfs @ 12.07 hrs, Volume= 0.067 af, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

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Type III 24-hr 2-Yr Rainfall=3.10"

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Area (sf)	CN	Description
7,931	98	Paved parking, HSG C
4,162	98	Paved parking, HSG D
191	74	>75% Grass cover, Good, HSG C
342	80	>75% Grass cover, Good, HSG D
12,626	97	Weighted Average
533		4.22% Pervious Area
12,093		95.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S204: S204

Runoff = 0.40 cfs @ 12.07 hrs, Volume= 0.030 af, Depth= 2.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
1,038	74	>75% Grass cover, Good, HSG C
5,313	98	Paved parking, HSG C
6,351	94	Weighted Average
1,038		16.34% Pervious Area
5,313		83.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S205: S205

Runoff = 1.78 cfs @ 12.14 hrs, Volume= 0.150 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
5,415	80	>75% Grass cover, Good, HSG D
4,992	74	>75% Grass cover, Good, HSG C
12,697	98	Paved parking, HSG D
11,718	98	Paved parking, HSG C
34,822	92	Weighted Average
10,407		29.89% Pervious Area
24,415		70.11% Impervious Area

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Type III 24-hr 2-Yr Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, A to B
					Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		Shallow Concentrated Flow, B to C
					Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S206A: S206A

Runoff = 1.64 cfs @ 12.07 hrs, Volume= 0.123 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
14,994	98	Paved parking, HSG D
2,860	80	>75% Grass cover, Good, HSG D
5,893	98	Paved parking, HSG C
1,403	74	>75% Grass cover, Good, HSG C
25,150	95	Weighted Average
4,263		16.95% Pervious Area
20,887		83.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S206B: S206B

Runoff = 1.69 cfs @ 12.07 hrs, Volume= 0.128 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
3,346	80	>75% Grass cover, Good, HSG D
21,909	98	Paved parking, HSG D
25,255	96	Weighted Average
3,346		13.25% Pervious Area
21,909		86.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 2-Yr Rainfall=3.10"

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Summary for Subcatchment S206C: S206C

Runoff = 0.31 cfs @ 12.07 hrs, Volume= 0.024 af, Depth= 2.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
517	80	>75% Grass cover, Good, HSG D
4,184	98	Paved parking, HSG D
4,701	96	Weighted Average
517		11.00% Pervious Area
4,184		89.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S206D: S206D

Runoff = 0.18 cfs @ 12.07 hrs, Volume= 0.014 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
327	80	>75% Grass cover, Good, HSG D
82	74	>75% Grass cover, Good, HSG C
2,180	98	Paved parking, HSG D
239	98	Paved parking, HSG C
2,828	95	Weighted Average
409		14.46% Pervious Area
2,419		85.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S207: S207

Runoff = 0.09 cfs @ 12.09 hrs, Volume= 0.006 af, Depth= 1.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 2-Yr Rainfall=3.10"

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Type III 24-hr 2-Yr Rainfall=3.10"

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Area (sf)	CN	Description
686	80	>75% Grass cover, Good, HSG D
1,738	74	>75% Grass cover, Good, HSG C
596	70	Woods, Good, HSG C
222	77	Woods, Good, HSG D
3,242	75	Weighted Average
3,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S208: S208

Runoff = 0.65 cfs @ 12.07 hrs, Volume= 0.048 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Rainfall=3.10"

Area (sf)	CN	Description
8,139	98	Paved parking, HSG D
338	98	Paved parking, HSG C
891	80	>75% Grass cover, Good, HSG D
585	74	>75% Grass cover, Good, HSG C
9,953	95	Weighted Average
1,476		14.83% Pervious Area
8,477		85.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach 1R: Ex. SD

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 2.45" for 2-Yr event
Inflow = 0.40 cfs @ 12.07 hrs, Volume= 0.030 af
Outflow = 0.39 cfs @ 12.09 hrs, Volume= 0.030 af, Atten= 3%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.40 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 2.0 min

Peak Storage= 16 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 95.0' Slope= 0.0054 '/'
Inlet Invert= 67.11', Outlet Invert= 66.60'

postdevelopment

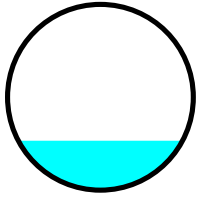
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Type III 24-hr 2-Yr Rainfall=3.10"

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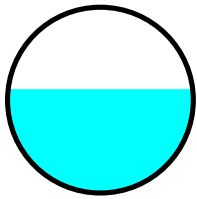
Summary for Reach 2R: Ex. RD

Inflow Area = 0.491 ac, 100.00% Impervious, Inflow Depth = 2.87" for 2-Yr event
Inflow = 1.49 cfs @ 12.07 hrs, Volume = 0.117 af
Outflow = 1.46 cfs @ 12.08 hrs, Volume = 0.117 af, Atten = 2%, Lag = 0.7 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 3.25 fps, Min. Travel Time = 0.3 min
Avg. Velocity = 1.11 fps, Avg. Travel Time = 0.9 min

Peak Storage = 28 cf @ 12.08 hrs
Average Depth at Peak Storage = 0.56'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.46 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 63.0' Slope = 0.0048 '/'
Inlet Invert = 67.20', Outlet Invert = 66.90'



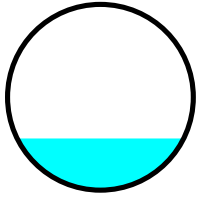
Summary for Reach 3R: Ex. SD

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 2.60" for 2-Yr event
Inflow = 0.42 cfs @ 12.80 hrs, Volume = 0.586 af
Outflow = 0.42 cfs @ 12.80 hrs, Volume = 0.585 af, Atten = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 2.38 fps, Min. Travel Time = 0.7 min
Avg. Velocity = 1.61 fps, Avg. Travel Time = 1.0 min

Peak Storage = 17 cf @ 12.80 hrs
Average Depth at Peak Storage = 0.28'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.52 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 94.0' Slope = 0.0050 '/'
Inlet Invert = 62.97', Outlet Invert = 62.50'



Summary for Pond 1P: Ex. CB

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 2.60" for 2-Yr event
 Inflow = 0.42 cfs @ 12.80 hrs, Volume= 0.585 af
 Outflow = 0.42 cfs @ 12.80 hrs, Volume= 0.585 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.42 cfs @ 12.80 hrs, Volume= 0.585 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 62.77' @ 12.80 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	12.0" Round Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.42 cfs @ 12.80 hrs HW=62.77' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 0.42 cfs @ 1.63 fps)

Summary for Pond 2P: Ex. VUSF

Inflow Area = 1.369 ac, 90.48% Impervious, Inflow Depth = 2.65" for 2-Yr event
 Inflow = 3.89 cfs @ 12.08 hrs, Volume= 0.302 af
 Outflow = 0.21 cfs @ 14.00 hrs, Volume= 0.302 af, Atten= 95%, Lag= 115.4 min
 Primary = 0.21 cfs @ 14.00 hrs, Volume= 0.302 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 67.90' @ 14.00 hrs Surf.Area= 5,381 sf Storage= 6,305 cf

Plug-Flow detention time=283.6 min calculated for 0.302 af (100% of inflow)
 Center-of-Mass det. time=283.6 min (1,055.1 - 771.5)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

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Type III 24-hr 2-Yr Rainfall=3.10"

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Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	12.0" Round Culvert L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	9.5" Vert. Orifice/Grate C= 0.600
#3	Device 2	67.85'	15.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	64.06'	2.0" Vert. Orifice/Grate C= 0.600
#5	Device 4	66.50'	2.410 in/hr Exfiltration over Surface area above 64.06' Excluded Surface area = 0 sf

Primary OutFlow Max=0.21 cfs @ 14.00 hrs HW=67.90' (Free Discharge)

- 1=Culvert (Passes 0.21 cfs of 3.89 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.01 cfs @ 0.74 fps)
 3=Orifice/Grate (Passes 0.01 cfs of 0.01 cfs potential flow)
 4=Orifice/Grate (Orifice Controls 0.20 cfs @ 9.33 fps)
 5=Exfiltration (Passes 0.20 cfs of 0.30 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area = 0.360 ac, 76.58% Impervious, Inflow Depth = 2.33" for 2-Yr event
 Inflow = 0.94 cfs @ 12.08 hrs, Volume= 0.070 af
 Outflow = 0.94 cfs @ 12.08 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.94 cfs @ 12.08 hrs, Volume= 0.070 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 67.00' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.91 cfs @ 12.08 hrs HW=66.99' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 0.91 cfs @ 2.38 fps)

Summary for Pond 4P: Ex. Vortechncs Unit

Inflow Area = 1.010 ac, 95.43% Impervious, Inflow Depth = 2.76" for 2-Yr event
 Inflow = 2.95 cfs @ 12.08 hrs, Volume= 0.233 af
 Outflow = 2.95 cfs @ 12.08 hrs, Volume= 0.233 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.95 cfs @ 12.08 hrs, Volume= 0.233 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 68.13' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	12.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.86 cfs @ 12.08 hrs HW=68.08' (Free Discharge)

- 1=Culvert (Barrel Controls 2.86 cfs @ 3.64 fps)

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Type III 24-hr 2-Yr Rainfall=3.10"

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Summary for Pond 5P: Ex. CB

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 2.45" for 2-Yr event
 Inflow = 0.40 cfs @ 12.07 hrs, Volume= 0.030 af
 Outflow = 0.40 cfs @ 12.07 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.40 cfs @ 12.07 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 68.90' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	12.0" Round Culvert L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.07 hrs HW=68.89' (Free Discharge)**1=Culvert** (Inlet Controls 0.39 cfs @ 1.59 fps)**Summary for Pond 6P: Ex. CB**

Inflow Area = 0.290 ac, 95.78% Impervious, Inflow Depth = 2.76" for 2-Yr event
 Inflow = 0.86 cfs @ 12.07 hrs, Volume= 0.067 af
 Outflow = 0.86 cfs @ 12.07 hrs, Volume= 0.067 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.86 cfs @ 12.07 hrs, Volume= 0.067 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 67.44' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	12.0" Round Culvert L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.83 cfs @ 12.07 hrs HW=67.42' (Free Discharge)**1=Culvert** (Barrel Controls 0.83 cfs @ 2.32 fps)**Summary for Pond 7P: Ex. CB**

Inflow Area = 0.720 ac, 95.29% Impervious, Inflow Depth = 2.77" for 2-Yr event
 Inflow = 2.10 cfs @ 12.08 hrs, Volume= 0.166 af
 Outflow = 2.10 cfs @ 12.08 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.10 cfs @ 12.08 hrs, Volume= 0.166 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 68.32' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	12.0" Round Culvert L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

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Type III 24-hr 2-Yr Rainfall=3.10"

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Primary OutFlow Max=2.03 cfs @ 12.08 hrs HW=68.27' (Free Discharge)↑ **1=Culvert** (Barrel Controls 2.03 cfs @ 2.59 fps)**Summary for Pond POI1: POI#1**

Inflow Area = 0.074 ac, 0.00% Impervious, Inflow Depth = 1.03" for 2-Yr event
 Inflow = 0.09 cfs @ 12.09 hrs, Volume= 0.006 af
 Primary = 0.09 cfs @ 12.09 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond POI2: POI#2

Inflow Area = 3.499 ac, 83.85% Impervious, Inflow Depth > 2.52" for 2-Yr event
 Inflow = 2.19 cfs @ 12.14 hrs, Volume= 0.736 af
 Primary = 2.19 cfs @ 12.14 hrs, Volume= 0.736 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond PP1: Porous Pavement 1

Inflow Area = 0.577 ac, 83.05% Impervious, Inflow Depth = 2.55" for 2-Yr event
 Inflow = 1.64 cfs @ 12.07 hrs, Volume= 0.123 af
 Outflow = 0.04 cfs @ 17.10 hrs, Volume= 0.117 af, Atten= 98%, Lag= 301.7 min
 Primary = 0.04 cfs @ 17.10 hrs, Volume= 0.117 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 68.24' @ 17.10 hrs Surf.Area= 20,887 sf Storage= 3,548 cf

Plug-Flow detention time= 891.1 min calculated for 0.117 af (96% of inflow)

Center-of-Mass det. time= 867.6 min (1,648.6 - 781.0)

Volume	Invert	Avail.Storage	Storage Description
#1	67.82'	8,355 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 20,887 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.82	20,887	0	0
68.82	20,887	20,887	20,887

Device	Routing	Invert	Outlet Devices
#1	Primary	66.25'	1.0" Vert. Orifice/Grate C= 0.600
#2	Device 4	67.82'	3.000 in/hr Exfiltration over Surface area above 66.65' Excluded Surface area = 0 sf
#3	Primary	68.32'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	66.65'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.04 cfs @ 17.10 hrs HW=68.24' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.04 cfs @ 6.73 fps)
 4=Orifice/Grate (Passes 0.04 cfs of 1.10 cfs potential flow)
 2=Exfiltration (Passes 0.04 cfs of 1.45 cfs potential flow)
 3=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond PP2: Porous Pavement 2

Inflow Area = 0.580 ac, 86.75% Impervious, Inflow Depth = 2.65" for 2-Yr event
 Inflow = 1.69 cfs @ 12.07 hrs, Volume= 0.128 af
 Outflow = 0.05 cfs @ 15.75 hrs, Volume= 0.128 af, Atten= 97%, Lag= 221.0 min
 Primary = 0.05 cfs @ 15.75 hrs, Volume= 0.128 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 69.75' @ 15.75 hrs Surf.Area= 20,435 sf Storage= 3,291 cf

Plug-Flow detention time=585.8 min calculated for 0.128 af (100% of inflow)
 Center-of-Mass det. time=586.1 min (1,360.2 - 774.0)

Volume	Invert	Avail.Storage	Storage Description
#1	69.35'	8,174 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 20,435 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.35	20,435	0	0
70.35	20,435	20,435	20,435

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	1.2" Vert. Orifice/Grate C= 0.600
#2	Device 4	69.35'	3.000 in/hr Exfiltration over Surface area above 68.18' Excluded Surface area = 0 sf
#3	Primary	69.85'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	68.18'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.05 cfs @ 15.75 hrs HW=69.75' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.05 cfs @ 6.73 fps)
 4=Orifice/Grate (Passes 0.05 cfs of 1.09 cfs potential flow)
 2=Exfiltration (Passes 0.05 cfs of 1.42 cfs potential flow)
 3=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond PP3: Porous Pavement 3

Inflow Area = 0.108 ac, 89.00% Impervious, Inflow Depth = 2.65" for 2-Yr event
 Inflow = 0.31 cfs @ 12.07 hrs, Volume= 0.024 af
 Outflow = 0.06 cfs @ 12.50 hrs, Volume= 0.024 af, Atten= 80%, Lag= 25.6 min
 Primary = 0.06 cfs @ 12.50 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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Type III 24-hr 2-Yr Rainfall=3.10"

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Peak Elev= 70.50' @ 12.50 hrs Surf.Area= 5,149 sf Storage= 266 cf

Plug-Flow detention time= 25.8 min calculated for 0.024 af (100% of inflow)

Center-of-Mass det. time= 25.8 min (799.8 - 774.0)

Volume	Invert	Avail.Storage	Storage Description
#1	70.37'	2,060 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 5,149 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.37	5,149	0	0
71.37	5,149	5,149	5,149

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	1.2" Vert. Orifice/Grate C= 0.600
#2	Device 4	70.37'	3.000 in/hr Exfiltration over Surface area above 69.20' Excluded Surface area = 0 sf
#3	Primary	70.87'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	69.20'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.06 cfs @ 12.50 hrs HW=70.50' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.06 cfs @ 7.91 fps)
 4=Orifice/Grate (Passes 0.06 cfs of 0.97 cfs potential flow)
 2=Exfiltration (Passes 0.06 cfs of 0.36 cfs potential flow)
 3=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond PP4: Porous Pavement 4

Inflow Area = 0.065 ac, 85.54% Impervious, Inflow Depth = 2.55" for 2-Yr event
 Inflow = 0.18 cfs @ 12.07 hrs, Volume= 0.014 af
 Outflow = 0.07 cfs @ 12.29 hrs, Volume= 0.014 af, Atten= 61%, Lag= 13.4 min
 Primary = 0.07 cfs @ 12.29 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 71.40' @ 12.29 hrs Surf.Area= 1,473 sf Storage= 73 cf

Plug-Flow detention time= 5.0 min calculated for 0.014 af (100% of inflow)

Center-of-Mass det. time= 5.0 min (786.1 - 781.0)

Volume	Invert	Avail.Storage	Storage Description
#1	71.28'	589 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 1,473 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
71.28	1,473	0	0
72.28	1,473	1,473	1,473

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Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	1.2" Vert. Orifice/Grate C= 0.600
#2	Device 4	71.28'	3.000 in/hr Exfiltration over Surface area above 70.11' Excluded Surface area = 0 sf
#3	Primary	71.78'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	70.11'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.07 cfs @ 12.29 hrs HW=71.40' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.07 cfs @ 9.14 fps)
4=Orifice/Grate (Passes 0.07 cfs of 0.97 cfs potential flow)
2=Exfiltration (Passes 0.07 cfs of 0.10 cfs potential flow)
3=Orifice/Grate (Controls 0.00 cfs)

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Type III 24-hr 10-Yr Rainfall=4.60"

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Summary for Subcatchment S201: S201

Runoff = 2.22 cfs @ 12.07 hrs, Volume= 0.179 af, Depth= 4.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
12,271	98	Roofs, HSG D
9,127	98	Roofs, HSG C
21,398	98	Weighted Average
21,398		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S202: S202

Runoff = 0.89 cfs @ 12.07 hrs, Volume= 0.066 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
3,185	98	Paved parking, HSG D
3,505	98	Paved parking, HSG C
1,579	80	>75% Grass cover, Good, HSG D
1,053	74	>75% Grass cover, Good, HSG C
9,322	92	Weighted Average
2,632		28.23% Pervious Area
6,690		71.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S203: S203

Runoff = 1.30 cfs @ 12.07 hrs, Volume= 0.103 af, Depth= 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-Yr Rainfall=4.60"

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Type III 24-hr 10-Yr Rainfall=4.60"

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Area (sf)	CN	Description
7,931	98	Paved parking, HSG C
4,162	98	Paved parking, HSG D
191	74	>75% Grass cover, Good, HSG C
342	80	>75% Grass cover, Good, HSG D
12,626	97	Weighted Average
533		4.22% Pervious Area
12,093		95.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S204: S204

Runoff = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
1,038	74	>75% Grass cover, Good, HSG C
5,313	98	Paved parking, HSG C
6,351	94	Weighted Average
1,038		16.34% Pervious Area
5,313		83.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S205: S205

Runoff = 2.85 cfs @ 12.14 hrs, Volume= 0.246 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
5,415	80	>75% Grass cover, Good, HSG D
4,992	74	>75% Grass cover, Good, HSG C
12,697	98	Paved parking, HSG D
11,718	98	Paved parking, HSG C
34,822	92	Weighted Average
10,407		29.89% Pervious Area
24,415		70.11% Impervious Area

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Type III 24-hr 10-Yr Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, A to B
					Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		Shallow Concentrated Flow, B to C
					Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S206A: S206A

Runoff = 2.53 cfs @ 12.07 hrs, Volume= 0.194 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
14,994	98	Paved parking, HSG D
2,860	80	>75% Grass cover, Good, HSG D
5,893	98	Paved parking, HSG C
1,403	74	>75% Grass cover, Good, HSG C
25,150	95	Weighted Average
4,263		16.95% Pervious Area
20,887		83.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S206B: S206B

Runoff = 2.57 cfs @ 12.07 hrs, Volume= 0.200 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
3,346	80	>75% Grass cover, Good, HSG D
21,909	98	Paved parking, HSG D
25,255	96	Weighted Average
3,346		13.25% Pervious Area
21,909		86.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 10-Yr Rainfall=4.60"

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Summary for Subcatchment S206C: S206C

Runoff = 0.48 cfs @ 12.07 hrs, Volume= 0.037 af, Depth= 4.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
517	80	>75% Grass cover, Good, HSG D
4,184	98	Paved parking, HSG D
4,701	96	Weighted Average
517		11.00% Pervious Area
4,184		89.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S206D: S206D

Runoff = 0.28 cfs @ 12.07 hrs, Volume= 0.022 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
327	80	>75% Grass cover, Good, HSG D
82	74	>75% Grass cover, Good, HSG C
2,180	98	Paved parking, HSG D
239	98	Paved parking, HSG C
2,828	95	Weighted Average
409		14.46% Pervious Area
2,419		85.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S207: S207

Runoff = 0.19 cfs @ 12.08 hrs, Volume= 0.013 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 10-Yr Rainfall=4.60"

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Type III 24-hr 10-Yr Rainfall=4.60"

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Area (sf)	CN	Description
686	80	>75% Grass cover, Good, HSG D
1,738	74	>75% Grass cover, Good, HSG C
596	70	Woods, Good, HSG C
222	77	Woods, Good, HSG D
3,242	75	Weighted Average
3,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S208: S208

Runoff = 1.00 cfs @ 12.07 hrs, Volume= 0.077 af, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Rainfall=4.60"

Area (sf)	CN	Description
8,139	98	Paved parking, HSG D
338	98	Paved parking, HSG C
891	80	>75% Grass cover, Good, HSG D
585	74	>75% Grass cover, Good, HSG C
9,953	95	Weighted Average
1,476		14.83% Pervious Area
8,477		85.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach 1R: Ex. SD

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 3.91" for 10-Yr event
Inflow = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af
Outflow = 0.61 cfs @ 12.09 hrs, Volume= 0.048 af, Atten= 3%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.72 fps, Min. Travel Time= 0.6 min
Avg. Velocity= 0.89 fps, Avg. Travel Time= 1.8 min

Peak Storage= 22 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 95.0' Slope= 0.0054 '/'
Inlet Invert= 67.11', Outlet Invert= 66.60'

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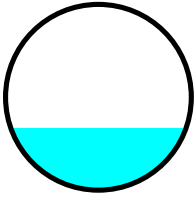
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Type III 24-hr 10-Yr Rainfall=4.60"

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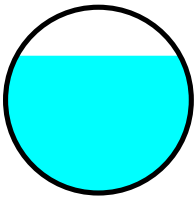
Summary for Reach 2R: Ex. RD

Inflow Area = 0.491 ac, 100.00% Impervious, Inflow Depth = 4.36" for 10-Yr event
Inflow = 2.22 cfs @ 12.07 hrs, Volume = 0.179 af
Outflow = 2.18 cfs @ 12.08 hrs, Volume = 0.179 af, Atten = 2%, Lag = 0.7 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 3.53 fps, Min. Travel Time = 0.3 min
Avg. Velocity = 1.25 fps, Avg. Travel Time = 0.8 min

Peak Storage = 39 cf @ 12.08 hrs
Average Depth at Peak Storage = 0.74'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.46 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 63.0' Slope = 0.0048 '/'
Inlet Invert = 67.20', Outlet Invert = 66.90'



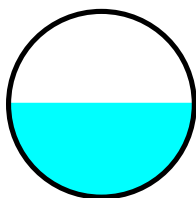
Summary for Reach 3R: Ex. SD

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 3.96" for 10-Yr event
Inflow = 1.29 cfs @ 12.55 hrs, Volume = 0.891 af
Outflow = 1.29 cfs @ 12.57 hrs, Volume = 0.891 af, Atten = 0%, Lag = 0.9 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 3.23 fps, Min. Travel Time = 0.5 min
Avg. Velocity = 1.82 fps, Avg. Travel Time = 0.9 min

Peak Storage = 38 cf @ 12.56 hrs
Average Depth at Peak Storage = 0.51'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.52 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 94.0' Slope = 0.0050 '/'
Inlet Invert = 62.97', Outlet Invert = 62.50'



Summary for Pond 1P: Ex. CB

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 3.96" for 10-Yr event
 Inflow = 1.29 cfs @ 12.57 hrs, Volume= 0.891 af
 Outflow = 1.29 cfs @ 12.57 hrs, Volume= 0.891 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.29 cfs @ 12.57 hrs, Volume= 0.891 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 63.09' @ 12.57 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	12.0" Round Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.29 cfs @ 12.57 hrs HW=63.09' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 1.29 cfs @ 2.23 fps)

Summary for Pond 2P: Ex. VUSF

Inflow Area = 1.369 ac, 90.48% Impervious, Inflow Depth = 4.13" for 10-Yr event
 Inflow = 5.94 cfs @ 12.08 hrs, Volume= 0.471 af
 Outflow = 1.04 cfs @ 12.53 hrs, Volume= 0.471 af, Atten= 83%, Lag= 27.4 min
 Primary = 1.04 cfs @ 12.53 hrs, Volume= 0.471 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 68.36' @ 12.53 hrs Surf.Area= 5,996 sf Storage= 8,954 cf

Plug-Flow detention time=248.1 min calculated for 0.471 af (100% of inflow)

Center-of-Mass det. time=248.2 min (1,010.1 - 761.9)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

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Type III 24-hr 10-Yr Rainfall=4.60"

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Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	12.0" Round Culvert L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	9.5" Vert. Orifice/Grate C= 0.600
#3	Device 2	67.85'	15.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	64.06'	2.0" Vert. Orifice/Grate C= 0.600
#5	Device 4	66.50'	2.410 in/hr Exfiltration over Surface area above 64.06' Excluded Surface area = 0 sf

Primary OutFlow Max=1.04 cfs @ 12.53 hrs HW=68.36' (Free Discharge)

1=Culvert (Passes 1.04 cfs of 4.11 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 0.82 cfs @ 2.44 fps)
 3=Orifice/Grate (Passes 0.82 cfs of 1.15 cfs potential flow)
 4=Orifice/Grate (Orifice Controls 0.22 cfs @ 9.89 fps)
 5=Exfiltration (Passes 0.22 cfs of 0.33 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area = 0.360 ac, 76.58% Impervious, Inflow Depth = 3.79" for 10-Yr event
 Inflow = 1.49 cfs @ 12.08 hrs, Volume= 0.114 af
 Outflow = 1.49 cfs @ 12.08 hrs, Volume= 0.114 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.49 cfs @ 12.08 hrs, Volume= 0.114 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 67.15' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.44 cfs @ 12.08 hrs HW=67.14' (Free Discharge)

1=Orifice/Grate (Orifice Controls 1.44 cfs @ 2.72 fps)

Summary for Pond 4P: Ex. Vortechincs Unit

Inflow Area = 1.010 ac, 95.43% Impervious, Inflow Depth = 4.25" for 10-Yr event
 Inflow = 4.45 cfs @ 12.08 hrs, Volume= 0.358 af
 Outflow = 4.45 cfs @ 12.08 hrs, Volume= 0.358 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.45 cfs @ 12.08 hrs, Volume= 0.358 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 69.31' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	12.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=4.31 cfs @ 12.08 hrs HW=69.19' (Free Discharge)

1=Culvert (Inlet Controls 4.31 cfs @ 5.49 fps)

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Type III 24-hr 10-Yr Rainfall=4.60"

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Summary for Pond 5P: Ex. CB

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 3.91" for 10-Yr event
 Inflow = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af
 Outflow = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.63 cfs @ 12.07 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 69.00' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	12.0" Round Culvert L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.61 cfs @ 12.07 hrs HW=68.99' (Free Discharge)↑**1=Culvert** (Inlet Controls 0.61 cfs @ 1.79 fps)**Summary for Pond 6P: Ex. CB**

Inflow Area = 0.290 ac, 95.78% Impervious, Inflow Depth = 4.25" for 10-Yr event
 Inflow = 1.30 cfs @ 12.07 hrs, Volume= 0.103 af
 Outflow = 1.30 cfs @ 12.07 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.30 cfs @ 12.07 hrs, Volume= 0.103 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 67.61' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	12.0" Round Culvert L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.25 cfs @ 12.07 hrs HW=67.59' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.25 cfs @ 2.58 fps)**Summary for Pond 7P: Ex. CB**

Inflow Area = 0.720 ac, 95.29% Impervious, Inflow Depth = 4.26" for 10-Yr event
 Inflow = 3.17 cfs @ 12.08 hrs, Volume= 0.255 af
 Outflow = 3.17 cfs @ 12.08 hrs, Volume= 0.255 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.17 cfs @ 12.08 hrs, Volume= 0.255 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 69.21' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	12.0" Round Culvert L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.07 cfs @ 12.08 hrs HW=69.12' (Free Discharge)

↑ **1=Culvert** (Barrel Controls 3.07 cfs @ 3.91 fps)

Summary for Pond POI1: POI#1

Inflow Area = 0.074 ac, 0.00% Impervious, Inflow Depth = 2.13" for 10-Yr event
 Inflow = 0.19 cfs @ 12.08 hrs, Volume= 0.013 af
 Primary = 0.19 cfs @ 12.08 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond POI2: POI#2

Inflow Area = 3.499 ac, 83.85% Impervious, Inflow Depth > 3.90" for 10-Yr event
 Inflow = 3.35 cfs @ 12.15 hrs, Volume= 1.137 af
 Primary = 3.35 cfs @ 12.15 hrs, Volume= 1.137 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond PP1: Porous Pavement 1

Inflow Area = 0.577 ac, 83.05% Impervious, Inflow Depth = 4.02" for 10-Yr event
 Inflow = 2.53 cfs @ 12.07 hrs, Volume= 0.194 af
 Outflow = 0.10 cfs @ 14.97 hrs, Volume= 0.161 af, Atten= 96%, Lag= 174.0 min
 Primary = 0.10 cfs @ 14.97 hrs, Volume= 0.161 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 68.47' @ 14.97 hrs Surf.Area= 20,887 sf Storage= 5,411 cf

Plug-Flow detention time= 780.7 min calculated for 0.160 af (83% of inflow)

Center-of-Mass det. time= 712.8 min (1,482.3 - 769.5)

Volume	Invert	Avail.Storage	Storage Description
#1	67.82'	8,355 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 20,887 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.82	20,887	0	0
68.82	20,887	20,887	20,887

Device	Routing	Invert	Outlet Devices
#1	Primary	66.25'	1.0" Vert. Orifice/Grate C= 0.600
#2	Device 4	67.82'	3.000 in/hr Exfiltration over Surface area above 66.65' Excluded Surface area = 0 sf
#3	Primary	68.32'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	66.65'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.10 cfs @ 14.97 hrs HW=68.47' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.04 cfs @ 7.10 fps)
 4=Orifice/Grate (Passes 0.04 cfs of 1.18 cfs potential flow)
 2=Exfiltration (Passes 0.04 cfs of 1.45 cfs potential flow)
 3=Orifice/Grate (Orifice Controls 0.06 cfs @ 1.31 fps)

Summary for Pond PP2: Porous Pavement 2

Inflow Area = 0.580 ac, 86.75% Impervious, Inflow Depth = 4.14" for 10-Yr event
 Inflow = 2.57 cfs @ 12.07 hrs, Volume= 0.200 af
 Outflow = 0.11 cfs @ 14.71 hrs, Volume= 0.200 af, Atten= 96%, Lag= 158.1 min
 Primary = 0.11 cfs @ 14.71 hrs, Volume= 0.200 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 69.99' @ 14.71 hrs Surf.Area= 20,435 sf Storage= 5,209 cf

Plug-Flow detention time=727.0 min calculated for 0.200 af (100% of inflow)
 Center-of-Mass det. time=726.8 min (1,490.3 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	69.35'	8,174 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 20,435 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.35	20,435	0	0
70.35	20,435	20,435	20,435

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	1.2" Vert. Orifice/Grate C= 0.600
#2	Device 4	69.35'	3.000 in/hr Exfiltration over Surface area above 68.18' Excluded Surface area = 0 sf
#3	Primary	69.85'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	68.18'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.11 cfs @ 14.71 hrs HW=69.99' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.06 cfs @ 7.12 fps)
 4=Orifice/Grate (Passes 0.06 cfs of 1.18 cfs potential flow)
 2=Exfiltration (Passes 0.06 cfs of 1.42 cfs potential flow)
 3=Orifice/Grate (Orifice Controls 0.06 cfs @ 1.26 fps)

Summary for Pond PP3: Porous Pavement 3

Inflow Area = 0.108 ac, 89.00% Impervious, Inflow Depth = 4.14" for 10-Yr event
 Inflow = 0.48 cfs @ 12.07 hrs, Volume= 0.037 af
 Outflow = 0.06 cfs @ 12.59 hrs, Volume= 0.037 af, Atten= 87%, Lag= 31.4 min
 Primary = 0.06 cfs @ 12.59 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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Type III 24-hr 10-Yr Rainfall=4.60"

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Peak Elev= 70.61' @ 12.59 hrs Surf.Area= 5,149 sf Storage= 501 cf

Plug-Flow detention time=51.6 min calculated for 0.037 af (100% of inflow)

Center-of-Mass det. time=51.6 min (815.1 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	70.37'	2,060 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 5,149 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.37	5,149	0	0
71.37	5,149	5,149	5,149

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	1.2" Vert. Orifice/Grate C= 0.600
#2	Device 4	70.37'	3.000 in/hr Exfiltration over Surface area above 69.20' Excluded Surface area = 0 sf
#3	Primary	70.87'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	69.20'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.06 cfs @ 12.59 hrs HW=70.61' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.06 cfs @ 8.08 fps)
 4=Orifice/Grate (Passes 0.06 cfs of 1.02 cfs potential flow)
 2=Exfiltration (Passes 0.06 cfs of 0.36 cfs potential flow)
 3=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond PP4: Porous Pavement 4

Inflow Area = 0.065 ac, 85.54% Impervious, Inflow Depth = 4.02" for 10-Yr event
 Inflow = 0.28 cfs @ 12.07 hrs, Volume= 0.022 af
 Outflow = 0.07 cfs @ 12.43 hrs, Volume= 0.022 af, Atten= 74%, Lag= 21.4 min
 Primary = 0.07 cfs @ 12.43 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 71.59' @ 12.43 hrs Surf.Area= 1,473 sf Storage= 184 cf

Plug-Flow detention time= 12.5 min calculated for 0.022 af (100% of inflow)

Center-of-Mass det. time= 12.5 min (782.0 - 769.5)

Volume	Invert	Avail.Storage	Storage Description
#1	71.28'	589 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 1,473 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
71.28	1,473	0	0
72.28	1,473	1,473	1,473

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Type III 24-hr 10-Yr Rainfall=4.60"

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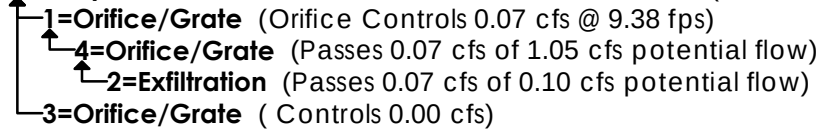
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Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	1.2" Vert. Orifice/Grate C= 0.600
#2	Device 4	71.28'	3.000 in/hr Exfiltration over Surface area above 70.11' Excluded Surface area = 0 sf
#3	Primary	71.78'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	70.11'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.07 cfs @ 12.43 hrs HW=71.59' (Free Discharge)



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Type III 24-hr 25-Yr Rainfall=5.80"

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Summary for Subcatchment S201: S201

Runoff = 2.81 cfs @ 12.07 hrs, Volume= 0.228 af, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
12,271	98	Roofs, HSG D
9,127	98	Roofs, HSG C
21,398	98	Weighted Average
21,398		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S202: S202

Runoff = 1.16 cfs @ 12.07 hrs, Volume= 0.087 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
3,185	98	Paved parking, HSG D
3,505	98	Paved parking, HSG C
1,579	80	>75% Grass cover, Good, HSG D
1,053	74	>75% Grass cover, Good, HSG C
9,322	92	Weighted Average
2,632		28.23% Pervious Area
6,690		71.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S203: S203

Runoff = 1.65 cfs @ 12.07 hrs, Volume= 0.132 af, Depth= 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-Yr Rainfall=5.80"

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Type III 24-hr 25-Yr Rainfall=5.80"

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Area (sf)	CN	Description
7,931	98	Paved parking, HSG C
4,162	98	Paved parking, HSG D
191	74	>75% Grass cover, Good, HSG C
342	80	>75% Grass cover, Good, HSG D
12,626	97	Weighted Average
533		4.22% Pervious Area
12,093		95.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S204: S204

Runoff = 0.81 cfs @ 12.07 hrs, Volume= 0.062 af, Depth= 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
1,038	74	>75% Grass cover, Good, HSG C
5,313	98	Paved parking, HSG C
6,351	94	Weighted Average
1,038		16.34% Pervious Area
5,313		83.66% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S205: S205

Runoff = 3.69 cfs @ 12.14 hrs, Volume= 0.325 af, Depth= 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
5,415	80	>75% Grass cover, Good, HSG D
4,992	74	>75% Grass cover, Good, HSG C
12,697	98	Paved parking, HSG D
11,718	98	Paved parking, HSG C
34,822	92	Weighted Average
10,407		29.89% Pervious Area
24,415		70.11% Impervious Area

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Type III 24-hr 25-Yr Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0100	0.11		Sheet Flow, A to B Grass: Short n= 0.150 P2= 3.10"
2.7	420	0.0167	2.62		Shallow Concentrated Flow, B to C Paved Kv= 20.3 fps
10.2	470	Total			

Summary for Subcatchment S206A: S206A

Runoff = 3.23 cfs @ 12.07 hrs, Volume= 0.251 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
14,994	98	Paved parking, HSG D
2,860	80	>75% Grass cover, Good, HSG D
5,893	98	Paved parking, HSG C
1,403	74	>75% Grass cover, Good, HSG C
25,150	95	Weighted Average
4,263		16.95% Pervious Area
20,887		83.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S206B: S206B

Runoff = 3.27 cfs @ 12.07 hrs, Volume= 0.257 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
3,346	80	>75% Grass cover, Good, HSG D
21,909	98	Paved parking, HSG D
25,255	96	Weighted Average
3,346		13.25% Pervious Area
21,909		86.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

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Type III 24-hr 25-Yr Rainfall=5.80"

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Summary for Subcatchment S206C: S206C

Runoff = 0.61 cfs @ 12.07 hrs, Volume= 0.048 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
517	80	>75% Grass cover, Good, HSG D
4,184	98	Paved parking, HSG D
4,701	96	Weighted Average
517		11.00% Pervious Area
4,184		89.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S206D: S206D

Runoff = 0.36 cfs @ 12.07 hrs, Volume= 0.028 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
327	80	>75% Grass cover, Good, HSG D
82	74	>75% Grass cover, Good, HSG C
2,180	98	Paved parking, HSG D
239	98	Paved parking, HSG C
2,828	95	Weighted Average
409		14.46% Pervious Area
2,419		85.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S207: S207

Runoff = 0.27 cfs @ 12.08 hrs, Volume= 0.019 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Type III 24-hr 25-Yr Rainfall=5.80"

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Type III 24-hr 25-Yr Rainfall=5.80"

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Area (sf)	CN	Description
686	80	>75% Grass cover, Good, HSG D
1,738	74	>75% Grass cover, Good, HSG C
596	70	Woods, Good, HSG C
222	77	Woods, Good, HSG D
3,242	75	Weighted Average
3,242		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment S208: S208

Runoff = 1.28 cfs @ 12.07 hrs, Volume= 0.099 af, Depth= 5.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Yr Rainfall=5.80"

Area (sf)	CN	Description
8,139	98	Paved parking, HSG D
338	98	Paved parking, HSG C
891	80	>75% Grass cover, Good, HSG D
585	74	>75% Grass cover, Good, HSG C
9,953	95	Weighted Average
1,476		14.83% Pervious Area
8,477		85.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Reach 1R: Ex. SD

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 5.10" for 25-Yr event
Inflow = 0.81 cfs @ 12.07 hrs, Volume= 0.062 af
Outflow = 0.79 cfs @ 12.09 hrs, Volume= 0.062 af, Atten= 3%, Lag= 1.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.91 fps, Min. Travel Time= 0.5 min
Avg. Velocity= 0.96 fps, Avg. Travel Time= 1.7 min

Peak Storage= 26 cf @ 12.08 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 2.61 cfs

12.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 95.0' Slope= 0.0054 '/'
Inlet Invert= 67.11', Outlet Invert= 66.60'

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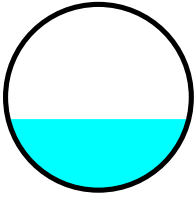
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Type III 24-hr 25-Yr Rainfall=5.80"

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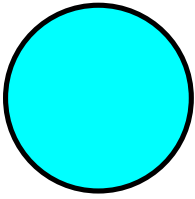
Summary for Reach 2R: Ex. RD

Inflow Area = 0.491 ac, 100.00% Impervious, Inflow Depth = 5.56" for 25-Yr event
Inflow = 2.81 cfs @ 12.07 hrs, Volume = 0.228 af
Outflow = 2.46 cfs @ 12.10 hrs, Volume = 0.228 af, Atten = 12%, Lag = 1.8 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 3.57 fps, Min. Travel Time = 0.3 min
Avg. Velocity = 1.35 fps, Avg. Travel Time = 0.8 min

Peak Storage = 51 cf @ 12.08 hrs
Average Depth at Peak Storage = 1.00'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.46 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 63.0' Slope = 0.0048 '/'
Inlet Invert = 67.20', Outlet Invert = 66.90'



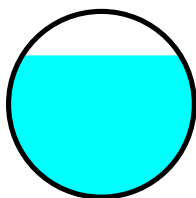
Summary for Reach 3R: Ex. SD

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 5.13" for 25-Yr event
Inflow = 2.34 cfs @ 12.52 hrs, Volume = 1.155 af
Outflow = 2.34 cfs @ 12.53 hrs, Volume = 1.155 af, Atten = 0%, Lag = 0.8 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-48.00 hrs, dt = 0.05 hrs
Max. Velocity = 3.64 fps, Min. Travel Time = 0.4 min
Avg. Velocity = 1.92 fps, Avg. Travel Time = 0.8 min

Peak Storage = 60 cf @ 12.52 hrs
Average Depth at Peak Storage = 0.76'
Bank-Full Depth = 1.00' Flow Area = 0.8 sf, Capacity = 2.52 cfs

12.0" Round Pipe
n = 0.013 Corrugated PE, smooth interior
Length = 94.0' Slope = 0.0050 '/'
Inlet Invert = 62.97', Outlet Invert = 62.50'



Summary for Pond 1P: Ex. CB

Inflow Area = 2.699 ac, 87.91% Impervious, Inflow Depth > 5.13" for 25-Yr event
 Inflow = 2.34 cfs @ 12.53 hrs, Volume= 1.155 af
 Outflow = 2.34 cfs @ 12.53 hrs, Volume= 1.155 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.34 cfs @ 12.53 hrs, Volume= 1.155 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 63.51' @ 12.53 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	62.40'	12.0" Round Culvert L= 10.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 62.40' / 61.70' S= 0.0700 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.34 cfs @ 12.53 hrs HW=63.51' (Free Discharge)

↑ **1=Culvert** (Inlet Controls 2.34 cfs @ 2.97 fps)

Summary for Pond 2P: Ex. VUSF

Inflow Area = 1.369 ac, 90.48% Impervious, Inflow Depth = 5.32" for 25-Yr event
 Inflow = 7.26 cfs @ 12.08 hrs, Volume= 0.607 af
 Outflow = 1.81 cfs @ 12.46 hrs, Volume= 0.607 af, Atten= 75%, Lag= 22.9 min
 Primary = 1.81 cfs @ 12.46 hrs, Volume= 0.607 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 68.70' @ 12.46 hrs Surf.Area= 6,443 sf Storage= 11,029 cf

Plug-Flow detention time= 220.5 min calculated for 0.607 af (100% of inflow)

Center-of-Mass det. time= 220.7 min (977.6 - 756.9)

Volume	Invert	Avail.Storage	Storage Description
#1	66.50'	13,049 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.50	3,670	0	0
67.00	4,261	1,983	1,983
68.00	5,510	4,886	6,868
69.00	6,851	6,181	13,049

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Type III 24-hr 25-Yr Rainfall=5.80"

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Device	Routing	Invert	Outlet Devices
#1	Primary	64.01'	12.0" Round Culvert L= 273.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 64.01' / 63.07' S= 0.0034 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	67.85'	9.5" Vert. Orifice/Grate C= 0.600
#3	Device 2	67.85'	15.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	64.06'	2.0" Vert. Orifice/Grate C= 0.600
#5	Device 4	66.50'	2.410 in/hr Exfiltration over Surface area above 64.06' Excluded Surface area = 0 sf

Primary OutFlow Max=1.81 cfs @ 12.46 hrs HW=68.70' (Free Discharge)

- 1=Culvert (Passes 1.81 cfs of 4.27 cfs potential flow)
 2=Orifice/Grate (Orifice Controls 1.59 cfs @ 3.23 fps)
 3=Orifice/Grate (Passes 1.59 cfs of 2.77 cfs potential flow)
 4=Orifice/Grate (Orifice Controls 0.22 cfs @ 10.27 fps)
 5=Exfiltration (Passes 0.22 cfs of 0.36 cfs potential flow)

Summary for Pond 3P: Ex. CB

Inflow Area = 0.360 ac, 76.58% Impervious, Inflow Depth = 4.96" for 25-Yr event
 Inflow = 1.92 cfs @ 12.08 hrs, Volume= 0.149 af
 Outflow = 1.92 cfs @ 12.08 hrs, Volume= 0.149 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.92 cfs @ 12.08 hrs, Volume= 0.149 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 67.27' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.50'	12.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=1.86 cfs @ 12.08 hrs HW=67.25' (Free Discharge)

- 1=Orifice/Grate (Orifice Controls 1.86 cfs @ 2.95 fps)

Summary for Pond 4P: Ex. Vortechncs Unit

Inflow Area = 1.010 ac, 95.43% Impervious, Inflow Depth = 5.45" for 25-Yr event
 Inflow = 5.42 cfs @ 12.07 hrs, Volume= 0.458 af
 Outflow = 5.42 cfs @ 12.07 hrs, Volume= 0.458 af, Atten= 0%, Lag= 0.0 min
 Primary = 5.42 cfs @ 12.07 hrs, Volume= 0.458 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 70.37' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.60'	12.0" Round Culvert L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.60' / 66.50' S= 0.0033 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.24 cfs @ 12.07 hrs HW=70.19' (Free Discharge)

- 1=Culvert (Inlet Controls 5.24 cfs @ 6.68 fps)

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Type III 24-hr 25-Yr Rainfall=5.80"

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Summary for Pond 5P: Ex. CB

Inflow Area = 0.146 ac, 83.66% Impervious, Inflow Depth = 5.10" for 25-Yr event
 Inflow = 0.81 cfs @ 12.07 hrs, Volume= 0.062 af
 Outflow = 0.81 cfs @ 12.07 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.81 cfs @ 12.07 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 69.06' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	68.54'	12.0" Round Culvert L= 78.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 68.54' / 67.21' S= 0.0171 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.78 cfs @ 12.07 hrs HW=69.05' (Free Discharge)↑**1=Culvert** (Inlet Controls 0.78 cfs @ 1.92 fps)**Summary for Pond 6P: Ex. CB**

Inflow Area = 0.290 ac, 95.78% Impervious, Inflow Depth = 5.44" for 25-Yr event
 Inflow = 1.65 cfs @ 12.07 hrs, Volume= 0.132 af
 Outflow = 1.65 cfs @ 12.07 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.65 cfs @ 12.07 hrs, Volume= 0.132 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 67.75' @ 12.07 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.80'	12.0" Round Culvert L= 71.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.80' / 66.60' S= 0.0028 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.59 cfs @ 12.07 hrs HW=67.72' (Free Discharge)↑**1=Culvert** (Barrel Controls 1.59 cfs @ 2.74 fps)**Summary for Pond 7P: Ex. CB**

Inflow Area = 0.720 ac, 95.29% Impervious, Inflow Depth = 5.45" for 25-Yr event
 Inflow = 3.71 cfs @ 12.08 hrs, Volume= 0.327 af
 Outflow = 3.71 cfs @ 12.08 hrs, Volume= 0.327 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.71 cfs @ 12.08 hrs, Volume= 0.327 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 69.82' @ 12.08 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	66.70'	12.0" Round Culvert L= 144.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 66.70' / 66.60' S= 0.0007 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.66 cfs @ 12.08 hrs HW=69.77' (Free Discharge)

↑ **1=Culvert** (Barrel Controls 3.66 cfs @ 4.66 fps)

Summary for Pond POI1: POI#1

Inflow Area = 0.074 ac, 0.00% Impervious, Inflow Depth = 3.11" for 25-Yr event
 Inflow = 0.27 cfs @ 12.08 hrs, Volume= 0.019 af
 Primary = 0.27 cfs @ 12.08 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond POI2: POI#2

Inflow Area = 3.499 ac, 83.85% Impervious, Inflow Depth > 5.07" for 25-Yr event
 Inflow = 5.11 cfs @ 12.17 hrs, Volume= 1.479 af
 Primary = 5.11 cfs @ 12.17 hrs, Volume= 1.479 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond PP1: Porous Pavement 1

Inflow Area = 0.577 ac, 83.05% Impervious, Inflow Depth = 5.21" for 25-Yr event
 Inflow = 3.23 cfs @ 12.07 hrs, Volume= 0.251 af
 Outflow = 0.23 cfs @ 13.27 hrs, Volume= 0.215 af, Atten= 93%, Lag= 71.8 min
 Primary = 0.23 cfs @ 13.27 hrs, Volume= 0.215 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 68.59' @ 13.27 hrs Surf.Area= 20,887 sf Storage= 6,415 cf

Plug-Flow detention time= 635.6 min calculated for 0.215 af (86% of inflow)

Center-of-Mass det. time= 573.1 min (1,336.6 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	67.82'	8,355 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 20,887 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
67.82	20,887	0	0
68.82	20,887	20,887	20,887

Device	Routing	Invert	Outlet Devices
#1	Primary	66.25'	1.0" Vert. Orifice/Grate C= 0.600
#2	Device 4	67.82'	3.000 in/hr Exfiltration over Surface area above 66.65' Excluded Surface area = 0 sf
#3	Primary	68.32'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	66.65'	6.0" Vert. Orifice/Grate C= 0.600

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Type III 24-hr 25-Yr Rainfall=5.80"

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Primary OutFlow Max=0.23 cfs @ 13.27 hrs HW=68.59' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.04 cfs @ 7.30 fps)
 4=Orifice/Grate (Passes 0.04 cfs of 1.23 cfs potential flow)
 2=Exfiltration (Passes 0.04 cfs of 1.45 cfs potential flow)
 3=Orifice/Grate (Orifice Controls 0.19 cfs @ 1.76 fps)

Summary for Pond PP2: Porous Pavement 2

Inflow Area = 0.580 ac, 86.75% Impervious, Inflow Depth = 5.33" for 25-Yr event
 Inflow = 3.27 cfs @ 12.07 hrs, Volume= 0.257 af
 Outflow = 0.24 cfs @ 13.14 hrs, Volume= 0.257 af, Atten= 93%, Lag= 64.4 min
 Primary = 0.24 cfs @ 13.14 hrs, Volume= 0.257 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 70.11' @ 13.14 hrs Surf.Area= 20,435 sf Storage= 6,241 cf

Plug-Flow detention time=629.7 min calculated for 0.257 af (100% of inflow)
 Center-of-Mass det. time=627.8 min (1,385.9 - 758.0)

Volume	Invert	Avail.Storage	Storage Description
#1	69.35'	8,174 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 20,435 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
69.35	20,435	0	0
70.35	20,435	20,435	20,435

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	1.2" Vert. Orifice/Grate C= 0.600
#2	Device 4	69.35'	3.000 in/hr Exfiltration over Surface area above 68.18' Excluded Surface area = 0 sf
#3	Primary	69.85'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	68.18'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.24 cfs @ 13.14 hrs HW=70.11' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.06 cfs @ 7.32 fps)
 4=Orifice/Grate (Passes 0.06 cfs of 1.23 cfs potential flow)
 2=Exfiltration (Passes 0.06 cfs of 1.42 cfs potential flow)
 3=Orifice/Grate (Orifice Controls 0.18 cfs @ 1.75 fps)

Summary for Pond PP3: Porous Pavement 3

Inflow Area = 0.108 ac, 89.00% Impervious, Inflow Depth = 5.33" for 25-Yr event
 Inflow = 0.61 cfs @ 12.07 hrs, Volume= 0.048 af
 Outflow = 0.06 cfs @ 12.75 hrs, Volume= 0.048 af, Atten= 89%, Lag= 40.8 min
 Primary = 0.06 cfs @ 12.75 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25-Yr Rainfall=5.80"

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Peak Elev= 70.71' @ 12.75 hrs Surf.Area= 5,149 sf Storage= 701 cf

Plug-Flow detention time= 75.6 min calculated for 0.048 af (100% of inflow)

Center-of-Mass det. time= 75.6 min (833.6 - 758.0)

Volume	Invert	Avail.Storage	Storage Description
#1	70.37'	2,060 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 5,149 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
70.37	5,149	0	0
71.37	5,149	5,149	5,149

Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	1.2" Vert. Orifice/Grate C= 0.600
#2	Device 4	70.37'	3.000 in/hr Exfiltration over Surface area above 69.20' Excluded Surface area = 0 sf
#3	Primary	70.87'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	69.20'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.06 cfs @ 12.75 hrs HW=70.71' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.06 cfs @ 8.21 fps)
 4=Orifice/Grate (Passes 0.06 cfs of 1.06 cfs potential flow)
 2=Exfiltration (Passes 0.06 cfs of 0.36 cfs potential flow)
 3=Orifice/Grate (Controls 0.00 cfs)

Summary for Pond PP4: Porous Pavement 4

Inflow Area = 0.065 ac, 85.54% Impervious, Inflow Depth = 5.21" for 25-Yr event
 Inflow = 0.36 cfs @ 12.07 hrs, Volume= 0.028 af
 Outflow = 0.08 cfs @ 12.48 hrs, Volume= 0.028 af, Atten= 79%, Lag= 24.8 min
 Primary = 0.08 cfs @ 12.48 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 71.77' @ 12.48 hrs Surf.Area= 1,473 sf Storage= 287 cf

Plug-Flow detention time= 20.1 min calculated for 0.028 af (100% of inflow)

Center-of-Mass det. time= 20.1 min (783.7 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	71.28'	589 cf	Custom Stage Data (Prismatic) Listed below (Recalc) 1,473 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
71.28	1,473	0	0
72.28	1,473	1,473	1,473

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Type III 24-hr 25-Yr Rainfall=5.80"

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Device	Routing	Invert	Outlet Devices
#1	Primary	67.75'	1.2" Vert. Orifice/Grate C= 0.600
#2	Device 4	71.28'	3.000 in/hr Exfiltration over Surface area above 70.11' Excluded Surface area = 0 sf
#3	Primary	71.78'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	70.11'	6.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.08 cfs @ 12.48 hrs HW=71.77' (Free Discharge)

1=Orifice/Grate (Orifice Controls 0.08 cfs @ 9.59 fps)
4=Orifice/Grate (Passes 0.08 cfs of 1.12 cfs potential flow)
2=Exfiltration (Passes 0.08 cfs of 0.10 cfs potential flow)
3=Orifice/Grate (Controls 0.00 cfs)

ATTACHMENT E

WATER QUALITY TREATMENT SUMMARY

90 Johnson Road Stormwater Management Summary										
Subarea ID	New Development			Redevelopment			Treated New Impervious Area (sf)	Treated New Landscaped Area (sf)	Treated Redeveloped Impervious Area (sf)	Treated Redeveloped Landscaped Area (sf)
	Impervious Area (sf)	Landscaped Area (sf)	Total Developed Area (sf)	Impervious Area (sf)	Landscaped Area (sf)	Total Redeveloped Area (sf)				
S201	0	0	0	21,396	0	21,396	0	0	21,396	0
S202	0	0	0	1,320	1,105	2,425	0	0	1,320	1,105
S203	0	0	0	12,093	507	12,600	0	0	12,093	507
S204	0	0	0	1,993	807	2,800	0	0	1,993	807
S208	0	0	0	8,477	1,476	9,953	0	0	8,477	1,476
S205	478	0	478	5,999	4,692	10,691	0	0	0	0
S206A	20,887	4,263	25,150	0	0	0	20,887	4,263	0	0
S206B	16,595	2,382	18,977	5,529	749	6,278	16,595	2,382	5,529	749
S206C	0	0	0	4,184	517	4,701	0	0	4,184	517
S206D	0	0	0	2,419	409	2,828	0	0	2,419	409
S207	0	2,424	2,424	0	0	0	0	0	0	0
Total (sf)	37,960	9,069	47,029	63,410	10,262	73,672	37,482	6,645	57,411	5,570
Total (ac)	0.87	0.21	1.08	1.46	0.24	1.69	0.86	0.15	1.32	0.13

BMP Summary					
Subarea ID	Treatment Method	Water Quality Volume Required (cf)	Water Quality Volume Provided (cf)	BMP Surface Area Required (sf)	BMP Surface Area Provided (sf)
S201	Existing Vegetated Underdrained Filter	3,903	4,801	2,342	3,670
S202					
S203					
S204					
S208	Untreated	N/A	N/A	N/A	N/A
S205					
S206A					
S206B					
S206B	Porous Pavement 2	1,948	4,087	N/A	20,435
S206C	Porous Pavement 3	366	1,030	N/A	5,149
S206D	Porous Pavement 4	215	295	N/A	1,473

Treatment Summary		
	Required	Provided
Treated New Impervious (%)	95%	98.74%
Treated New Developed (%)	80%	93.83%
Treated Redev Impervious (%)	N/A	90.54%
Treated Redev Developed (%)	60%	85.49%

ATTACHMENT F

DRAWDOWN COMPUTATIONS

Drawdown Calculation - Porous Pavement #1

Orifice Diameter =1 in

Elev. (ft)	Depth (ft)	Surface Area (sq.ft)	Ave. End Area (sq.ft)	End Area Depth (ft)	Incremental Volume (cf)	Head, h (ft)	Orifice Flow (cfs)	Drawdown Time (secs)	Drawdown Time (hours)
68.32	0.50	20,887	20887.00	0.25	2088.70	1.67	0.0339	61625.73	17.118
68.07	0.25	20,887	20887.00	0.25	2088.70	1.42	0.0312	66841.31	18.567
67.82	0.00	20,887	0.00	0.00	0.00	1.17	0.0284	0.00	0.000
								TOTAL	35.685

Orifice Formula $CA (2gh)^{1/2}$

Orifice Diameter: 1 inch

A: 0.005454 sq.ft

Filter Thickness: 1.167 feet

g: 32.174 ft/s²

C: 0.6 Orifice/Grate

Drawdown Calculation - Porous Pavement #2, #3, & #4

Orifice Diameter =1.25 in

Elev. (ft)	Depth (ft)	Surface Area (sq.ft)	Ave. End Area (sq.ft)	End Area Depth (ft)	Incremental Volume (cf)	Head, h (ft)	Orifice Flow (cfs)	Drawdown Time (secs)	Drawdown Time (hours)
69.85	0.50	27,057	27057.00	0.25	2705.70	1.67	0.0530	51091.15	14.192
69.60	0.25	27,057	27057.00	0.25	2705.70	1.42	0.0488	55415.15	15.393
69.35	0.00	27,057	0.00	0.00	0.00	1.17	0.0443	0.00	0.000
								TOTAL	29.585

Orifice Formula $CA (2gh)^{1/2}$

Orifice Diameter: 1.25 inch

A: 0.008522 sq.ft

Filter Thickness: 1.167 feet

g: 32.174 ft/s²

C: 0.6 Orifice/Grate

ATTACHMENT G

REDEVELOPMENT COMPUTATIONS

Redevelopment Treatment Calculation						
	Existing Condition			Proposed Condition		
Pollutant Ranking	Area (sf)	Area (ac)	Impact Rating	Area (sf)	Area (ac)	Impact Rating
0	0	0	0	0	0	0
1	0	0	0	0	0.00	0.00
2	21,615	0.50	0.99	18,240	0.42	0.84
3	51,943	1.19	3.58	55,318	1.27	3.81
4	0	0.00	0.00	0	0.00	0.00
5	0	0	0	0	0	0
Total	73,558	1.69	4.57	73,558	1.69	4.65

Redevelopment Treatment Summary	
Total Redevelopment Area (ac)	1.69
Existing Impact Rating	4.57
Proposed Impact Rating	4.65
Existing Ranked Impact	2.71
Proposed Ranked Impact	2.75
Resultant Ranked Impact Change	0.05
Redeveloped Area Treatment	60%

ATTACHMENT H

STORMWATER OPERATIONS & MAINTENANCE MANUAL

**OPERATION AND MAINTENANCE MANUAL
FOR STORMWATER MANAGEMENT AND
RELATED STORMWATER FACILITIES**

**90 JOHNSON ROAD PROPERTY
90 JOHNSON ROAD
PORTLAND, MAINE**

PREPARED FOR

**TRANSPORT LEASING CORP.
58 LOWELL JUNCTION ROAD
ANDOVER, MA 01810**

PREPARED BY

**STANTEC CONSULTING SERVICES, INC.
482 PAYNE ROAD
SCARBOROUGH, MAINE 04074
(207) 883-3355**

JULY 2018

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APPENDICES

Appendix A – Sample Inspection Logs

Appendix B – Permits for Project

Appendix C – Summary Checklist for Inspection and Maintenance

I. INTRODUCTION

Relatively complex stormwater management facilities are commonly installed in development projects including, commercial facilities, and many other developments. The complexity and goals of these systems vary with the nature of the receiving water, as well as the type of development. Runoff from developed areas of the project, including rooftops, paved, or lawn areas typically contain materials that can impact the receiving waters. Source control and the installation of bio-retention facilities and pervious surfaces are often combined with pretreatment measures or vegetated buffer strips. Other best management practices are also among the options that can significantly reduce the non-point pollution discharge from the developed area. These measures are particularly important to projects in the watersheds of sensitive water bodies, or projects with potential impacts to groundwater. With the increased cost of land and development, there is an increased tendency to construct portions of the stormwater management systems underground.

The effectiveness of water quality management provisions and other components of the stormwater management system are dependent on their design, upkeep, and maintenance to assure they meet their intended function over an extended period of years. It is critical that the stormwater management facilities are regularly inspected, and that maintenance is performed on an as-needed basis. It must also be recognized that the effectiveness of these facilities, and their maintenance requirements, are related to the stormwater drainage facilities that collect and transport the flow to the ponds, infiltration galleries, and other treatment measures. Thus, maintenance should be directed to the total system, not just the collection system or primary stormwater management facility.



The purpose of this document is to define, in detail, the inspection and maintenance requirements deemed necessary to assure that the stormwater management facilities function as intended when they were designed. Subsequent sections identify individual maintenance items, give a brief commentary of the function and need for the item, a description of the work required, and a suggested frequency of accomplishment. While the suggested programs and schedules must be adapted to specific projects, the material presented should provide guidance for a successful long-term program for operation and maintenance. Certain facilities, specifically the potential water quality volume storage or treatment measures such as bio-retention cells and pervious surfaces are not intended to be placed in service until the tributary catchment area has the permanent cover in place and any contributing turf areas have achieved a 90% catch of vegetation (i.e. established).

A. GUIDELINES OVERVIEW

A summary of the individual components of stormwater management facilities for this project has been prepared. The format used in the summary is as follows:

Preface: A general description of what function/benefit the element is intended to provide. This is a short summary and not intended to provide the design basis, which can be found in other sources.

Inspection: This section provides the inspection requirements for the individual component.

Maintenance: The section provides general information on the routine maintenance requirements of this element.

Frequency: This section outlines the best judgment of the designer on the system to the frequency of maintenance.

Comments: This section provides any particular comment on the site-specific features of this element. This is a summary only. The owner/operator should review the design drawings and documents carefully to understand the particular elements of the project. The end of this section should allow the owner/operator to make notes on the specific program. This may include the selected maintenance procedure, cross-references to applicable design drawings, etc.

A list of the individual inspection/maintenance elements is provided in the table of contents. The guidelines are proposed for initial use with adjustments made as appropriate based upon specific project experience.

This report includes the Operation and Maintenance requirements for any potential BMP identified in the Stormwater Management Report for this project.

B. RESPONSIBLE PARTY

The responsible party for operation and maintenance of the stormwater and other site infrastructure will be Transport Leasing Corp., or their agents or assigns.

II. PROJECT OVERVIEW

Key permits issued (or applied for) on the project include:

- MaineDEP Stormwater Permit through the City of Portland Delegated Authority
- City of Portland Level III Site plan and Subdivision Review

A copy of the permits and Stormwater Management Report should be appended to this manual as Appendix B. The Owner/Operator of the stormwater management system should review these permits for a general description and background of the project, as well as any specific permit conditions or requirements of the project.

The applicant has retained Stantec for civil engineering for the development project. Stantec has prepared the design for the stormwater management facilities and may be contacted at:

Stantec
482 Payne Road
Scarborough, ME 04074
(207) 887.3478

It is recommended the preparer of the plan be contacted with any particular questions on the design intent or similar issues.

The applicable plans and design documents which apply to the project are:

1. Civil Site Plans Prepared by Stantec.
2. The Erosion Control/Sedimentation Control Plan for the project.
3. The Stormwater Management Plan for the project.

A copy of these documents should be retained with this manual.

The proposed design includes pervious pavement and stormwater conveyance lines. There are existing inlets, manholes, outlet control structures, conveyance lines, pretreatment devices, and a vegetated filter that will be utilized for stormwater management for the proposed project.

III. STANDARD INSPECTION/MAINTENANCE DESCRIPTIONS

The following narratives describe the inspection/maintenance provisions for the Stormwater Management system. These O&M procedures will complement scheduled sweeping of the parking lots which is anticipated to occur at least twice per year. Proper O&M is necessary to make sure the system will provide its intended purpose of conveying runoff, removing a substantial amount of the suspended solids, and other contaminants in the stormwater runoff.

A. STORMWATER INLETS

Preface: The success of any stormwater facility relies on the ability to intercept stormwater runoff at the design locations. Stormwater inlets may include catch basins, open culverts, culverts with bar screens, roof scuppers, plaza scuppers, trench drains, and field inlets. Inlets exist throughout the proposed systems.

Inspection: The inspection of inlet points will need to be coordinated with other maintenance items, these include:

- Landscape services
- Building maintenance areas
- Grounds maintenance

The key elements of the inspection are to assure the inlet entry point is clear of debris and will allow the intended water entry.

Maintenance: The key maintenance is the removal of any blockage which restricts the entry of stormwater to the inlet. The removed material should be taken out of the area of the inlet and placed where it will not reenter the runoff collection system. Snow should be removed from inlets



on parking lots or plaza areas. Grass clippings and leaves should be bagged and removed particularly near the yard inlets near the buildings.

Frequency: All inlets should be inspected on a quarterly basis, and after/during significant storm events.

Maintenance Personnel: The maintenance personnel will perform the normal maintenance/ inspections of the inlets and tributary drainage system.

Comments: Maintenance of inlets is critical on this project.



B. TRIBUTARY DRAINAGE SYSTEM

Preface: Stormwater from most of the project will be directed through a conveyance system which transports the flow to a public system within Johnson Road. This conveyance system will be principally overland flow and/or infiltration through porous pavement that discharges to piped drain systems. Most of the sediment that the drainage system is intended to be trapped near the inlets or in pretreatment devices such as an existing Vortech hydrodynamic separator. Maintenance of this system can play a key role in the long-term maintenance costs and the effectiveness of the onsite systems.

Inspection: The tributary drainage system should be periodically inspected to assure that it is operating as intended, and that its carrying capacity has not been diminished by accumulations of debris and sediment or other hydraulic impediments. On piped systems, the inlets must be inspected to ensure the rims are set at the proper elevation to optimize flow entry and are not clogged with debris. The inlet catch basins will be equipped with sumps and hooded outlets which will remove gross floatables and large sediment particles from the flow stream. These must be cleaned on an as-needed basis.

The level of sediment in the sumps or hydrodynamic separator should be checked to assure their effectiveness. Pipelines connecting the inlets should be checked to determine if siltation is occurring. This will be most critical on drain lines laid at minimal slopes. This can usually be accomplished by a light and mirror procedure.

Maintenance: Maintenance of the storm drainage system must assure that it continues to serve its design function on a long-term basis, and that its operation does not transport excessive sedimentation to any downstream BMP or the receiving waters. Elevations on the rim of catch basins should be adjusted as needed to assure optimal water entry. Depending on the frost susceptibility of the soil, the rims may become elevated over time causing flow to circumvent the inlet. If a temporary filter bag has been designated for the inlet during construction, silt or other deleterious materials, can significantly reduce capacity and the bags should be removed with the sediment and replaced during construction. Catch basin cleaning would normally be accomplished with vacuum trucks contracted as a maintenance service for the Development. The removed material must be disposed of at an approved site for such materials.

If sediment in the pipeline is observed, it should be removed. This may be accomplished by hydraulic flushing, or by mechanical means. If hydraulic flushing is used the downstream conditions should be analyzed.

Frequency: The piped drainage system should be inspected on an annual basis. Adjustment of inlet rim elevations should be on an as needed basis. Cleaning catch basin sumps, hydrodynamic separator, and pipelines will depend on the rate of accumulation.

Maintenance/Inspection Responsibility:

Maintenance Personnel: A hired 3rd party maintenance crew as retained by the applicant, their agents or assigns.

Special Services: The owner may elect to contract with an independent agent for cleaning of catch basins, sumps, and pipelines. Remedial source control measures may be performed by the owner or an outside service depending upon the nature of the particular situation.

Comments: Maintenance of inlets and catch basins is of utmost importance to the project to avoid unintended release of sediments or related materials in the runoff flow stream.

C. POROUS PAVEMENT

Preface: The porous pavement collects stormwater runoff from the surface before passing it through a treatment section and discharging into a closed drainage system.

Inspection: The pavement should be inspected regularly to ensure that the surface is not clogged, and that runoff can pass freely through the porous section. The asphalt surface must be inspected for integrity and to ensure rutting or deformation of the surface is minimized.

Maintenance: Any debris should be removed from the pavement surface. If the porous pavement area is holding water in excess of 48-72 hours corrective action is needed. To correct a standing water problem, the following remedial actions are recommended:

1. Vacuum any sediment or debris from the pavement surface on a semi-annual basis
2. Ensure the underdrain system is not clogged with any silt or other materials.
3. Ensure that the porous pavement can pass water freely and drain quickly while handling large amounts of water.

Frequency: The porous pavement should be inspected and vacuumed semi-annually and maintained as needed.

Maintenance/Inspection Responsibility: The Owner or an outside agent is responsible for inspection and maintenance of the porous pavement areas.

D. WATER QUALITY FILTERS (ABOVE GROUND)

Preface: The soil filter is an underdrain system with multi-media aggregates. This section is applicable to the existing underdrained grass soil filter.

Inspection: The soil filter can be inspected visually. A good time for inspection is within one day of a substantial rain event.

Maintenance: The procedures for maintenance are as follows:

Inlets

Inlets to each soil filter area should be kept open and in good working condition. This is particularly important around curb breaks and pavement edges. These locations should be marked on the roadway at the completion of construction to allow for winter snow dam removal. All eroded areas should be repaired.

Initial Turf Maintenance (when applicable)

Grassed soil filters should be allowed to develop for one full growing season post-construction prior to their first mowing or replacement of vegetation. This allows for natural re-seeding of grass seed mixes and establishment of a healthy stand of grass or plant materials.

Long-Term Turf Maintenance (when applicable)

It is preferable to only mow grassed soil filters two to three times per year. While grassed soil filters can be mown during routine lawn maintenance, excessive mowing reduces the viability of grasses and grass roots and can over-compact the surface layer of the soil filter media.

Large Debris

Large debris, trash etc. within the ponding area should be removed on a routine basis.

Erosion in the Soil Filter Area

Any eroded areas should be repaired as soon as practicable.

Weeds in the Soil Filter Area

Periodic weeding of the soil filter area may be necessary, particularly in the landscaped soil filters. Hand weeding is required as the use of herbicides is not recommended.

Surface Mulch Layer (when applicable)

Areas devoid of mulch should be re-mulched by hand. Every year, in the spring, a fresh layer of mulch should be added to the soil filter area.

Sedimentation (or Clogging) of Soil Filter Area

If the soil filter area is holding water for a period longer than 48-72 hours, the soil mix has, more than likely, become clogged with sediment and/or the underdrains have clogged. To correct a standing water problem, the following remedial actions are recommended:

1. Evaluate the drainage area to the soil filter area to identify any potential sources of sediment, such as an erosive condition, that may be contributing to the clogging of the device. If a source is identified, it is recommended that that source be eliminated to the fullest extent practicable before proceeding with the remaining recommendations provided below.
2. Flush the underdrains. Use cleanouts to flush the underdrains. Sediment in the drains may be preventing the soil mix from draining. Make sure to provide a way to capture any flushed sediment before it enters the stream environment or storm drain system downstream of the device. If, after flushing the underdrains, the device continues to hold water, the soil mix may be contaminated. As such, following the guidelines provided below is recommended.
3. Gage the extent of soil contamination. To do this, it is recommended that one or more test pits be dug with a shovel and that the soil layer be evaluated for contamination. Once the levels of contamination have been determined (for example, the top 4" of soil appears to be contaminated), it is recommended that you proceed with the remaining remedial actions.
4. Harvest the plants (when applicable). Care should be taken in the removal and temporary storage of the plants so that as many as possible can be harvested for replanting in the soil filter area once the functioning of the device has been restored sufficiently.
5. Remove the mulch layer.
6. Remove the top few inches of contaminated soil plus an additional 2-inch of soil and replace the removed soil with a clean soil mix in accordance with the soil mix specification applicable to the particular soil filter area.
7. Monitor the functioning of the soil filter area during the next two to three rain events. If the device appears to be draining as intended (e.g., there is no standing water 48-72 following a rain event), proceed with the remaining remedial actions. If the area continues to hold standing

water, then the entire soil filter area soil mix and the underdrains may need to be removed and replaced. Reuse of any undamaged underdrains may be possible once they have been cleaned thoroughly.

8. Replant the harvested plants and replace any plants that were rendered unusable during or following their removal from the soil filter area.
9. Replace the removed mulch layer with fresh mulch.
10. Water the plants in the soil filter for the next two or more weeks unless there is sufficient rainfall. This will help the plants to re-establish themselves.

Frequency: The water quality filter should be inspected semi-annually and maintained as needed.

Applicability: The development has one existing filter.

Snow storage within the filters should be prohibited by Maintenance Personnel.

E. LITTER

Litter should be removed as a matter of course by workers and as part of the grounds maintenance contract.

F. SUMMARY CHECKLIST

The above described inspection and maintenance items have been summarized on a checklist attached hereto as Appendix C.

IV. PROGRAM ADMINISTRATION

A. GENERAL

A reliable administrative structure must be established to assure implementation of the maintenance programs described in the foregoing section. Key factors that must be considered in establishing a responsive administrative structure include:

1. Administrative body must be responsible for long-term operation and maintenance of the facilities.
2. Administrative body must have the financial resources to accomplish the inspection and maintenance program over the life of the facility.
3. The administrative body must have a responsible administrator to manage the inspection and maintenance programs.
4. The administrative body must have the staff to accomplish the inspection and maintenance programs or must have authority to contract for the required services.

5. The administrative body must have a management information system sufficient to file, retain, and retrieve all inspection and maintenance records associated with the inspection and maintenance programs.
6. A qualified post construction inspector shall be retained by the Owner. His duties shall include preparing schedules for the Owner's maintenance, summarizing the results of this maintenance and preparing an annual report on the operation, maintenance, and repair of the stormwater system which must be copied to the City. (The Owner shall be responsible for retaining a separate entity to perform maintenance which cannot be performed by the management of building and property grounds.) This person shall also participate in troubleshooting of the stormwater management system if a problem develops.

If any of the above criteria cannot be met by the entity assigned inspection and maintenance responsibilities, it is likely that the system will fail to meet its water quality objectives at some point during its life. While each of the above criteria may be met by a variety of formats, it is critical to clearly establish the assigned administrative body in a responsible and sustainable manner.

B. RECORD KEEPING

Records of all inspections and maintenance work accomplished must be kept and maintained to document facility operations. These records should be filed and retained for a minimum 5-year time span. The filing system should be capable of ready retrieval of data for periodic reviews by appropriate regulatory bodies. Where possible, copies of such records should also be filed with the designated primary regulatory agency for their review for compliance with permit conditions. Typical inspection and maintenance record forms are attached hereto as Appendix B.

C. CONTRACT SERVICES

In some instances, or at specific times, the Maintenance Personnel may not have the staff to conduct the required inspection and/or maintenance programs as outlined in this document. In such cases, the work should be accomplished on a contractual basis with a firm or organization that has the staff and equipment to accomplish the required work.

The service contract for inspection and maintenance should be formal, well written legal document which clearly defines the services to be provided, the contractual conditions that will apply, and detailed payment schedules. Liability insurance should be required in all contracts.

APPENDIX A

Sample Inspection Logs

**90 JOHNSON ROAD
PORTLAND, MAINE**

STORMWATER MANAGEMENT
WATER QUALITY STORAGE OR WET POND
ANNUAL INSPECTION & MAINTENANCE LOG

FACILITY:		YEAR:	
LOCATION:		CONTRACTOR:	
FUNCTION:		INSPECTOR:	
DATE OF INSPECTION:			
ITEM IDENTIFICATION	DESCRIPTION OF CONDITIONS	MAINTENANCE ACCOMPLISHED	DATE OF MAINTENANCE
GENERAL COMMENTS:			

SAMPLE

**90 JOHNSON ROAD
PORTLAND, MAINE**

STORMWATER MANAGEMENT
SEMI-ANNUAL INSPECTION & MAINTENANCE LOG

SEMI-ANNUAL INSPECT 1.2	FACILITY:
DATE:	LOCATION:
INSPECTOR:	FUNCTION:
SURFACE CONDITION:	
OUTLET CONDITION	

DEVICE/STRUCTURE	EST. DEPTH SED.	REMOVED? Y/N	EST. VOL. CY	WHERE DISPOSED OF	STRUCTURAL CONDITION

CONTROL STRUCTURE:
DESCRIBE CONDITIONS FOUND & MAINTENANCE ACCOMPLISHED:

APPENDIX B

Permits for Project

(To be Added at a Subsequent Time)

APPENDIX C

Summary Checklist Inspection and Maintenance

**Stormwater Management System
Maintenance Program
Summary Checklist**

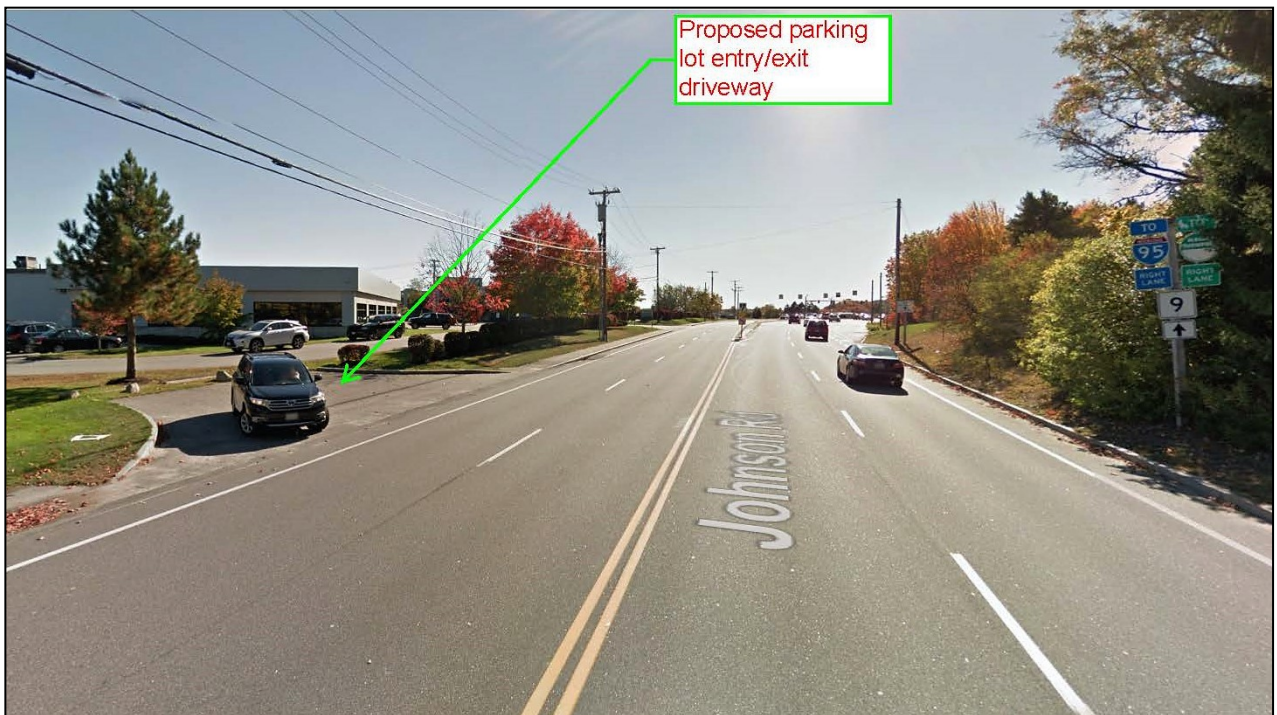
Item	Commentary	Frequency				
		Monthly	Quarterly	Semi-Annual	Annual	Long Term
Stormwater Inlets	Stormwater inlets allow flow entry from a surface swale to a piped system. Entry may or may not be equipped with a bar rack. Inspect entry for debris accumulation. Remove debris to allow unimpeded entry. Lawn clippings and leaves should be removed from yard areas.		X		X Clearing	
Tributary Drainage System	Inspect to assure that the carrying capacity has not been diminished by debris, sediment or other hydraulic impediments.				X	
Porous Pavement	Pavement areas should be inspected and vacuumed semi-annually and maintained as needed.			X		
Water Quality Filters	Filters should be inspected semi-annually and maintained as needed. <u>Snow storage within the filter should be prohibited by Maintenance Personnel.</u>			X		
Litter	Litter should be removed daily.					

TAB 2 – TRANSPORTATION

TRAFFIC

The following is a description of existing and proposed access conditions in the site vicinity:

- The intersection of Johnson Road, Skyway Drive and Jetport Boulevard is fully signalized. Site generated traffic from points west (Gorham/Westbrook) likely uses the intersection to access Jetport Boulevard and the private City Line Drive to access the site.
- The intersection of City Line Drive and Jetport Boulevard is Stop Sign controlled on the City Line Drive leg. Exiting traffic may turn left or right. Eastbound traffic on Jetport Boulevard may turn left into City Line Drive from a center lane and there is a by-pass lane for Jetport bound traffic to continue straight thru, thus minimizing delays on the Jetport Boulevard.
- Site generated traffic from South Portland and Scarborough can turn right onto Jetport Boulevard to access City Line Drive or turn right onto City Line Drive off Johnson Road. This traffic may also turn right into the proposed driveway entrance into the parking area to be constructed at the 68 Johnson Road property. This entrance will utilize an existing curb opening on Johnson Road.



Existing Curb Opening on Johnson Road

Traffic to South Portland/Scarborough will be primarily directed to the signalized intersection where there is a stand-alone left turn lane for SB vehicles onto Johnson Road.

As currently configured exiting vehicles from the proposed parking lot may also turn left onto Johnson Road SB as there are two travels lanes in Johnson Road in this area. City line Drive cannot be used to turn left onto Johnson Road as there is an existing median island prohibiting this movement.

- Traffic from Congress Street (Intown Portland or Westbrook) could turn left into the proposed parking lot entrance off Johnson Road or proceed to the signalized intersection to turn left onto Jetport Boulevard and onto City Line Drive. Traffic from the north (Intown Portland) may also simply turn onto International Parkway at the Congress Street intersection and potentially travel to City Line Drive from the Jetport Direction.
- Exiting traffic from the proposed parking lot, intending to go northbound to Congress Street may also use a proposed exit only drive to be located at an existing curb opening at the far north end of the property. This exiting lane will allow right turn only exiting movements.



Existing Curb Opening to Become Right Turn Only Exit

- The METRO Route #5 travels on Jetport Boulevard in the vicinity of the site. There are bus shelters on both sides of the Boulevard (outbound at DHHS and inbound near the Skyway/Johnson/Jetport Boulevard intersection (runway side of the road)).

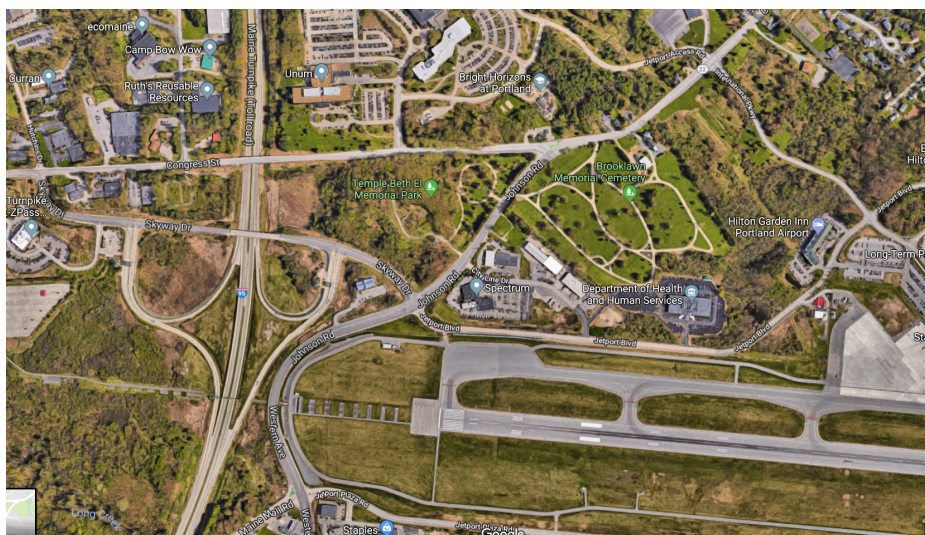
- The proposed building expansion and parking lot will result in an increase of approximately 18,262 SF of space. The following is an estimate of the additional trip generation attributable to the building expansion, assuming that a similar trip generation will apply for that portion of the building that already exists:

Description	Average Rate ¹	Estimated Additional Trips
AM Peak Hour	1.55 /1,000 SFGFA	28 trips
PM Peak Hour	1.49 / 1,000 SFGFA	27 trips



Jetport Boulevard Inbound Bus Shelter (Metro Route 5)

The South Portland Bus service Route 24 goes thru the intersection of Maine Mall Road/Western Ave (near Burlington Coat Factory)



Vicinity Map

¹ Per ITE Trip Generation 7th Edition LUC 710

Section 14-526. Site Plan Standards.

The following statements are provided in accordance with the submission checklist Tab 2 and Section 14-526 of the ordinance.

(a) Transportation Standards

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*

1. Impact on Surrounding Street Systems:

The development will fit in with the existing street system as it will continue to use the existing access locations off Johnson Road and City Line Drive. Based on the limited intensity of use, the project is expected to have an insignificant impact on traffic in the neighborhood. Vehicle and loading circulation to the building are accounted for on the plan.

2. Traffic Impact Study

A full traffic impact study has not been completed at this time on the basis that the proposed trip generation and existing robust access conditions do not warrant a study in our opinion. Much of the site is currently developed and in the past has generated traffic into the surrounding street system. The current tenant, Charter Communications, has decreased operations and staffing at the project location, thus in the more recent period, site generated traffic has decreased.

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*

3. Access and Circulation:

a. Site Access and Circulation.

- (i) Access to the site is provided by a single two way driveway along Johnson Road and two full driveways along City Line Drive. A single right turn only exit drive will also be provided on Johnson Road. One original site curb cut on Johnson Road will be closed. Based on the primary parking field layout towards the north side of the site, we believe that adequate site access and circulation is provided.
- (ii) Access and egress have been designed to avoid conflict with existing turning movements and traffic flows.

(iii) The site does not feature drive up services as mentioned in this requirement.

(iv) Site access has been designed so as not to impede potential future connection to adjacent streets.

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*

2. Access and Circulation:

b. Loading and Servicing:

- (i) Adequate provisions are made at the site for periodic loading from panel trucks to service two overhead doors at the ground level. The site provides clear area in front of the solid waste enclosures for servicing and loading vehicles.

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)*

2. Access and Circulation:

c. Sidewalks:

- (i) The site benefits from an existing sidewalk system along Johnson Road and the Jetport Boulevard. Based on the lower traffic volumes on City Line Drive, it is not felt that a sidewalk is necessary along this route. The building improvements include a sidewalk along the perimeter of the building space and at the main building entrances.

Public Transit (14-526 (a) 3), if applicable

- *Existing available transit services*
- *Proposed site plan design details, such as easement, pad base, and shelter*

3. Public Transit Access.

- a. The proposed project is not residential
- b. Two transit shelters are located less than ¼ mile from the site each.
- c. The two transit shelters are located on the Jetport Boulevard sidewalk.
- d. A waiver of any further transit related activities is requested given the proximity of existing transit measures to the development.

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*

4. Parking.

a. Location and Required Number of Vehicle Parking Spaces.

- (i) Off-street parking is provided on the site to accommodate the proposed uses. Parking supply exceeds that which is required by the code for office use.
- (ii) The Applicant has not prepared a TDM strategy, as it is not applicable until a defined tenant is in place.
- (iii) The Applicant proposes the amount of parking which is appropriate for the anticipated uses of this site.
- (iv) Parking spaces and aisles have been designed to meet the dimensional requirements of the Technical Manual.
- (v) All parking lots will be paved.

c. Motorcycles and Scooter Parking.

- (i) Two spaces are provided for motorcycle/scooter parking.

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)*

4. Parking.

b. Location and Required Number of Bicycle Parking Spaces.

- (i) Bicycle parking for up to ten bikes is identified on the plan. Based on a parking count of 188 spaces at least 24 bicycle spaces are required.
- (ii) The applicant is requesting a waiver to provide only 10 bike spaces when 24 are required.

Snow Storage (14-526 (a) 4 d)

- *Management plan for snow removal and locate snow storage areas on plans*

4. *Parking.*

d. *Snow Storage.*

(i) Snow storage management will employ two strategies:

- a. Limited snow storage of the parking areas (this will suffice for small storm events and temporary storage only).
- b. Snow removal and off-site disposal. The applicant owns all the land off City Line Drive and they have ample area to store snow as necessary on the property.

Traffic Demand Management (TDM) (14-526 (a) 5), if applicable

- *Develop TDM with Trip Reduction Targets and Strategies*

5. *Transportation Demand Management (TDM).*

- a. The applicant has not completed a TDM plan as they do not currently have a tenant for the proposed office space. Once a tenant is identified they will work with the tenant to identify and implement possible TDM strategies. The site's proximity to transit is an advantage as is the access to the Turnpike and regional transportation corridors.

ATTACHMENT C

ZONING ASSESSMENT

See attached Zoning Analysis Table and additional information provided in cover letter.


ZONING ANALYSIS Relevant Zone(s) B4-Commercial Corridor Zone
All Projects:

	Required	Proposed
Lot Size	10,000 SF	202,554 SF
Area Per Dwelling Unit	N/A	N/A
Minimum Street Frontage	60'	447.82'
Front Yard Minimum	20'	41'
Front Yard Maximum	N/A	N/A
Rear Yard	20'	278'
Yard Right	12'	77'
Yard Left	12'	273'
Side Street Setback	12'	N/A
Step Back	N/A	N/A
Maximum Lot Coverage	N/A	N/A
Minimum Lot Coverage	N/A	N/A
Maximum Height	65'	57'-5"
Open Space	N/A	N/A
Maximum Impervious Area	80%	45.7%
Pavement Setback	N/A	N/A
Floor Area Ratio	0.65	0.34
Off Street Parking Spaces	99	188
Loading Bays	1	0
Other 1		
Other 2		
Other 3		

Planned Residential Unit Developments (PRUD) Requirements

NOT APPLICABLE

	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):			

ATTACHMENT D

WAIVER REQUESTS

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.
14-526 Site Plan Standards (a) Transportation Standards 3. Public Transit Access:	d. Waiver: All or some of this standard may be waived if the Reviewing Authority determines one or more of the following: (i) That some or all of the required improvements cannot reasonably be made due to site constraints and/or insufficient right of way width; or (ii) That the development is not anticipated to generate public transit usage due to particular characteristics or proposed use of the development.	A waiver of any further transit related activities is requested given the proximity of existing transit measures to the development.	Two transit shelters are located less than ¼ mile from the site each and the two transit shelters are located on the Jetport Boulevard sidewalk. A waiver of any further transit related activities is requested given the proximity of existing transit measures to the development.
14-526 Site Plan Standards (a) Transportation Standards 4. Parking: b. Location and Required Number of Bicycle Parking Spaces	ii. Waiver: The reviewing authority may reduce the required number of bicycle parking spaces if it is determined, based on evidence submitted by the applicant, that the proposed development is expected to generate reduced demand for bicycle parking due to characteristics or uses such as elderly or disabled persons housing or industrial uses located in outlying areas.	The applicant is requesting a waiver to provide only 10 bike spaces when 24 are required.	Bicycle parking for up to ten bikes is identified on the plan. Based on a parking count of 188 spaces at least 24 bicycle spaces are required.

<i>14-526 Site Plan Standards</i> <i>(b) Environmental Quality Standards</i> <i>2. Landscaping and Landscape Preservation:</i> <i>a. Landscape Preservation</i>	(iv) Waiver: Where the applicant can demonstrate that preservation of existing vegetation would compromise development of the site, the Reviewing Authority may permit the substitution of replacement landscaping in other areas of the site, and/or a financial contribution to the City of Portland Tree Fund for an amount proportionate to the cost of trees removed, as described below: (a) For each tree required to be preserved that is removed and is greater than 16" in caliper DBH, two (2) replacement trees of a species identified on the City of Portland Recommended Tree List shall be planted on the site as detailed in Section 4 of the Technical Manual). (b) For each tree required to be preserved that is removed and is between ten (10) and sixteen (16) inch DBH, one (1) replacement tree of a species identified on the City of Portland Recommended Tree List shall be planted on the site as detailed in Section 4 of the Technical Manual). (c) Where the planting of replacement trees on the site is not feasible, the applicant shall contribute an amount proportionate to the cost of required replacement trees to the City of Portland Tree Fund, as detailed in Section 4 of the Technical Manual.		Landscaping has been provided for on the site plan. This includes perimeter tree plantings to supplement existing landscaping, primarily along the Johnson Road frontage. Where necessary, the owners will provide grass cover to stabilize non-gravel or non-paved surfaces and add a few street trees for landscaping. Protection measures will be made for existing vegetation during construction.
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Stantec Consulting Services Inc.

482 Payne Road, Scarborough Court, Scarborough, ME 04074

July 9, 2018

Mr. Pat Cloutier
Water Resource Protection Director
City of South Portland
PO Box 9422-111 Waterman Drive
South Portland, Maine 04106

**Subject: Proposed Building Expansion
90 Johnson Road, Portland, Maine
Request for Ability to Serve Letter**

Dear Pat:

Transport Leasing Corp. have retained our office to prepare site plans and assist with permitting for a building expansion on their property (Map 214A, Block A, Lots 001 & 003) in the City of Portland. The existing 24,249 SF building has been leased by Charter Communications (aka Time Warner Cable) for a long period of time, however that lease condition is soon running out. The existing building contains a combination of office and warehouse space. The owner is now seeking to complete renovations and additions to the building that would increase the gross leasable area to around 42,500 SF of Class A office space. This will involve second and third level building addition space as well as new parking lot development. We understand that the existing building is presently serviced by a sanitary line that connects to a line in Johnson Road that ultimately ties into the South Portland municipal system.





Pat Cloutier
July 9, 2018
Page 2

On behalf of the developer, we are requesting a letter affirming that the proposed project can continue to be served by the municipal sewer system that we understand is part of the City of South Portland collection system.

The project will consist of interior renovations to the existing building that currently has a total size of approximately 22,019 square feet. Additional office space of approximately 20,492 SF will be added to the building. A tenant has not yet been determined however it is predicted that the employee count will be approximately 125 persons to 150 persons. Assuming 20 gpd/employee¹, the estimated flow is 3,000 gpd. We are not aware of the historic water use and wastewater generation for the site but assume the proposed activity will result in an increase to wastewater generation. A copy of the site plan has been attached to this letter for reference. The PWD records indicate a domestic water service line off Johnson Road currently serving this building. We understand at least one 4" or 6" sanitary sewer service line serves the building. The existing building's utility services will remain and continue in their current use and capacity. Based on a limited increase in daily activity and peak use we trust that the existing sewer system has adequate capacity to continue to serve this project. We have submitted our Site Plan Application to the City of Portland Planning Authority and would appreciate your attention to this request in a timely manner.

If you need any further information regarding this review, please contact our office.

Regards,

STANTEC CONSULTING SERVICES INC.

Stephen R. Bushey, P.E.

Associate

Tel: 207-887-3478

Stephen.bushey@stantec.com

Attachments

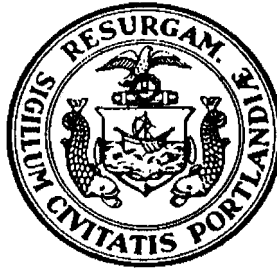
c: Portland Planning Authority

V:\2108\active\210801617\civil\admin\permitting\local\level 3 site plan\lfr_Cloutier wastewater 20180709.docx

¹ See Table 4C Design Flows for other Facilities from Maine Subsurface Disposal Rules

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: June 26, 2018

1. Please, Submit Utility, Site, and Locus Plans.

Site Address: 90 Johnson Road

Chart Block Lot Number: Tax Map 214A/Block A/Lots A001 & A003

Proposed Use: Office Building

Previous Use: Rail Yard

Existing Sanitary Flows: _____ GPD

Existing Process Flows: _____ GPD

Description and location of City sewer that is to receive the proposed building sewer lateral.

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: Barbara Barhydt Phone: 207-874-8725

Owner/Developer Name: Transport Leasing Corp. - Mark Sanborn

Owner/Developer Address: PO Box 11054 - Portland, ME 04104

Phone: 207-774-1067 Fax: _____ E-mail: mark@abcorental.com

Engineering Consultant Name: Stephen Bushey, P.E.

Engineering Consultant Address: Stantec, 482 Payne Rd, Scarborough, ME 04074

Phone: 207-887-3478 Fax: 207-883-3376 E-mail: stephen.bushey@stantec.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: _____ GPD

Peaking Factor/ Peak Times: Not Applicable

Specify the source of design guidelines: (i.e. "Handbook of Subsurface Wastewater Disposal in Maine," "Plumbers and Pipe Fitters Calculation Manual," X Portland Water District Records, Other (specify) _____

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.

4. Please, Submit External Grease Interceptor Calculations.

Total Drainage Fixture Unit (DFU) Values: Not Applicable

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: Not Applicable 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.

September 5, 2018

Ms. Barbara Barhydt/Ms. Shukria Wiar
Planning and Development Department
City of Portland
389 Congress Street
Portland, ME 04101-3509

Subject: 90 Johnson Road
Applicant – Transport Leasing Corp.
Preliminary Traffic Comments from Tom Errico Dated August 24, 2018 and
Engineering comments from Lauren Swett dated August 28, 2018
Letter of Response #1

Dear Barbara:

On behalf of Transport Leasing Corp. (Applicant), Stantec has received and reviewed the comments from Tom Errico dated August 24, 2018 and Lauren Swett dated August 28, 2018 associated with the proposed above referenced project. For ease of reference, we have repeated the comments below in *italics* followed by our responses.

PRELIMINARY TRAFFIC COMMENTS FROM TOM ERRICO DATED AUGUST 24, 2018

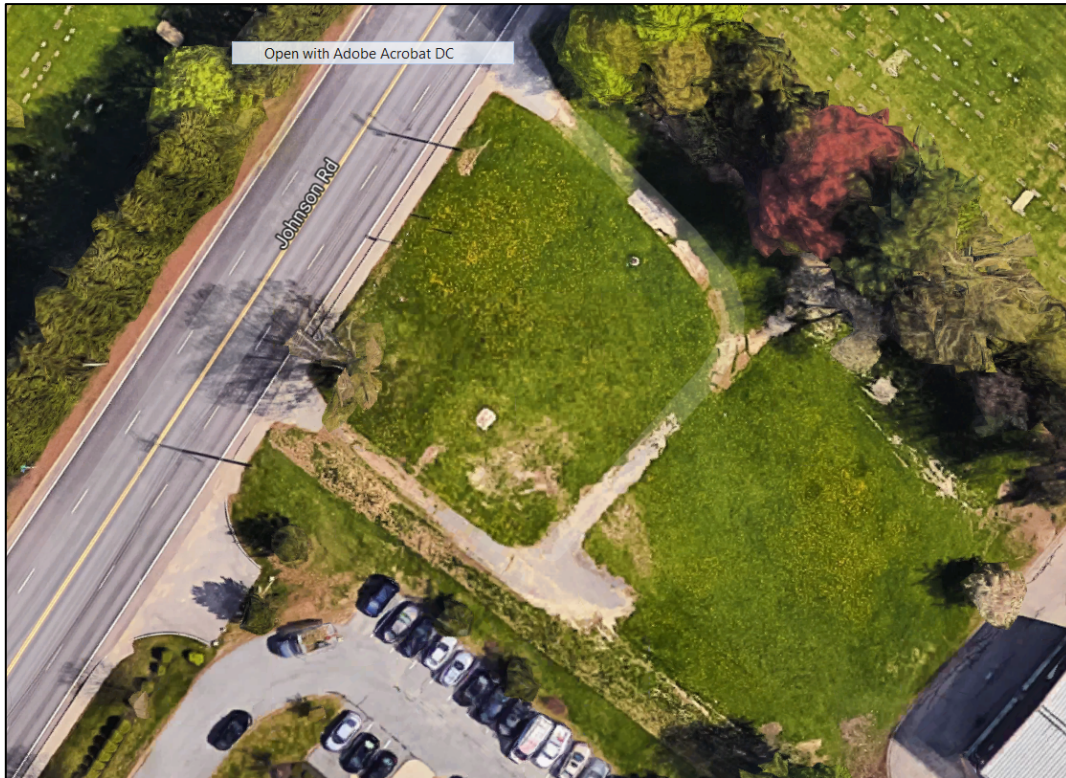
- *The Applicant will be required to conduct a traffic impact study for the project. The key issue to be evaluated is the creation of a full movement driveway on Johnson Road, which has historically experienced safety problems. I would suggest that we schedule a meeting to identify the specific scope of the study.*

Response:

We are amenable to an immediate meeting to discuss the driveways. We note that the proposed driveways are already in existence but are not active, as shown in the image below. We are also interested in understanding the scope of study that is necessary for the proposed development. The owner/applicant is currently seeking approvals for the proposed building expansion, although they do not have a specific user/tenant(s) on board at this time. They will not construct the building expansion until they have sufficient tenant(s) in place to support the development. They will however construct the proposed parking lot as soon as the site plan approval is in place. A short-term use of the parking area is proposed that involves using the lot for supplemental long-term parking at the Jetport. The owner has held discussions with Jetport representatives and there appears to be a need for additional long-term parking capacity. The owner is amenable to discussing the use of the lot and how that might be controlled if necessary until the actual building expansion takes place.



Ms. Barbara Barhydt/Ms. Shukria Wiar
September 5, 2018
Page 2



- *The Applicant should provide information in support of the two driveways on Johnson Road. This item would be part of the traffic study.*

Response:

The two driveways currently exist, and it is the applicant's goal simply to begin their use. A third existing driveway to the former house at 68 Johnson Road will be eliminated from the site and the curb opening closed and new sidewalk constructed. Given the nature of the proposed parking lot the more easterly opening would function as a full movement driveway allowing both left and right turn entering and exiting movements. We note that the City Line driveway intersection with Johnson Road allows only right turn in and out movements, as there is an existing raised median in City Line Drive, prohibiting left turns in/out at that intersection.

- *I am concerned about the internal intersection near the main Johnson Road driveway. The Study would need to confirm vehicle backups into Johnson Road will not occur.*

Response:

If there is a concern about left turns into the proposed easterly driveway from Johnson Road, the applicant is amenable to modifying the driveway to allow only right turns in, thus any approaching traffic on eastbound Johnson Road will be required to proceed to the traffic signal at Jetport Blvd and turn left onto the Blvd and proceed to the City Line drive intersection.



Ms. Barbara Barhydt/Ms. Shukria Wiar
September 5, 2018
Page 3

- The Applicant did provide a trip generation estimate and that projection seems inconsistent with the amount of parking provided. Trip generation methods will be discussed at the suggested scoping meeting.*

Response:

The following estimates are derived from the 10th Edition ITE Trip Generation manual and are associated only with the 22,064 SF building addition:

Land Use Category	Trips – Weekday Avg (equation)	Trips – AM Peak Hour Avg (Equation)	Trips – PM Peak Hour Avg (Equation)
710 General Office	215 (245)	26 (47)	25 (27)
715 Single Tenant Office Building	248 (NA)	39 (54)	38 (62)
770 Business Park	274 (950)	9 (NA)	9 (NA)

We note that the existing building has been occupied for many years and the long-term tenant has been Spectrum (aka Time Warner Cable (TWC)). TWC occupies the building with various uses, including offices, call-center, training and warehouse space. TWC may or may not continue its tenancy in the building. Currently they have a lease period that remains in effect for another 4.5 years.

- Parking lot aisle widths do not meet City standards and the Applicant shall provide supporting documentation as part of a formal request for a waiver.*

Response:

The applicant requests a waiver of the Technical Standards under Section 1.14 Transportation Systems and Street Design requiring drive aisles to be 24' wide. The applicant is requesting the drive aisles be constructed at 22' wide. The parking lots will be low turnover and the frequency of vehicle movements is expected to be low, unlike in a retail or other high turnover location. The placement of longitudinal landscape islands to separate the parking modules also allows for vehicles to extend into the full depth of the parking spaces, thus minimizing the amount of vehicular overhang into the drive aisles and thereby supporting the narrower drive aisle width in our opinion.

- Although not required by City ordinance, in my professional opinion a sidewalk on City Line Drive to Jetport Boulevard is needed to provide a safe walking connection to the sidewalk on Jetport Boulevard. I have observed pedestrians walking on City Line Drive, particularly during mid-day time periods.*

Response:

City Line Drive is an existing private drive that is approximately 40 feet wide or greater for most of its length. There are curbed islands on the south side of the drive and an uncurbed edge of pavement on the north side of the drive. There are existing sidewalk ramps at



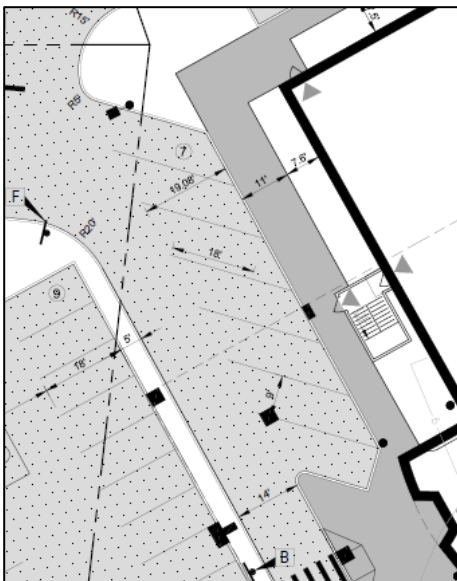
Ms. Barbara Barhydt/Ms. Shukria Wiar
September 5, 2018
Page 4

the Johnson Road intersection, associated with the Johnson Road sidewalk. The Johnson Road sidewalk extends to the intersection of Jetport Boulevard/Skyway Drive and Johnson Road, where there are pedestrian crossing signals associated with the traffic signal system. These allow sidewalk users to cross to the south side of Jetport Boulevard where a sidewalk runs the length of Jetport Boulevard to the Jetport. There is no sidewalk on the north side of Jetport Boulevard, thus any sidewalk extending to the City Line Drive/Jetport Boulevard intersection would require a midblock cross walk of Jetport Boulevard, which we consider less desirable than the pedestrian signal-controlled crossing at the Johnson Road signalized intersection. In addition, City Line Drive has a large number of curb or driveway openings along its length, thus the opportunity for any traditional raised sidewalk condition is minimized. As noted in the comment, pedestrians do frequently simply walk along the edge of City Line Drive and at a 40' road width, the paved surface seems to have ample area to accommodate the infrequent vehicle movement and pedestrian movements. The traffic volume on City Line Drive is low, thus, like many low volume road systems, pedestrian use along the road edge is considered acceptable and a low safety hazard in our opinion. For these reasons we believe that a sidewalk along this private drive is not necessary.

- *The site plan notes back in angle parking on the north side of the building. Dimensions should be provided for these spaces and confirmation that this is the parking configuration proposed.*

Response:

The reverse entry angled parking is dimensioned as shown below. It is the applicant's intent to have vehicles reverse into these parking spaces as this is becoming more common for users to park vehicles in this manner. It is considered a safety measure that helps reduce vehicle conflict for parked vehicles needing to reverse into any oncoming vehicles in the drive aisle, when leaving their parking space.





Ms. Barbara Barhydt/Ms. Shukria Wiar
September 5, 2018
Page 5

- *The Applicant should provide information on parking and circulation interaction with the abutting 52 City Line Drive site.*

Response:

The abutting site at 52 City Line Drive contains warehouse space and Maine Lobster Now, an online lobster processor and shipping company. The warehouse and Maine Lobster Now are both very low traffic volume producers. Maine Lobster Now has less than 20 employees and their hours of operation are typically 7 a.m. to 8 p.m. Maine Lobster also uses the warehouse area of the building for storage. 52 City Line Drive was previously used by The East Point Christian Church for worship services on Sundays, however that use is no longer active at this location, since they have relocated to Clarks Pond.

STORMWATER COMMENTS FROM LAUREN SWETT, WOODARD & CURRAN DATED AUGUST 28, 2018

- *Portions of the project area are located within the Long Creek Urban Impaired Stream Watershed. The Urban Impaired Stream Standard should be addressed.*

Response:

The Owner/Applicant has previously made improvements to the site, the private way (City Line Drive) and the adjacent lot to ensure that stormwater discharge is not tributary to the Long Creek Watershed. The area that previously was within the watershed is now piped to a grassed underdrained soil filter that discharges to the public storm drain system in Johnson Road, which ultimately outfalls into the Stroudwater River and then into the Fore River. All new development will maintain existing drainage patterns and therefore will also be tributary to the Stroudwater River and Fore River and not within the Long Creek watershed.

- *The HydroCAD model for the porous pavement sections includes varied-sized vertical orifices. Provide details of the structures/pipes showing the installation of these orifices. Maintenance of the orifices should be specifically addressed within the Operations and Maintenance Manual.*

Response:

Details describing orifice installation have been added to Plan Sheet C-8.2. A section regarding orifice maintenance has been added into the Operations and Maintenance Manual that accompanies this response letter.

- *It is noted that some of the pipes within the porous pavement system have less than 3 feet of cover and may be susceptible to freezing. That said, the entire stormwater system will be impacted by freezing conditions, and snow/ice cover. The Applicant should provide some discussion of where stormwater flow will go in the event that the system is frozen or clogged and ensure that it will not have an impact on adjacent properties and building.*



Response:

The porous section is designed as a granular section and should promote drainage. Therefore, it should not be impacted by freezing conditions. Examples of this type of design functioning properly can be observed throughout the region, with an example as close by as the State of Maine DHS building located off Jetport Boulevard.

- *There is a small amount of snow storage provided adjacent to the porous pavement parking. This space is immediately next to the abutting cemetery property which appears to have trees along it's boundary. The snow storage includes some areas of proposed steep slope. Snow clearing will be important to the functionality of the stormwater system. It is anticipated that snow removal will be required.*

Response:

The owner typically maintains the yard areas in the winter, otherwise an outside entity will be hired to maintain the parking lot, including snow removal. The maintenance of the proposed development will likely be included in the maintenance program that has been taking place at the existing property for many years. In severe cases there may be the need to move snow from the property. Snow storage will not occur on any adjoining property not owned by the applicant.

- *The Applicant shall submit letters to request utility capacity and response letters confirming ability to serve the proposed development and adequacy of the existing sewer service should be submitted to the City upon receipt. It is noted that the project is serviced by sewer from the City of South Portland.*

Response:

The City of South Portland has provided the accompanying letter indicating their capacity to continue to provide sanitary wastewater treatment.

- *A stormwater maintenance agreement with the City of Portland will be required.*

Response:

The accompanying draft Stormwater Maintenance agreement is offered for your review. If acceptable a final document will be executed and recorded.



Ms. Barbara Barhydt/Ms. Shukria Wiar
September 5, 2018
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If you have any questions with the information being submitted, please contact our office.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Stephen R. Bushey, P.E.
Associate
Phone: (207) 887-3478
Fax: (207) 883-3376
stephen.bushey@stantec.com

c: Mark Sanborn, Transport Leasing Corp.

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Stantec Consulting Services Inc.

482 Payne Road Scarborough Court, Scarborough ME 04074-8929

September 20, 2018

Ms. Barbara Barhydt/Ms. Shukria Wiar

Planning and Development Department
City of Portland
389 Congress Street
Portland, ME 04101-3509

**Subject: 90 Johnson Road
Applicant – Transport Leasing Corp.
Supplemental Information
Letter of Response #2**

Dear Shukria and Barbara:

On behalf of Transport Leasing Corp. (Applicant), Stantec has prepared the accompanying revised phasing plans reflecting the applicant's objectives. Basically, the proposal is as follows:

- Phase 1 work which the applicant is seeking to commence immediately, involves the construction of 85 parking spaces to be primarily located on the property at 68 Johnson Road. This is a former residential house lot that currently lies vacant. The parking lot will be constructed to provide for overflow parking capacity for the Portland Jetport. We are in the process of obtaining written evidence from Paul Bradbury outlining the Jetport's need for available parking near the Jetport, to accommodate for peak periods and ongoing construction that may temporarily displace long and short-term passenger parking, rental company parking etc. During peak periods it has been necessary in the past to have long-term and PWM employee parking provided at the City-owned property off the end of District Road off outer Congress Street. The accompanying phase 1 plan depicts the construction of 85 parking spaces that will be accessed from Johnson Road from the existing curb opening located just northeast of the City Line Drive/Johnson Road intersection. A right turn exit only driveway will also be provided. This exit only is located within an existing curb opening that served the former residence at the property. The parking lot will not be connected to the existing uses off City Line Drive during this Phase.

Because the parking lot will be used for only interim Jetport overflow parking we believe that no further traffic analysis is required for this development phase. The lot will be maintained by Transport Leasing and its use will be limited to only use by the Jetport until such time that the Building expansion in Phase 2 occurs. As outlined in the original submission materials, the parking lot will be constructed as a porous pavement surface, like the Dept of Human Services site nearby, and the drainage associated with the lot will ultimately flow into the Johnson Road storm drain system that ultimately discharges to the Stroudwater River, off Congress Street east of the site.

- Phase 2 will consist of the building expansion and renovations to the existing building at 90 Johnson Road. At this time there is no specific tenant associated with this building work, so the timing of this possible expansion is unknown. The applicant is



Ms. Barbara Barhydt/Ms. Shukria Wiar
September 20, 2018
Page 2

amenable to preparing a full traffic study and if necessary a Traffic Movement Permit once a tenant user(s) is identified and in advance of the applicant seeking a Building permit. They are aware that this may require reappearing before the Planning Board. We are also aware that the City may revisit access conditions including the drives off Johnson Road as well as site access from City Line Drive at that time. Ultimately it remains the applicant's goal to continue full service use of the existing southerly Johnson Road Drive and allow for right turn exiting movement from the existing northerly drive off Johnson Road. Once a tenant(s) is identified it will be possible to evaluate the overall Johnson Road access conditions then also including the placement of the existing median, the City Line Drive connection/operations, and the Jetport Boulevard signalized intersection.

On behalf of Transport Leasing, we must emphasize the importance of the Phase 1 construction timing. The owner has Shaw Bros. Construction prepared to commence the work immediately, thus it is imperative that at least the Phase 1 approval be granted as expeditiously as possible. We appreciate the City's willingness to assist in that regard.

If you have any questions with the information being submitted, please contact our office.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Stephen R. Bushey, P.E.
Associate
Phone: (207) 887-3478
Fax: (207) 883-3376
stephen.bushey@stantec.com

c: Mark Sanborn, Transport Leasing Corp.

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You're on your way.

September 20, 2018

Mark Sanborn
TLC Property Management
58 Lowell Junction Road
Andover, MA 01810

Paul H. Bradbury, P.E.
Airport Director

Zachary R. Sundquist, A.A.E.
Assistant Airport Director

Dear Mr. Sanborn:

The Portland International Jetport has seen significant passenger growth this year of 13.6% year to date with record passenger volumes from April through August. August alone was up 25.4% over last year, setting an all-time single month record of 255,330 total arriving/departing passengers.

I mention this passenger growth relative to our recent conversation of your plans to develop a private parking lot near the airport campus along Jetport Boulevard this fall. You noted this lot would not be immediately occupied under your development plans. Our passenger growth has caused some on campus parking capacity constraints that we are now working to address. We will be opening our discount parking lot on District Road full time this fall to increase available parking. Your proposed lot could provide welcome additional parking capacity for the Jetport in the short term. The location is ideal since our discount lot shuttle operation already passes this site on the way to District Road.

I look forward to discussing this opportunity further as your project is developed.

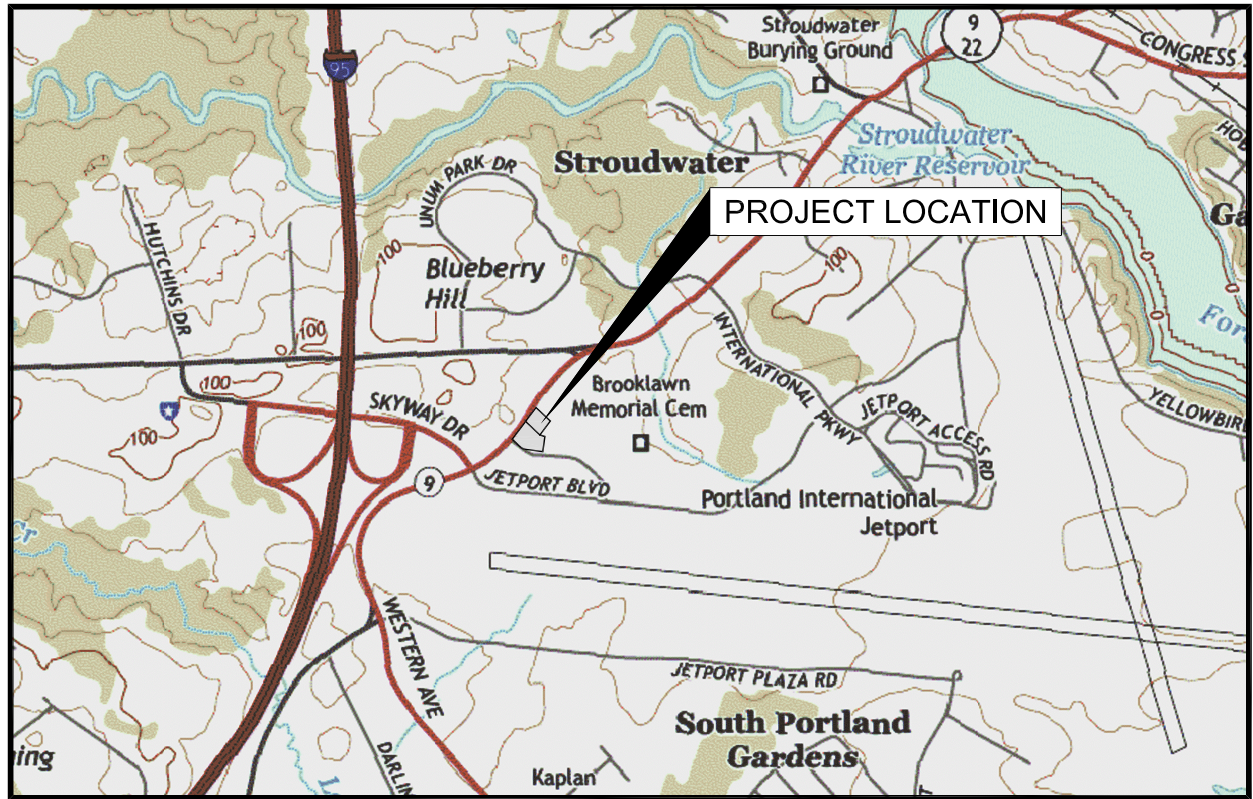
Best regards,

Paul Bradbury
Airport Director
Portland International Jetport

cc: Stephen Bushey, Stantec Consulting

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PROJECT PARCEL SITE CITY OF PORTLAND TAX ASSESSOR'S MAP, LOT & BLOCK NUMBERS			
MAP	BLOCK	LOTS	CCRD
214A	A	A-1	BOOK 2960, PAGE 848
214A	A	A-2	BOOK 7111, PAGE 250
214A	A	A-3	BOOK 34653, PAGE 201



LOCATION MAP
N.T.S.

OWNER/APPLICANT:
TRANSPORT LEASING CORP.
58 LOWELL JUNCTION ROAD
ANDOVER, MA 01810

INDEX

- C-1.0 COVER SHEET, GENERAL NOTES AND LEGEND
C-2.0 BOUNDARY SURVEY PLAN (THIRD AMENDED SUBDIVISION PLAN BY OWEN HASKELL, INC.)
C-2.1 PHASE 1 EXISTING CONDITIONS PLAN & DEMOLITION PLAN
C-2.2 PHASE 2 EXISTING CONDITIONS PLAN & DEMOLITION PLAN
C-3.0 PHASE 1 SITE LAYOUT & UTILITY PLAN
C-3.1 PHASE 2 SITE LAYOUT & UTILITY PLAN
C-4.0A PHASE 1 GRADING & DRAINAGE PLAN
C-4.0B PHASE 2 GRADING & DRAINAGE PLAN
C-4.1 STORMWATER MANAGEMENT PLAN - SHEET 1 OF 2
C-4.2 STORMWATER MANAGEMENT PLAN - SHEET 2 OF 2
C-5.0 PHASE 1 EROSION CONTROL PLAN
C-5.1 PHASE 2 EROSION CONTROL PLAN
C-6.0 FULL DEPTH BOX CUT ASPHALT PLAN
C-7.0 LANDSCAPE PLAN
C-8.0 DETAILS
C-9.0 DETAILS
C-10.0 EROSION AND SEDIMENT CONTROL NOTES
C-11.0 PRE WATERSHED PLAN
C-12.0 POST WATERSHED PLAN
E-0.1 SITE LIGHTING ILLUMINANCE CALCULATION PLAN
E-0.2 SITE LIGHTING ILLUMINANCE CALCULATION STATISTICS
E-1.1 ELECTRICAL SITE PLAN - 1
E-1.2 ELECTRICAL SITE PLAN - 2
E-1.3 ELECTRICAL DETAILS

PREPARED BY

CIVIL ENGINEER:
STANTEC CONSULTING SERVICES, INC.
482 PAYNE ROAD, SCARBOROUGH COURT
SCARBOROUGH, MAINE 04074
(207) 883-3355
ATTN: STEPHEN BUSHEY
EMAIL: STEPHEN.BUSHEY@STANTEC.COM

SURVEYOR :
OWEN HASKELL
390 U.S. ROUTE 1, UNIT 10
FALMOUTH, MAINE 04105
(207) 772-0424

ARCHITECT :
ALPHA ARCHITECTS
17 CHESTNUT ST.
PORTLAND, ME 04101
(207) 761-9500
MARK@ALPHAARCHITECTS.COM

LIGHTING/ELECTRICAL:
BARTLETT DESIGN INC.
942 WASHINGTON ST.
BATH, ME 04530
(207) 443-5447

I HEREBY ACKNOWLEDGE THAT THESE PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECT SUPERVISION, AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MAINE AND THAT I AM COMPETENT TO PREPARE THIS DOCUMENT.

JOHNSON ROAD PROPERTY

90 JOHNSON ROAD

PORTLAND, MAINE

SITE PLAN APPLICATION SUBMISSION

FOR PROPOSED BUILDING EXPANSION

AND PARKING AREA

UTILITIES

WATER
PORTLAND WATER DISTRICT
ATTN: ROBERT BARTELLS
225 DOUGLASS STREET,
P.O. BOX 3553
PORTLAND, MAINE 04104-3553
(207) 774-5961 EXT. 3197
RBARTELLS@PWD.ORG

SEWER

PORTLAND SANITARY DISTRICT
ATTN: BRAD ROLAND
55 PORTLAND STREET
PORTLAND, MAINE 04101
(207) 874-8300

ELECTRIC

CENTRAL MAINE POWER COMPANY
ATTN: JAMIE COUGH
162 CANCO ROAD
PORTLAND, MAINE 04103
(207) 842-2367 (OFFICE)
(207) 626-4082 (CELL)
JAMIECOUGH@CMP.CO.COM

GAS

ATTN: RICK BELLEMARE
NORTHERN UTILITIES, INC.
1075 FOREST AVENUE
PORTLAND, MAINE 04103
(207) 797-8002, EXT.6247

TELEPHONE

FAIRPOINT COMMUNICATIONS
ATTN: SCOTT DERRIG
5 DAVIS FARM ROAD
PORTLAND, MAINE 04103
(207) 797-1842 (OFFICE)
SDERRIG@FAIRPOINT.COM

CABLE TV

TIME WARNER CABLE
ATTN: MARK PELLETIER
118 JOHNSON ROAD
PORTLAND, MAINE 04102
(207) 546-0962

FIRE ALARM

PORTLAND FIRE DEPT.
CENTRAL FIRE STATION
CONGRESS STREET
PORTLAND, MAINE 04101
(207) 8874-8300

DIG SAFE
1-800-225-4977

PERMITS

LOCAL
LEVEL III SITE PLAN APPROVAL
DELEGATED REVIEW OF
STORMWATER MANAGEMENT

GOVERNING BODY
CITY OF PORTLAND PLANNING AUTHORITY
4TH FLOOR CITY HALL
389 CONGRESS STREET
PORTLAND, MAINE 04101

STATUS
SUBMITTED 7/9/2018

LEGEND

EXISTING	DESCRIPTION	PROPOSED
--- --	ABUTTING PROPERTY LINE / R.O.W. LINE	
JOHN N/F G. OWNER 1111/222	PROPERTY OWNER NAME & DEED INFO.	
- . - . - .	EASEMENT LINE	- - - - -
● IPF	BOUNDARY MONUMENTATION	● ■
OP 3/4	SURVEY CONTROL POINT	
	CONSTRUCTION CENTER LINE	---
	SETBACK LINE	---
	EDGE OF PAVEMENT	---
TYPE AS NOTED	CURB	--- SEE SITE LAYOUT PLAN ---
	BUILDING	
	STEPS	
	TREELINE / CLEARING LIMIT	---
	TREES / LANDSCAPING	SEE LANDSCAPE PLAN
	SIGN - SEE SITE LAYOUT PLAN FOR TYPE	
	LIGHT POLE / FIXTURE	
	UTILITY POLE	
	GUY WIRE	
	FENCE TYPES (AS NOTED)	
	RIPRAP AREA	
--- --99---	GRADING CONTOUR LINE	99.63
	GRADING SPOT GRADE	
	TEST PIT	
○ SMH	SANITARY SEWER MANHOLE	● DMH 1
○ DMH	DRAIN MANHOLE	
S	SANITARY SEWER LINE	
	SANITARY SERVICE	
● CB □ CB ■ CB	CATCH BASIN	● CB 1
---15" SD---	STORM DRAIN	18"SD
	UNDERDRAIN	---
	WATER GATE VALVE	
	WATER SHUT OFF	
6"W	WATER MAIN	
○ HYD.	FIRE HYDRANT	
OE OH	OVERHEAD ELECTRIC LINES	
UE	UNDERGROUND ELECTRIC LINES	UE
UE/T/C	UNDERGROUND ELECTRIC/TEL./CABLE	
☒	TRAFFIC CONTROL BOX	
G	GAS LINE	
	CATCH BASIN SEDIMENT BARRIER	
	SILTATION FENCE	
	TEMP. STABILIZED CONSTRUCTION ENTRANCE	
	BITUMINOUS ASPHALT SIDEWALK	
	BITUMINOUS ASPHALT PAVEMENT	

GENERAL NOTES:

- THIS PROJECT IS SUBJECT TO THE TERMS AND CONDITIONS OF ALL REGULATIONS ADMINISTERED BY THE MAINE DEPARTMENT OF TRANSPORTATION, LOCAL UTILITY COMPANIES AND THE CITY OF PORTLAND.
- 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 ADDITIONAL COST TO THE OWNER UNLESS OTHERWISE AGREED UPON.
- 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.
- 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.
- ALL MATERIALS AND CONSTRUCTION METHODS SHALL CONFORM TO MAINE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS, AND THE CITY OF PORTLAND TECHNICAL STANDARDS. IN THE CASE OF A CONFLICT BETWEEN THE DOT SPECS AND PORTLAND STANDARDS, THE MORE STRINGENT SHALL BE USED AT NO ADDITIONAL COST TO THE OWNER AND THE OWNER NOTIFIED.
- TOPOGRAPHIC SURVEY INFORMATION WAS TAKEN FROM CITY OF PORTLAND AERIAL SURVEY, ELECTRONIC DATA PROVIDED BY CITY OF PORTLAND GIS DEPARTMENT AND SURVEY DATA PROVIDED BY OWEN HASKELL, INC. SUPPLEMENTAL DATA COLLECTION WAS PERFORMED BY STANTEC IN JUNE 2018.
- BOUNDARY SURVEY INFORMATION TAKEN FROM A PLAN PREPARED BY OWEN HASKELL, INC. TITLED "BOUNDARY & TOPOGRAPHIC SURVEY" ON 68 JOHNSON ROAD, PORTLAND, MAINE, MADE FOR DELUCA-HOFFMAN ASSOCIATES, INC. DATED NOVEMBER 13, 2009.
- FEMA MAP COMMUNITY PANEL NUMBER 2300510012C. THE PARCEL DOES NOT LIE WITHIN A FLOOD HAZARD ZONE.
- 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 AUTHORITY 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.
- ALL SIGNAGE SHALL CONFORM TO THE STANDARDS FOR SIZE, HEIGHT, LOCATION AND REFLECTIVITY SET FORTH IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- ALL PARKING STALLS SHALL BE MARKED OFF BY 4" SOLID WHITE LINES EXCEPT AS SHOWN ON THE LAYOUT PLAN.
- ALL CURB SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS AS NOTED ON THE PLANS: GRANITE, SLIPFORM CONCRETE, AND BITUMINOUS CONCRETE CURB SHALL MEET THE REQUIREMENTS OF MAINE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS 609.03 AND 609.04 AND CITY OF PORTLAND TECHNICAL STANDARDS.
- ALL DIMENSIONING UNLESS OTHERWISE NOTED IS TO THE FACE OF CURB.
- A FORMER HOUSE ON LOT 3 WAS SERVICED BY PUBLIC WATER, SEWER AND OVERHEAD UTILITIES ACCORDING TO THE OWNER. THE PORTLAND WATER DISTRICT WAS UNABLE TO PROVIDE A SERVICE LOCATION AND THE PUBLIC SERVICES DEPARTMENT ALSO HAS NO RECORD OF THE SANITARY SERVICE. THE CONTRACTOR SHALL INCLUDE COSTS TO LOCATE AND CLOSE EACH SERVICE IN ACCORDANCE WITH EACH UTILITY PROVIDER'S REQUIREMENTS.
- THE CONTRACTOR OR DEVELOPER 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. SHOULD THE IMPROVEMENTS BE OF SIGNIFICANT CONCERN OR IN A SENSITIVE AREA, A PRE-CONSTRUCTION MEETING MAY BE REQUIRED AT THE DISCRETION OF THE PUBLIC WORKS AUTHORITY OR DEVELOPMENT REVIEW COORDINATOR.
- AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE. THE DEVELOPER, OR AN AUTHORIZED AGENT, MUST BE AVAILABLE AT ALL TIMES DURING CONSTRUCTION.
- WARNING SIGNS, MARKERS, BARRICADES OR FLAGMEN MUST BE EMPLOYED ON ADJACENT STREETS AS NECESSARY.
- CONSTRUCTION AND DEMOLITION DEBRIS SHALL BE CONTAINERIZED AND DISPOSED OF IN ACCORDANCE WITH THE CITY OF PORTLAND'S SOLID WASTE ORDINANCE CHAPTER 12.
- ANY DAMAGE TO PUBLIC OR PRIVATE PROPERTY RESULTING FROM CONSTRUCTION ACTIVITIES SHALL BE REPAIRED BY THE DEVELOPER/CONTRACTOR AT THEIR EXPENSE.
- 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/DEVELOPER'S EXPENSE.
- THE CLOSURE OF ANY SANITARY SERVICES AND APPURTENANCES SHALL BE COMPLETED IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF PORTLAND PUBLIC SERVICES DEPARTMENT AND / OR THE CITY OF SOUTH PORTLAND WASTEWATER DIVISION, WHICHEVER IS MORE STRINGENT, AT NO ADDITIONAL EXPENSE TO THE OWNER.
- 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.

DIMENSIONAL REQUIREMENTS
ZONE: B4 COMMERCIAL CORRIDOR

	REQUIRED	PROVIDED
MINIMUM LOT SIZE	10,000 SF	202,554 SF
MINIMUM STREET FRONTAGE	60 FT	447.82 FT
MINIMUM YARD		
FRONT	20 FT	41 FT
REAR	20 FT	278 FT
SIDE LEFT	10 FT (1 TO 2 STORY BUILDING)	273 FT
SIDE RIGHT	12 FT (3 OR MORE STORIES)	77 FT
MINIMUM LOT WIDTH	40 FT	448 FT
MAXIMUM HEIGHT	65 FT	57'-5"
MAXIMUM IMPERVIOUS SURFACE RATIO	80%	45.7%
MAXIMUM FLOOR AREA RATIO	0.65	0.34



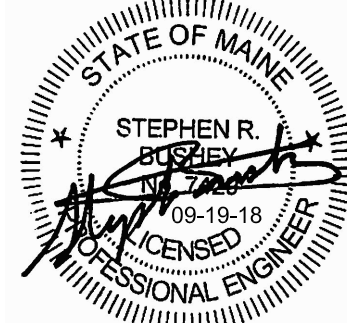
Stantec
482 Payne Road Scarborough Court
Scarborough, Maine 04074-8929
Tel. 207.883.3355
www.stantec.com

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The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.
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File Name: PBF SRB SRB 18.05.22
DWN. CHKD. DSGN. DATE

Permit-Seal



Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY
90 JOHNSON ROAD, PORTLAND, MAINE

Title

COVER SHEET, GENERAL NOTES
AND LEGEND

Project No.

210801617

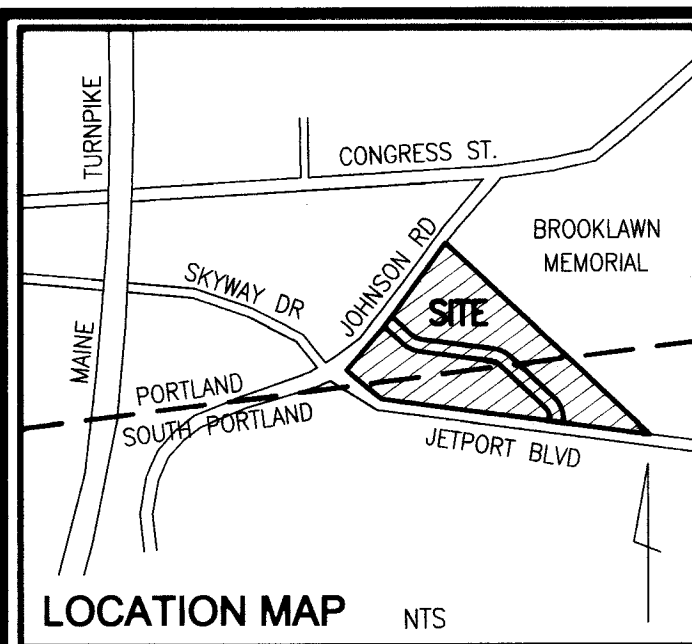
Scale

N.T.S.

Sheet

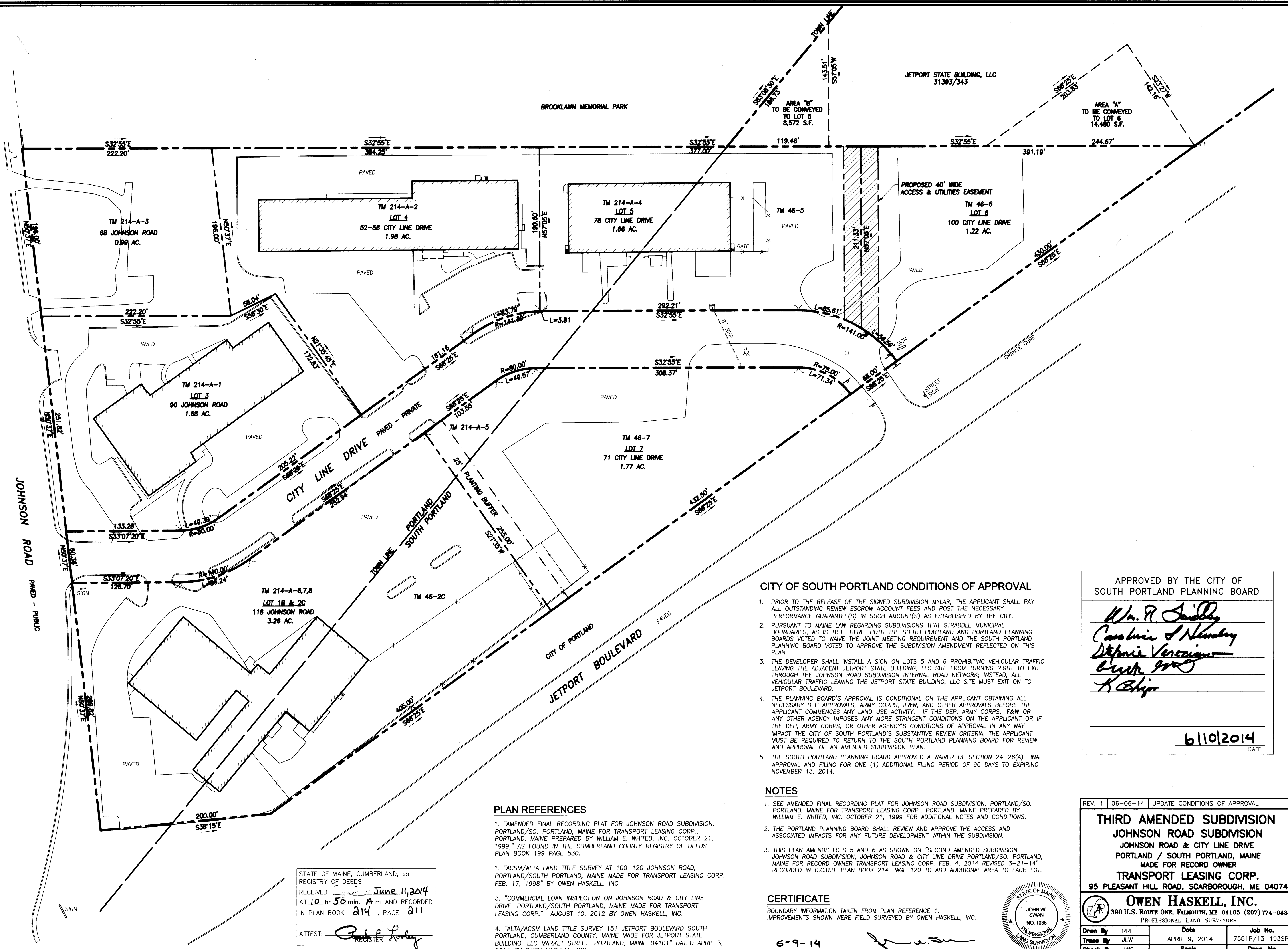
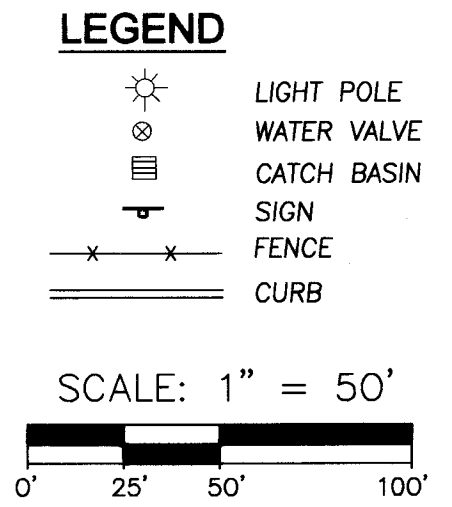
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18.07.19	18.07.09	18.03.22	17.04.00
SRB	SRB	SRB	Appcl.
PBF	PBF	PBF	By
3	2	1	
RELEASED TO SITE CONTRACTOR AND SUBMITTED TO CITY	SUBMITTED TO CITY FOR LEVEL III SITE PLAN REVIEW	SUBMITTED FOR OWNER REVIEW	Revision



RECORD OWNER:

TM 214-A-1	TRANSPORT LEASING CORP. BOOK 2960 PAGE 848
TM 214-A-2	TRANSPORT LEASING CORP. BOOK 7111 PAGE 250
TM 214-A-3	68 JOHNSON ROAD LLC BOOK 27253 PAGE 38
TM 214-A-4	TRANSPORT LEASING CORP. BOOK 2960 PAGE 848
TM 46-5	TRANSPORT LEASING CORP. BOOK 2960 PAGE 848
TM 214-A-6,7,8	TRANSPORT LEASING CORP. BOOK 2960 PAGE 848
TM 46-2C	TRANSPORT LEASING CORP. BOOK 2960 PAGE 848
TM 46-6	TRANSPORT LEASING CORP. BOOK 2960 PAGE 848
TM 46-7	TRANSPORT LEASING CORP. BOOK 2960 PAGE 848



STATE OF MAINE, CUMBERLAND, ss
REGISTRY OF DEEDS
RECEIVED June 11, 2014
AT 10 hr. 50 min. A m AND RECORDED
IN PLAN BOOK 214, PAGE 211
ATTEST: Paul E. Loring
REGISTER

- PLAN REFERENCES**
- "AMENDED FINAL RECORDING PLAT FOR JOHNSON ROAD SUBDIVISION, PORTLAND/SO. PORTLAND, MAINE FOR TRANSPORT LEASING CORP., PORTLAND, MAINE PREPARED BY WILLIAM E. WHITED, INC. OCTOBER 21, 1999," AS FOUND IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS PLAN BOOK 199 PAGE 530.
 - "ACSM/ALTA LAND TITLE SURVEY AT 100-120 JOHNSON ROAD, PORTLAND/SOUTH PORTLAND, MAINE MADE FOR TRANSPORT LEASING CORP. FEB. 17, 1998" BY OWEN HASKELL, INC.
 - "COMMERCIAL LOAN INSPECTION ON JOHNSON ROAD & CITY LINE DRIVE, PORTLAND/SOUTH PORTLAND, MAINE MADE FOR TRANSPORT LEASING CORP." AUGUST 10, 2012 BY OWEN HASKELL, INC.
 - "ALTA/ACSM LAND TITLE SURVEY 151 JETPORT BOULEVARD SOUTH PORTLAND, CUMBERLAND COUNTY, MAINE MADE FOR JETPORT STATE BUILDING, LLC MARKET STREET, PORTLAND, MAINE 04101" DATED APRIL 3, 2014 BY OWEN HASKELL, INC.

- CITY OF SOUTH PORTLAND CONDITIONS OF APPROVAL**
- PRIOR TO THE RELEASE OF THE SIGNED SUBDIVISION MYLAR, THE APPLICANT SHALL PAY ALL OUTSTANDING REVIEW ESCROW ACCOUNT FEES AND POST THE NECESSARY PERFORMANCE GUARANTEE(S) IN SUCH AMOUNT(S) AS ESTABLISHED BY THE CITY.
 - PURSUANT TO MAINE LAW REGARDING SUBDIVISIONS THAT STRADDLE MUNICIPAL BOUNDARIES, AS IS TRUE HERE, BOTH THE SOUTH PORTLAND AND PORTLAND PLANNING BOARDS VOTED TO WAIVE THE JOINT MEETING REQUIREMENT AND THE SOUTH PORTLAND PLANNING BOARD VOTED TO APPROVE THE SUBDIVISION AMENDMENT REFLECTED ON THIS PLAN.
 - THE DEVELOPER SHALL INSTALL A SIGN ON LOTS 5 AND 6 PROHIBITING VEHICULAR TRAFFIC LEAVING THE ADJACENT JETPORT STATE BUILDING, LLC SITE FROM TURNING RIGHT TO EXIT THROUGH THE JOHNSON ROAD SUBDIVISION INTERNAL ROAD NETWORK; INSTEAD, ALL VEHICULAR TRAFFIC LEAVING THE JETPORT STATE BUILDING, LLC SITE MUST EXIT ON TO JETPORT BOULEVARD.
 - THE PLANNING BOARD'S APPROVAL IS CONDITIONAL ON THE APPLICANT OBTAINING ALL NECESSARY DEP APPROVALS, ARMY CORPS, IF&W, AND OTHER APPROVALS BEFORE THE APPLICANT COMMENCES ANY LAND USE ACTIVITY. IF THE DEP, ARMY CORPS, IF&W OR ANY OTHER AGENCY IMPOSES ANY MORE STRINGENT CONDITIONS ON THE APPLICANT OR IF THE DEP, ARMY CORPS, OR OTHER AGENCY'S CONDITIONS OF APPROVAL IN ANY WAY IMPACT THE CITY OF SOUTH PORTLAND'S SUBSTANTIVE REVIEW CRITERIA, THE APPLICANT MUST BE REQUIRED TO RETURN TO THE SOUTH PORTLAND PLANNING BOARD FOR REVIEW AND APPROVAL OF AN AMENDED SUBDIVISION PLAN.
 - THE SOUTH PORTLAND PLANNING BOARD APPROVED A WAIVER OF SECTION 24-26(A) FINAL APPROVAL AND FILING FOR ONE (1) ADDITIONAL FILING PERIOD OF 90 DAYS TO EXPIRING NOVEMBER 13, 2014.

NOTES

- SEE AMENDED FINAL RECORDING PLAT FOR JOHNSON ROAD SUBDIVISION, PORTLAND/SO. PORTLAND, MAINE FOR TRANSPORT LEASING CORP., PORTLAND, MAINE PREPARED BY WILLIAM E. WHITED, INC. OCTOBER 21, 1999 FOR ADDITIONAL NOTES AND CONDITIONS.
- THE PORTLAND PLANNING BOARD SHALL REVIEW AND APPROVE THE ACCESS AND ASSOCIATED IMPACTS FOR ANY FUTURE DEVELOPMENT WITHIN THE SUBDIVISION.
- THIS PLAN AMENDS LOTS 5 AND 6 AS SHOWN ON "SECOND AMENDED SUBDIVISION JOHNSON ROAD SUBDIVISION, JOHNSON ROAD & CITY LINE DRIVE PORTLAND/SO. PORTLAND, MAINE FOR RECORD OWNER TRANSPORT LEASING CORP. FEB. 4, 2014 REVISED 3-21-14" RECORDED IN C.C.R.D. PLAN BOOK 214 PAGE 120 TO ADD ADDITIONAL AREA TO EACH LOT.

CERTIFICATE

BOUNDARY INFORMATION TAKEN FROM PLAN REFERENCE 1.
IMPROVEMENTS SHOWN WERE FIELD SURVEYED BY OWEN HASKELL, INC.

6-9-14
DATE

JOHN W. SWAN, PLS NO. 1038

APPROVED BY THE CITY OF
SOUTH PORTLAND PLANNING BOARD

Wm. R. Sady
Carolyn L. Hensley
Stephen Verso
Chris G...
K. Bligh

6/10/2014
DATE

REV. 1 06-06-14 UPDATE CONDITIONS OF APPROVAL

THIRD AMENDED SUBDIVISION
JOHNSON ROAD SUBDIVISION
JOHNSON ROAD & CITY LINE DRIVE
PORTLAND / SOUTH PORTLAND, MAINE
MADE FOR RECORD OWNER
TRANSPORT LEASING CORP.
95 PLEASANT HILL ROAD, SCARBOROUGH, ME 04074

OWEN HASKELL, INC.
390 U.S. ROUTE ONE, FALMOUTH, ME 04105 (207) 774-0424
PROFESSIONAL LAND SURVEYORS

Drawn By	RRJ	Date	Job No.
Trace By	JLW	APRIL 9, 2014	7551P/13-193SP
Check By	JWS	Scale	Drwg. No.
Book No.	FILE	1" = 50'	1C

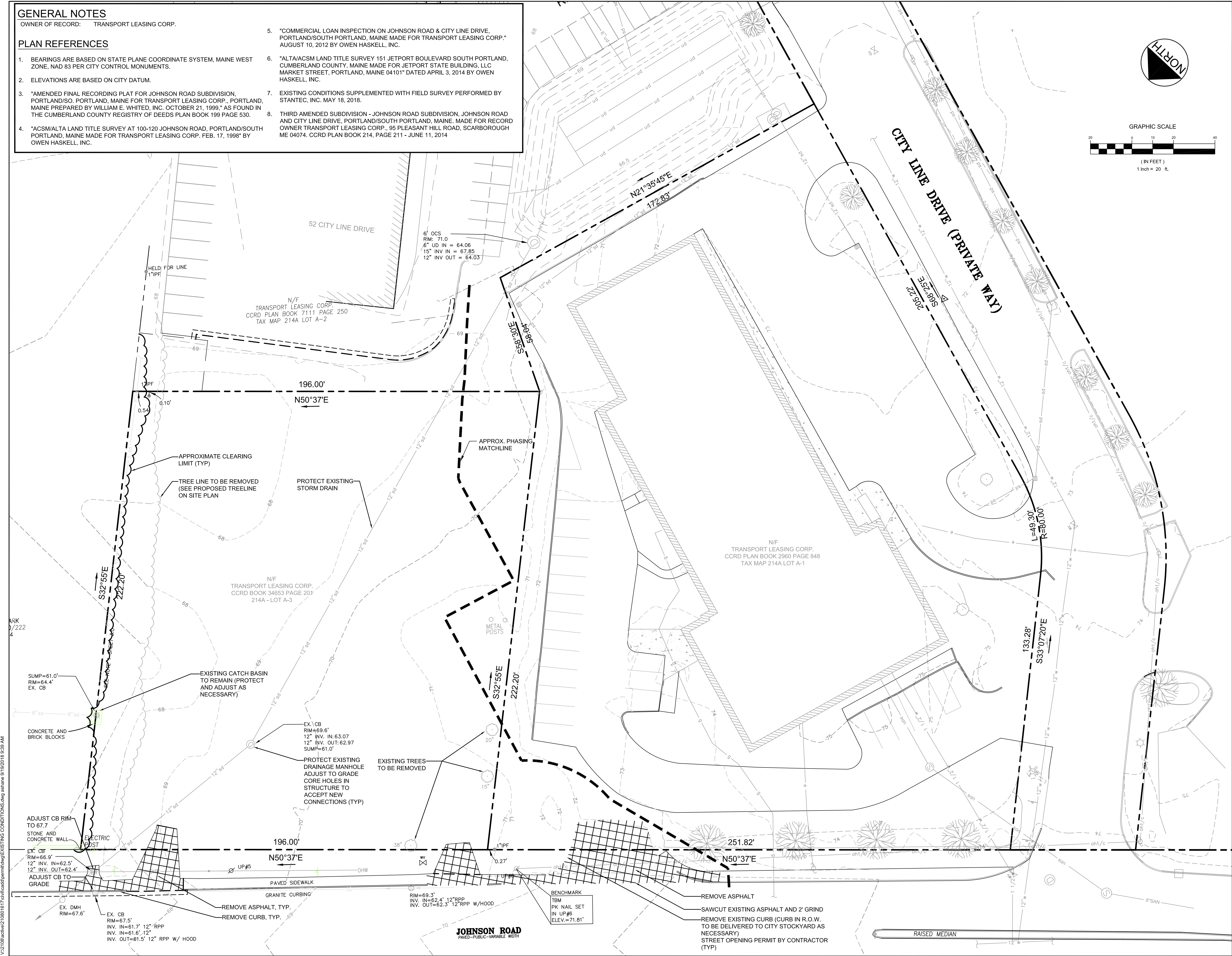
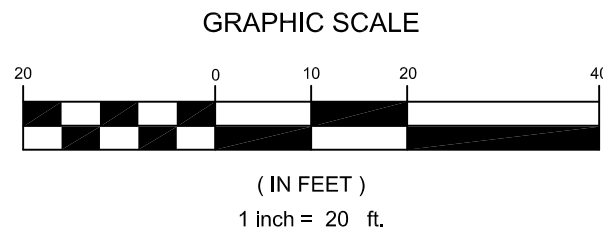
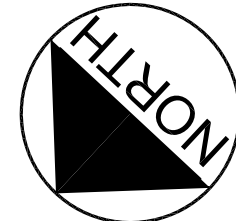
GENERAL NOTES

OWNER OF RECORD: TRANSPORT LEASING CORP.

PLAN REFERENCES

1. BEARINGS ARE BASED ON STATE PLANE COORDINATE SYSTEM, MAINE WEST ZONE, NAD 83 PER CITY CONTROL MONUMENTS.
2. ELEVATIONS ARE BASED ON CITY DATUM.
3. "AMENDED FINAL RECORDING PLAT FOR JOHNSON ROAD SUBDIVISION, PORTLAND/SO. PORTLAND, MAINE FOR TRANSPORT LEASING CORP., PORTLAND, MAINE PREPARED BY WILLIAM E. WHITED, INC. OCTOBER 21, 1999," AS FOUND IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS PLAN BOOK 199 PAGE 530.
4. "ACSM/ALTA LAND TITLE SURVEY AT 100-120 JOHNSON ROAD, PORTLAND/SOUTH PORTLAND, MAINE MADE FOR TRANSPORT LEASING CORP. FEB. 17, 1998" BY OWEN HASKELL, INC.

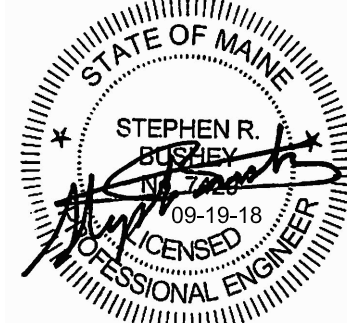
5. "COMMERCIAL LOAN INSPECTION ON JOHNSON ROAD & CITY LINE DRIVE, PORTLAND/SOUTH PORTLAND, MAINE MADE FOR TRANSPORT LEASING CORP." AUGUST 10, 2012 BY OWEN HASKELL, INC.
6. "ALTA/ACSM LAND TITLE SURVEY 151 JETPORT BOULEVARD SOUTH PORTLAND, CUMBERLAND COUNTY, MAINE MADE FOR JETPORT STATE BUILDING, LLC MARKET STREET, PORTLAND, MAINE 04101" DATED APRIL 3, 2014 BY OWEN HASKELL, INC.
7. EXISTING CONDITIONS SUPPLEMENTED WITH FIELD SURVEY PERFORMED BY STANTEC, INC. MAY 18, 2018.
8. THIRD AMENDED SUBDIVISION - JOHNSON ROAD SUBDIVISION, JOHNSON ROAD AND CITY LINE DRIVE, PORTLAND/SOUTH PORTLAND, MAINE, MADE FOR RECORD OWNER TRANSPORT LEASING CORP. 95 PLEASANT HILL ROAD, SCARBOROUGH ME 04074. CORD PLAN BOOK 214, PAGE 211 - JUNE 11, 2014



Revision		By	Date
3	RELEASED TO SITE CONTRACTOR AND SUBMITTED TO CITY	PBF	18.07.19
2	SUBMITTED TO CITY FOR LEVEL III SITE PLAN REVIEW	PBF	18.07.09
1	SUBMITTED FOR OWNER REVIEW	PBF	18.03.22

File Name: _____

Permit-Seal



Client/Project
TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY
90 JOHNSON ROAD, PORTLAND, MAINE

Title
PHASE I
EXISTING CONDITIONS AND
DEMOLITION PLAN

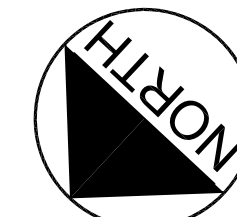
Project No. 210801617 Scale N.T.S.

Sheet

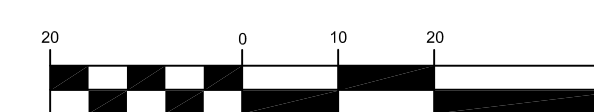
PLAN REFERENCES

1. BEARINGS ARE BASED ON STATE PLANE COORDINATE SYSTEM, MAINE WEST ZONE, NAD 83 PER CITY CONTROL MONUMENTS.
2. ELEVATIONS ARE BASED ON CITY DATUM.
3. "AMENDED FINAL RECORDING PLAT FOR JOHNSON ROAD SUBDIVISION, PORTLAND/SO. PORTLAND, MAINE FOR TRANSPORT LEASING CORP., PORTLAND, MAINE PREPARED BY WILLIAM E. WHITED, INC. OCTOBER 21, 1999," AS FOUND IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS PLAN BOOK 199 PAGE 530.
4. "ACSM/ALTA LAND TITLE SURVEY AT 100-120 JOHNSON ROAD, PORTLAND/SOUTH PORTLAND, MAINE MADE FOR TRANSPORT LEASING CORP. FEB. 17, 1998" BY OWEN HASKELL, INC.

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6. "ALTA/ACSM LAND TITLE SURVEY 151 JETPORT BOULEVARD SOUTH PORTLAND, CUMBERLAND COUNTY, MAINE MADE FOR JETPORT STATE BUILDING, LLC MARKET STREET, PORTLAND, MAINE 04101" DATED APRIL 3, 2014 BY OWEN HASKELL, INC.
7. EXISTING CONDITIONS SUPPLEMENTED WITH FIELD SURVEY PERFORMED BY STANTEC, INC. MAY 18, 2018.
8. THIRD AMENDED SUBDIVISION - JOHNSON ROAD SUBDIVISION, JOHNSON ROAD AND CITY LINE DRIVE, PORTLAND/SOUTH PORTLAND, MAINE, MADE FOR RECORDER OF DEEDS FOR TRANSPORT LEASING CORP., 95 PLEASANT HILL ROAD, SCARBOROUGH ME 04074, CCRD PLAN BOOK 214, PAGE 211 - JUNE 11, 2014.



GRAPHIC SCALE



(IN FEET)
1 inch = 20 f



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482 Payne Road Scarborough Court
Scarborough, Maine 04074-8929
Tel. 207.883.3355
www.stantec.com

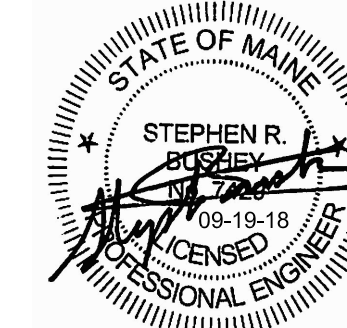
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		PBF	\$88	18.09.19
3.	RELEASED TO SITE CONTRACTOR AND SUBMITTED TO CITY	PBF	\$88	18.07.09
2.	SUBMITTED TO CITY FOR LEVEL II SITE PLAN REVIEW	PBF	\$88	18.05.22
1.	SUBMITTED FOR OWNER REVIEW	PBF	\$88	
				By Asst. Proj. Mgr.
Division:				YY-MM-DD

File Name: PBF SRB SRB 18.05.22

Permit-Seal



Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title
PHASE 2
EXISTING CONDITIONS AND
DEMOLITION PLAN

Project No.	Scale
210801617	N.T.S.

Sheet

C-2.2

SITE IS IDENTIFIED AS MAP 214A, BLOCK A, LOTS A-2 & A-3 ON THE CITY OF PORTLAND ASSESSOR'S DATABASE.

PLAN REFERENCES

1. BOUNDARY & TOPOGRAPHIC ON 68 JOHNSON ROAD PORTLAND, MAINE PREPARED BY OWEN HASKELL, INC., FOR DELUCA HOFFMAN ASSOCIATES, DATED ON JANUARY 7, 2010.
2. EXISTING CONDITIONS PLAN OF JOHNSON ROAD PROPERTY, TAX MAP 214A, LOT A-3, PREPARED BY DELUCA HOFFMAN ASSOCIATES, DATED ON SEPTEMBER 9, 2010.
3. SUBDIVISION PLAN PREPARED BY WILLIAM WHITE, INC., TITLED "AMENDED FINAL RECORDING PLAT FOR JOHNSON ROAD SUBDIVISION, PORTLAND/SO. PORTLAND, MAINE FOR TRANSPORT LEASING CORP., PORTLAND, MAINE". RECORDED ON NOVEMBER 15, 1999 IN C.C.R.D. BOOK 199, PAGE 530.
4. SHEET A2.1 OF SANBORN PROFESSIONAL BUILDING, BY ALPHA ARCHITECTS ISSUED JUNE 21, 2017.

ZONE: B-4 COMMERCIAL CORRIDOR ZONE
PERMIT USES INCLUDE:

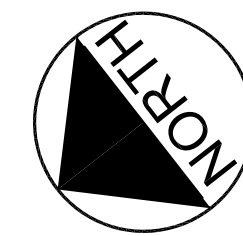
REQUIRED

PROVIDED

MINIMUM LOT SIZE	10,000 SF	202,554 SF
MINIMUM STREET FRONTAGE	60 FT.	447.82'
MINIMUM FRONT YARD SETBACK	20 FT.	41'±
MINIMUM REAR YARD SETBACK	20 FT.	278'±
MINIMUM RIGHT SIDE YARD SETBACK	12 FT.	77'±
MINIMUM LEFT SIDE YARD SETBACK	12 FT	273'±
MINIMUM LOT WIDTH	60 FT.	448'±
MAXIMUM HEIGHT	65 FT.	57'-5"
MAXIMUM IMPERVIOUS SURFACE RATIO	80%	45.7%
MAXIMUM FLOOR AREA RATIO	0.65	0.34
PARKING (1 SPACE / 400 SF)	99 SPACES	188 SPACES

GRAPHIC SCALE

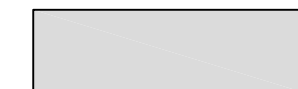
(IN FEET)
1 inch = 20 ft.



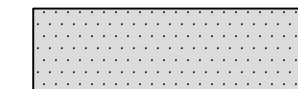
BUILDING EXIT



7' LONG TIP DOWN CURB



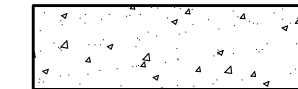
STANDARD DUTY PAVEMENT



BITUMINOUS POROUS PAVEMENT



BITUMINOUS ASPHALT SIDEWALK



CONCRETE SURFACE



R1-1
24"X24"



R7-8A
18"X9"



R7.
12" x



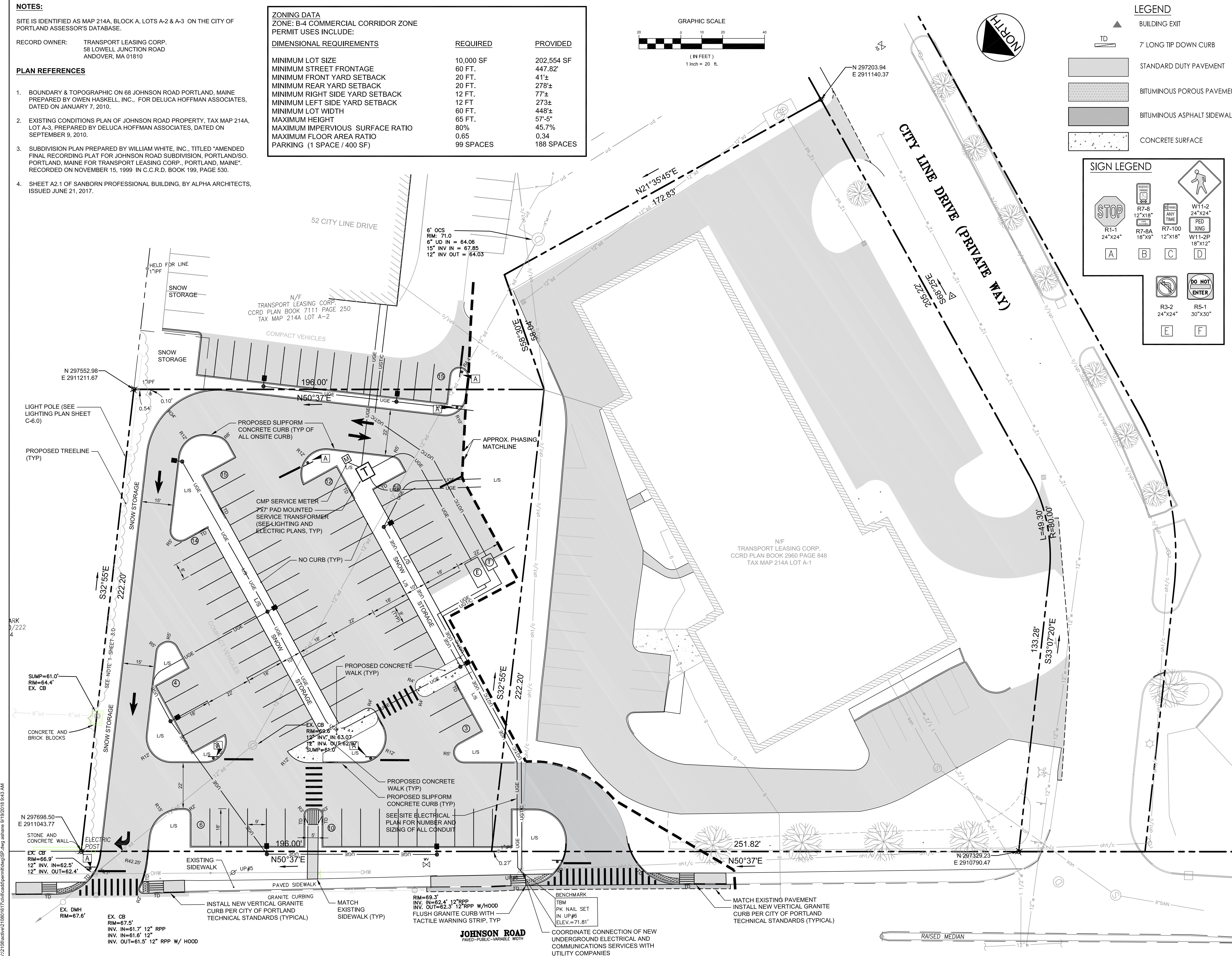
W11-2P
12"X12"



R3-
24"X:



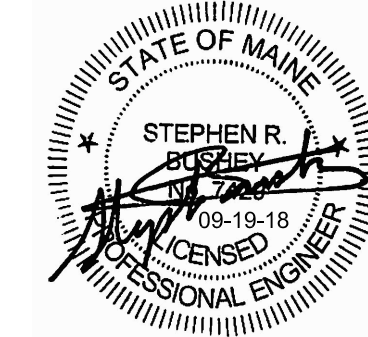
2 R5-1
24" 30"X30"



3	RELEASED TO SITE CONTRACTOR AND SUBMITTED TO CITY	PBF	SRB	18.09.19
2	SUBMITTED TO CITY FOR LEVEL III SITE PLAN REVIEW	PBF	SRB	18.07.09
1	SUBMITTED FOR OWNER REVIEW	PBF	SRB	18.05.22
Revision			By	YY.MM.DD

File Name:	PBF	SRB	SRB	18.05.22
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Permit-Seal



Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY
90 JOHNSON ROAD, PORTLAND, MAINE

Title
PHASE 1
SITE LAYOUT & UTILITY PLAN

Project No.	Scale
210801617	1" = 20'

Sheet

C-3.0

NOTES:

SITE IS IDENTIFIED AS MAP 214A, BLOCK A, LOTS A-2 & A-3 ON THE CITY OF PORTLAND ASSESSOR'S DATABASE.

RECORD OWNER: TRANSPORT LEASING CORP.
58 LOWELL JUNCTION ROAD
ANDOVER, MA 01810

PLAN REFERENCES

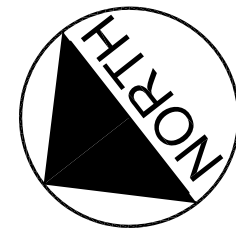
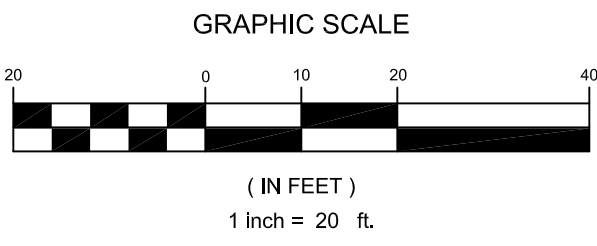
- BOUNDARY & TOPOGRAPHIC ON 68 JOHNSON ROAD PORTLAND, MAINE PREPARED BY OWEN HASKELL, INC., FOR DELUCA HOFFMAN ASSOCIATES, DATED ON JANUARY 7, 2010.
- EXISTING CONDITIONS PLAN OF JOHNSON ROAD PROPERTY, TAX MAP 214A, LOT A-3, PREPARED BY DELUCA HOFFMAN ASSOCIATES, DATED ON SEPTEMBER 9, 2010.
- SUBDIVISION PLAN PREPARED BY WILLIAM WHITE, INC., TITLED "AMENDED FINAL RECORDING PLAT FOR JOHNSON ROAD SUBDIVISION, PORTLAND/SO. PORTLAND, MAINE FOR TRANSPORT LEASING CORP., PORTLAND, MAINE", RECORDED ON NOVEMBER 15, 1999 IN C.C.R.D. BOOK 199, PAGE 530.
- SHEET A2.1 OF SANBORN PROFESSIONAL BUILDING, BY ALPHA ARCHITECTS, ISSUED JUNE 21, 2017.

ZONING DATA

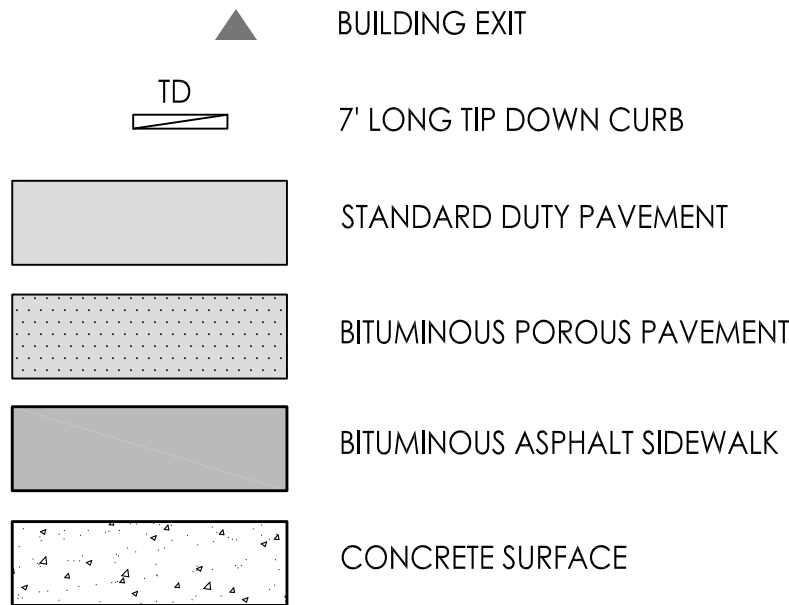
ZONE: B-4 COMMERCIAL CORRIDOR ZONE
PERMIT USES INCLUDE:

DIMENSIONAL REQUIREMENTS

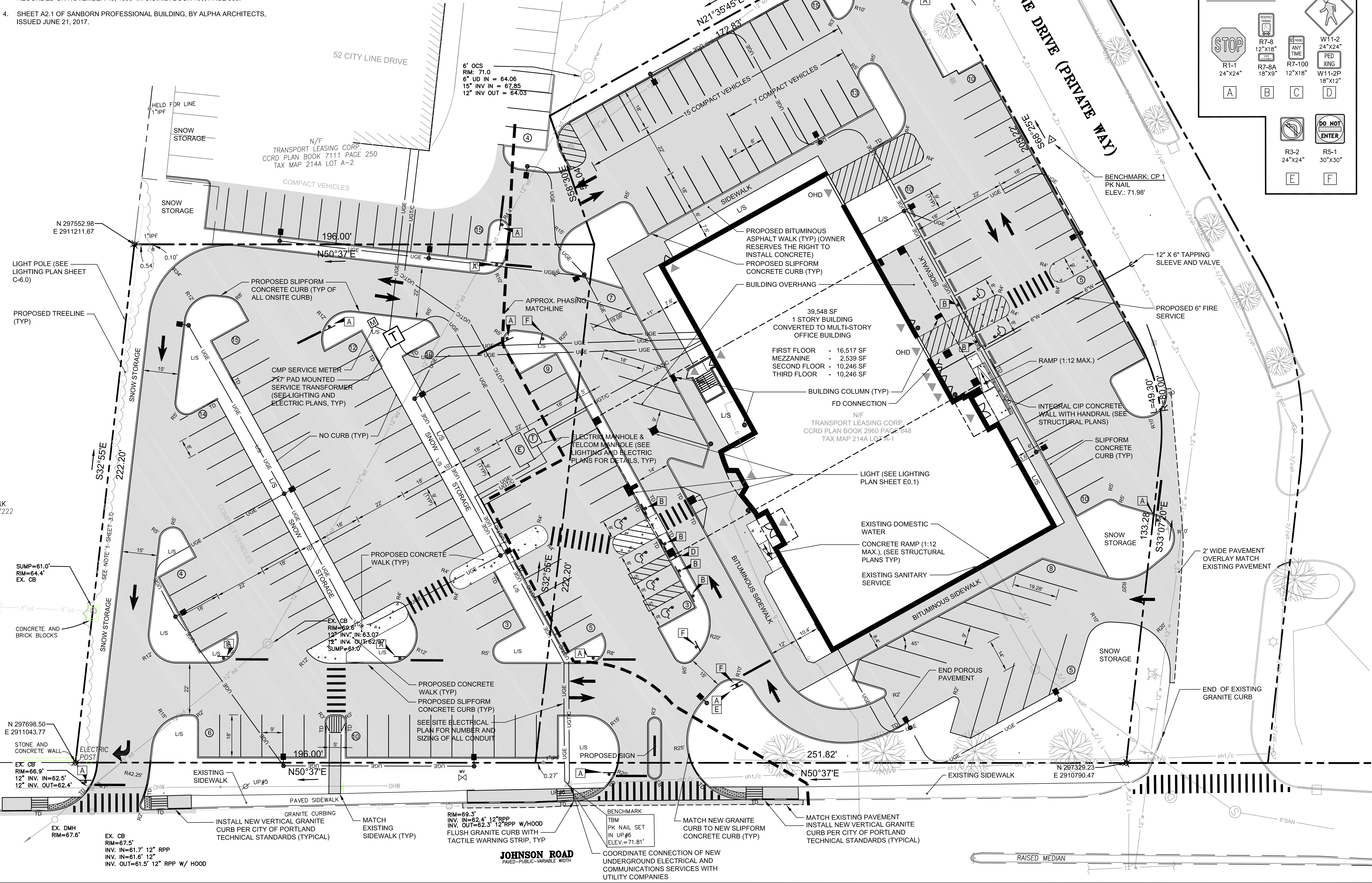
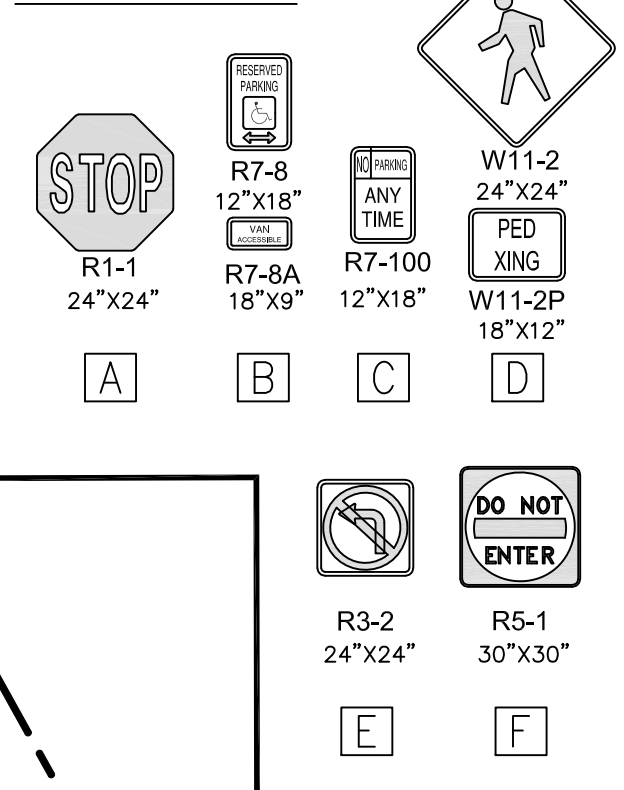
	REQUIRED	PROVIDED
MINIMUM LOT SIZE	10,000 SF	202,554 SF
MINIMUM STREET FRONTAGE	60 FT.	447.82'
MINIMUM FRONT YARD SETBACK	20 FT.	41'±
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MAXIMUM FLOOR AREA RATIO	0.65	0.34
PARKING (1 SPACE / 400 SF)	99 SPACES	188 SPACES



LEGEND



SIGN LEGEND



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482 Payne Road Scarborough Court
Scarborough, Maine 04074-8929
Tel. 207.883.3355
www.stantec.com

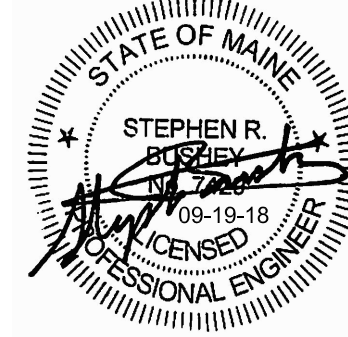
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18.07.19	SRB	SRB	SRB	18.07.09	18.03.22	Y1/MK/DD
3	RELEASED TO SITE CONTRACTOR AND SUBMITTED TO CITY	PRB	PRB	PRB	By	
2	SUBMITTED TO CITY FOR LEVEL III SITE PLAN REVIEW	PRB	PRB	PRB		
1	SUBMITTED FOR OWNER REVIEW	PRB	PRB	PRB		
	Revision					

File Name: PBF SRB SRB 18.05.22
DWN. CHKD. DSGN. DATE

Permit-Seal



Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title

PHASE 2
SITE LAYOUT & UTILITY PLAN

Project No.

210801617

Scale

1" = 20'

Sheet

C-3.1

GRADING & 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. C/P AND PVC PIPING SHALL NOT BE USED IN AREAS OF EXPOSED SUNLIGHT.
2. ALL SLOPES STEEPER THAN 3:1 ARE TO RECEIVE RIPRAP SLOPE PROTECTION⁵, OR CURLEX BLANKET TURF REINFORCEMENT WITHIN 5 DAYS OF FINAL GRADING OR PRIOR TO A PREDICTED RAINFALL EVENT.
3. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION DURING EARTHWORK OPERATIONS TO INSURE THAT STEEP SLOPE AREAS ARE NOT DISTURBED. THE LIMITS OF CLEARING SHALL BE 1' BEYOND THE GRADING LIMITS AS SHOWN ON THE SITE LAYOUT PLAN AND AS WELL AS ON THIS PLAN SHEET.
4. THE CONTRACTOR IS HEREBY CAUTIONED THAT ALL SITE FEATURES SHOWN HERON ARE BASED ON FIELD OBSERVATIONS BY THE SURVEYOR AND BY

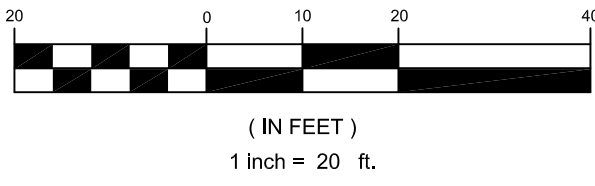
- INFORMATION PROVIDED BY UTILITY COMPANIES. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR SHALL CONTACT DIG SAFE (1-888-DIGSAFE) AT LEAST THREE (3) BUT NOT MORE THAN THIRTY (30) DAYS PRIOR TO COMMENCEMENT OF EXCAVATION OR DEMOLITION TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITIES.
- ALL PAVEMENT JOINTS SHALL BE SAWCUT PRIOR TO PAVING TO PROVIDE A DURABLE AND UNIFORM JOINT.
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/TOWNER.
 8. CONTRACTOR SHALL INCORPORATE PROVISIONS AS NECESSARY IN CONSTRUCTION TO PROTECT EXISTING STRUCTURES, PHYSICAL FEATURES,

- AND MAINTAIN SITE STABILITY DURING CONSTRUCTION. CONTRACTOR SHALL RESTORE ALL AREAS TO A PERMANENT STABILIZED CONDITION AS PAVEMENT, LAWN OR LANDSCAPING 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 ATTENTION OF THE ENGINEER.
 10. SUBGRADE FILL AREAS UNDER PAVEMENT SHALL BE GRANULAR BORROW. ALL OTHER FILL AREAS SHALL BE A COMMON BORROW MATERIAL SUITABLE FOR EMBANKMENT CONSTRUCTION, FREE FROM FROZEN MATERIAL, PERISHABLE RUBBLE, PEAT, ORGANICS, ROCKS LARGER THAN 12" IN DIAMETER, VEGETATION AND OTHER MATERIAL UNSUITABLE FOR ROADWAY AND SUBGRADE CONSTRUCTION. EXCAVATED ON-SITE MATERIALS MAY BE USED FOR SUBGRADE FILL PROVIDED THE MATERIAL IS FREE FROM UNSUITABLE MATERIAL DESCRIBED IN THIS NOTE AND UPON APPROVAL OF THE ENGINEER. GRANULAR BORROW AND COMMON BORROW SHALL COMPLY WITH THE MDOT SPECIFICATIONS.

LEGEND

- 100 —
100 —
EXISTING CONTOUR
PROPOSED CONTOUR
- STANDARD DUTY PAVEMENT
- BITUMINOUS POROUS PAVEMENT
- BITUMINOUS ASPHALT SIDEWALK
- CONCRETE SURFACE

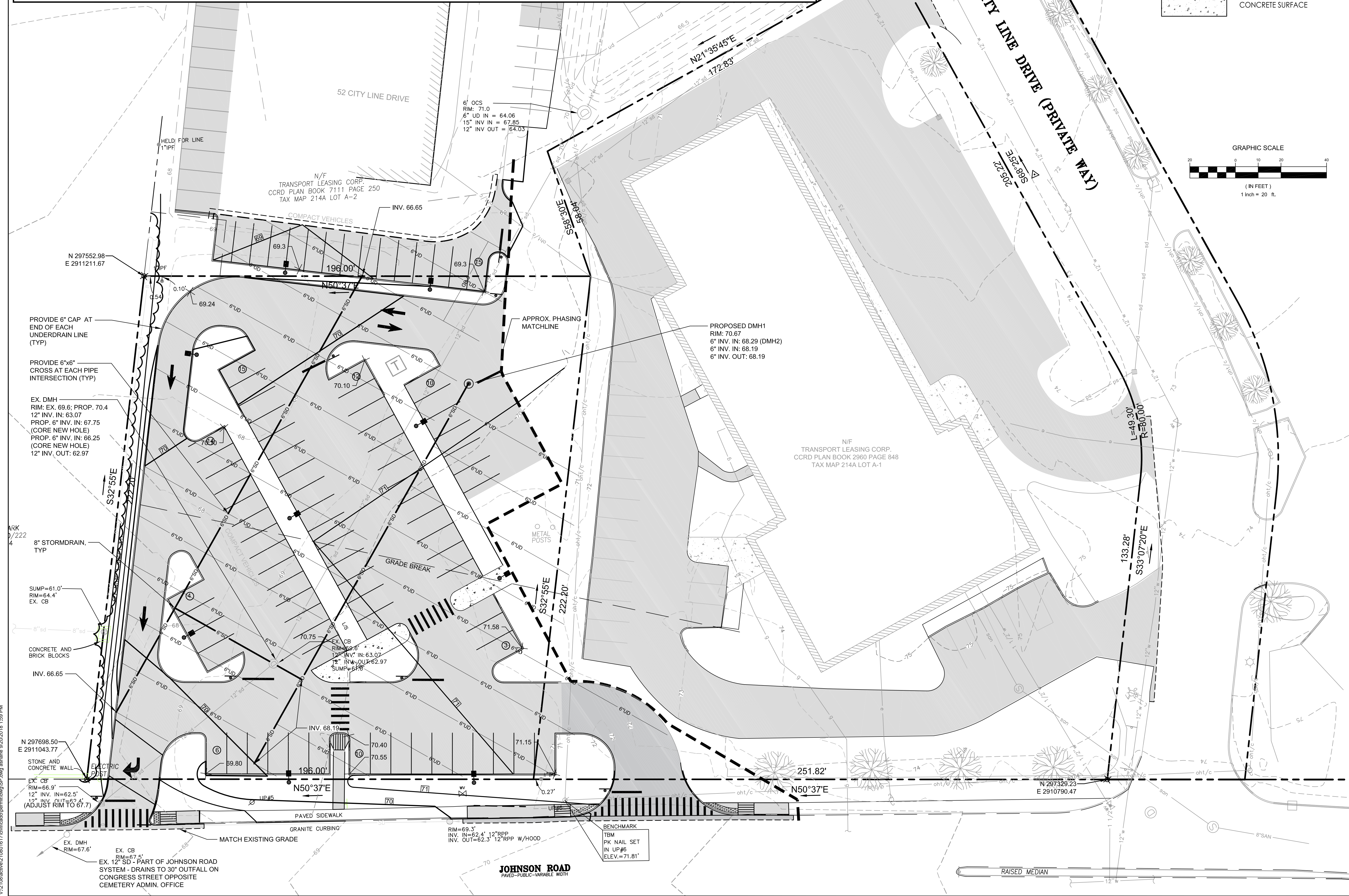
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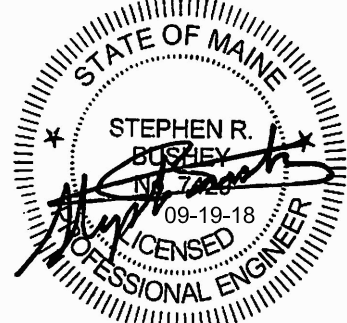
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Revision	By	Date
3	PBF	18.09.19
2	SRB	18.07.09
1	SRB	18.03.22

File Name:	PBF	SRB	SRB	18.05.22
	DWN.	CHKD.	DSGN.	DATE

Permit-Seal



Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title

PHASE I
GRADING & DRAINAGE PLAN

Project No.

210801617

Scale

N.T.S.

Sheet

C-4.0A

GRADING & 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, C/P AND PVC PIPING SHALL NOT BE USED IN AREAS OF EXPOSED SUNLIGHT.
2. ALL SLOPES STEEPER THAN 3:1 ARE TO RECEIVE RIPRAP SLOPE PROTECTION⁵, OR CURLEX BLANKET TURF REINFORCEMENT WITHIN 5 DAYS OF FINAL GRADING OR PRIOR TO A PREDICTED RAINFALL EVENT.
3. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION DURING EARTHWORK OPERATIONS TO INSURE THAT STEEP SLOPE AREAS ARE NOT DISTURBED. THE LIMITS OF CLEARING SHALL BE 1' BEYOND THE GRADING LIMITS AS SHOWN ON THE SITE LAYOUT PLAN AND AS WELL AS ON THIS PLAN SHEET.
4. THE CONTRACTOR IS HEREBY CAUTIONED THAT ALL SITE FEATURES SHOWN HEREON ARE BASED ON FIELD OBSERVATIONS BY THE SURVEYOR AND BY

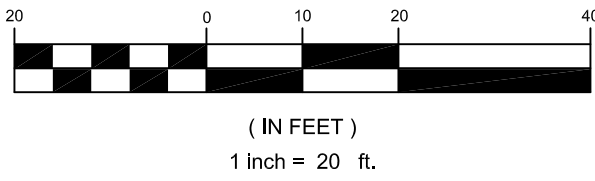
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LEGEND

- 100—
100—
- EXISTING CONTOUR
PROPOSED CONTOUR
- STANDARD DUTY PAVEMENT
- BITUMINOUS POROUS PAVEMENT
- BITUMINOUS ASPHALT SIDEWALK
- CONCRETE SURFACE

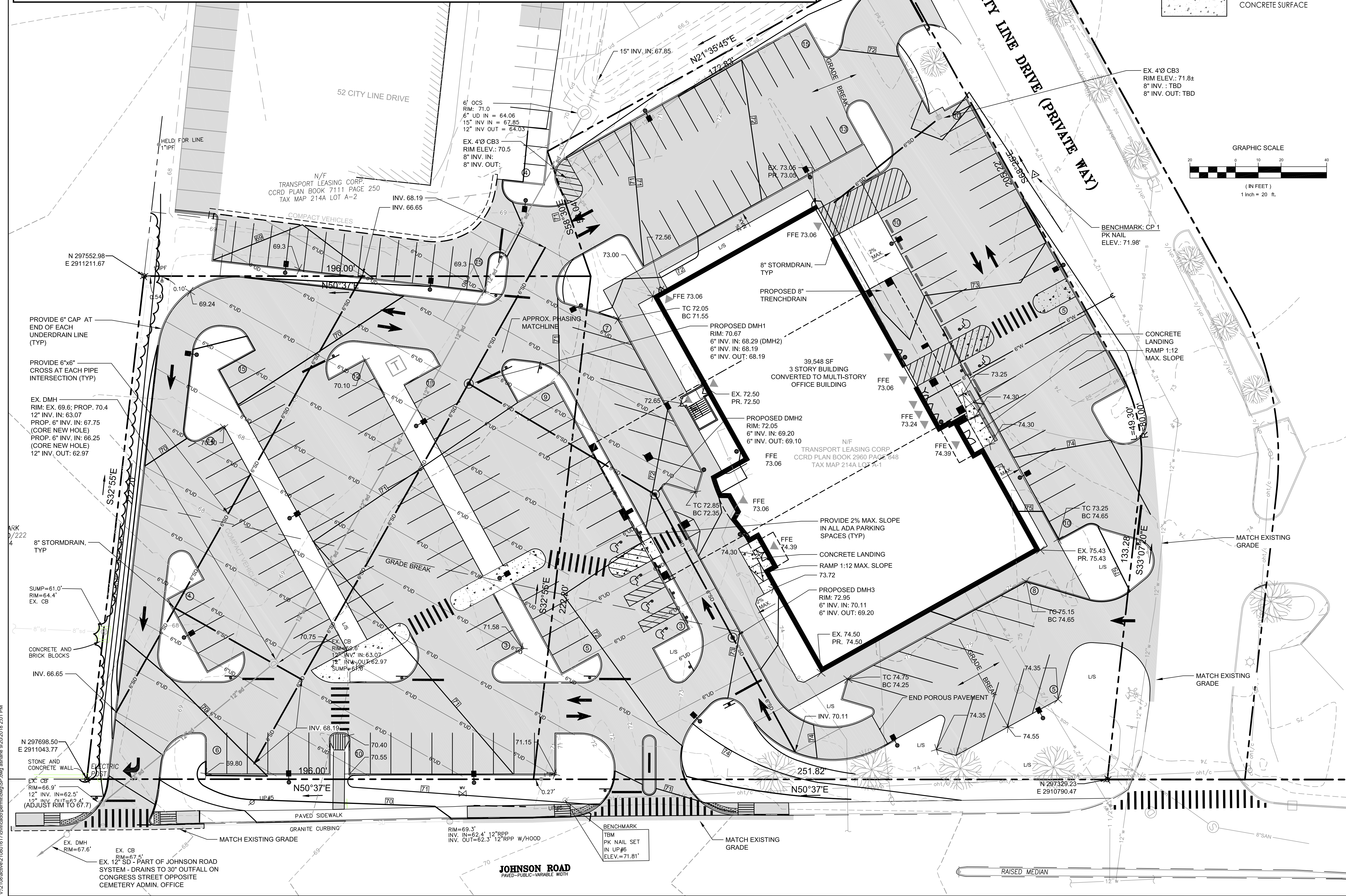
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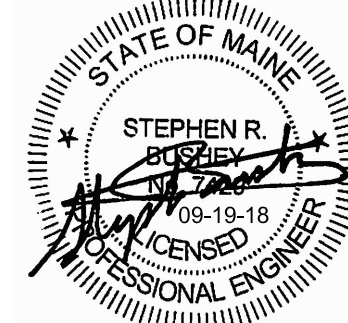
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Revision	By	Date
3	SRB	18.07.19
2	SRB	18.07.09
1	SRB	18.03.22

File Name: PBF SRB SRB 18.05.22
DWN. CHKD. DSGN. DATE

Permit-Seal



Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title

PHASE 2
GRADING & DRAINAGE PLAN

Project No.

210801617

Scale

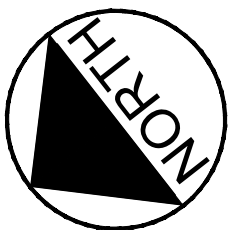
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Sheet

C-4.0B

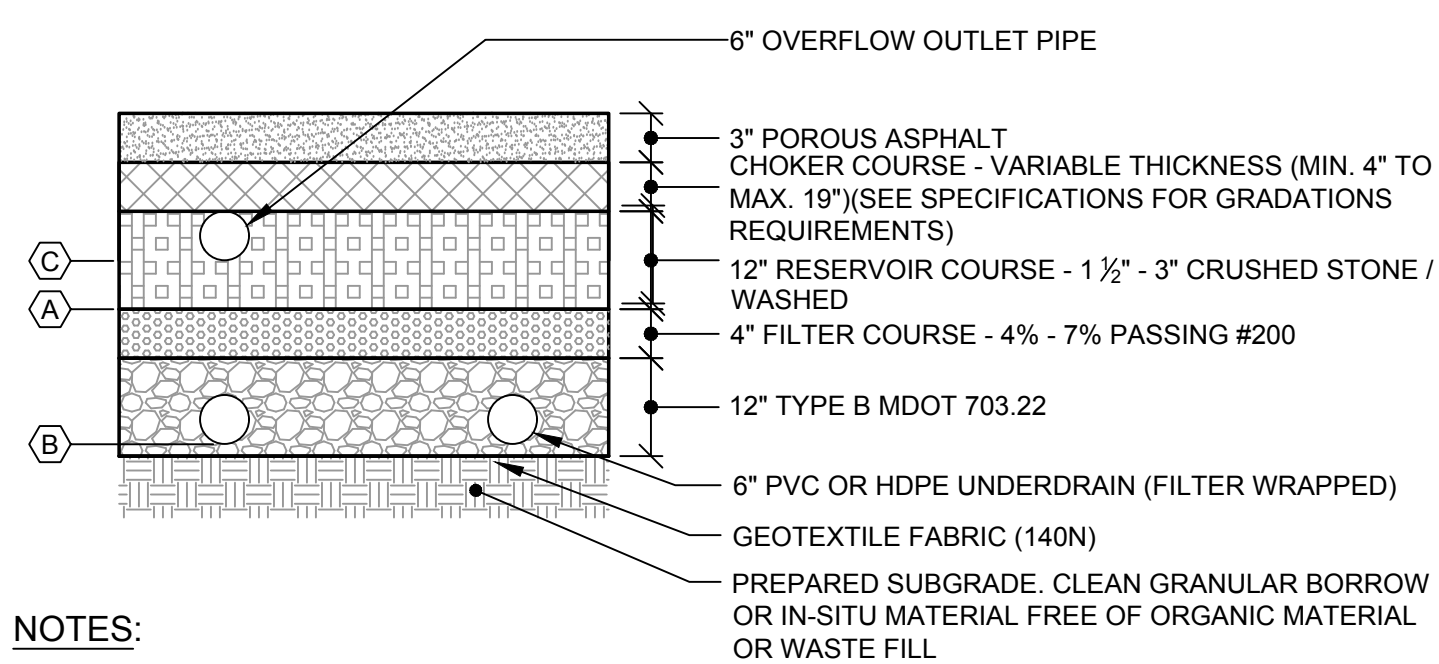
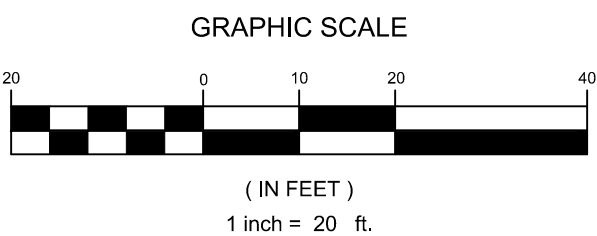
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LEGEND

	STANDARD DUTY PAVEMENT
	BITUMINOUS POROUS PAVEMENT
	BITUMINOUS ASPHALT SIDEWALK
	CONCRETE SURFACE



NOTES:

ALL MATERIALS SHALL CONFORM TO MDOT SPECIFICATIONS, LATEST REVISION. COMPACTION OF ALL MATERIALS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS AND THE GEOTECHNICAL REPORT. POROUS ASPHALT MIX DESIGN TO BE PROVIDED TO CONTRACTOR AT TIME OF BIDDING.

POROUS PAVEMENT SECTION	AREA 1	AREA 2	AREA 3	AREA 4
A-TOP OF FILTER COURSE ELEV.	67.82	69.35	70.37	71.28
B - UD INV. ELEV.	66.65	68.18	69.20	70.11
C - OVERFLOW PIPE INV. ELEV.	68.32	69.85	70.87	71.78

C POROUS PAVEMENT SECTION
N.T.S.

6" OCS
RIM: 71.0
6" UD IN = 64.06
15" INV IN = 67.85
12" INV OUT = 64.03

N/F
TRANSPORT LEASING CORP.
CCRD PLAN BOOK 7111 PAGE 250
TAX MAP 214A LOT A-2

BITUMINOUS
ASPHALT SIDEWALK, TYP

STANDARD DUTY PAVEMENT

BITUMINOUS
ASPHALT SIDEWALK, TYP

STANDARD DUTY PAVEMENT

PROVIDE SEPARATION
GEOTEXTILE AT THE
LOWER END OF EACH
POROUS PAVEMENT
SECTION (SEE CROSS
SECTION ON SHEET
C-4.2 FOR ADDITIONAL
DETAIL)

EX. CB
RIM=64.4'
SUMP=61.0'

CONCRETE AND
BRICK BLOCKS

STONE AND
CONCRETE WALL

ELECTRIC
POST

12" RIM=66.9'
INV. IN=62.5'
12" INV. OUT=62.4'

DMH
RIM=67.6'

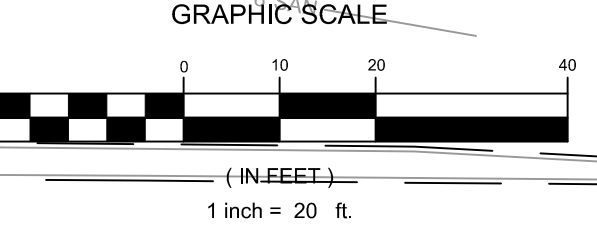
RIM=67.5'
INV. IN=61.7' 12" RPP
INV. IN=61.6' 12"
INV. OUT=61.5' 12" RPP W/ HOOD

RIM=69.3'
INV. IN=62.4' 12" RPP
INV. OUT=62.3' 12" RPP W/ HOOD

BENCHMARK
TBM
PK NAIL SET
IN UP#6
ELEV.=71.81'

JOHNSON ROAD
PAVED-PUBLIC-VARIABLE WIDTH

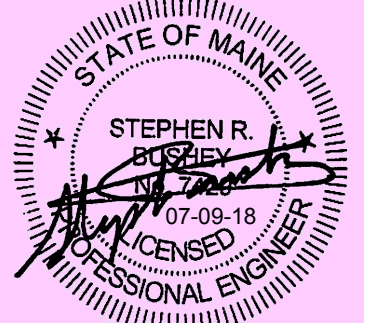
RAISED MEDIAN



Revision	By	Date
2	SRB	18.07.09
1	SRB	18.05.22

File Name:	PBF	SRB	SRB	18.05.22
	DWN.	CHKD.	DSGN.	DATE

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Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title

STORMWATER MANAGEMENT PLAN
SHEET 1 OF 2

Project No.

210801617

Scale

N.T.S.

Sheet

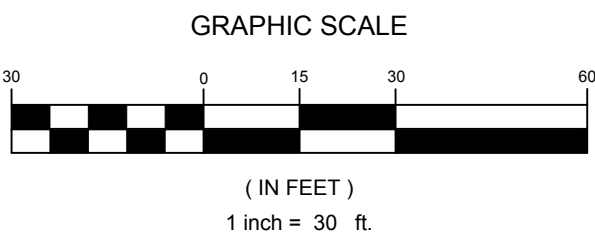
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2	SUBMITTED TO CITY FOR LEVEL III SITE PLAN REVIEW	P8F	SR8	18.07.09
1	SUBMITTED FOR OWNER REVIEW	P8F	SR8	18.05.22
Revision			By	YY.MM.DD



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JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Project No.	Scale
210801617	N.T.S.

Sheet

C-4.2

EROSION CONTROL NOTES

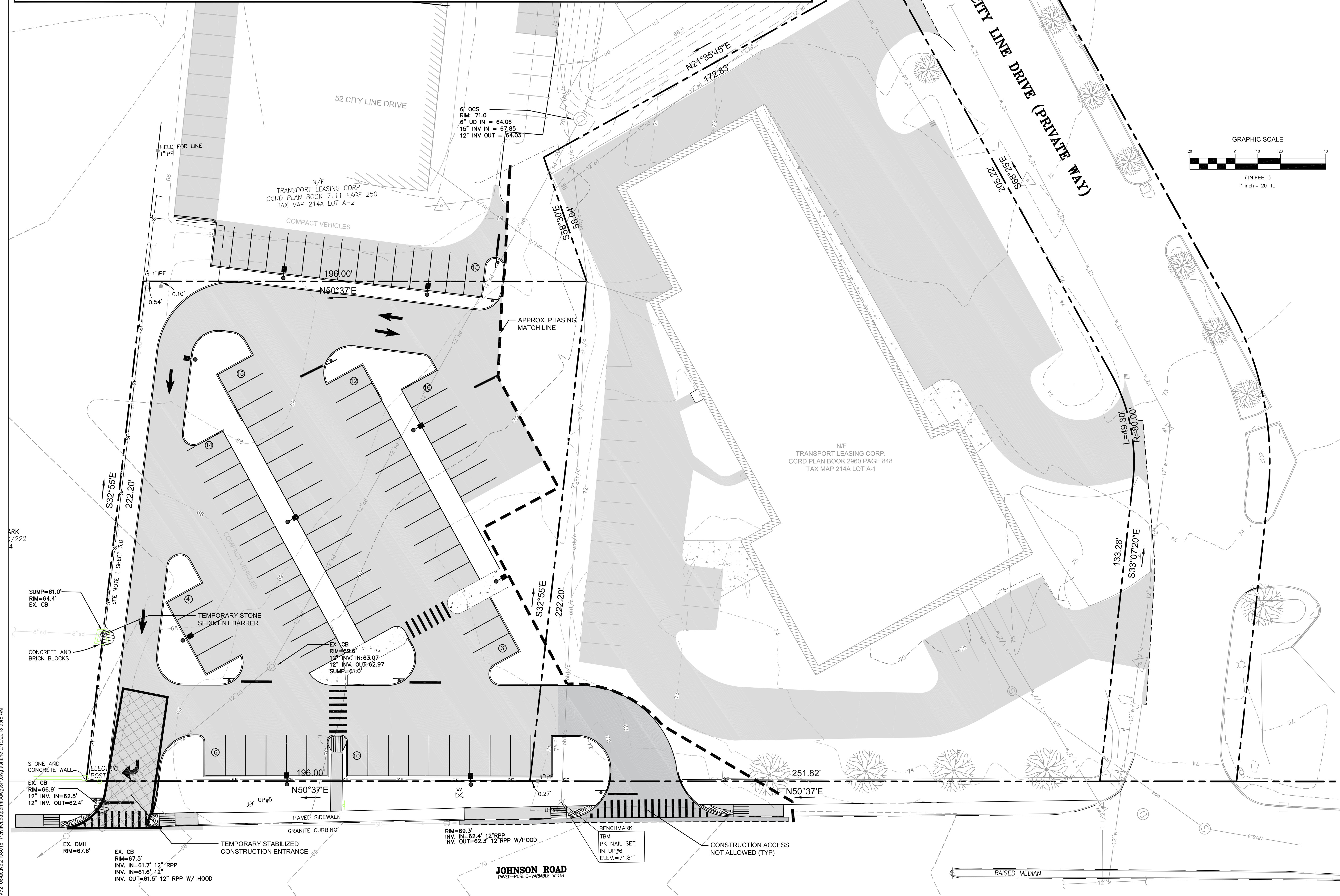
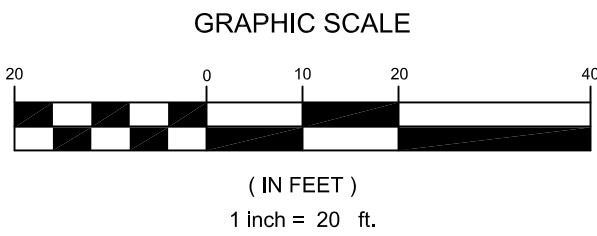
1. LAND DISTURBING ACTIVITIES SHALL BE ACCOMPLISHED IN A MANNER AND SEQUENCE THAT CAUSES THE LEAST PRACTICAL DISTURBANCE OF THE SITE.
2. PRIOR TO BEGINNING ANY CLEARING/LAND DISTURBING ACTIVITIES, THE CONTRACTOR SHALL INSTALL THE PERIMETER SILT FENCES AND THE STABILIZED CONSTRUCTION ENTRANCES.
3. ALL GROUND AREAS DISTURBED DURING CONSTRUCTION NOT SUBJECT TO PAVING OR OTHER SURFACE STABILIZATION WILL BE GRADED, LOAMED AND SEEDED AS SOON AS POSSIBLE. A MINIMUM OF 6" OF SCREENED TOPSOIL SHALL BE PLACED OVER ALL GRASSED AREAS.
4. SILT BARRIERS SHALL BE INSPECTED, REPAIRED AND CLEANED AS REQUIRED.

5. THE CONTRACTOR SHALL REPAIR AND ADD STONE TO THE CONSTRUCTION ENTRANCES AS THEY BECOME SATURATED WITH MUD TO ENSURE THAT THEY WORK AS PLANNED DURING CONSTRUCTION AND SHALL KEEP NEARBY STREETS CLEAR OF DIRT AND MUD.
6. SILT REMOVED FROM AROUND INLETS AND BEHIND THE SILT FENCES SHALL BE PLACED ON A TOPSOIL STOCKPILE AND MIXED INTO IT FOR LATER USE IN LANDSCAPING OPERATIONS.
7. CONTRACTOR SHALL CONFIRM LOCATIONS OF ELECTRICAL UTILITIES PRIOR TO CONSTRUCTION.
8. CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION.
9. ALL FILLS SHALL BE PLACED LAYERS NOT MORE THAN 12" LOOSE DEPTH AND COMPACTED BY HEAVY COMPACTION EQUIPMENT. MINIMUM COMPACTION

SHALL BE 95% OF MAXIMUM DENSITY ASTM 1557, MODIFIED AND FIELD DENSITY ASTM D2922 (NUCLEAR METHODS).

10. IMMEDIATELY UPON COMPLETION OF CUTS/FILLS, THE CONTRACTOR SHALL STABILIZE DISTURBED AREAS IN ACCORDANCE WITH EROSION CONTROL NOTES AS SPECIFIED ON PLANS.

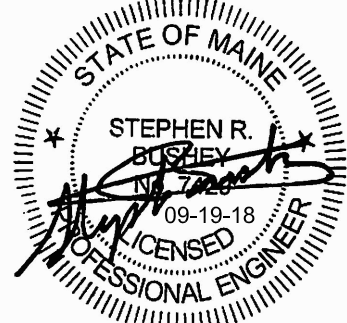
11. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH "MAINE EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES" PUBLISHED BY THE CUMBERLAND COUNTY SOIL AND WATER CONSERVATION DISTRICT AND MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, MARCH 1991 OR LATEST EDITION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO POSSESS A COPY OF THE EROSION CONTROL PLAN AT ALL TIMES.



Revision	By	Date
3	PBF	18.07.19
2	SRB	18.07.09
1	SRB	18.03.22

File Name: _____

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Client/Project
TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY
90 JOHNSON ROAD, PORTLAND, MAINE

Title
PHASE I
EROSION CONTROL PLAN

Project No. 210801617
Scale N.T.S.

Sheet

C-5.0

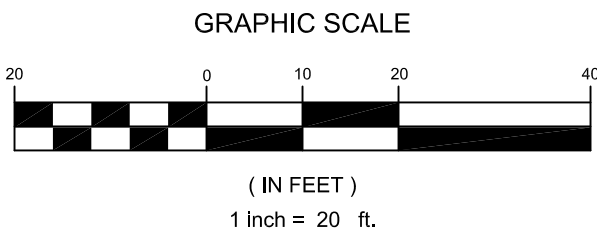
EROSION CONTROL NOTES

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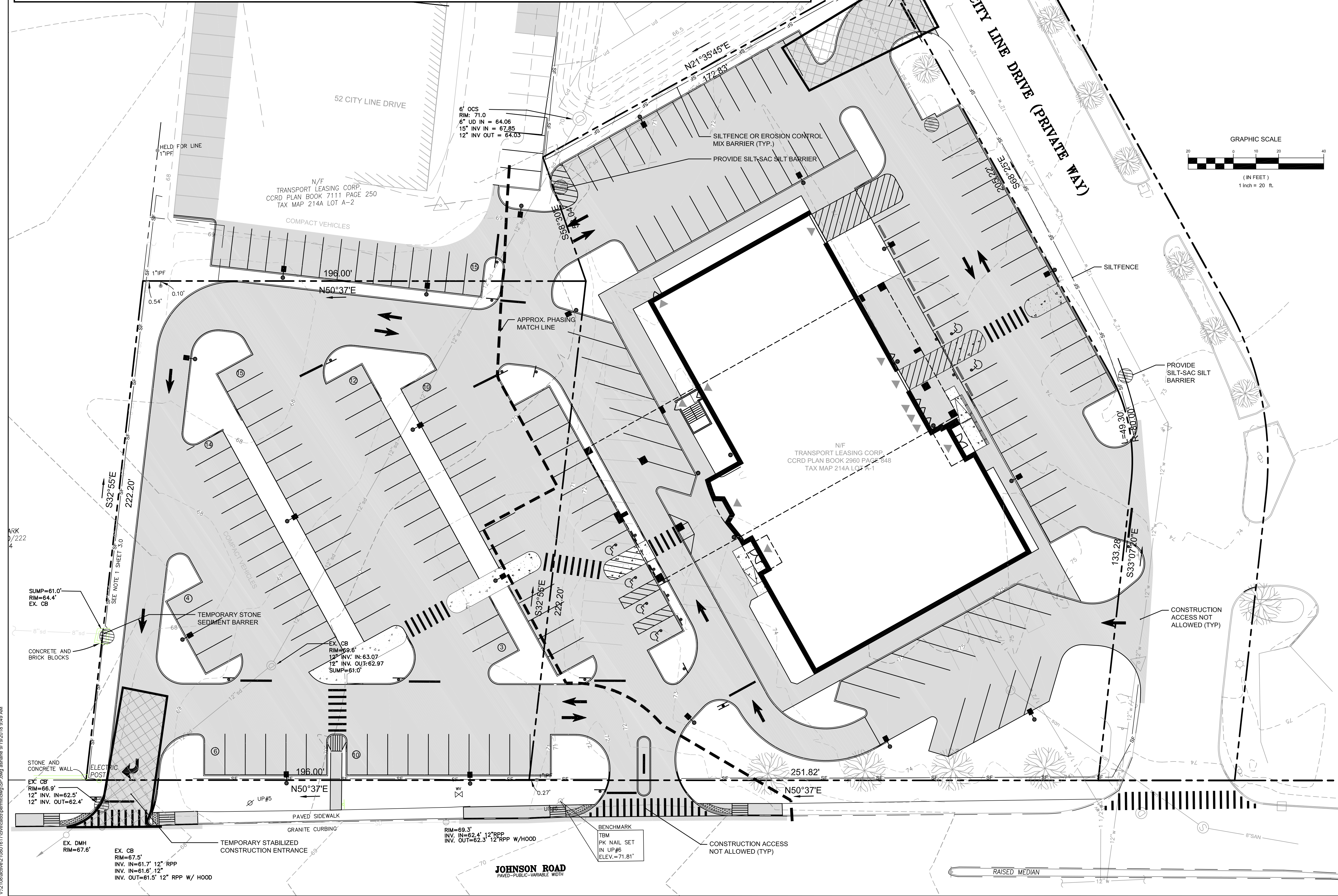
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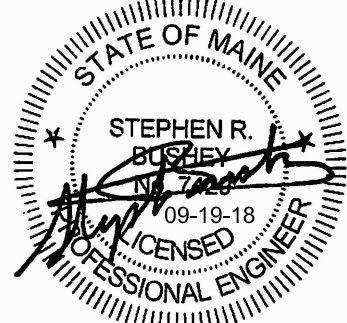
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Client/Project
TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY
90 JOHNSON ROAD, PORTLAND, MAINE

Title
PHASE 2
EROSION CONTROL PLAN

Project No.
210801617

Sheet

Scale
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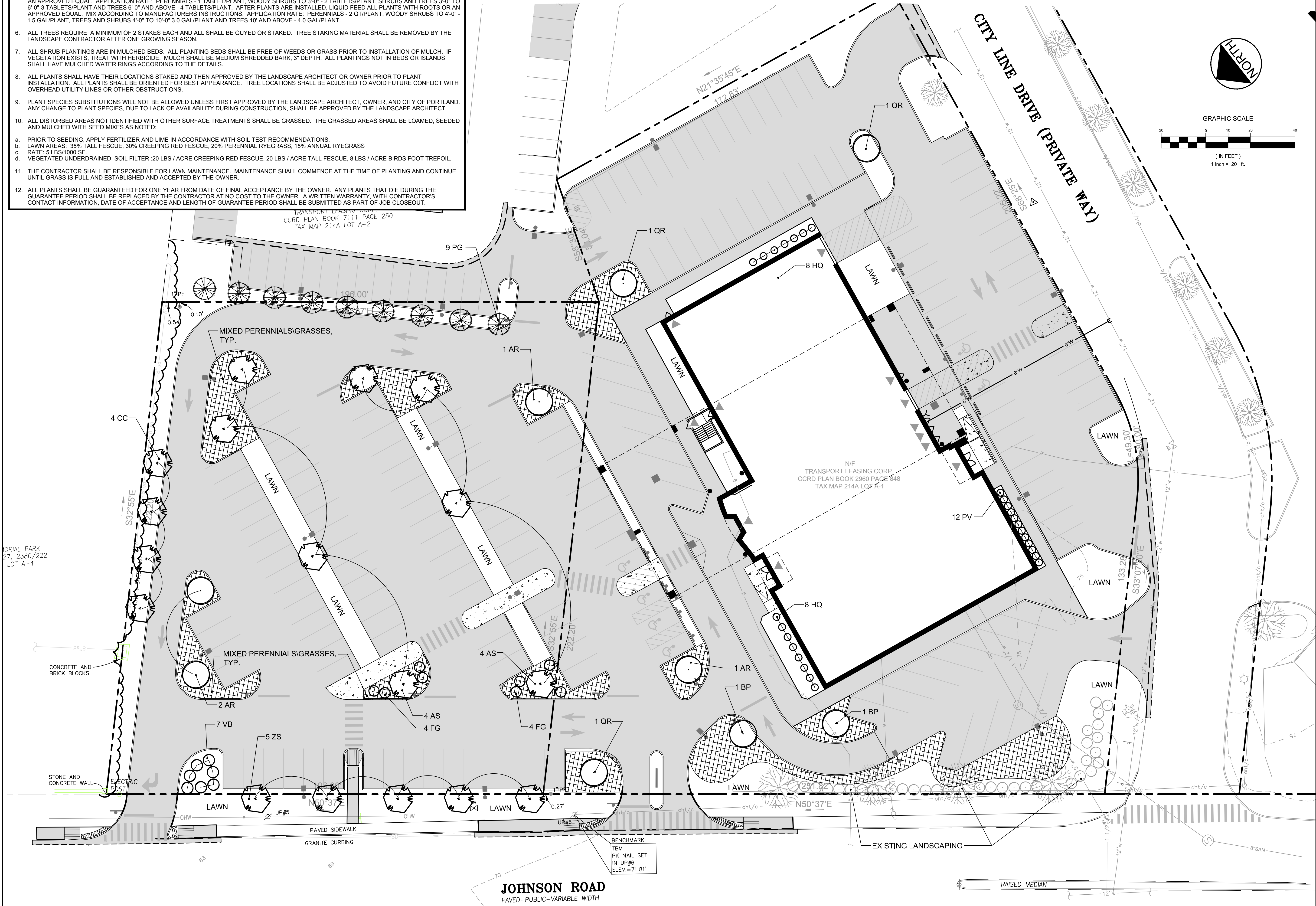
C:\Users\pflieftaz\OneDrive\Documents\210801617\civil\cadd\permit\dwg\FULL BOX CUT PLAN.dwg 7/10/2018 12:09 PM

C-6.0

1. PLANTING OF TREES AND SHRUBS SHALL NOT OCCUR UNTIL ALL GRADING AND PAVING IS COMPLETED IN THE AREA.
2. ALL PLANTS SHALL HAVE A NORMAL HABIT OF GROWTH FOR THE SPECIES AND SHALL BE SOUND, HEALTHY AND FREE OF DISEASE AND INSECTS. THEY SHALL CONFORM TO THE SIZE SPECIFICATION INDICATED ON THE PLANT LIST AND SHALL CONFORM TO ANSI Z60.1 - NURSERY STOCK, LATEST REVISION.
3. ALL PLANTS SHALL HAVE ALL ROOTBALL WRAPPING MATERIALS (BURLAP, WIRE, STRING, ROPE, POTS, ETC.) REMOVED AT THE TIME OF PLANTING. REMOVE SOIL PLACED ABOVE ROOTS TO EXPOSE TRUNK FLARE AS NECESSARY TO DETERMINE SETTING LEVEL AND PIT DEPTH. CIRCLING ROOTS OR ROOTS THAT WOULD LATER GIROLE THE PLANT SHALL BE STRAIGHTENED OR CUT OR THE ROOT BALL SHALL BE CUT UTILIZING THE "BUTTERFLY METHOD".
4. BACKFILL MIX FOR ALL PLANT MATERIAL, EXCEPT TREES, SHALL BE COMPOSED OF TWO PARTS EXISTING SOIL AMENDED WITH ONE PART COMPOST OR TOPSOIL, OR WITH ONE PART SANDY FILL IF HEAVY SOILS. TREE PITS SHALL BE BACKFILLED WITH EXISTING SOIL. PLANTING PITS SHALL BE EXCAVATED TO TWICE THE DIAMETER AND TO THE SAME DEPTH OF THE PLANT ROOT BALL. BACKFILL 1/2 OF DEPTH OF PIT AT A TIME AND COMPACT. REFER TO FERTILIZER RATES AND INSTALL SLOW RELEASE FERTILIZER AFTER FIRST BACKFILL LIFT.
5. ALL PLANTINGS SHALL HAVE SLOW RELEASE FERTILIZER TABLETS INSTALLED. TABLETS SHALL BE AGRIFORM 21-GRAM 20-10-5 PLANTING TABLETS OR AN APPROVED EQUAL. APPLICATION RATE: PERENNIALS - 1 TABLET/PLANT, WOODY SHRUBS TO 3'-0" - 2 TABLETS/PLANT, SHRUBS AND TREES 3'-0" TO 6'-0" - 3 TABLETS/PLANT AND TREES 6'-0" AND ABOVE - 4 TABLETS/PLANT. AFTER PLANTS ARE INSTALLED, LIQUID FEED ALL PLANTS WITH ROOTS OR AN APPROVED EQUAL. MIX ACCORDING TO MANUFACTURERS INSTRUCTIONS. APPLICATION RATE: PERENNIALS - 2 QT/PLANT, WOODY SHRUBS TO 4'-0" - 1.5 GAL/PLANT, TREES AND SHRUBS 4'-0" TO 10'-0" - 3.0 GAL/PLANT AND TREES 10' AND ABOVE - 4.0 GAL/PLANT.
6. ALL TREES REQUIRE A MINIMUM OF 2 STAKES EACH AND ALL SHALL BE GUYED OR STAKED. TREE STAKING MATERIAL SHALL BE REMOVED BY THE LANDSCAPE CONTRACTOR AFTER ONE GROWING SEASON.
7. ALL SHRUB PLANTINGS ARE IN MULCHED BEDS. ALL PLANTING BEDS SHALL BE FREE OF WEEDS OR GRASS PRIOR TO INSTALLATION OF MULCH. IF VEGETATION EXISTS, TREAT WITH HERBICIDE. MULCH SHALL BE MEDIUM SHREDDED BARK, 3" DEPTH. ALL PLANTINGS NOT IN BEDS OR ISLANDS SHALL HAVE MULCHED WATER RINGS ACCORDING TO THE DETAILS.
8. ALL PLANTS SHALL HAVE THEIR LOCATIONS STAKED AND THEN APPROVED BY THE LANDSCAPE ARCHITECT OR OWNER PRIOR TO PLANT INSTALLATION. ALL PLANTS SHALL BE ORIENTED FOR BEST APPEARANCE. TREE LOCATIONS SHALL BE ADJUSTED TO AVOID FUTURE CONFLICT WITH OVERHEAD UTILITY LINES OR OTHER OBSTRUCTIONS.
9. PLANT SPECIES SUBSTITUTIONS WILL NOT BE ALLOWED UNLESS FIRST APPROVED BY THE LANDSCAPE ARCHITECT, OWNER, AND CITY OF PORTLAND. ANY CHANGE TO PLANT SPECIES, DUE TO LACK OF AVAILABILITY DURING CONSTRUCTION, SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT.
10. ALL DISTURBED AREAS NOT IDENTIFIED WITH OTHER SURFACE TREATMENTS SHALL BE GRASSED. THE GRASSED AREAS SHALL BE LOAMED, SEEDED AND MULCHED WITH SEED MIXES AS NOTED.
- a. PRIOR TO SEEDING, APPLY FERTILIZER AND LIME IN ACCORDANCE WITH SOIL TEST RECOMMENDATIONS.
b. LAWN AREAS: 35% TALL FESCUE, 30% CREEPING RED FESCUE, 20% PERENNIAL RYEGRASS, 15% ANNUAL RYEGRASS
c. RATE: 5 LBS/1000 SF
d. VEGETATED UNDERDRAINED SOIL FILTER: 20 LBS / ACRE CREEPING RED FESCUE, 20 LBS / ACRE TALL FESCUE, 8 LBS / ACRE BIRDS FOOT TREFOIL.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAWN MAINTENANCE. MAINTENANCE SHALL COMMENCE AT THE TIME OF PLANTING AND CONTINUE UNTIL GRASS IS FULL AND ESTABLISHED AND ACCEPTED BY THE OWNER.
12. ALL PLANTS SHALL BE GUARANTEED FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY THE OWNER. ANY PLANTS THAT DIE DURING THE GUARANTEE PERIOD SHALL BE REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER. A WRITTEN WARRANTY, WITH CONTRACTOR'S CONTACT INFORMATION, DATE OF ACCEPTANCE AND LENGTH OF GUARANTEE PERIOD SHALL BE SUBMITTED AS PART OF JOB CLOSEOUT.

PLANT LIST - TREES						
QTY	SYM	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	NATIVE
4	AR	<i>Acer rubrum x freemanii</i>	Freeman's Red Maple	2" CAL.	B&B	Y
8	AS	<i>Acer saccharum</i>	Sugar Maple	2" CAL.	B&B	Y
4	AC	<i>Amelanchier canadensis</i>	Serviceberry	8' - 10'	B&B, Multistem	Y
2	BP	<i>Betula papyrifera</i>	White Paper Birch	2" CAL.	B&B, Multistem	Y
4	CC	<i>Carpinus Caroliniana</i>	American Hornbeam	2" - 2 1/2" CAL.	B&B	
9	PG	<i>Picea glauca</i>	White Spruce	6' - 8'	B&B	Y
3	QR	<i>Quercus rubra</i>	Red Oak	2" CAL.	B&B	Y
5	ZS	<i>Zelkova Serrata 'Green Vase'</i>	Japanese Zelkova	3" CAL.	B&B	

PLANT LIST - SHRUBS + PERENNIALS + GROUND COVERS						
QTY	SYM	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	NATIVE
500		Mixed perennials & grasses - TBD		# 1	2' O.C.	Y
8	FG	<i>Fothergilla gardenii</i>	Dwarf Fothergilla	#7	CONT.	Y
15	HQ	<i>Hydrangea quercifolia</i>	"Ruby Slipper" Oakleaf hydrangea	#5	3' O.C.	
12	PV	<i>Panicum virgatum</i>	"Cheyenne Sky" Switchgrass	#2	3' O.C.	Y
7	VB	<i>Viburnum x burkwoodii</i>	Burkwood viburnum	#3	3' O.C.	Y



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482 Payne Road Scarborough Court
Scarborough, Maine 04074-8929
Tel. 207.883.3355
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Revision	By	Appr.	Date
2	PBF	SRB	18.07.09
1	PBF	SRB	18.05.22
			YJAM/DD

File Name: _____

Permit-Seal

Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title

LANDSCAPE PLAN

Project No.

210801617

Scale

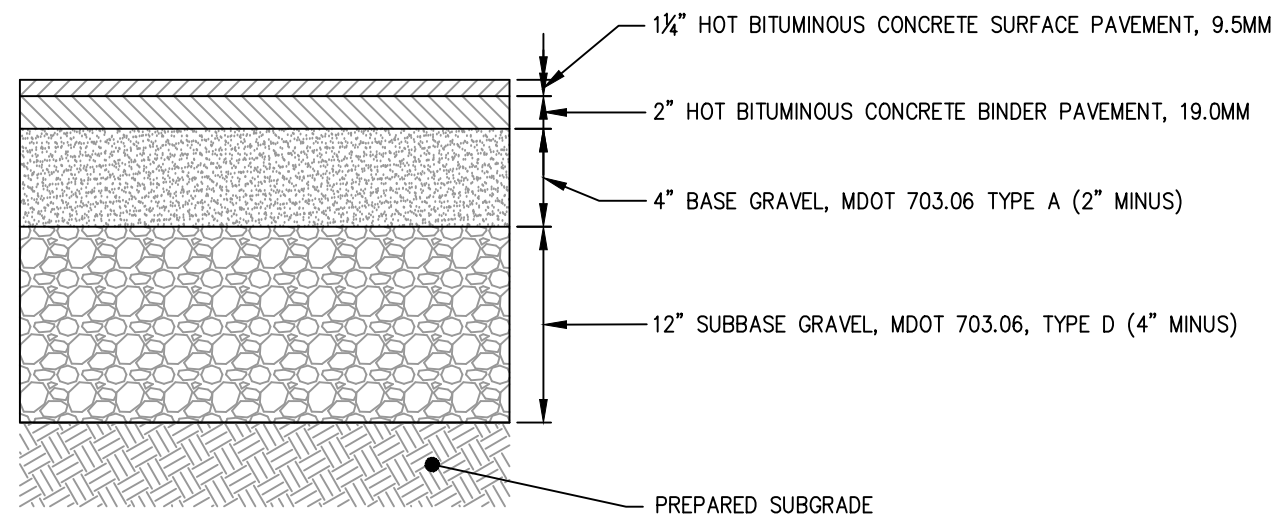
1" = 20'

Sheet

C-7.0

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NOTES

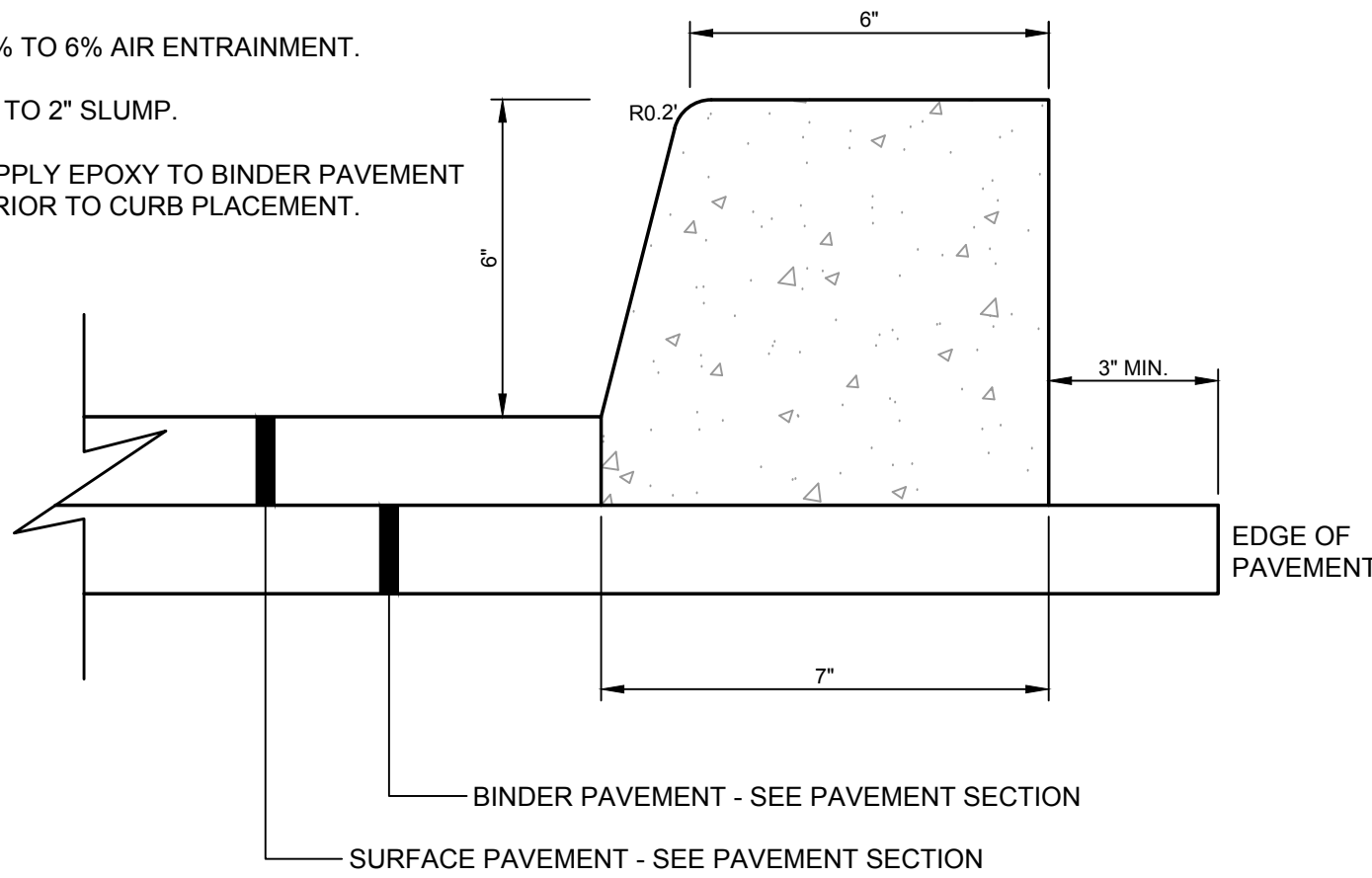
1. APPLY TACK COAT BETWEEN BINDER AND SURFACE COURSES.
2. ALL MATERIALS SHALL CONFORM TO MDOT SPECIFICATIONS, LATEST REVISION. COMPACTION OF ALL MATERIALS TO BE IN ACCORDANCE WITH THE MDOT SPECIFICATIONS.
3. USE SMOOTH BLADE BUCKET TO MINIMIZE DISTURBANCE AS SUBGRADE IS PREPARED.
4. GEOTEXTILE FABRIC MAY BE NECESSARY OVER SILTY CLAY OR YIELDING SUBGRADE. CONTRACTOR SHALL NOTIFY OWNER IF YIELDING SUBGRADE CONDITIONS ARE ENCOUNTERED IN ORDER TO DISCUSS AND DETERMINE A COURSE OF ACTION.

**STANDARD DUTY BITUMINOUS
CONCRETE PAVEMENT SECTION**

(A) N.T.S.

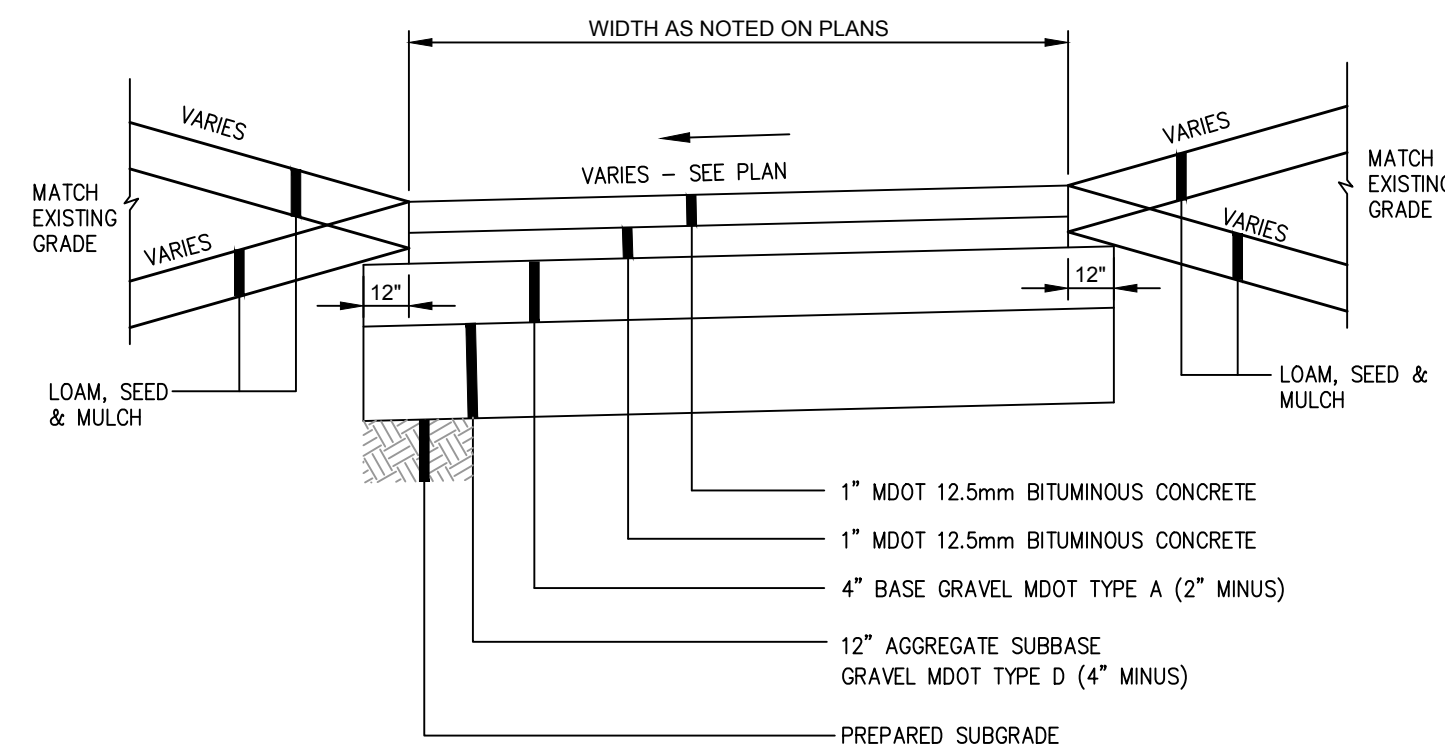
NOTES:

1. 4,000 PSI CONCRETE WITH FIBER REINFORCEMENT.
2. 4% TO 6% AIR ENTRAINMENT.
3. 1" TO 2" SLUMP.
4. APPLY EPOXY TO BINDER PAVEMENT PRIOR TO CURB PLACEMENT.



(B) EXTRUDED SLIPFORM VERTICAL CONCRETE CURB

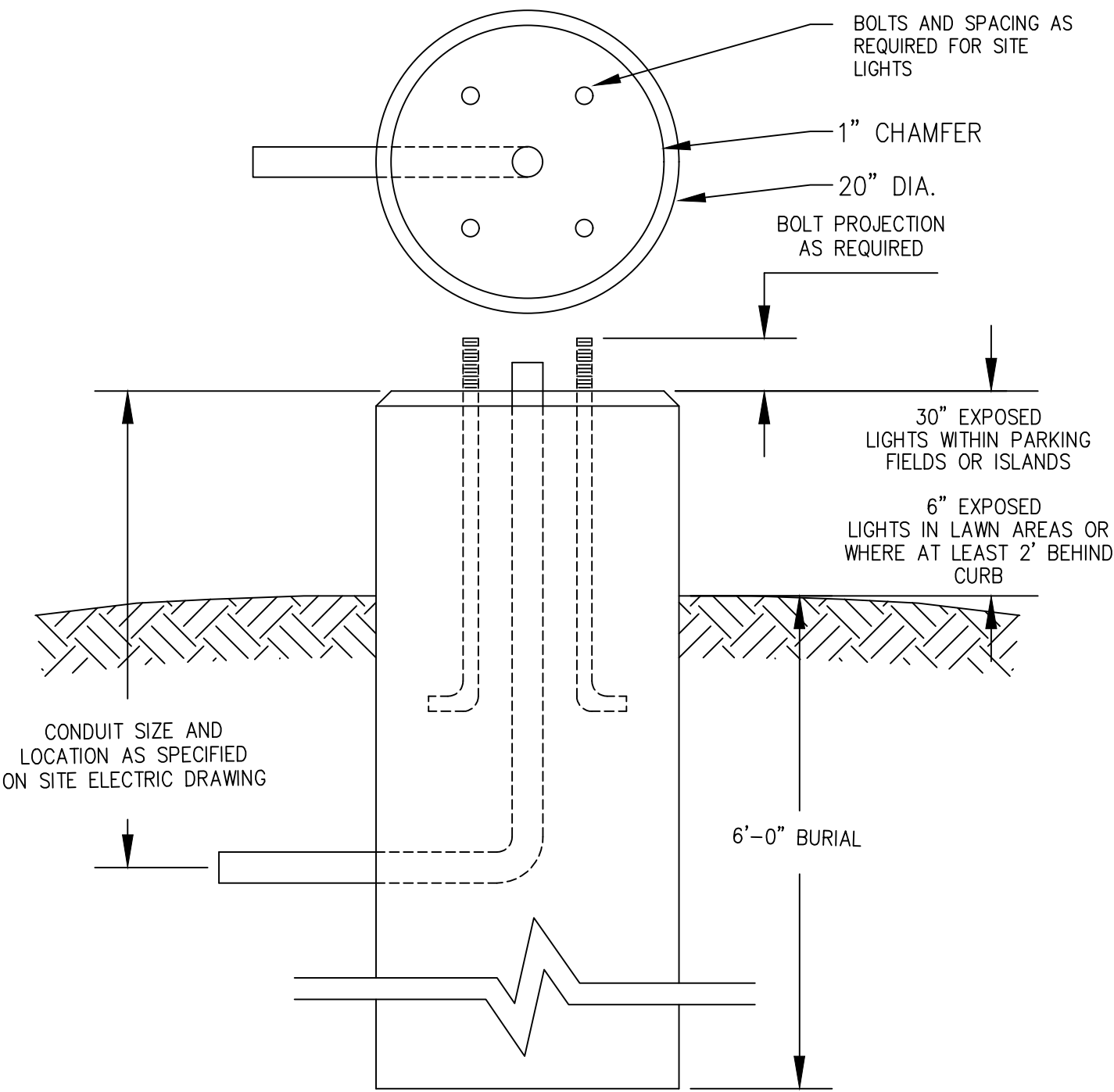
N.T.S.



(C) BITUMINOUS SIDEWALK DETAIL-NO CURB

N.T.S.

NOTE: ANCHOR BOLTS TO BE PROVIDED TO CONTRACTOR BY THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR SUPPLYING AND INSTALLING ALL LIGHT POLE FOUNDATIONS. THE CONTRACTOR IS ALSO RESPONSIBLE FOR TRENCHING AND BACKFILLING ALL CONDUITS. THE OWNER WILL BE RESPONSIBLE FOR SETTING OF LIGHT POLES AND ALL WIRING AND LIGHTING ASSEMBLIES.

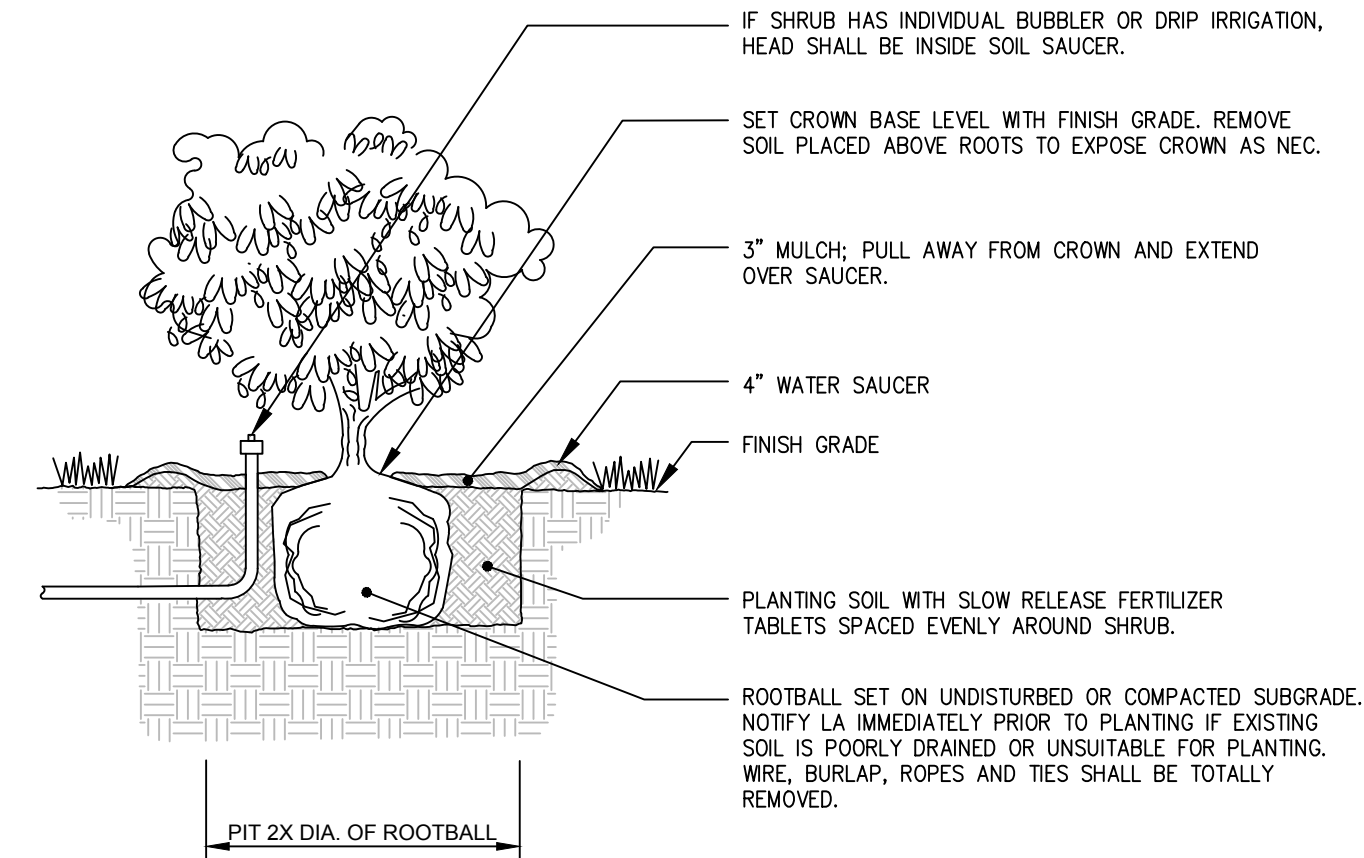


DESIGN NOTES:

1. CONCRETE 4,000 PSI AT 28 DAYS
2. REINFORCING IS AS SPECIFIED. (TYP. 4 - #4 VERTICALLY AND #3 STIRRUPS 12" O.C. HORIZONTALLY)
3. ANCHOR BOLTS AND GROUNDING AS SPECIFIED AND REQUIRED BY SUPPLIER.
4. EXPOSED PORTION OF CONCRETE FOUNDATION TO BE PAINTED WITH 2 COATS OF ACRYLIC PAINT. COLOR TO MATCH POLE COLOR.
5. FOR POLE HEIGHTS EQUAL TO OR LESS THAN 25' TALL.

(D) 20" ROUND LIGHT POLE FOUNDATION

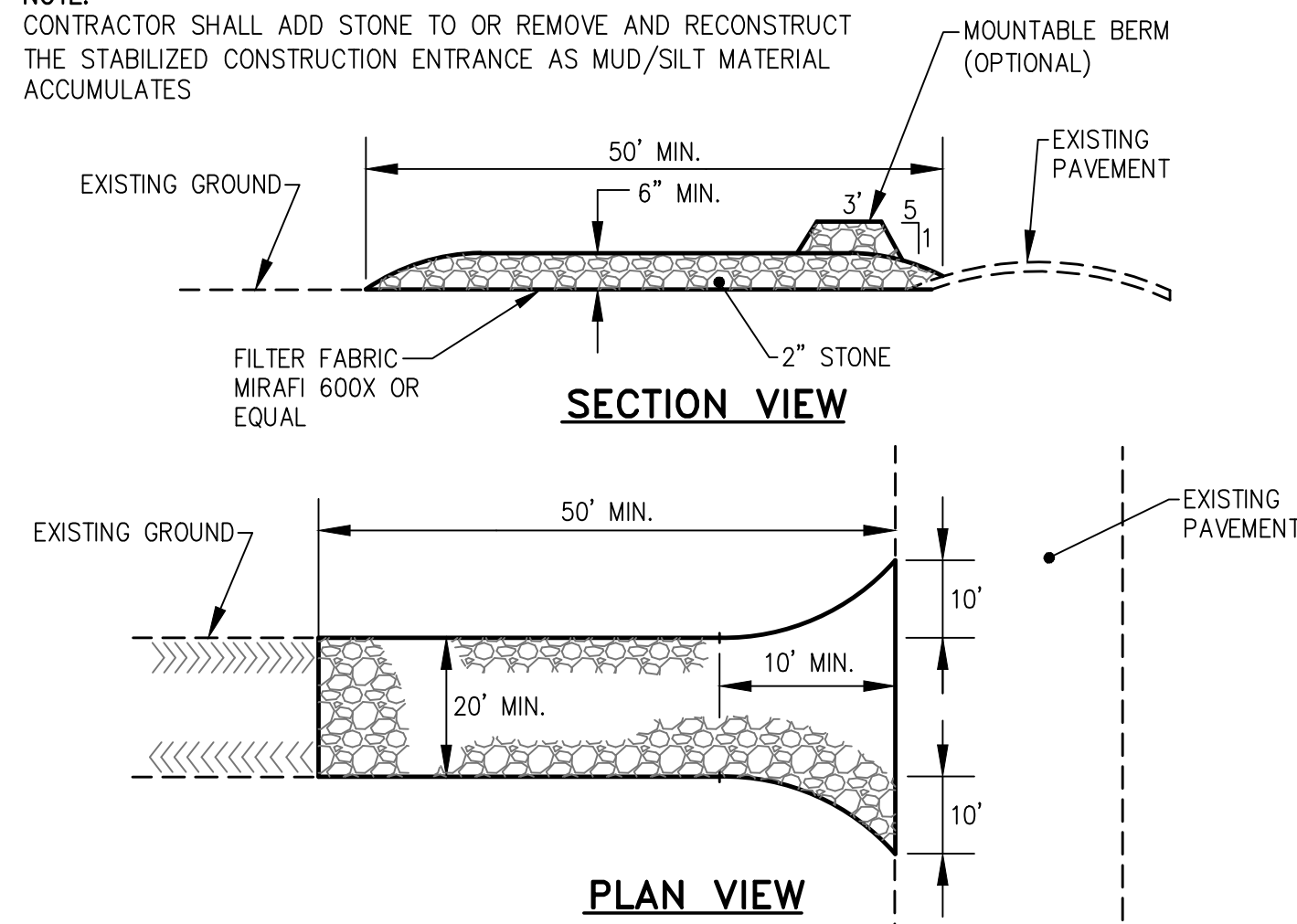
N.T.S.



(E) SHRUB INSTALLATION DETAIL

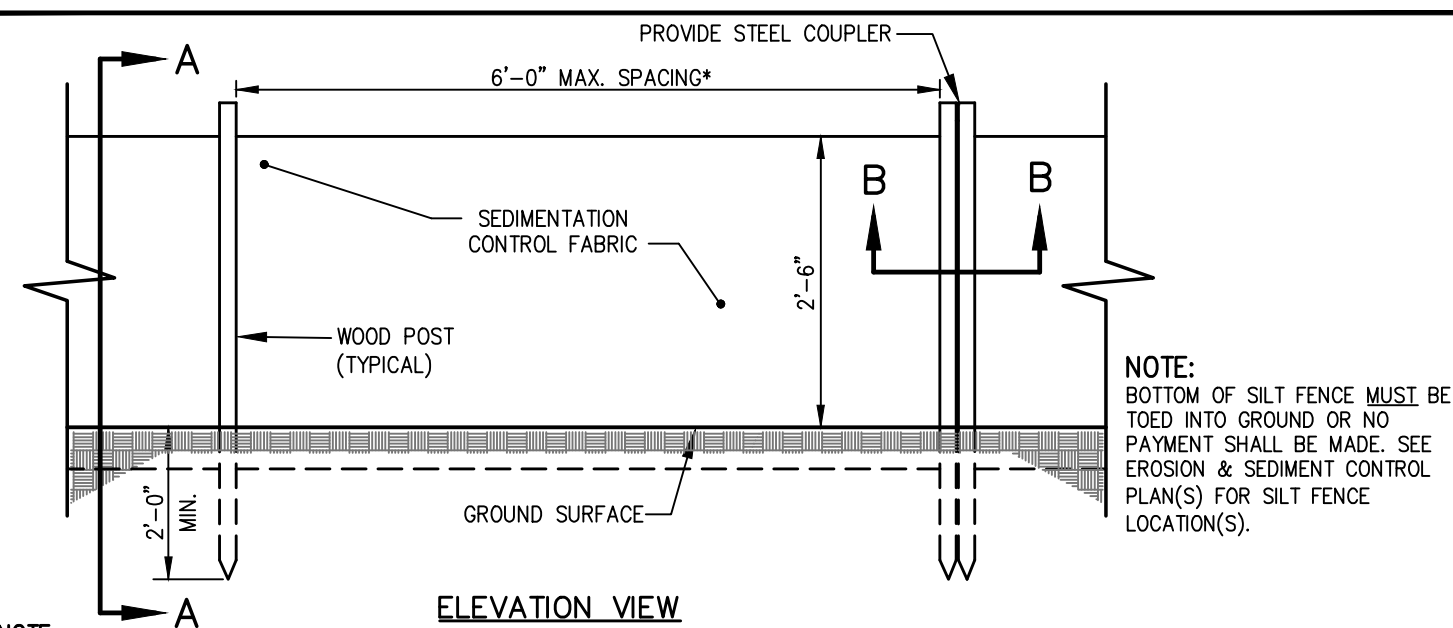
N.T.S.

NOTE: CONTRACTOR SHALL ADD STONE TO OR REMOVE AND RECONSTRUCT THE STABILIZED CONSTRUCTION ENTRANCE AS MUD/SILT MATERIAL ACCUMULATES

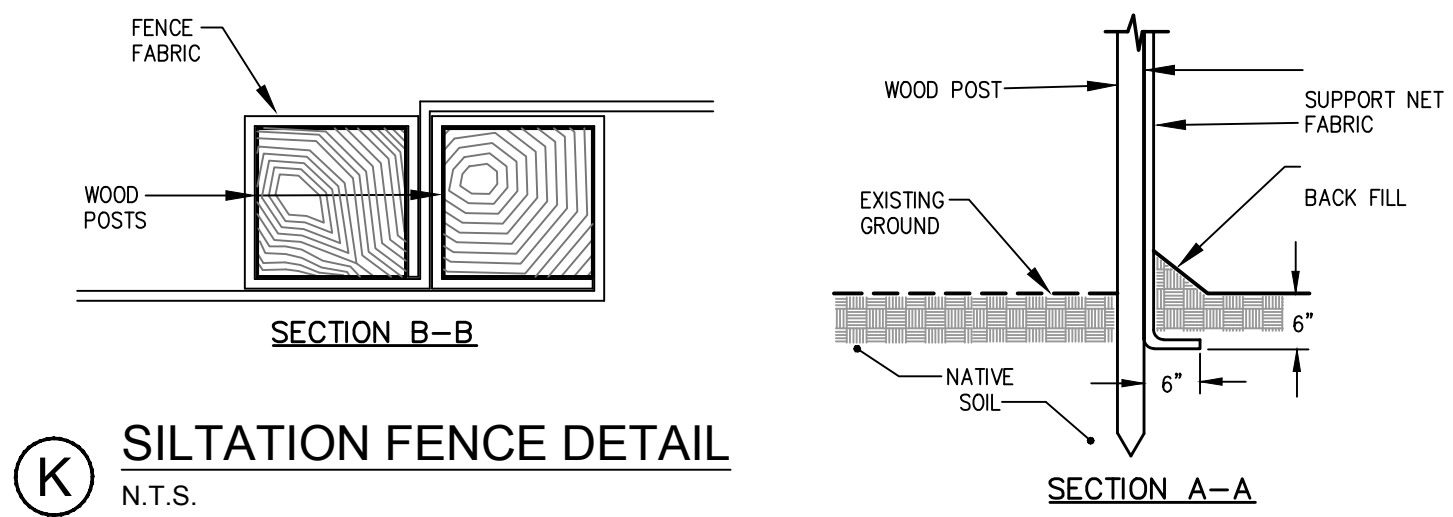


(J) STABILIZED CONSTRUCTION ENTRANCE DETAIL

N.T.S.

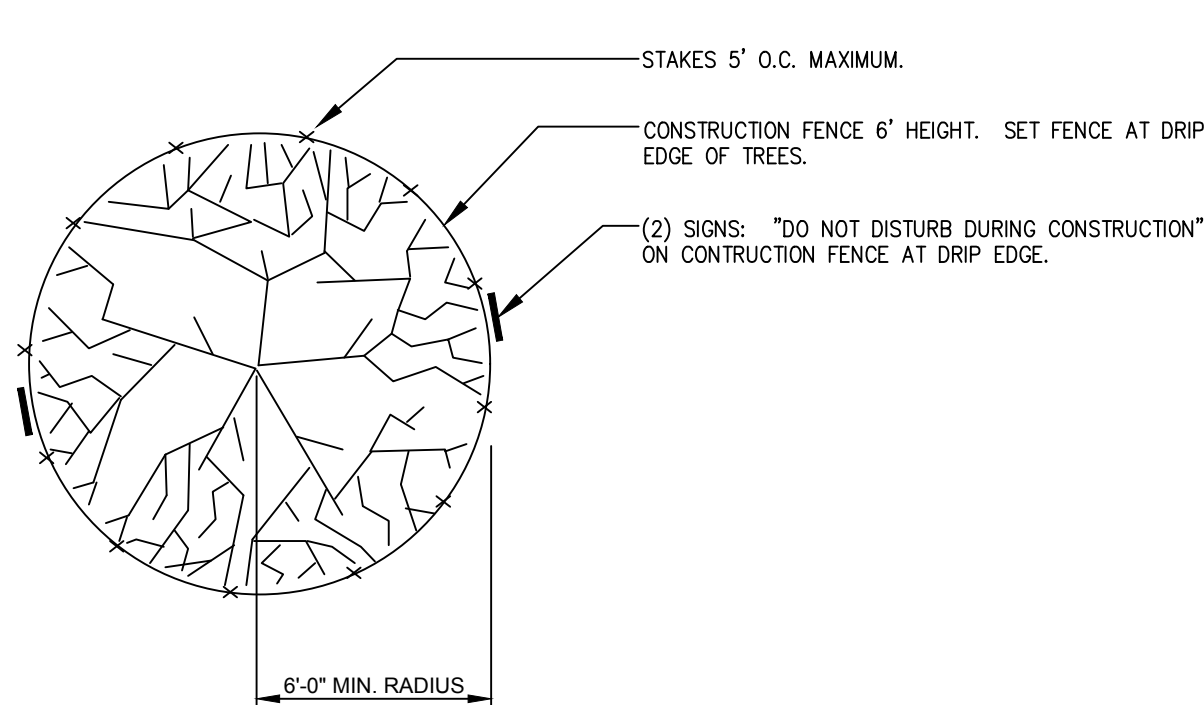


*NOTE: THE SILT FENCE SHOULD HAVE A MAXIMUM STAKING DISTANCE OF 6' UNLESS THE FENCE IS SUPPORTED BY WIRE FENCE REINFORCEMENT A MAXIMUM 14 GAUGE AND WITH A MINIMUM MESH SPACING OF 6".



(K) SILTATION FENCE DETAIL

N.T.S.

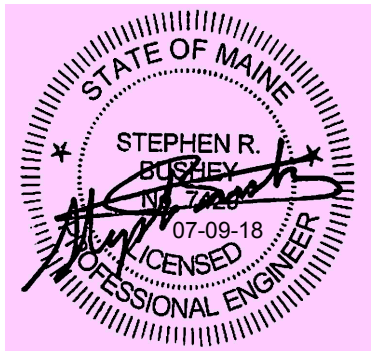


(H) TREE PROTECTION DETAIL

N.T.S.

File Name: PBF DWN. SRB CHKD. SRB DSGN. 18.05.22 DATE

Permit-Seal



Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title

DETAILS

Project No. Scale

210801617

Sheet

C-8.0

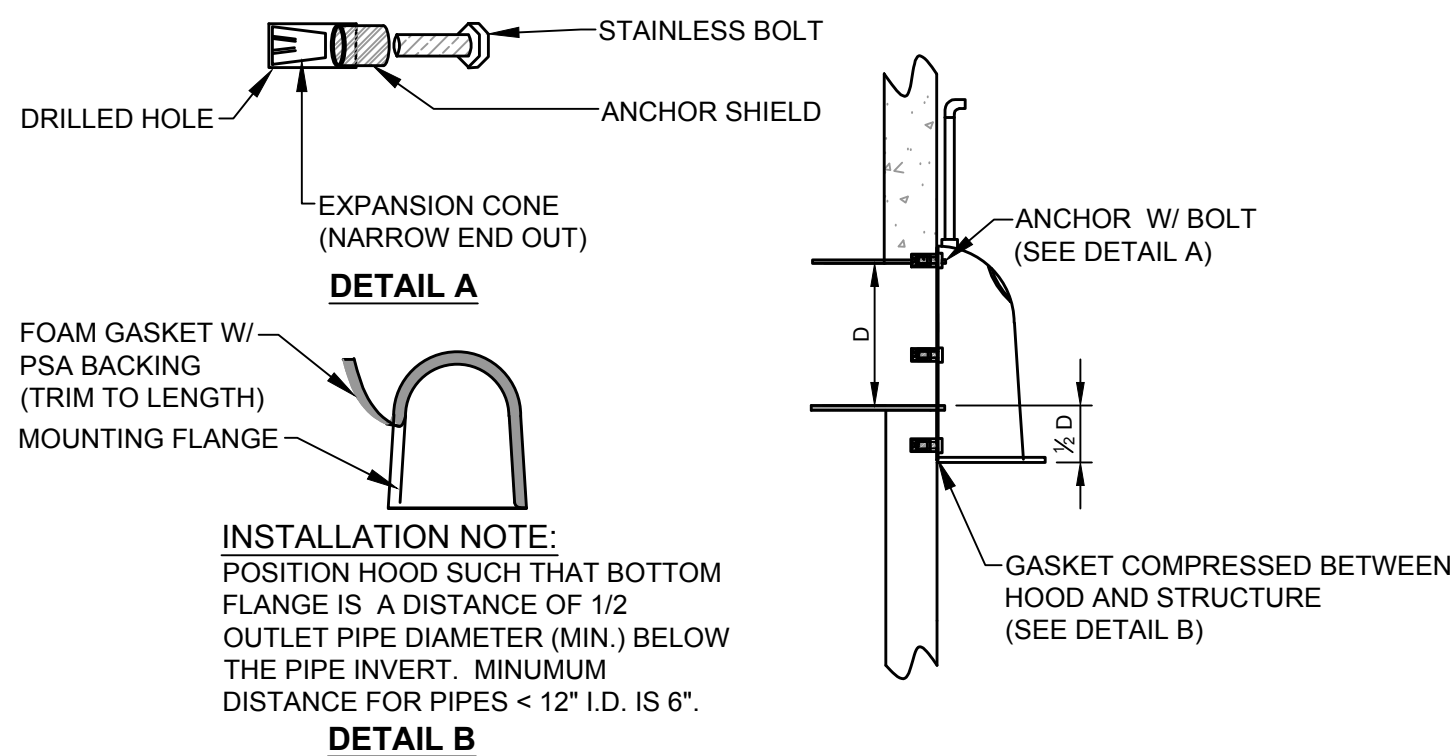
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NOTES:

- ALL HOODS AND TRAPS FOR CATCH BASINS AND WATER QUALITY STRUCTURES SHALL BE AS MANUFACTURED BY BEST MANAGEMENT PRODUCTS, INC. TOLL FREE: (800) 504-8008 OR (888) 354-7585 WEB SITE: www.bmpinc.com OR PRE-APPROVED EQUAL.
- ALL HOODS SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125" LAMINATE THICKNESS.
- ALL HOODS SHALL BE EQUIPPED WITH A WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, & AN ANTI-SIPHON VENT AS DRAWN. (SEE CONFIGURATION DETAIL.)
- THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE IN ACCORDANCE WITH THE FOLLOWING TABLE:

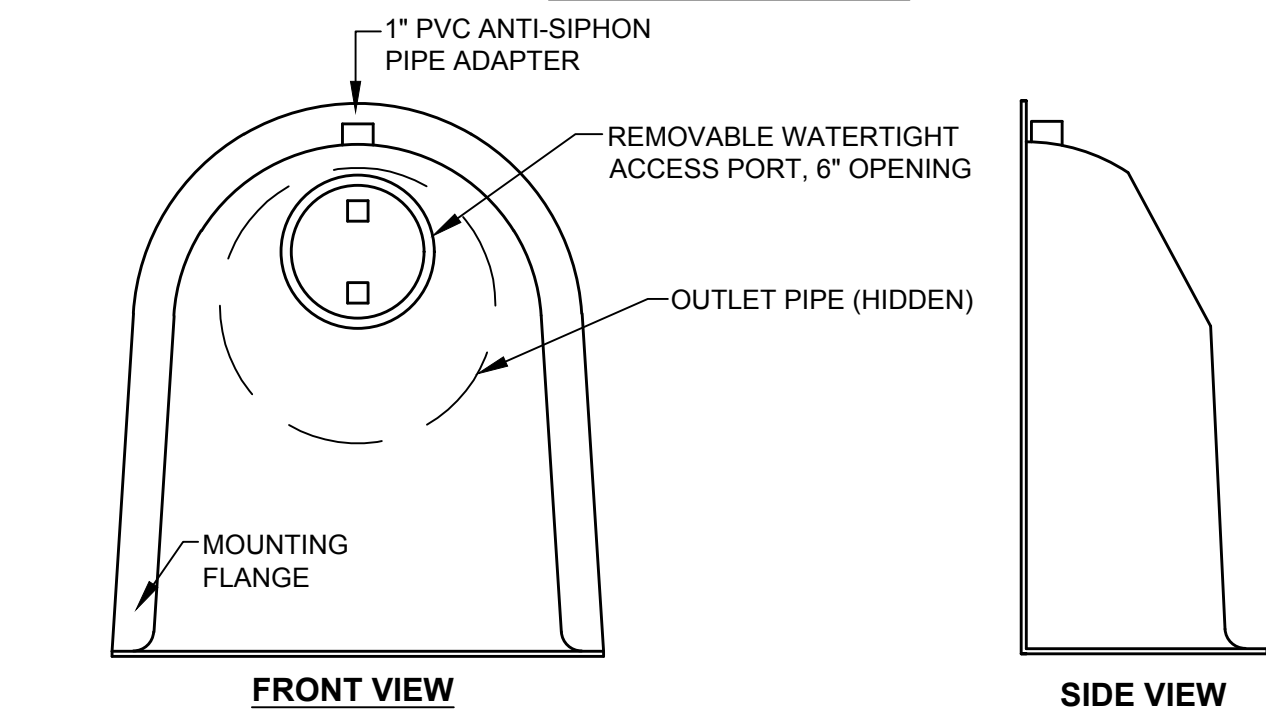
STRUCTURE OUTLET HOLE SIZE	SNOUT SIZE
11.9" O.D. OR LESS	12 F or R
12.0"-17.9" O.D.	18 F or R
18.0"-23.9" O.D.	24 F or R
24.0"-29.9" O.D.	30 F or R
30.0"-47.9" O.D.	48 F
48.0"-95.9" O.D.	96 F

- THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A DISTANCE EQUAL TO 1/2 THE OUTLET PIPE DIAMETER WITH A MINIMUM DISTANCE OF 6" FOR PIPES <12" I.D.
- THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 24" ACCORDING TO STRUCTURE CONFIGURATION.
- THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL.
- THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH 3/8" STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET AS SUPPLIED BY MANUFACTURER. (SEE INSTALLATION DETAIL.)
- INSTALLATION INSTRUCTIONS SHALL BE FURNISHED WITH MANUFACTURER SUPPLIED INSTALLATION KIT, WHICH INCLUDES:
 - INSTALLATION INSTRUCTIONS
 - PVC ANTI-SIPHON VENT PIPE AND ADAPTER
 - OIL-RESISTANT CRUSHED CELL FOAM GASKET WITH PSA BACKING
 - 3/8" STAINLESS STEEL BOLTS
 - ANCHOR SHIELDS

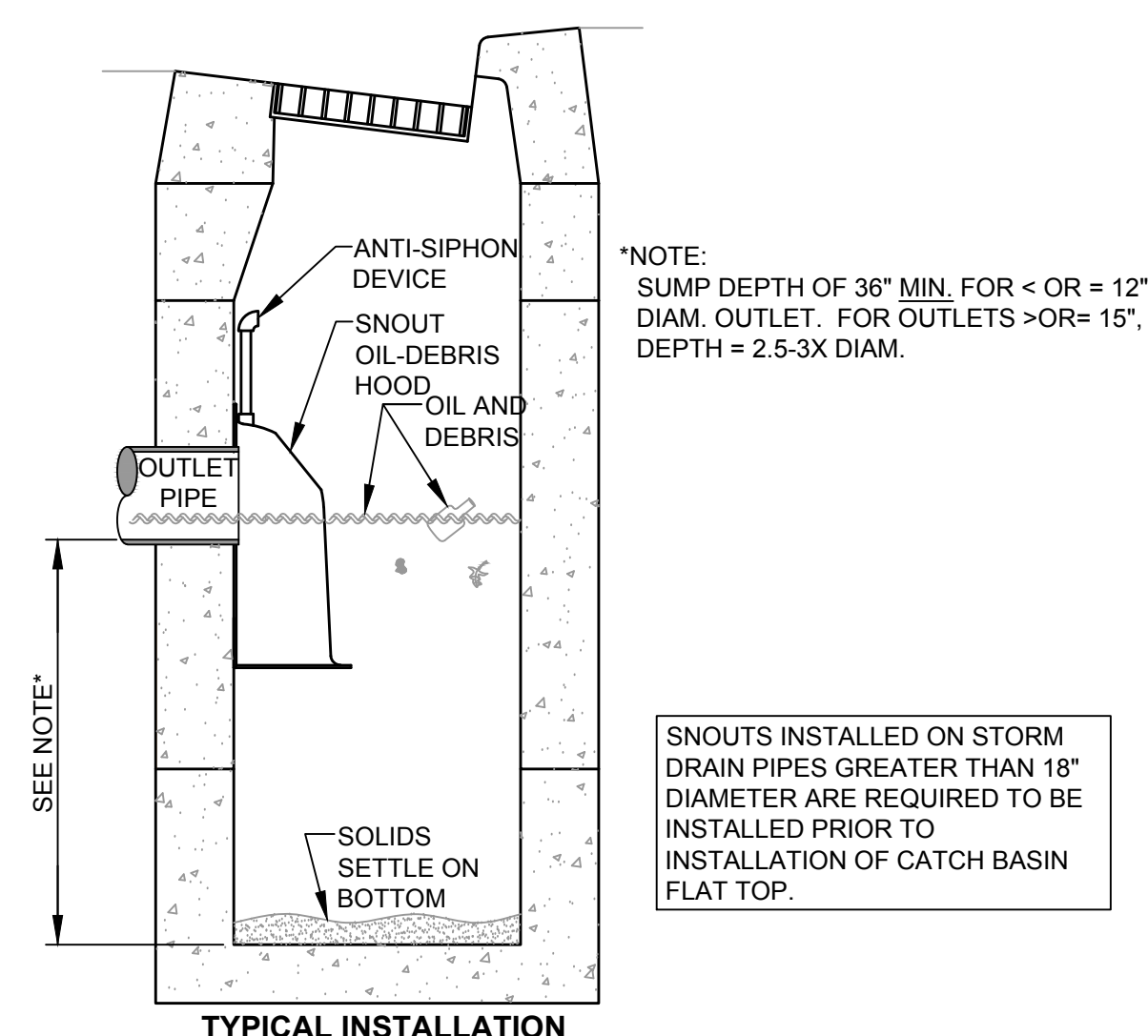


DETAIL B

INSTALLATION DETAIL



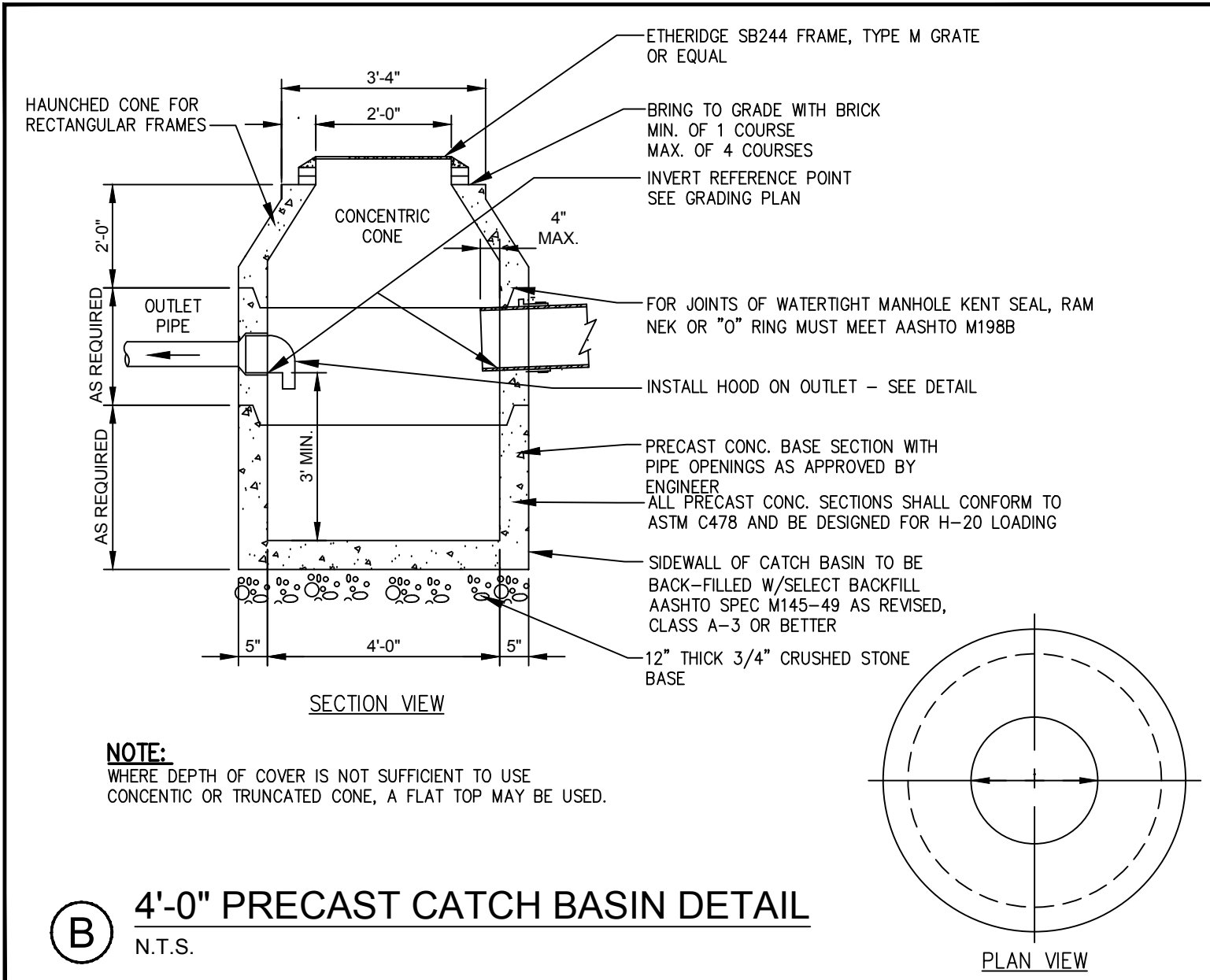
CONFIGURATION DETAIL



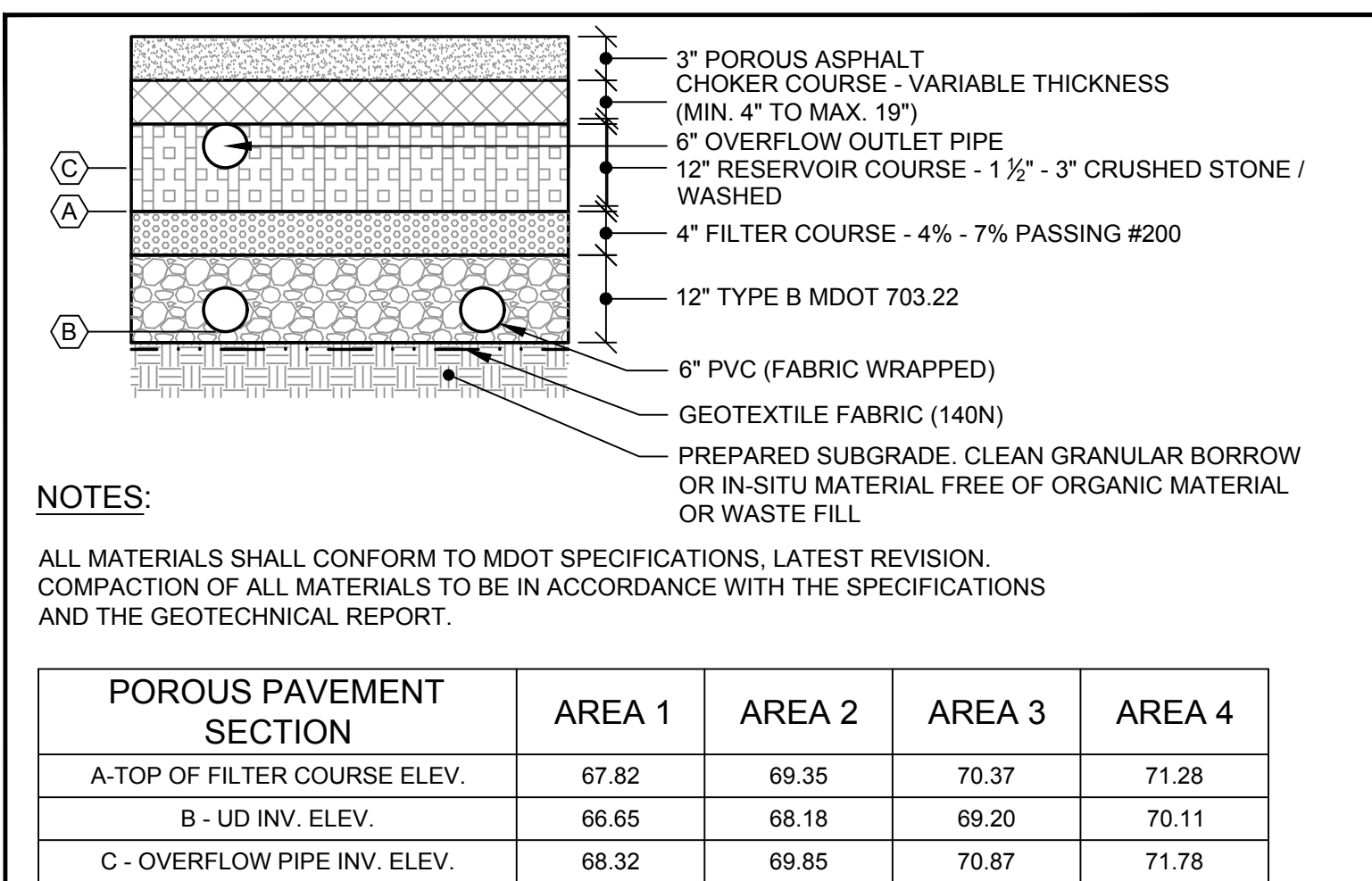
*NOTE:
SUMP DEPTH OF 36" MIN. FOR < OR = 12"
DIAM. OUTLET. FOR OUTLETS >OR= 15",
DEPTH = 2.5-3X DIAM.

SNOUTS INSTALLED ON STORM
DRAIN PIPES GREATER THAN 18"
DIAMETER ARE REQUIRED TO BE
INSTALLED PRIOR TO
INSTALLATION OF CATCH BASIN
FLAT TOP.

(A) SNOUT OIL-WATER-DEBRIS SEPARATOR DETAIL
N.T.S.



(B) 4'-0" PRECAST CATCH BASIN DETAIL
N.T.S.

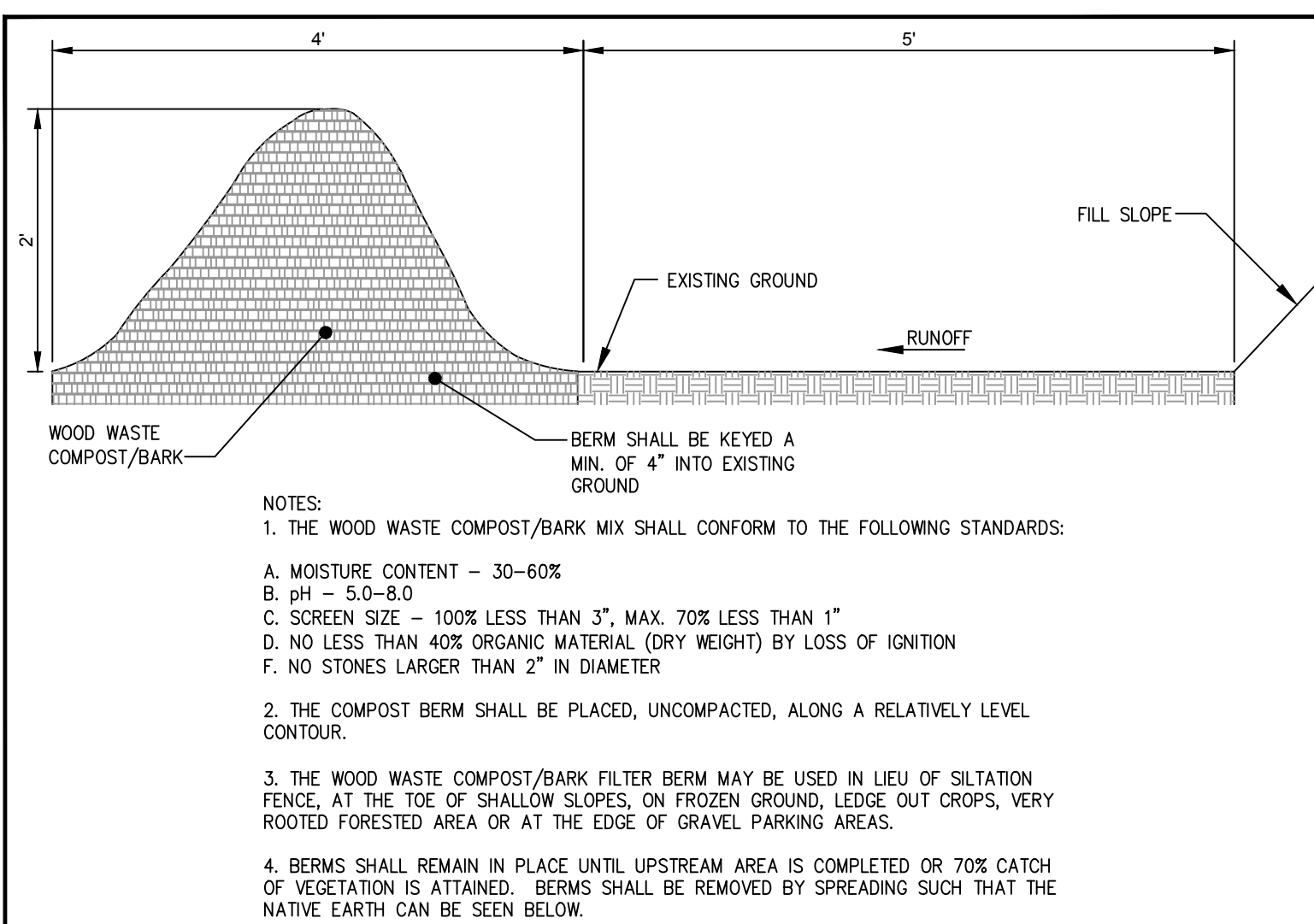


NOTES:

ALL MATERIALS SHALL CONFORM TO MDOT SPECIFICATIONS, LATEST REVISION.
COMPACTION OF ALL MATERIALS TO BE IN ACCORDANCE WITH THE SPECIFICATIONS
AND THE GEOTECHNICAL REPORT.

POROUS PAVEMENT SECTION	AREA 1	AREA 2	AREA 3	AREA 4
A-TOP OF FILTER COURSE ELEV.	67.82	69.35	70.37	71.28
B - UD INV. ELEV.	66.65	68.18	69.20	70.11
C - OVERFLOW PIPE INV. ELEV.	68.32	69.85	70.87	71.78

(C) POROUS PAVEMENT SECTION
N.T.S.



NOTES:

1. THE WOOD WASTE COMPOST/BARK MIX SHALL CONFORM TO THE FOLLOWING STANDARDS:

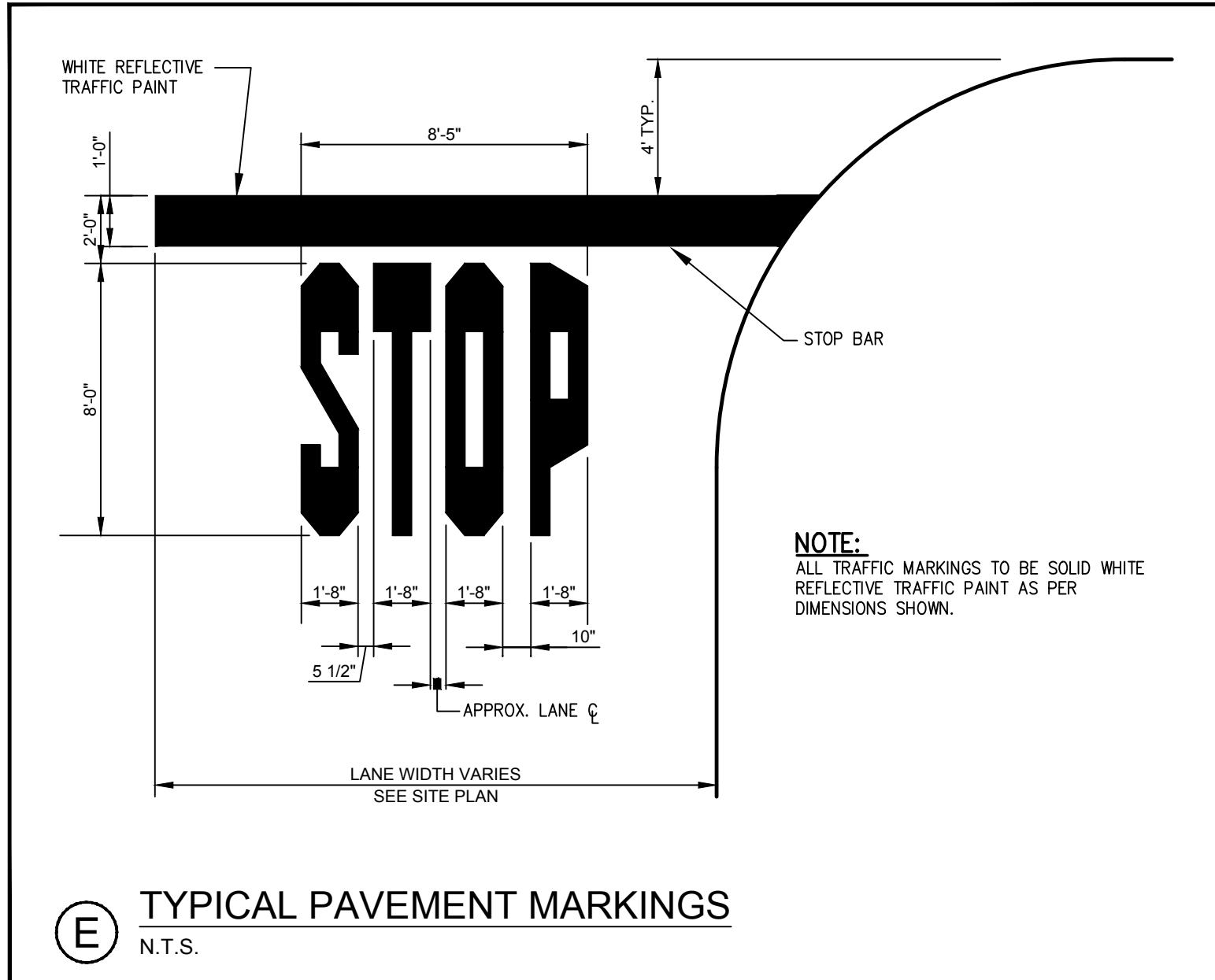
- MOISTURE CONTENT - 30-60%
- pH - 5.0-8.0
- SCREEN SIZE - 100% LESS THAN 3", MAX. 70% LESS THAN 1"
- NO LESS THAN 40% ORGANIC MATERIAL (DRY WEIGHT) BY LOSS OF IGNITION
- NO STONES LARGER THAN 2" IN DIAMETER

2. THE COMPOST BERM SHALL BE PLACED, UNCOMPACTED, ALONG A RELATIVELY LEVEL
CONTOUR.

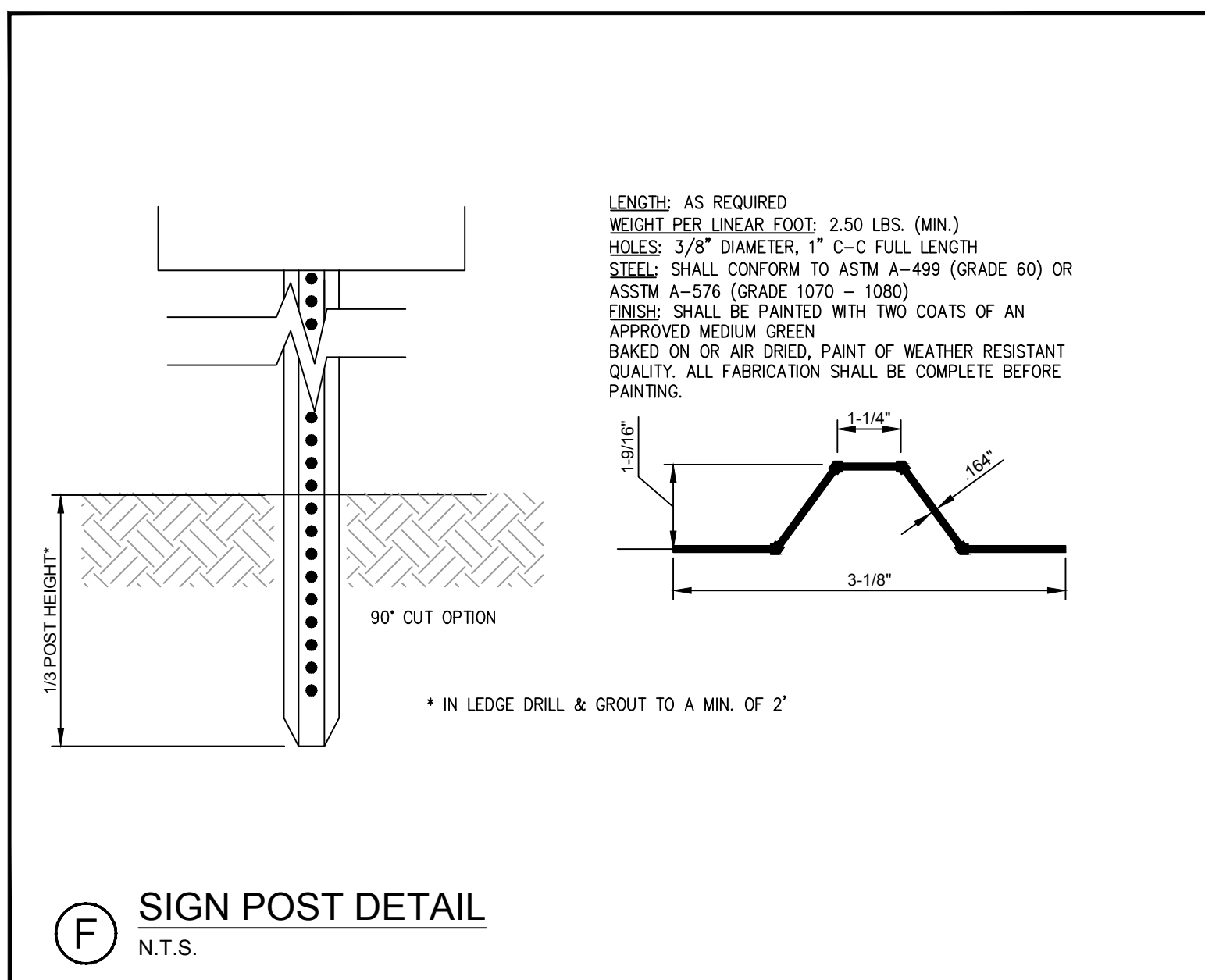
3. THE WOOD WASTE COMPOST/BARK FILTER BERM MAY BE USED IN LIEU OF SILTATION
FENCE, AT THE TOE OF SHALLOW SLOPES, ON FROZEN GROUND, LEDGE OUT CROPS, VERY
ROOTED FORESTED AREA OR AT THE EDGE OF GRAVEL PARKING AREAS.

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 THE
NATIVE EARTH CAN BE SEEN BELOW.

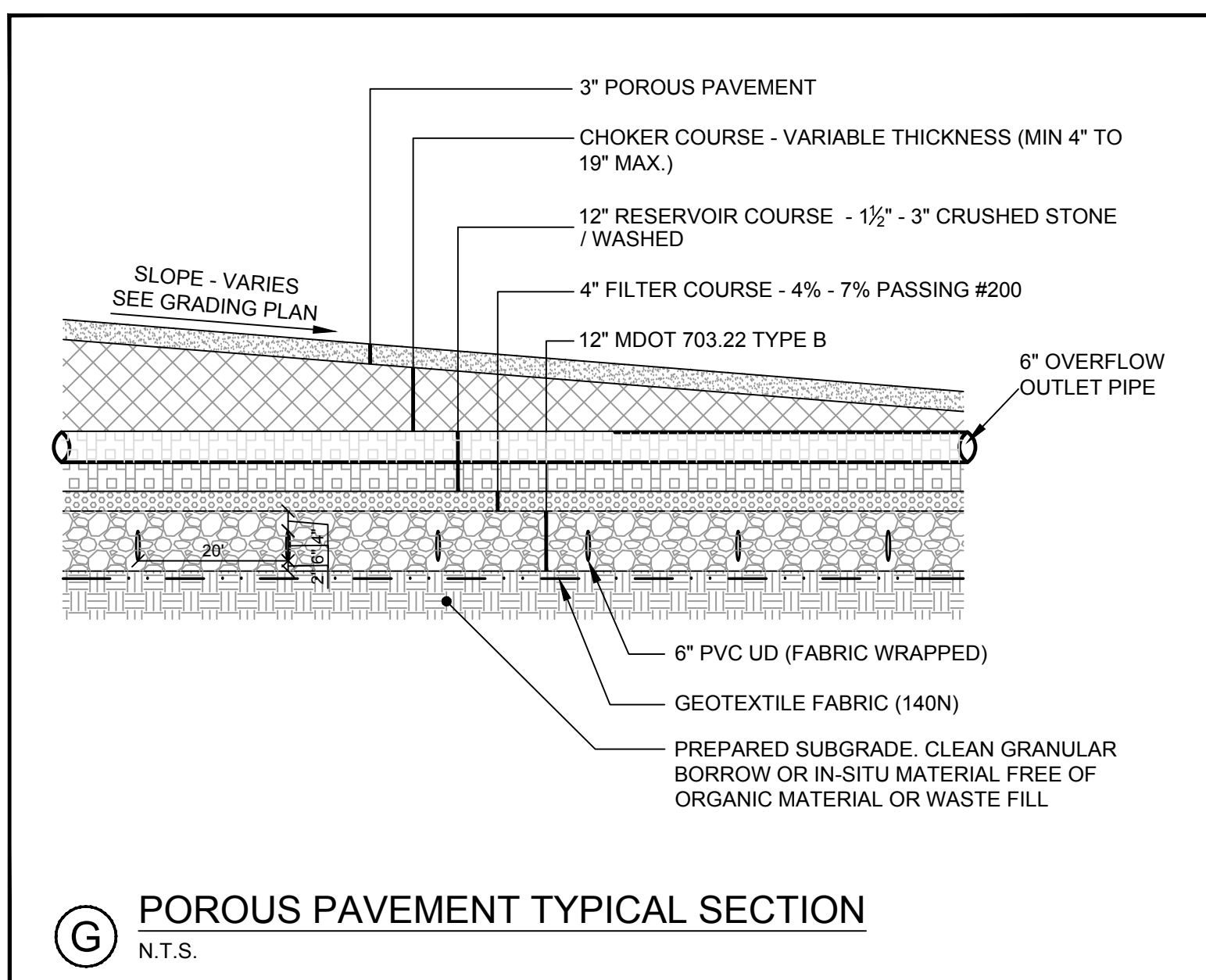
(D) WOOD WASTE COMPOST / BARK FILTER BERM
N.T.S.



(E) TYPICAL PAVEMENT MARKINGS
N.T.S.



(F) SIGN POST DETAIL
N.T.S.



(G) POROUS PAVEMENT TYPICAL SECTION
N.T.S.



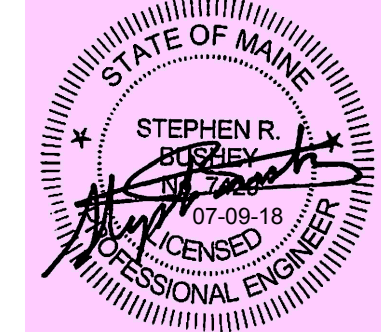
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File Name: PBF SRB SRB 18.05.22
DWN. CHKD. DSGN. DATE

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Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title

DETAILS

Project No. Scale

210801617

Sheet

C-9.0

18.07.09	SRB	SRB	YTM/DD
18.05.22	PBF	SRB	Appr.
1	SUBMITTED FOR OWNER REVIEW	By	
2	SUBMITTED TO CITY FOR LEVEL II SITE PLAN REVIEW		

Revision

EROSION AND SEDIMENTATION CONTROL NOTES

THE PRIMARY EMPHASIS OF THE EROSION/SEDIMENTATION CONTROL PLAN TO BE IMPLEMENTED FOR THIS PROJECT ARE AS FOLLOWS:

- DEVELOPMENT OF A CAREFUL CONSTRUCTION SEQUENCE.
- RAPID REVEGETATION OF DENUDED AREAS TO MINIMIZE THE PERIOD OF SOIL EXPOSURE.
- RAPID STABILIZATION OF DRAINAGE PATHS TO AVOID RILL AND GULLY EROSION.
- THE USE OF ONSITE MEASURES TO CAPTURE SEDIMENT (HAY BALES/SILT FENCE, ETC.)

DESCRIPTION AND LOCATION OF LIMITS OF ALL PROPOSED EARTH MOVEMENTS
THE CONSTRUCTION OF THE DEVELOPMENT WILL REQUIRE THE FOLLOWING ON-SITE IMPROVEMENTS.

EARTHWORK ACTIVITY INCLUDING CUTS AND FILLS TO BRING THE PARKING, DRIVE AISLE AND WALKWAY AREAS TO SUBGRADE.

CONSTRUCTION OF PARKING LOTS, DRIVE AISLES, WALKWAYS AND INSTALLATION OF THE DRAINAGE SYSTEMS.

EROSION/SEDIMENTATION CONTROL DEVICES

THE FOLLOWING EROSION/SEDIMENT CONTROL DEVICES WILL BE IMPLEMENTED BY THE CONTRACTOR AS PART OF THE SITE DEVELOPMENT. THESE DEVICES SHALL BE INSTALLED AS INDICATED ON THE PLANS OR AS DESCRIBED WITHIN THIS REPORT. ALL EROSION/SEDIMENT CONTROL DEVICES SHALL BE IN PLACE PRIOR TO ANY WORK BEING DONE SO THAT NO SEDIMENT ENTERS THE PROPOSED DRAINAGE SYSTEM. FOR FURTHER REFERENCE, SEE THE MAINE EROSION AND SEDIMENT CONTROL HANDBOOK FOR CONSTRUCTION BEST MANAGEMENT PRACTICES.

SILTATION FENCE OR A SEDIMENT BARRIER SHALL BE INSTALLED DOWNSTREAM OF ANY DISTURBED AREAS TO TRAP RUNOFF BORNE SEDIMENTS UNTIL THE SITE IS REVEGETATED. THE SEDIMENT BARRIER SHALL BE INSTALLED PER THE DETAIL PROVIDED IN THE PLAN SET AND INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. REPAIRS SHALL BE MADE IMMEDIATELY BY THE CONTRACTOR IF THERE ARE ANY SIGNS OF EROSION OR SEDIMENTATION BELOW THE SEDIMENT BARRIER LINE. PROPER PLACEMENT OF STAKES AND FABRIC INTO THE GROUND IS CRITICAL TO SILT FENCE EFFECTIVENESS. IF THERE ARE SIGNS OF UNDERCUTTING AT THE CENTER OR THE EDGES, OR IMPOUNDING OF LARGE VOLUMES OF WATER BEHIND THE BARRIER, THE BARRIER SHALL BE REPLACED WITH A STONE CHECK DAM. STRAW OR HAY MULCH INCLUDING HYDROSEEDING IS INTENDED TO PROVIDE COVER FOR DENUDED OR SEEDED AREAS UNTIL REVEGETATION IS ESTABLISHED. MULCH PLACED ON SLOPES OF LESS THAN 15 PERCENT OR 8 PERCENT DEPENDING ON THE TIME OF YEAR SHALL BE ANCHORED BY APPLYING WATER; MULCH PLACED ON SLOPES STEEPER THAN 15 PERCENT OR 8 PERCENT DEPENDING ON THE TIME OF YEAR SHALL BE COVERED WITH A FABRIC NETTING AND ANCHORED WITH STAPLES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. SLOPES STEEPER THAN 3:1 WHICH ARE TO BE REVEGETATED SHALL RECEIVE CURLEX BLANKETS BY AMERICAN EXCELSIOR OR EQUAL WITHIN 5 DAYS OF FINAL GRADING OR PRIOR TO A PREDICTED RAINFALL EVENT. HAY MULCH SHALL BE AVAILABLE ON SITE AT ALL TIMES IN ORDER TO PROVIDE IMMEDIATE TEMPORARY STABILIZATION WHEN NECESSARY. A CONSTRUCTION ENTRANCE WILL BE CONSTRUCTED AT ALL ACCESS POINTS ONTO THE SITE TO PREVENT TRACKING OF SOIL ONTO ADJACENT PAVED AREAS. STONE SEDIMENT TRAPS OR A PREMANUFACTURED SILTSACK WILL BE INSTALLED AT CATCH BASIN INLETS TO PREVENT SILT FROM ENTERING ONSITE OR OFFSITE THE STORM DRAIN SYSTEM. LOAM AND SEED IS INTENDED TO SERVE AS THE PRIMARY PERMANENT REVEGETATIVE MEASURE FOR ALL DENUDED AREAS NOT PROVIDED WITH OTHER EROSION CONTROL MEASURES, SUCH AS RIPRAP. APPLICATION RATES ARE PROVIDED AT THE END OF THIS SECTION FOR TEMPORARY AND PERMANENT SEEDING.

TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES

THE FOLLOWING ARE PLANNED AS TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES DURING CONSTRUCTION:

A CRUSHED STONE STABILIZED CONSTRUCTION ENTRANCE(S) SHALL BE PLACED AT THE SITE ACCESS ONTO ADJACENT PAVED AREAS.

SILTATION FENCE OR A MULCH FILTER BARRER SHALL BE INSTALLED ALONG THE DOWNGRAIDENT SIDE OF THE PARKING AREAS AND OF ALL FILL SECTIONS. THE SILTATION FENCE WILL REMAIN IN PLACE AND PROPERLY MAINTAINED UNTIL THE SITE IS ACCEPTABLY REVEGETATED.

TEMPORARY STOCKPILES OF STUMPS, GRUBBINGS, OR COMMON EXCAVATION WILL BE PROTECTED AS FOLLOWS:

TEMPORARY STOCKPILES SHALL BE LOCATED AWAY FROM DRAINAGE SWALES.

STOCKPILES SHALL BE STABILIZED WITHIN 7 DAYS BY EITHER TEMPORARILY SEEDING THE STOCKPILE WITH A HYDROSEED METHOD CONTAINING AN EMULSIFIED MULCH TACKIFIER OR BY COVERING THE STOCKPILE WITH MULCH.

ALL DENUDED AREAS WHICH HAVE BEEN ROUGH GRADED AND ARE NOT LOCATED WITHIN THE PARKING AND DRIVEWAY SUBBASE AREA, SHALL RECEIVE MULCH OR EROSION CONTROL MESH FABRIC WITHIN 7 DAYS OF INITIAL DISTURBANCE OF SOIL.

FOR WORK WHICH IS CONDUCTED BETWEEN OCTOBER 1 AND APRIL 15 OF ANY CALENDAR YEAR, ALL DENUDED AREAS WILL BE COVERED WITH HAY MULCH, APPLIED AT TWICE THE NORMAL APPLICATION RATE AND ANCHORED WITH A FABRIC NETTING. THE TIME PERIOD FOR APPLYING MULCH SHALL BE LIMITED TO 5 DAYS FOR ALL AREAS OR IMMEDIATELY IN ADVANCE OF A PREDICTED RAINFALL EVENT.

ADJACENT PAVED AREAS SHALL BE SWEEPED TO CONTROL MUD AND DUST AS NECESSARY. A STREET SWEEPER SHALL BE AVAILABLE ON IMMEDIATE NOTICE.

DURING GRUBBING OPERATIONS STONE CHECK DAMS OR HAY BALE BARRIERS WILL BE INSTALLED AT ANY EVIDENT CONCENTRATED FLOW DISCHARGE POINTS.

SILT FENCING WITH A MAXIMUM STAKE SPACING OF 6 FEET SHOULD BE USED, UNLESS THE FENCE IS SUPPORTED BY WIRE FENCE REINFORCEMENT OF MINIMUM 14 GAUGE AND WITH A MAXIMUM MESH SPACING OF 6 INCHES, IN WHICH CASE STAKES MAY BE SPACED A MAXIMUM OF 10 FEET APART. THE BOTTOM OF THE FENCE SHOULD BE PROPERLY ANCHORED A MINIMUM OF 6" PER THE PLAN DETAIL AND BACKFILLED. ANY SILT FENCE IDENTIFIED BY THE OWNER OR REVIEWING AGENCIES AS NOT BEING PROPERLY INSTALLED DURING CONSTRUCTION SHALL BE IMMEDIATELY REPAIRED IN ACCORDANCE WITH THE INSTALLATION DETAILS.

PERMANENT EROSION CONTROL MEASURES

THE FOLLOWING PERMANENT EROSION CONTROL MEASURES HAVE BEEN DESIGNED AS PART OF THE EROSION/SEDIMENTATION CONTROL PLAN:

ALL AREAS DISTURBED DURING CONSTRUCTION, BUT NOT SUBJECT TO OTHER RESTORATION (PAVING, RIPRAP, ETC.) WILL BE LOAMED, LIMED, FERTILIZED, MULCHED, AND SEEDED. FABRIC NETTING, ANCHORED WITH STAPLES, SHALL BE PLACED OVER THE MULCH IN AREAS WHERE THE FINISH GRADE SLOPE IS GREATER THAN 10 PERCENT. NATIVE TOPSOIL SHALL BE STOCKPILED TEMPORARILY STABILIZED WITH SEED AND MULCH AND REUSED FOR FINAL RESTORATION WHEN IT IS OF SUFFICIENT QUALITY.

CATCH BASINS WILL BE PROVIDED WITH A 3'-0" DEEP SEDIMENT SUMP.

TIMING AND SEQUENCE OF EROSION/SEDIMENTATION CONTROL MEASURES

THE FOLLOWING CONSTRUCTION SEQUENCE SHALL BE REQUIRED TO INSURE THE EFFECTIVENESS OF THE EROSION AND SEDIMENTATION CONTROL MEASURES ARE OPTIMIZED. THE SEQUENCE APPLIES TO ALL PHASES OF CONSTRUCTION.

NOTE: FOR ALL GRADING ACTIVITIES, THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION NOT TO OVEREXPOSE THE SITE BY LIMITING THE DISTURBED AREA.
INSTALL CRUSHED STONE STABILIZED CONSTRUCTION ENTRANCE.
INSTALL PERIMETER SILTATION FENCE OR SEDIMENT BARRIER AS INDICATED ON THE PLANS.
COMPLETE DEMOLITION ACTIVITY.
PERFORM EARTHWORK TO BRING PARKING AREAS TO SUBGRADE.
BEGIN INSTALLATION OF DRAINAGE APPURTENANCES AND PIPING.
COMMENCE ADDITIONAL EARTHWORK IN FILL AREAS AND FOR WATER QUALITY TREATMENT AREAS.
COMPLETE EARTHWORK, GRADING AND PIPE INSTALLATION FOR WATER QUALITY TREATMENT FILTERS UP TO BOTTOM OF SOIL FILTER MEDIA - SOIL FILTER MEDIA SHALL NOT BE INSTALLED UNTIL PARKING LOT PAVING (BINDER) IS COMPLETED.
COMPLETE EARTHWORK AND GRADING TO SUBGRADE AS NECESSARY FOR PARKING AREAS.
COMPLETE INSTALLATION OF STORM DRAINAGE APPURTENANCES.
COMMENCE INSTALLATION OF UTILITIES FROM THE STREET OR ON SITE AS NECESSARY.

INSTALL LIGHT POLE FOUNDATIONS.
COMPLETE ALL REMAINING EARTHWORK OPERATIONS INCLUDING FINE GRADING OF SLOPES.
INSTALL SUBBASE AND BASE GRAVELS.
INSTALL BASE COURSE PAVING.
INSTALL CURBING.
LOAM, LIME, FERTILIZE, SEED AND MULCH DISTURBED AREAS, AND COMPLETE ALL LANDSCAPING.
INSTALL SOIL FILTER MEDIA IN WATER QUALITY TREATMENT AREAS.
INSTALL SURFACE COURSE PAVING, STRIPE PER PLANS.
REMOVE ACCUMULATED SEDIMENT FROM AHEAD OF ANY SEDIMENT BARRIERS AS NECESSARY.
ONCE THE SITE IS STABILIZED AND A 90% CATCH OF VEGETATION HAS BEEN OBTAINED, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.
TOUCH UP LOAM AND SEED.

NOTE: ALL DENUDED AREAS NOT SUBJECT TO FINAL PAVING, RIPRAP OR GRAVEL, SHALL BE REVEGETATED. DUE TO THE TIMING AND SIZE OF THE PROJECT, COMPLETION OF THE FACILITY WITHIN A SUMMER CONSTRUCTION SEASON IS EXPECTED. HOWEVER, IF CIRCUMSTANCES DICTATE FOR ALL WORK WHICH WILL BE CONDUCTED BETWEEN OCTOBER 1 AND APRIL 15 OF THE CALENDAR YEAR, THE CONTRACTOR SHALL SUBMIT A SCHEDULE WHICH WILL SATISFY THE FOLLOWING CRITERIA:

LIMIT THE AMOUNT OF EXPOSED AREA TO THOSE AREAS IN WHICH WORK IS EXPECTED TO BE UNDERTAKEN DURING THE PROCEEDING 7 DAYS. DURING THE CONSTRUCTION PROCESS, ALL DISTURBED AREAS SHALL BE COVERED WITH MULCH WITHIN 5 DAYS OF FINAL GRADING. ONCE FINAL GRADE HAS BEEN ESTABLISHED, THE CONTRACTOR MAY CHOOSE TO DORMANT SEED THE DISTURBED AREAS PRIOR TO PLACEMENT OF MULCH AND PLACEMENT OF FABRIC NETTING ANCHORED WITH STAPLES. IF DORMANT SEEDING IS USED FOR THE SITE, ALL DISTURBED AREAS SHALL RECEIVE 4" OF LOAM AND SEED AT AN APPLICATION RATE OF 5#/1000 S.F.

ALL AREAS SEEDED DURING THE WINTER MONTHS WILL BE INSPECTED IN THE SPRING FOR ADEQUATE CATCH. ALL AREAS INSUFFICIENTLY VEGETATED (LESS THAN 90% CATCH) SHALL BE REVEGETATED BY REPLACING LOAM, SEED AND MULCH. IF DORMANT SEEDING IS NOT USED FOR THE SITE, ALL DISTURBED AREAS SHALL BE REVEGETATED IN THE SPRING.

THE AREA OF DENUDED NON-STABILIZED CONSTRUCTION SHALL BE LIMITED TO THE MINIMUM AREA PRACTICABLE. AN AREA SHALL BE CONSIDERED TO BE DENUDED UNTIL THE SUBBASE GRAVEL IS INSTALLED IN PARKING AREAS, OR THE AREAS OF FUTURE LOAM AND SEED HAVE BEEN LOAMED, SEEDED, AND MULCHED. THE MULCH RATE SHALL BE TWICE THE RATE SPECIFIED IN THE SEEDING PLAN. [FOR EXAMPLE, 115#/1,000 S.F. X 2 = 230#/S.F.]
THE CONTRACTOR MUST INSTALL ANY ADDED MEASURES WHICH MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION FROM THE SITE DEPENDENT UPON THE ACTUAL SITE AND WEATHER CONDITIONS.

PERMANENT SEEDING PLAN
PROJECT - 90 JOHNSON ROAD - PARKING AREA
SITE LOCATION -
X PERMANENT SEEDING TEMPORARY SEEDING
1.AREA TO BE SEEDED: LESS THAN 1/2 ACRE
2.INSTRUCTIONS ON PREPARATION OF SOIL: PREPARE A GOOD SEED BED FOR PLANTING METHOD USED.
3.APPLY LIME AS FOLLOWS: 138#M SQ. FT.
4.FERTILIZE WITH 18.4 POUNDS OF 10 - 20 - 20 N-P-K/M SQ. FT.
5.METHOD OF APPLYING LIME AND FERTILIZER: SPREAD AND WORK INTO THE SOIL BEFORE SEEDING.
6.SEED WITH THE FOLLOWING MIXTURE:
15% ANNUAL RYEGRASS
35% TALL FESCUE
30% CREEPING RED FESCUE
20% PERENNIAL RYEGRASS
WHEN USING SMALL GRAIN AS NURSE CROP SEED IT AT ONE-HALF THE NORMAL SEEDING RATE.
7.MULCHING INSTRUCTIONS: APPLY AT THE RATE OF 115 POUNDS PER M. SQ. FT.
AMOUNT UNIT #, TONS, ETC.
8.TOTAL LIME 138 #/1000 SQ. FT.
9.TOTAL FERTILIZER 18.4 #/1000 SQ. FT.
10.TOTAL SEED 5 LBS/1000 SQ. FT.
11.TOTAL MULCH 115 #/1000 SQ. FT.
12.TOTAL OTHER MATERIALS, SEEDS, ETC. N/A
13.REMARKS
SPRING SEEDING IS RECOMMENDED, HOWEVER, LATE SUMMER (PRIOR TO SEPTEMBER 1) SEEDING CAN BE MADE. PERMANENT SEEDING SHOULD BE MADE PRIOR TO AUGUST 5 OR AS A DORMANT SEEDING AFTER THE FIRST KILLING FROST AND BEFORE THE FIRST SNOWFALL. IF SEEDING CANNOT BE DONE WITHIN THESE SEEDING DATES, TEMPORARY SEEDING AND MULCHING SHALL BE USED TO PROTECT THE SITE. PERMANENT SEEDING SHALL BE DELAYED UNTIL THE NEXT RECOMMENDED SEEDING PERIOD.

FERTILIZER REQUIREMENTS SHALL BE SUBJECT TO ACTUAL TEST RESULTS OF THE TOPSOIL USED FOR THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TOPSOIL TEST RESULTS FOR PH AND RECOMMENDED FERTILIZER APPLICATION RATES TO THE OWNER.

TEMPORARY SEEDING PLAN
PROJECT - 90 JOHNSON ROAD - PARKING AREA
SITE LOCATION -
PERMANENT SEEDING X TEMPORARY SEEDING
1.AREA TO BE SEEDED: LESS THAN 1/2 ACRE
2.INSTRUCTIONS ON PREPARATION OF SOIL: PREPARE A GOOD SEED BED FOR PLANTING METHOD USED.
3.APPLY LIME AS FOLLOWS: 138#M SQ. FT.
4.FERTILIZE WITH POUNDS OF N-P-K/AC. OR 18.4 POUNDS OF 10 - 20 - 20 N-P-K/M SQ. FT.
5.METHOD OF APPLYING LIME AND FERTILIZER: SPREAD AND WORK INTO THE SOIL BEFORE SEEDING.
6.SEED WITH THE FOLLOWING MIXTURE:
50% PERENNIAL RYEGRASS
50% WINTER RYE
WHEN USING SMALL GRAIN AS NURSE CROP SEED IT AT ONE-HALF THE NORMAL SEEDING RATE.
7.MULCHING INSTRUCTIONS: APPLY AT THE RATE OF 230 POUNDS PER M. SQ. FT.
AMOUNT UNIT #, TONS, ETC.
8.TOTAL LIME 138#/1000 SQ. FT.
9.TOTAL FERTILIZER 13.8#/1000 SQ. FT.
10.TOTAL SEED 3.5#/1000 SQ. FT.
11.TOTAL MULCH 230#/1000 SQ. FT.
12.TOTAL OTHER MATERIALS, SEEDS, ETC. N/A
13.REMARKS
RECOMMENDED SEEDING DATES AFTER AUGUST 15.
FOR AREAS WITH SLOPES > 10%, FALL AND WINTER EROSION CONTROL AREAS, MULCH NETTING SHALL BE USED PER MANUFACTURER'S SPECIFICATIONS.

STANDARDS FOR STABILIZING SITES FOR THE WINTER

IN THE EVENT THAT WINTERTIME WORK IS WARRANTED OR NECESSARY, THE FOLLOWING STANDARDS SHALL APPLY:

- STANDARD FOR THE TIMELY STABILIZATION OF DITCHES AND CHANNELS: THE CONTRACTOR SHALL CONSTRUCT AND STABILIZE ALL STONE-LINED DITCHES AND CHANNELS ON THE SITE BY NOVEMBER 15. THE CONTRACTOR SHALL CONSTRUCT AND STABILIZE ALL GRASS-LINED DITCHES AND CHANNELS ON THE SITE BY SEPTEMBER 15. IF THE CONTRACTOR FAILS TO STABILIZE A DITCH OR CHANNEL TO BE GRASS-LINED BY SEPTEMBER 15, THEN THE CONTRACTOR SHALL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE DITCH FOR LATE FALL AND WINTER.
 - INSTALL A SOD LINING IN THE DITCH. THE CONTRACTOR SHALL LINE THE DITCH WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE APPLICANT PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL, AND ANCHORING THE SOD WITH JUTE OR PLASTIC MESH TO PREVENT THE SOD STRIPS FROM SLOUGHING DURING FLOW CONDITIONS.
 - INSTALL A STONE LINING IN THE DITCH. THE CONTRACTOR SHALL LINE THE DITCH WITH STONE RIPRAP BY NOVEMBER 15. THE CONTRACTOR SHALL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE AND LINING THICKNESS NEEDED TO WITHSTAND THE ANTICIPATED FLOW VELOCITIES AND FLOW DEPTHS WITHIN THE DITCH. IF NECESSARY, THE CONTRACTOR SHALL REGRADE THE DITCH PRIOR TO PLACING THE STONE LINING SO AS TO PREVENT THE STONE LINING FROM REDUCING THE DITCH'S CROSS-SECTIONAL AREA.
- STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SLOPES: THE CONTRACTOR SHALL CONSTRUCT AND STABILIZE STONE-COVERED SLOPES BY NOVEMBER 15. THE CONTRACTOR SHALL SEED AND MULCH ALL SLOPES TO BE VEGETATED BY SEPTEMBER 15. THE DEPARTMENT WILL CONSIDER ANY AREA HAVING A GRADE GREATER THAN 10% (10H: 1V) TO BE A SLOPE. IF THE CONTRACTOR FAILS TO STABILIZE ANY SLOPE TO BE VEGETATED BY SEPTEMBER 15, THEN THE CONTRACTOR SHALL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SLOPE FOR LATE FALL AND WINTER.
 - STABILIZE THE SOIL WITH TEMPORARY VEGETATION AND EROSION CONTROL MESH. BY OCTOBER 1 THE CONTRACTOR SHALL SEED THE DISTURBED SLOPE WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND APPLY EROSION CONTROL MATS OVER THE MULCHED SLOPE. THE CONTRACTOR SHALL MONITOR GROWTH OF THE RYE OVER THE NEXT 45 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE DISTURBED SLOPE BY NOVEMBER 15, THEN THE CONTRACTOR SHALL COVER THE SLOPE WITH A LAYER OF WOOD WASTE COMPOST AS DESCRIBED IN ITEM III OF THIS STANDARD OR WITH STONE RIP RAP AS DESCRIBED IN ITEM IV OF THIS STANDARD.
 - STABILIZE THE SLOPE WITH SOD. THE CONTRACTOR SHALL STABILIZE THE DISTURBED SLOPE WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SLOPE WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL. THE CONTRACTOR SHALL NOT USE LATE-SEASON SOD INSTALLATION TO STABILIZE SLOPES HAVING A GRADE GREATER THAN 33% (3H: 1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
 - STABILIZE THE SLOPE WITH WOOD WASTE COMPOST. THE CONTRACTOR SHALL PLACE A SIX-INCH LAYER OF WOOD WASTE COMPOST ON THE SLOPE BY NOVEMBER 15. PRIOR TO PLACING THE WOOD WASTE COMPOST, THE CONTRACTOR SHALL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED SLOPE. THE CONTRACTOR SHALL NOT USE WOOD WASTE COMPOST TO STABILIZE SLOPES HAVING GRADES GREATER THAN 50% (2H: 1V) OR HAVING GROUNDWATER SEEPS ON THE SLOPE FACE.
 - STABILIZE THE SLOPE WITH STONE RIP RAP. THE CONTRACTOR SHALL PLACE A LAYER OF STONE RIPRAP ON THE SLOPE BY NOVEMBER 15. THE CONTRACTOR SHALL HIRE A REGISTERED PROFESSIONAL ENGINEER TO DETERMINE THE STONE SIZE NEEDED FOR STABILITY AND TO DESIGN A FILTER LAYER FOR UNDERNEATH THE RIPRAP.
- STANDARD FOR THE TIMELY STABILIZATION OF DISTURBED SOIL: BY SEPTEMBER 15, THE CONTRACTOR SHALL SEED AND MULCH ALL DISTURBED SOILS ON AREAS HAVING A SLOPE LESS THAN 15%. IF THE CONTRACTOR FAILS TO STABILIZE THESE SOILS BY THIS DATE, THEN THE CONTRACTOR SHALL TAKE ONE OF THE FOLLOWING ACTIONS TO STABILIZE THE SOIL FOR LATE FALL AND WINTER.
 - STABILIZE THE SOIL WITH TEMPORARY VEGETATION. BY OCTOBER 1, THE CONTRACTOR SHALL SEED THE DISTURBED SOIL WITH WINTER RYE AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET, LIGHTLY MULCH THE SEEDED SOIL WITH HAY OR STRAW AT 75 POUNDS PER 1,000 SQUARE FEET, AND ANCHOR THE MULCH WITH PLASTIC NETTING. THE CONTRACTOR SHALL MONITOR THE GROWTH OF THE RYE OVER THE NEXT 45 DAYS. IF THE RYE FAILS TO GROW AT LEAST THREE INCHES OR FAILS TO COVER AT LEAST 75% OF THE DISTURBED SOIL BEFORE NOVEMBER 15, THEN THE CONTRACTOR SHALL MULCH THE AREA FOR OVER-WINTER PROTECTION AS DESCRIBED IN ITEM III OF THIS STANDARD.
 - STABILIZE THE SOIL WITH SOD. THE CONTRACTOR SHALL STABILIZE THE DISTURBED SOIL WITH PROPERLY INSTALLED SOD BY OCTOBER 1. PROPER INSTALLATION INCLUDES THE CONTRACTOR PINNING THE SOD ONTO THE SOIL WITH WIRE PINS, ROLLING THE SOD TO GUARANTEE CONTACT BETWEEN THE SOD AND UNDERLYING SOIL, AND WATERING THE SOD TO PROMOTE ROOT GROWTH INTO THE DISTURBED SOIL.
 - STABILIZE THE SOIL WITH MULCH. BY NOVEMBER 15, THE CONTRACTOR SHALL MULCH THE DISTURBED SOIL BY SPREADING HAY OR STRAW AT A RATE OF AT LEAST 150 POUNDS PER 1,000 SQUARE FEET ON THE AREA SO THAT NO SOIL IS VISIBLE THROUGH THE MULCH. PRIOR TO APPLYING THE MULCH, THE CONTRACTOR SHALL REMOVE ANY SNOW ACCUMULATION ON THE DISTURBED AREA. IMMEDIATELY AFTER APPLYING THE MULCH, THE CONTRACTOR SHALL ANCHOR THE MULCH WITH PLASTIC NETTING TO PREVENT WIND FROM MOVING THE MULCH OFF THE DISTURBED SOIL.



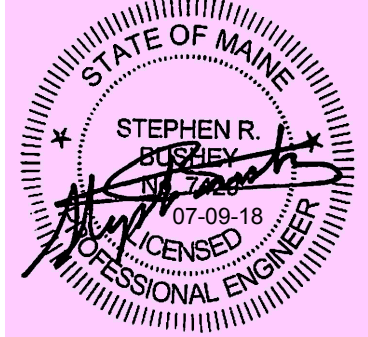
Stantec
482 Payne Road Scarborough Court
Scarborough, Maine 04074-8929
Tel. 207.883.3355
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File Name:	PBF	SRB	SRB	18.05.22
	DWN.	CHKD.	DSGN.	DATE

Permit-Seal



Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title

EROSION AND SEDIMENT
CONTROL NOTES

Project No. 210801617

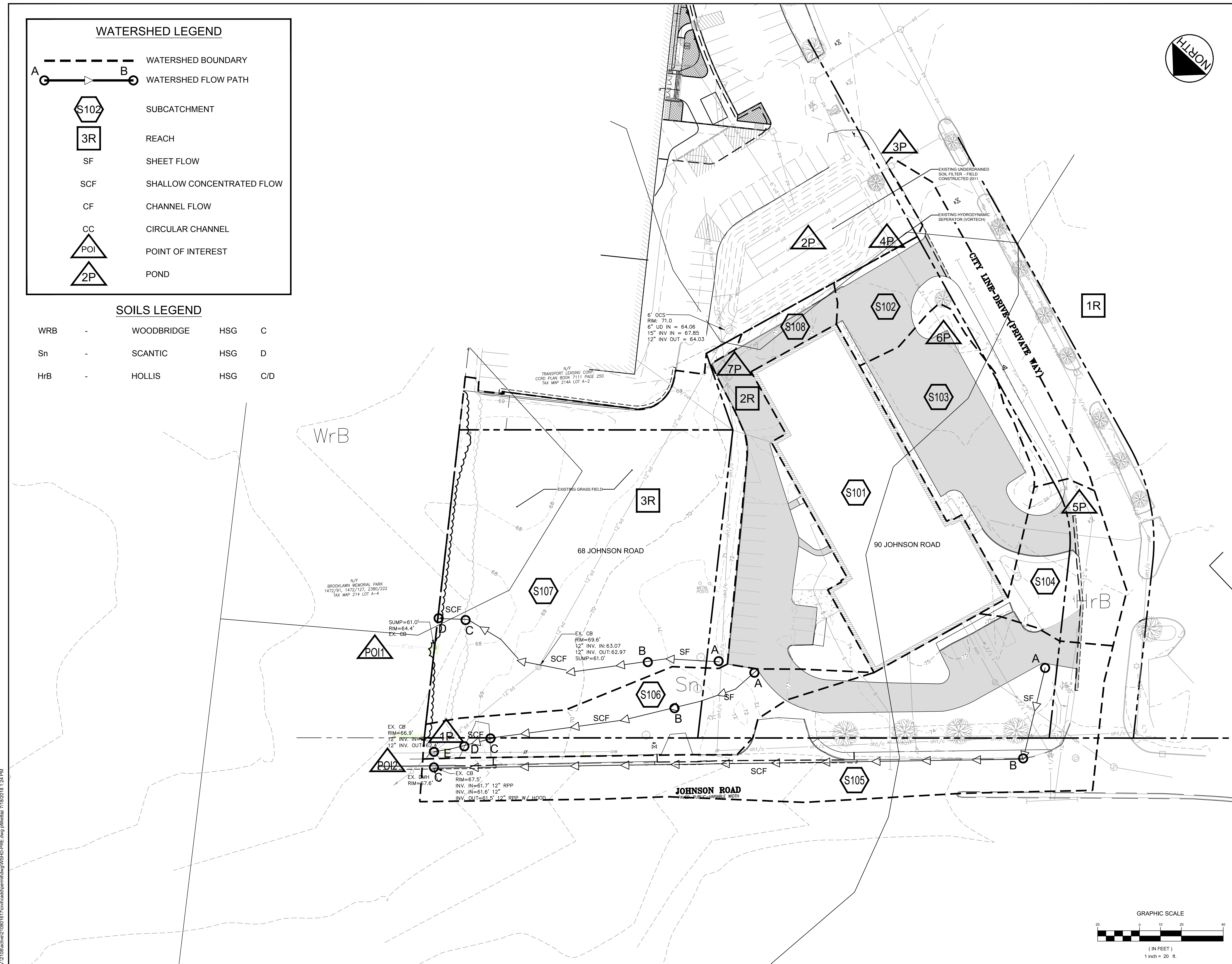
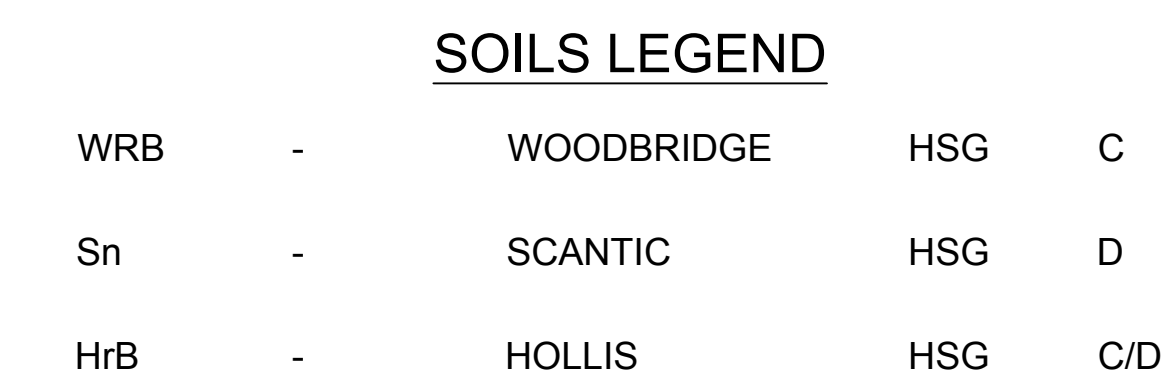
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Sheet

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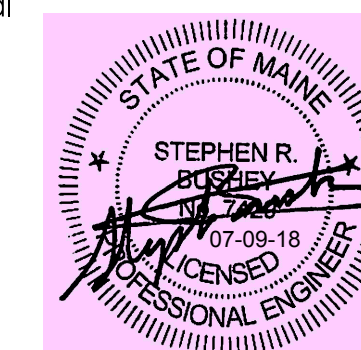
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2	SUBMITTED TO CITY FOR LEVEL III SITE PLAN REVIEW	PBF	SR8	18.07.09
1	SUBMITTED FOR OWNER REVIEW	PBF	SR8	18.05.22
Revision		By		YY.MM.DD

File Name:	PBF	SRB	SRB	18.05.22
	OWN	CHKD	DSGN	DATE

Permit-Seal



Client/Project

TRANSPORT LEASING CORP.
ANDOVER, MA

JOHNSON ROAD
PROPERTY

90 JOHNSON ROAD, PORTLAND, MAINE

Title
PREDEVELOPMENT WATERSHED
PLAN

Project No.	Scale
210801617	N.T.S.

Sheet

C-11.0

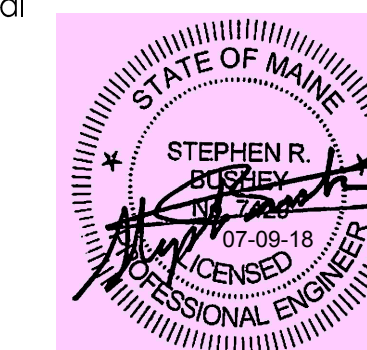
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2	SUBMITTED TO CITY FOR LEVEL III SITE PLAN REVIEW	PBF	SR8	18.07.09
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Revision		By		YY.MM.DD

File Name:	PBF	SRB	SRB	18.05.22
	DWN	CHKD	DSGN	DATE

Permit-Seal



Client/Project
TRANSPORT LEASING CORP.
ANDOVER, MA

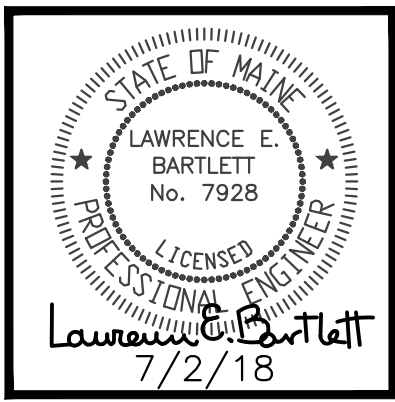
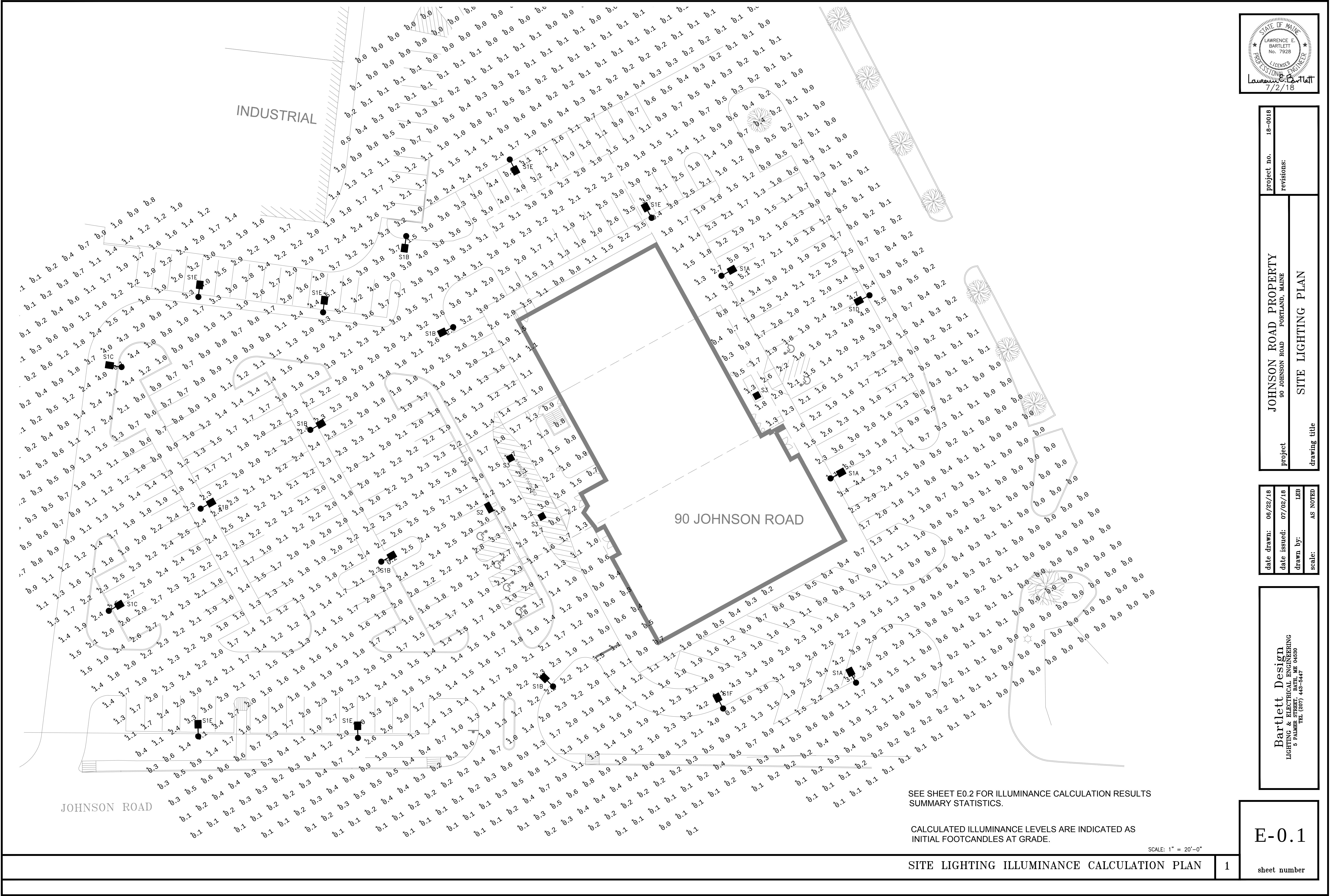
JOHNSON ROAD
PROPERTY
90 JOHNSON ROAD, PORTLAND, MAINE

Title
POST DEVELOPMENT WATERSHED
PLAN

Project No.	Scale
210801617	1" = 30'

Sheet

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project no. 18-0018	
revisions:	
Project	JOHNSON ROAD PROPERTY
	90 JOHNSON ROAD PORTLAND, MAINE
drawing title	
SITE LIGHTING PLAN	

date drawn:	06/22/18
date issued:	07/02/18
drawn by:	LEB
scale:	AS NOTED

Bartlett Design

LIGHTING & ELECTRICAL ENGINEERING

5 PALMER STREET, BATH, ME 04530

TEL (207) 443-5447

SEE SHEET E0.2 FOR ILLUMINANCE CALCULATION RESULTS SUMMARY STATISTICS.

CALCULATED ILLUMINANCE LEVELS ARE INDICATED AS INITIAL FOOTCANDLES AT GRADE.

SCALE: 1" = 20'-0"

RECOMMENDED ILLUMINANCE ACCORDING TO THE IESNA

MINIMUM:	0.5 FC (or greater)
UNIFORMITY RATIO:	4.0-TO-1 (or lesser)
UNIFORMITY RATIO:	15.0-TO-1 (or lesser)

RECOMMENDED ILLUMINANCE LEVELS
ARE PUBLISHED BY THE ILLUMINATING
ENGINEERING SOCIETY OF NORTH AMERICA
IN RP-20-14 LIGHTING FOR PARKING FACILITIES.

PARKING LOT 1 LIGHTING STATISTICS:

AS DESIGNED	
AVERAGE:	2.2 FC
MAXIMUM:	5.1 FC
MINIMUM:	0.6 FC
AVERAGE-TO-MINIMUM UNIFORMITY RATIO:	3.7-TO-1
MAXIMUM-TO-MINIMUM UNIFORMITY RATIO:	8.5-TO-1

PARKING LOT 2 LIGHTING STATISTICS:

AS DESIGNED	
AVERAGE:	2.1 FC
MAXIMUM:	4.8 FC
MINIMUM:	0.5 FC
AVERAGE-TO-MINIMUM UNIFORMITY RATIO:	4.2-TO-1
MAXIMUM-TO-MINIMUM UNIFORMITY RATIO:	9.6-TO-1

PARKING LOT 7 LIGHTING STATISTICS:

AS DESIGNED	
AVERAGE:	1.8 FC
MAXIMUM:	2.5 FC
MINIMUM:	0.7 FC
AVERAGE-TO-MINIMUM UNIFORMITY RATIO:	2.5-TO-1
MAXIMUM-TO-MINIMUM UNIFORMITY RATIO:	3.6-TO-1

PARKING LOT 8 LIGHTING STATISTICS:

AS DESIGNED	
AVERAGE:	2.2 FC
MAXIMUM:	4.0 FC
MINIMUM:	1.3 FC
AVERAGE-TO-MINIMUM UNIFORMITY RATIO:	1.7-TO-1
MAXIMUM-TO-MINIMUM UNIFORMITY RATIO:	3.1-TO-1

PARKING LOT 9 LIGHTING STATISTICS:

AS DESIGNED	
AVERAGE:	2.0 FC
MAXIMUM:	2.9 FC
MINIMUM:	0.6 FC
AVERAGE-TO-MINIMUM UNIFORMITY RATIO:	3.4-TO-1
MAXIMUM-TO-MINIMUM UNIFORMITY RATIO:	4.8-TO-1

PARKING LOT 3 LIGHTING STATISTICS:

AS DESIGNED	
AVERAGE:	2.2 FC
MAXIMUM:	3.6 FC
MINIMUM:	1.5 FC
AVERAGE-TO-MINIMUM UNIFORMITY RATIO:	1.5-TO-1
MAXIMUM-TO-MINIMUM UNIFORMITY RATIO:	2.4-TO-1

PARKING LOT 4 LIGHTING STATISTICS:

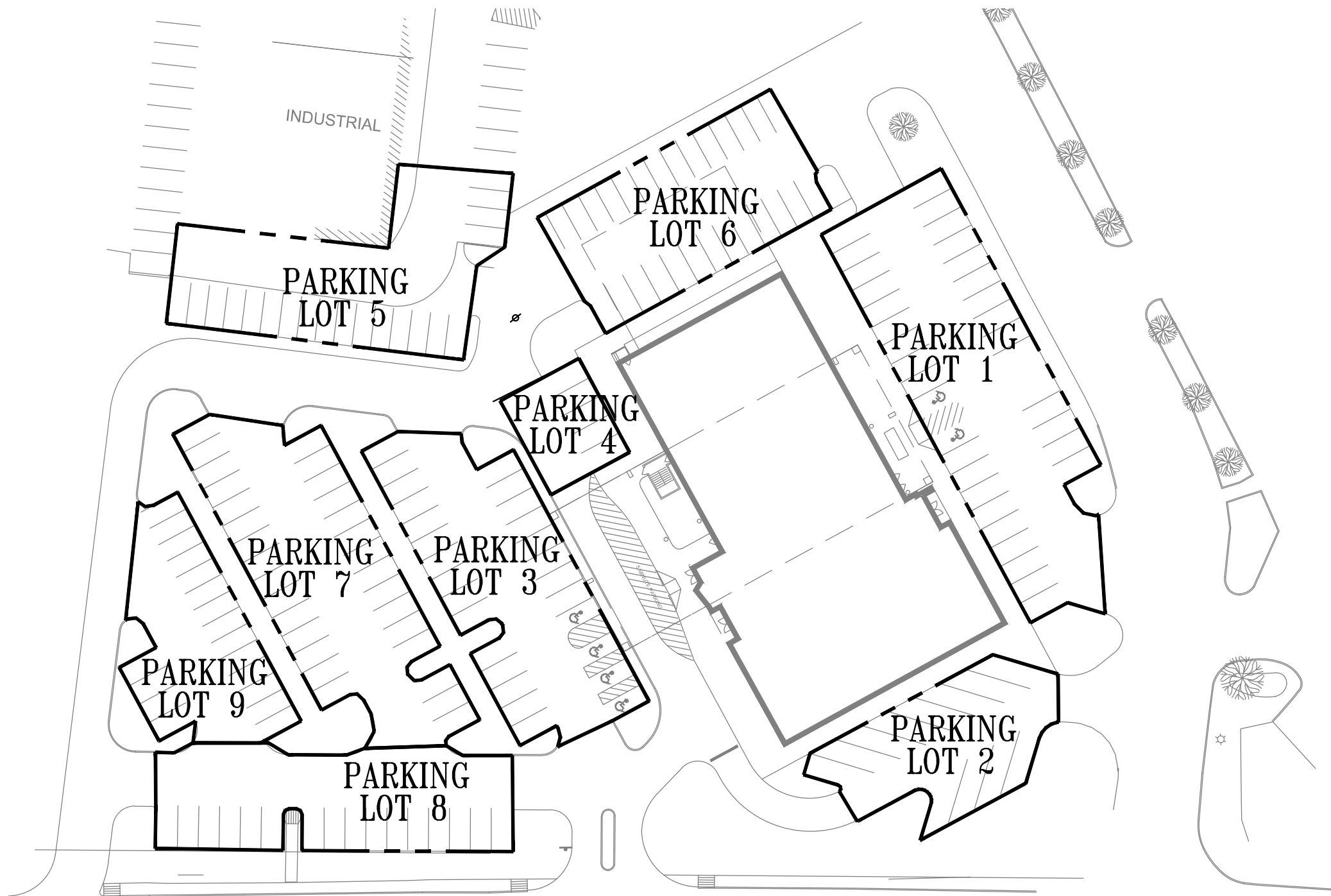
AS DESIGNED	
AVERAGE:	1.8 FC
MAXIMUM:	2.6 FC
MINIMUM:	1.2 FC
AVERAGE-TO-MINIMUM UNIFORMITY RATIO:	1.4-TO-1
MAXIMUM-TO-MINIMUM UNIFORMITY RATIO:	2.2-TO-1

PARKING LOT 5 LIGHTING STATISTICS:

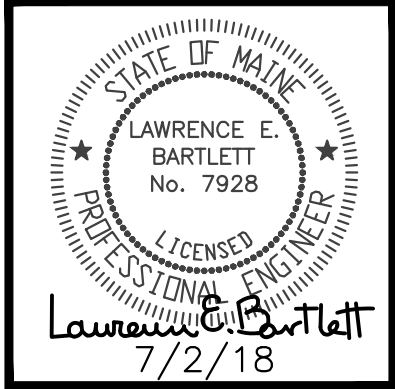
AS DESIGNED	
AVERAGE:	2.4 FC
MAXIMUM:	5.1 FC
MINIMUM:	0.7 FC
AVERAGE-TO-MINIMUM UNIFORMITY RATIO:	3.4-TO-1
MAXIMUM-TO-MINIMUM UNIFORMITY RATIO:	7.3-TO-1

PARKING LOT 6 LIGHTING STATISTICS:

AS DESIGNED	
AVERAGE:	2.3 FC
MAXIMUM:	4.4 FC
MINIMUM:	0.6 FC
AVERAGE-TO-MINIMUM UNIFORMITY RATIO:	3.8-TO-1
MAXIMUM-TO-MINIMUM UNIFORMITY RATIO:	7.3-TO-1



TYPE S1A
MANUFACTURER: AMERICAN ELECTRIC LIGHTING
ATB2-40BLED70-MVOLT-R3-BK (LUMINAIRE)
MANUFACTURER: VALMONT # R-170830504T5-P2-DBL (LIGHTING POLE)
MANUFACTURER: VALMONT # 1HT90 (POLE BRACKET ARM)
MANUFACTURER: VALMONT # CL14AC-DBL (POLE BASE COVER)
DESCRIPTION: 18-FOOT TALL TAPERED ALUMINUM POLE WITH
CONCRETE FOUNDATION BASE WITH 30-INCHES EXPOSED ABOVE GRADE.
LUMINAIRE TO UTILIZE 4000K LED LAMPS WITH IES TYPE III OPTICAL
DISTRIBUTION.
TYPE S1B
DESCRIPTION: SIMILAR TO TYPE S1A EXCEPT WITH 20-FOOT TALL
POLE WITH CONCRETE FOUNDATION WITH 6-INCHES EXPOSED ABOVE
GRADE. LUMINAIRE TO HAVE IES TYPE V OPTICAL DISTRIBUTION.
TYPE S1C
DESCRIPTION: SIMILAR TO TYPE S1A EXCEPT LUMINAIRE TO HAVE
IES TYPE V OPTICAL DISTRIBUTION.
TYPE S1D
DESCRIPTION: SIMILAR TO TYPE S1A EXCEPT LUMINAIRE TO HAVE
IES TYPE II OPTICAL DISTRIBUTION.
TYPE S1E
DESCRIPTION: SIMILAR TO TYPE S1A EXCEPT LUMINAIRE TO HAVE
IES TYPE IV OPTICAL DISTRIBUTION.
TYPE S1F
DESCRIPTION: SIMILAR TO TYPE S1A EXCEPT WITH 20-FOOT TALL
POLE WITH CONCRETE FOUNDATION WITH 6-INCHES EXPOSED ABOVE
GRADE. LUMINAIRE TO HAVE IES TYPE II OPTICAL DISTRIBUTION.
TYPE S2
MANUFACTURER: HOLOPHANE LIGHTING
HLWPC2-P40-40K-12-T3M-BKSDP-PE (LUMINAIRE)
DESCRIPTION: WALL MOUNTED LUMINAIRE INSTALLED 20-FEET ABOVE
GRADE. LUMINAIRE TO UTILIZE 4000K LED LAMPS WITH IES TYPE III OPTICAL
DISTRIBUTION.
TYPE S3
MANUFACTURER: HOLOPHANE LIGHTING
PPSQL2-P10-40K-12-FC-T5M-BKSPD-SPD (LUMINAIRE)
DESCRIPTION: SURFACE CEILING MOUNTED LUMINAIRE INSTALLED UNDER
ENTRANCE CANOPY. LUMINAIRE TO UTILIZE WITH 4000K LED LAMPS WITH
IES TYPE V OPTICAL DISTRIBUTION.



project no.	18-0018
revisions:	
project	JOHNSON ROAD PROPERTY 90 JOHNSON ROAD PORTLAND, MAINE
drawing title	SITE LIGHTING CALCULATION RESULTS

date drawn:	06/22/18
date issued:	07/02/18
drawn by:	LEB
scale:	AS NOTED

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E-0.2

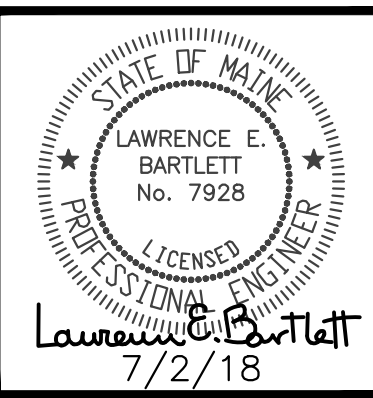
SEE SHEET E1.2 FOR CONTINUATION

UNDERGROUND CONDUIT SCHEDULE

- * (A) (2) 5" PVC CDTS (CMP PRIMARY)
- (B) (2) 4" PVC CDTS (TELEPHONE)
- (C) (2) 4" PVC CDTS (SECONDARY SERVICE)
- (D) (4) 4" PVC CDTS (SECONDARY SERVICE)
- (E) (1) 1-1/4" PVC CDT (CMP METER)
- (F) (1) 1-1/4" PVC CDT (SITE LIGHTING)

* CONCRETE ENCASE CONDUITS

1. DISCONNECT AND REMOVE EXISTING UNDERGROUND ELECTRICAL SERVICE ONLY AFTER NEW SERVICE IS INSTALLED AND IS FUNCTIONAL.
2. DISCONNECT AND REMOVE EXISTING OVERHEAD ELECTRICAL AND TELEPHONE UTILITY LINES ONLY AFTER NEW SERVICES ARE INSTALLED AND ARE FUNCTIONAL.
3. COORDINATE EXACT LOCATION OF NEW SERVICE ENTRANCE CONDUITS INTO ELECTRICAL ROOM WITH ARCHITECTURAL FLOOR PLANS.
4. WHERE INDICATED, PROVIDE REPLACEMENT ELECTRICAL SERVICE TO MATCH EXISTING SERVICE SIZE.
5. WHERE REPLACEMENT SERVICES ARE INDICATED AT EXISTING BUILDINGS, PROVIDE ALL NECESSARY CONNECTIONS TO EXISTING FACILITIES.
6. MINIMUM BURIAL DEPTH FOR CONDUITS SHALL BE 36-INCHES.

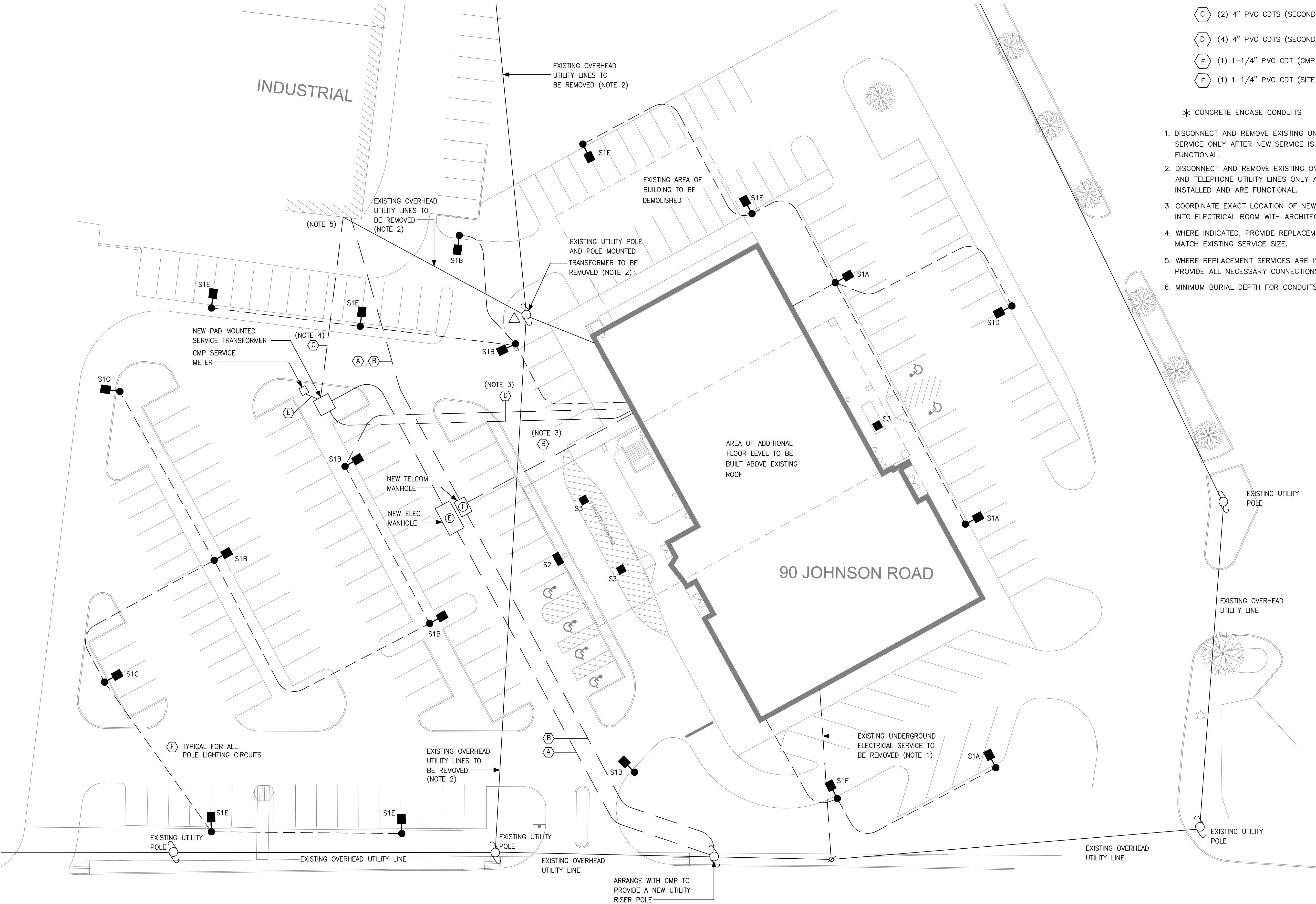


project no.	18-0018
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project	JOHNSON ROAD PROPERTY 90 JOHNSON ROAD PORTLAND, MAINE
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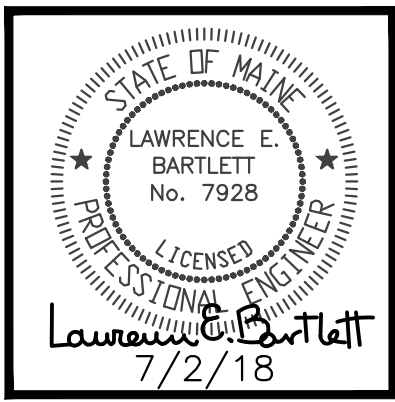
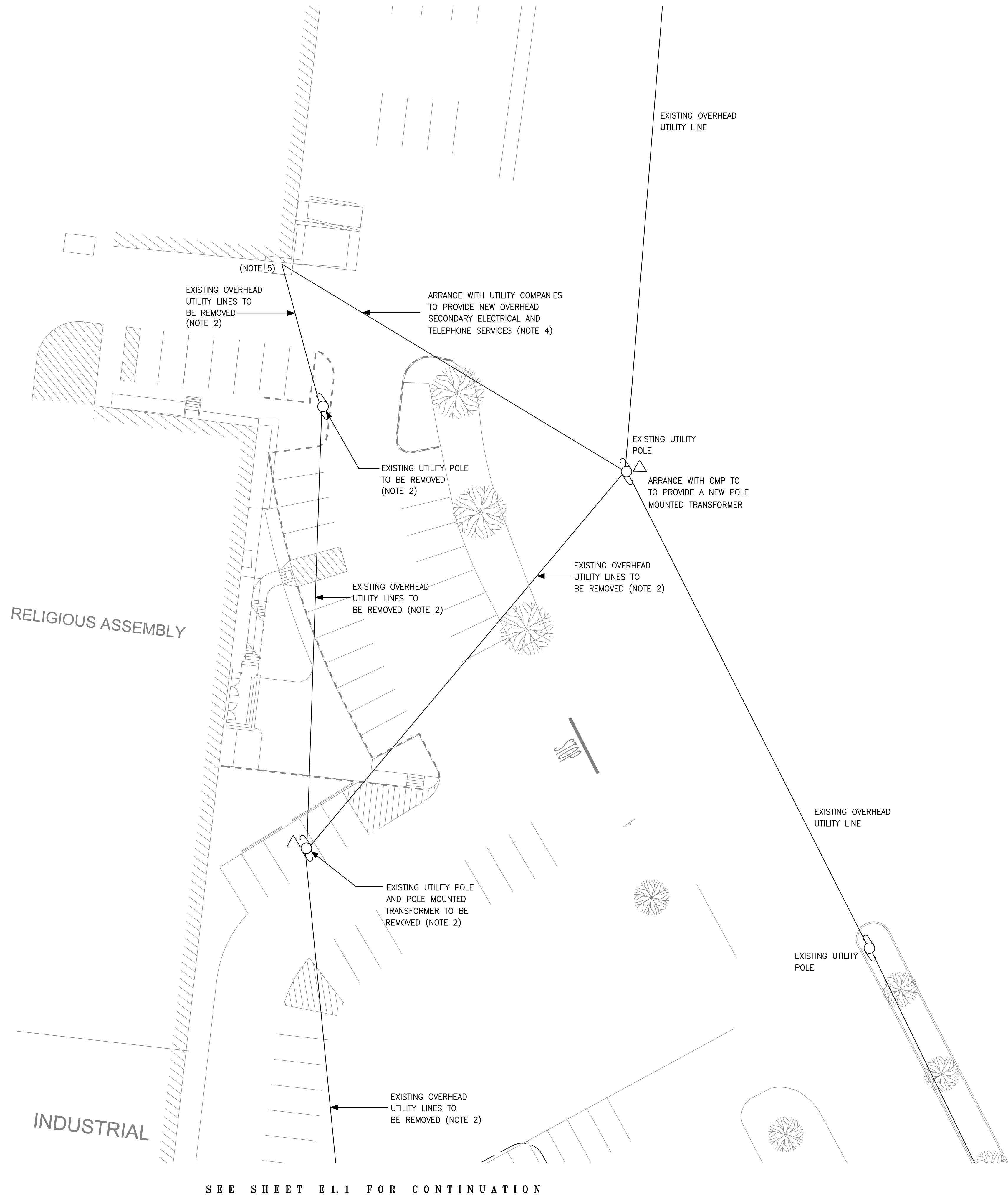
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E-1.1
sheet number



SCALE: 1" = 20'-0"

ELECTRICAL SITE PLAN



project no. 18-0018	
revisions:	
JOHNSON ROAD PROPERTY	
90 JOHNSON ROAD PORTLAND, MAINE	
project	drawing title
SITE LIGHTING CALCULATION RESULTS	

date drawn: 06/22/18	date issued: 07/02/18
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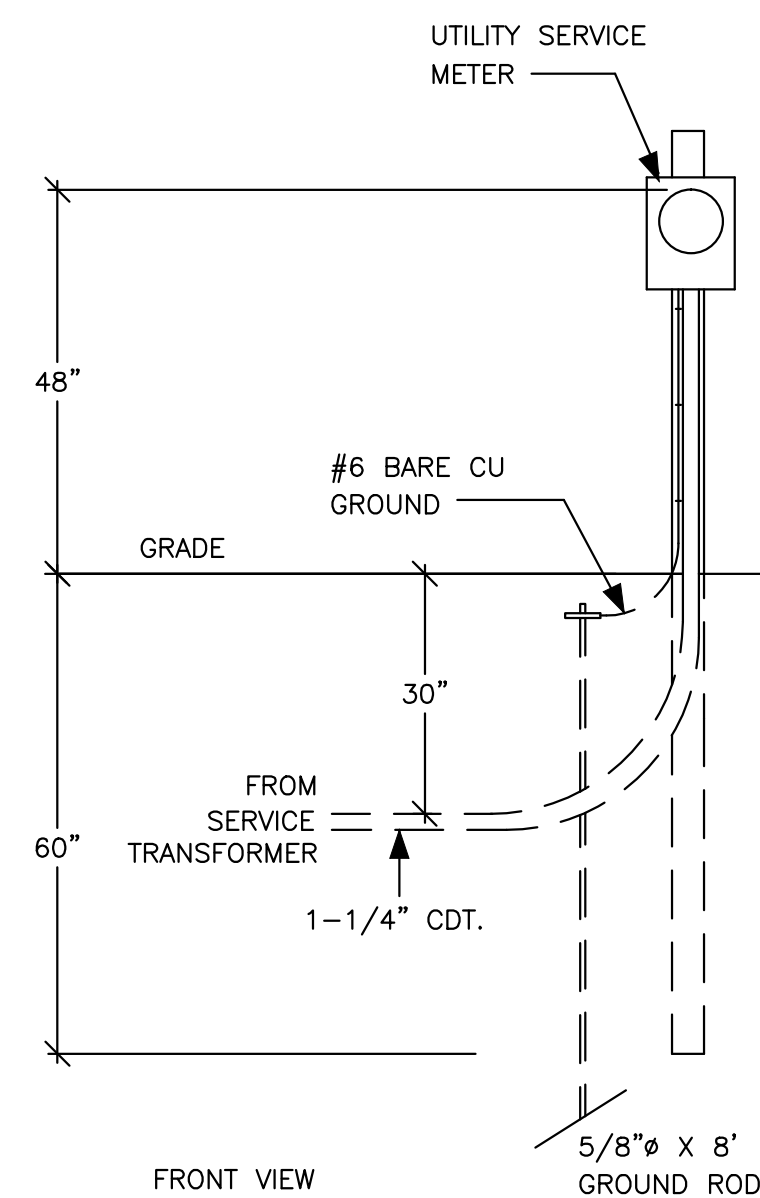
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sheet number

SCALE: 1" = 20'-0"

ELECTRICAL SITE PLAN

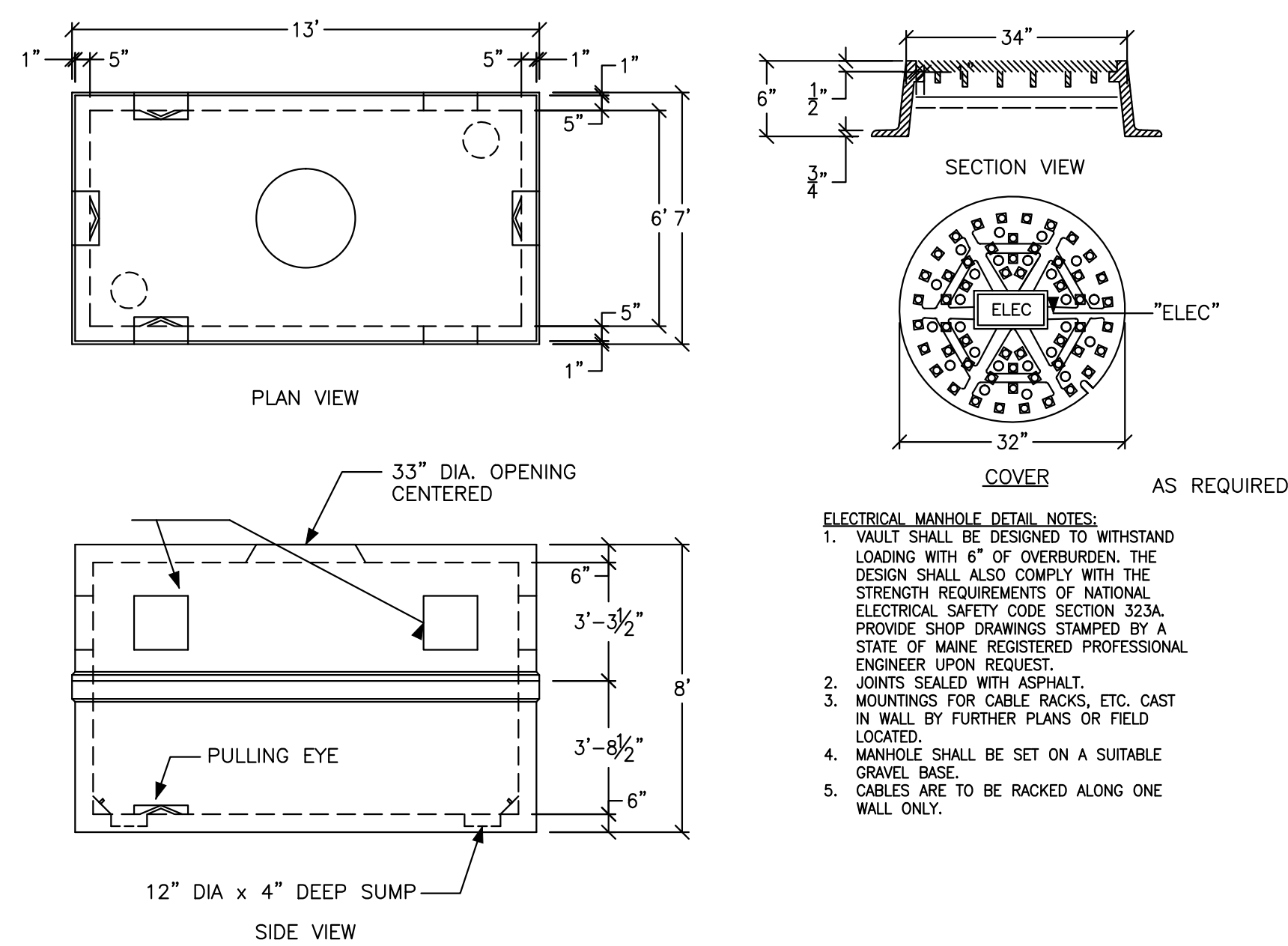
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NOT TO SCALE

ELECTRICAL SERVICE METER DETAIL

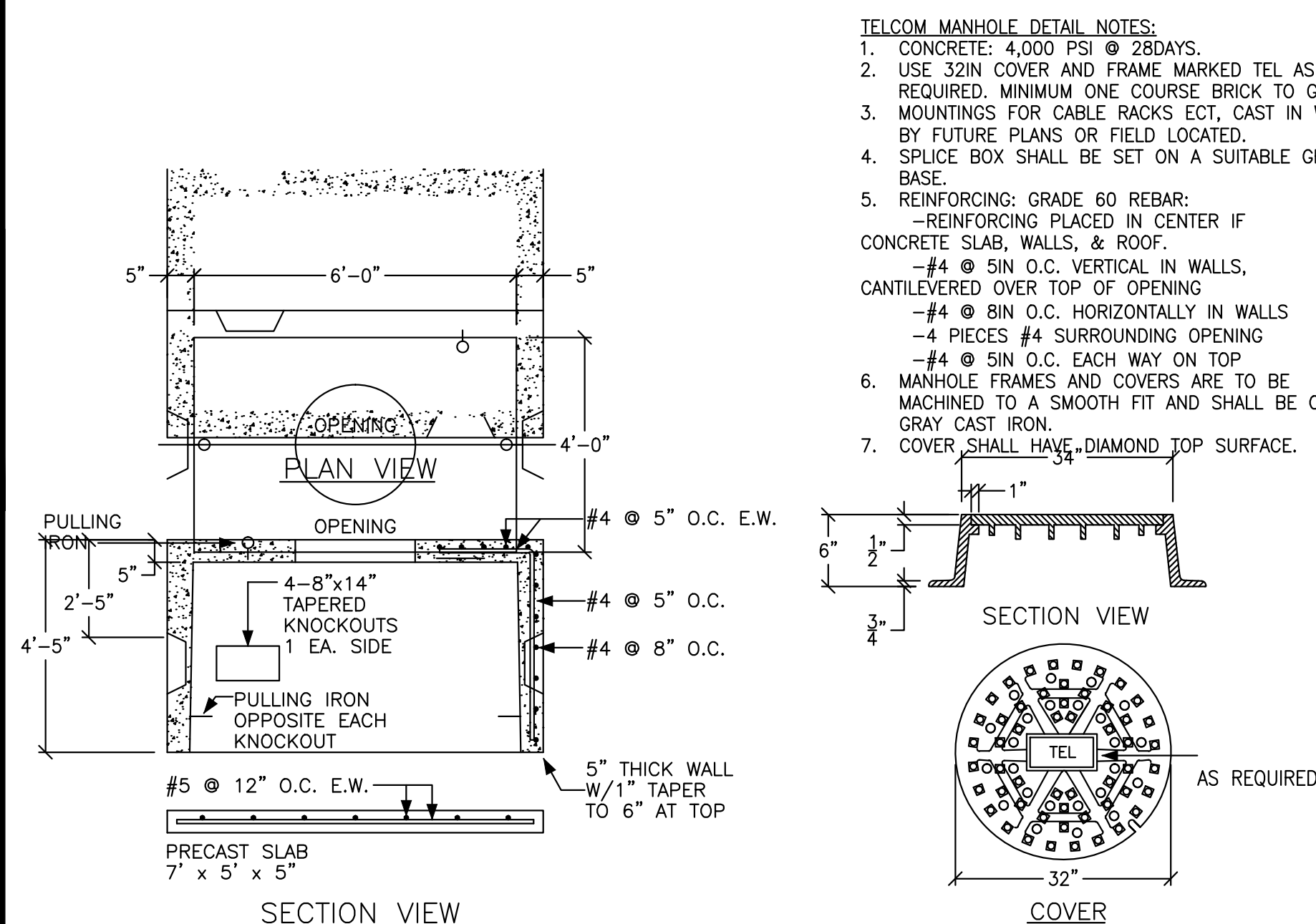
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NOT TO SCALE

ELECTRICAL MANHOLE DETAIL

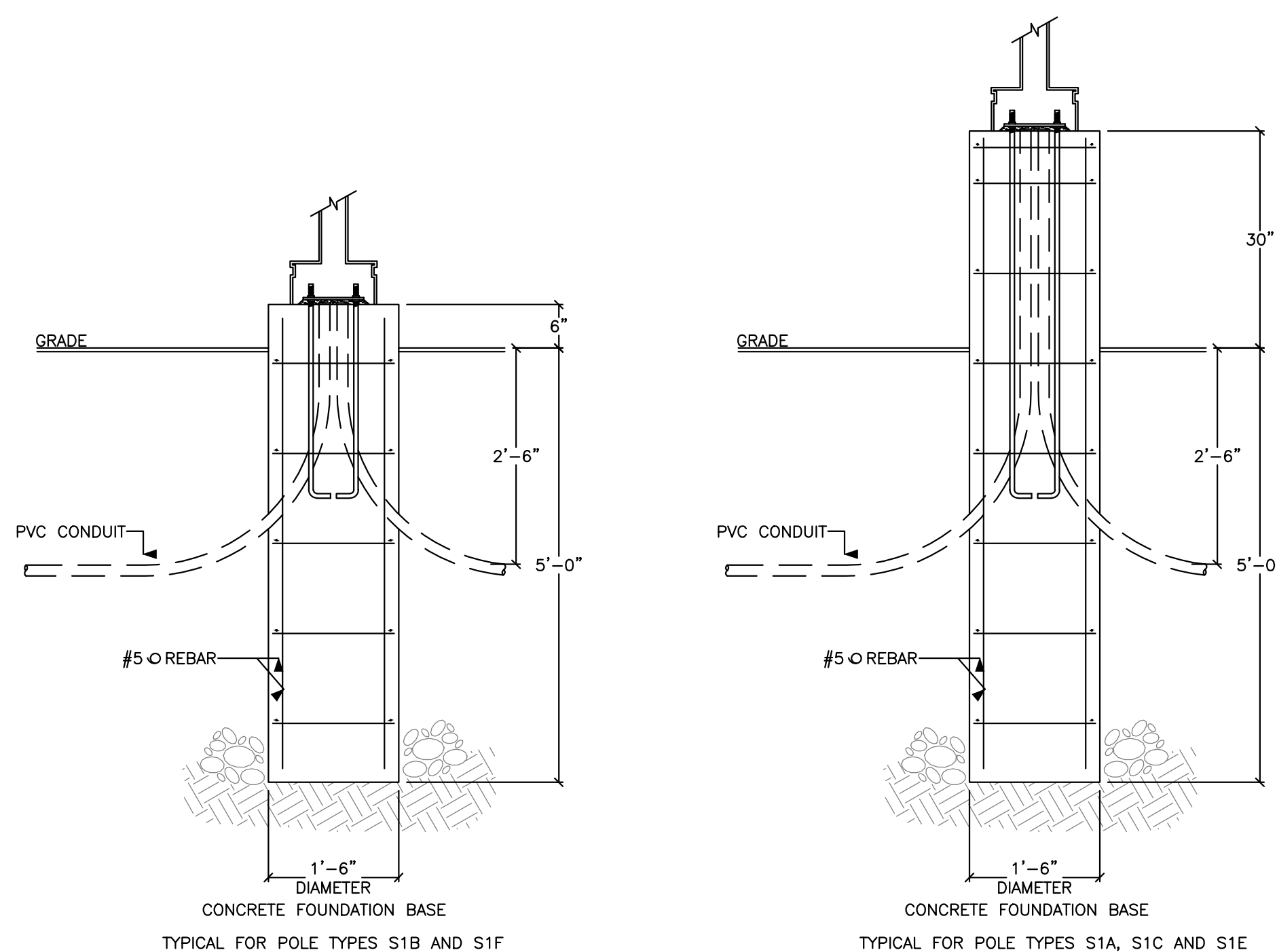
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NOT TO SCALE

TELCOM MANHOLE DETAIL

2

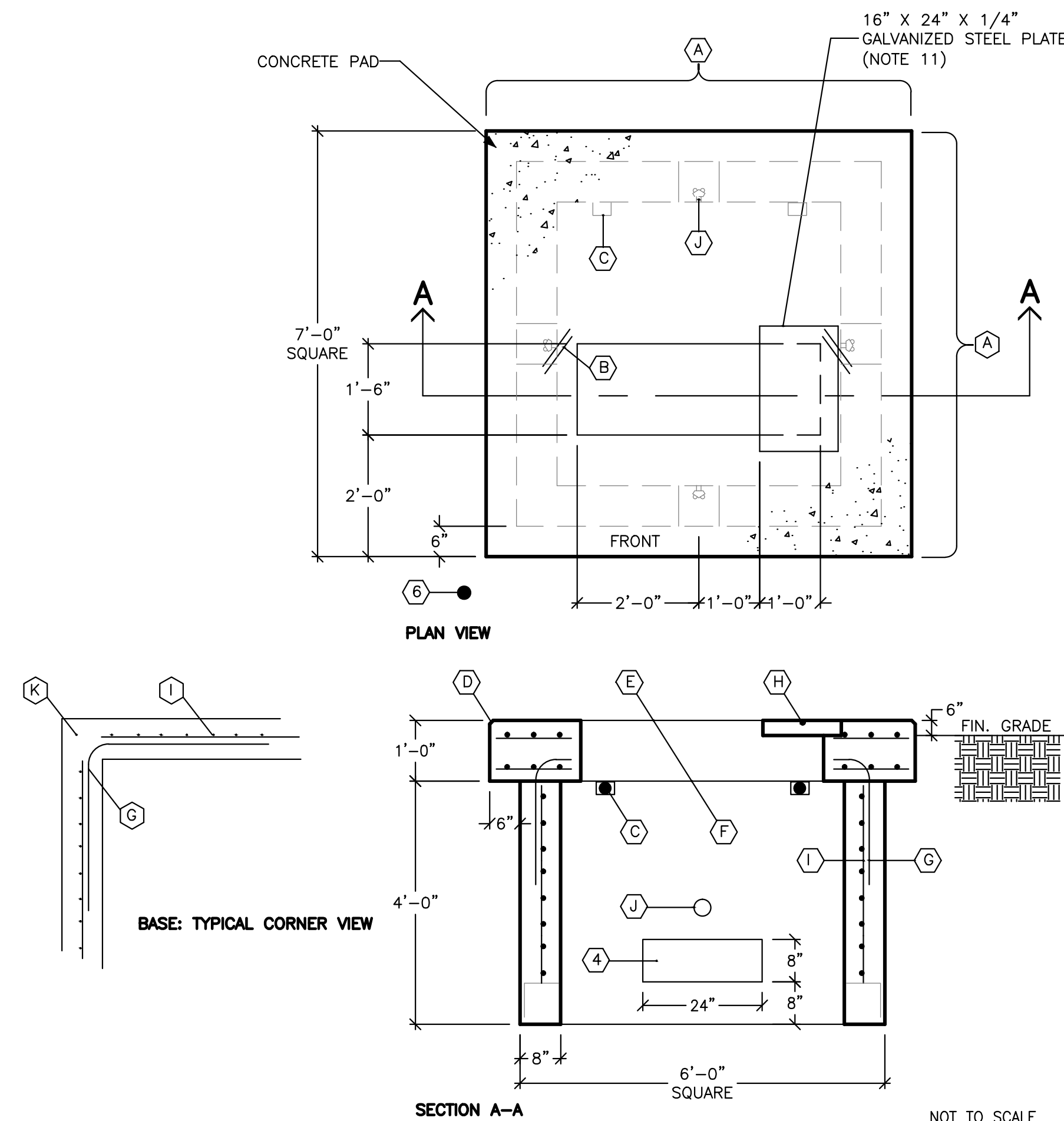


NOT TO SCALE

LIGHT POLE BASE DETAILS

5

1. "FRONT" DENOTES THE SIDE ON WHICH THE ACCESS DOORS ARE LOCATED. THE CONCRETE BASE SHALL BE SET ON A SUITABLE GRAVEL BASE AND LOCATED SO THE FRONT IS ACCESSIBLE BY TRUCK AND SUITABLY PROTECTED FROM PLOW AND TRAFFIC DAMAGE.
 2. BEFORE INSTALLING OR REQUIRING ANY ACTIVE DRAINAGE STRUCTURE (EG. DRAIN PIPE) INTO THE FOUNDATION OR PAD, THE CONTRACTOR, CMP LINE SUPERVISOR, OR CMP DISTRIBUTION ENGINEER MUST CONTACT CENTRAL MAINE POWER COMPANY'S ENVIRONMENTAL SERVICES DEPARTMENT AT 623-3521 EXT 3479 TO REQUEST A SITE INSPECTION.
 3. FINISH GRADE SHALL BE GRADED IN SUCH A MANNER TO ALLOW SURFACE WATER TO FLOW AWAY FROM THE PAD.
 4. PROVIDE 8" X 24" CABLE HOLES (BOND OUTS) 8" UP THE WALL FROM THE BASE. LOCATE ONE CABLE HOLE PER WALL, MORE IF NECESSARY. LINE UP CABLE HOLES WITH TRENCH.
 5. CONDUITS ENTERING CONCRETE STRUCTURES SHALL BE SET BACK FROM THE INSIDE WALL 1 TO 2 INCHES AND THE SPACE WITHIN THE KNOCKOUT SURROUNDING THE CONDUITS COMPLETELY FILLED WITH MORTAR TO PREVENT SOIL FROM ENTERING STRUCTURE. INSIDE THE STRUCTURE THE MORTAR SHALL BE FINISHED AND BEVELED FROM THE CONDUIT ENDS TO THE INSIDE WALL FACE TO COVER AND SMOOTH THE EDGES OF THE KNOCKOUTS.
 6. A 3/4" X 8'-0" GALVANIZED GROUND ROD IS TO BE SET SIX INCHES IN FRONT OF THE FRONT CORNER OF THE FOUNDATION. THE TOP OF THE GROUND IS TO BE 6" BELOW FINAL GRADE.
 7. A GROUND WIRE SHALL BE INSTALLED FROM THE GROUND ROD THROUGH THE CABLE HOLE AT THE BOTTOM OF THE PAD. 10 FEET OF GROUND WIRE SHALL BE PROVIDED SO THAT IT CAN BE INSTALLED THROUGH THE TWO GROUNDING LUGS AND CONNECTED TO THE NEUTRAL SPARE.
 8. CONCRETE COMPRESSION STRENGTH SHALL BE 4000 PSI @ 28 DAYS. FOR CAST IN PLACE EARLY HIGH STRENGTH CONCRETE MAY BE USED WITH A MINIMUM OF SEVEN DAY CURE TIME.
 9. REINFORCING STEEL TO HAVE: FY = 60 KSI.
 10. FOR PRECAST UNITS: THE PRECAST SUPPLIER SHALL PROVIDE FITTING LUGS IN THE SLAB (FOUNDATION) AND BASE; THE PRECAST SUPPLIER SHALL ASSEMBLE THE SLAB TO THE BASE PRIOR TO SHIPPING TO THE SITE TO ENSURE THAT THE SLAB AND THE BASE FIT PROPERLY (WITH NO ROCKING OF THE SLAB EVIDENT).
 11. 1 16" X 24" X 1/4" GALVANIZED STEEL PLATE TO COVER A PORTION OF THE CABLE HOLE WHEN THE TRANSFORMER DOES NOT COMPLETELY COVER IT. CUT THE STEEL PLATE TO FIT IF NECESSARY.
- A. 7-#5 REBAR EVENLY SPACED EACH WAY TOP TO BOTTOM
 - B. 2-#4 CORNER DIAGONAL REBAR 2'-0" LONG TOP AND BOTTOM
 - C. 4" X 4" X 1/2" ANGLE 6" LONG WITH 2-3/4" DIAMETER EXPANSION ANCHORS TYPICAL - 4 PLACES (TWO PIECE PRECAST ONLY)
 - D. CHAMFER TYPICAL
 - E. 2" CONCRETE COVER OVER TOP REBAR
 - F. 3" CONCRETE COVER OVER BOTTOM REBAR
 - G. #5 L-BAR @ 12" (CAST IN PLACE ONLY)
 - H. 16" X 24" X 1/4" GALVANIZED STEEL PLATE. MID #6000621790
 - I. #5 REBAR ON 12" CENTERS
 - J. PULLING EYE INSERT, FOR USE WITH 3/4" NATIONAL COURSE THREAD EYE-BOLT, (RICHMOND LCB-1 OR EQUIVALENT). LOCATED OPPOSITE EACH CABLE HOLE AND 2 FEET FROM THE BOTTOM.
 - K. ALL REBAR ENDS TO BE COVERED BY 1" OF CONCRETE MINIMUM.



NOT TO SCALE

SERVICE TRANSFORMER PAD DETAIL

1



18-0018

project no.

JOHNSON ROAD PROPERTY
90 JOHNSON ROAD PORTLAND, MAINE

project.

SITE LIGHTING CALCULATION RESULTS

date drawn: 06/22/18

date issued: 07/02/18

drawn by: **LEB**

scale: AS NOTED

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E-1.3

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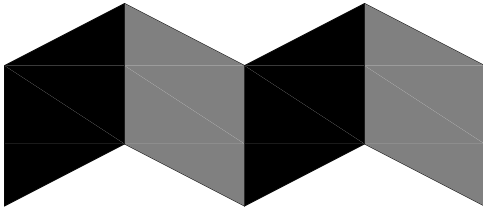
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A1.1

FIRST FLOOR PLAN
NOTE: SCALE: 1/8" = 1'-0"
ALL NEW INTERIOR PARTITIONS TO BE TYPE NA U.O.N.

AREA: 17,234sf



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17 CHESTNUT STREET
PORTLAND, ME 04101
PHONE: 207.761.9500
FAX: 207.761.9595
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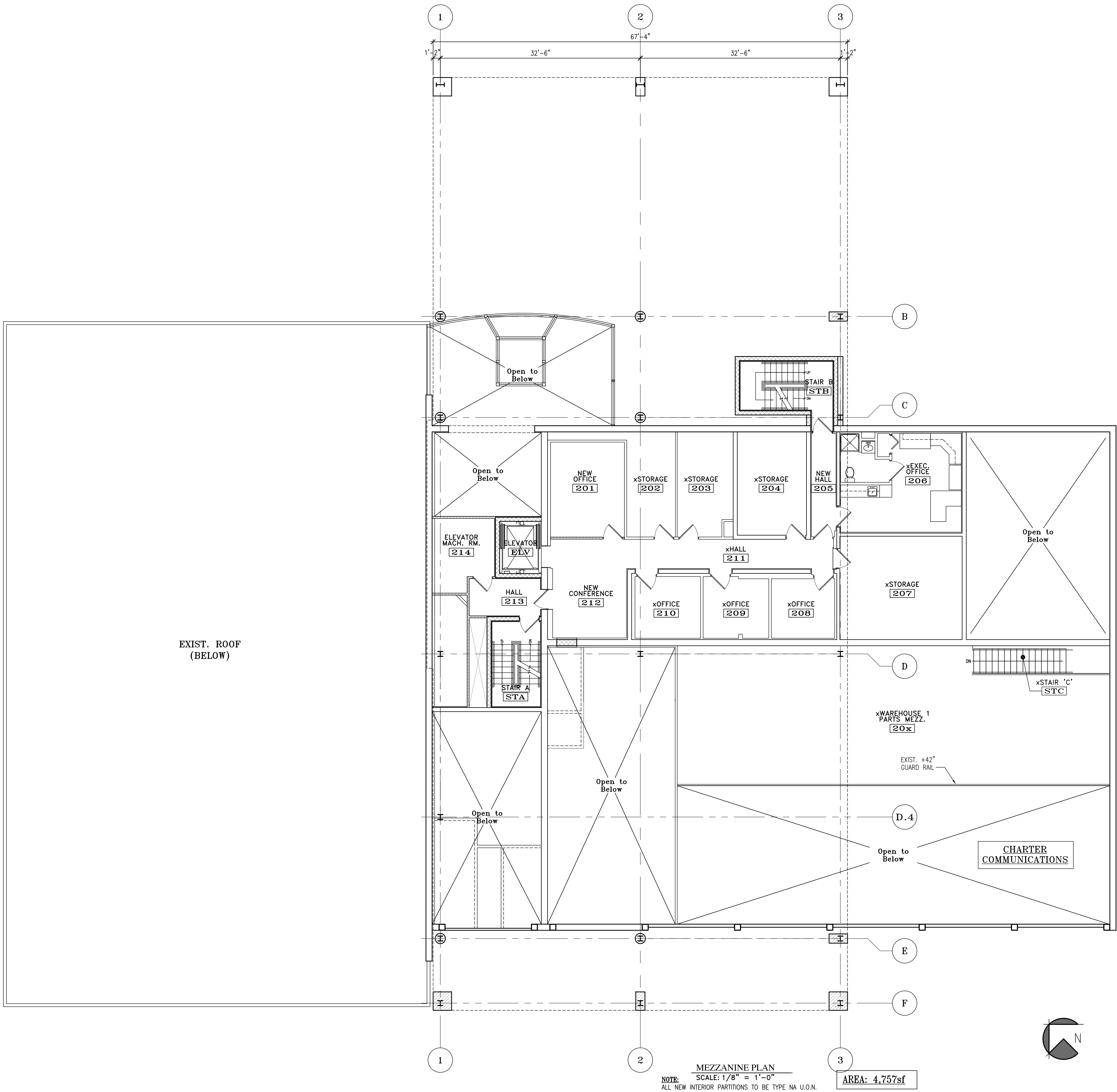
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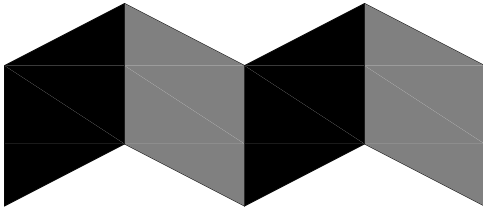
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MEZZANINE
PLAN

A1.2



07-02-18



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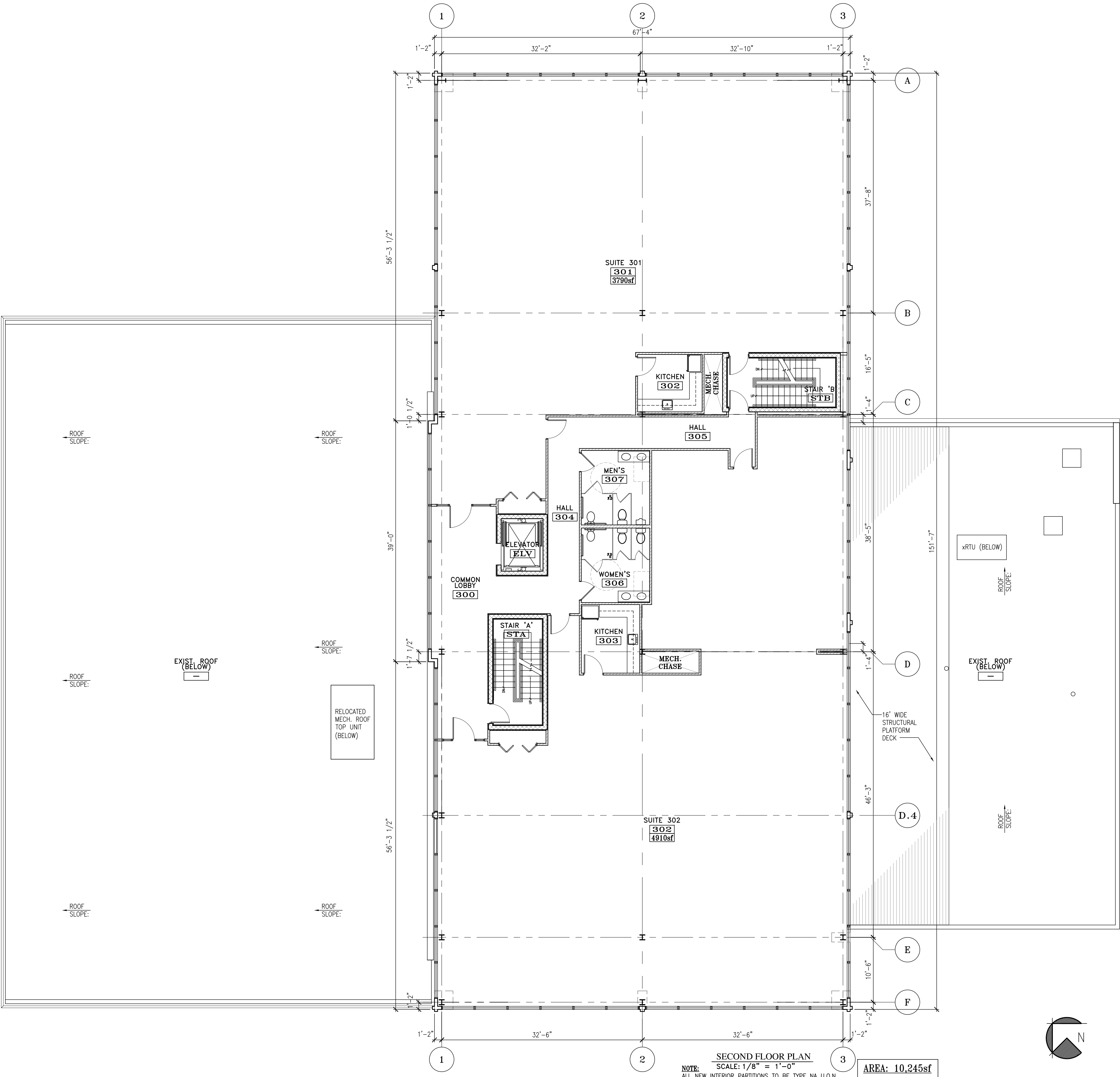
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SECOND
FLOOR
PLAN

A1.3



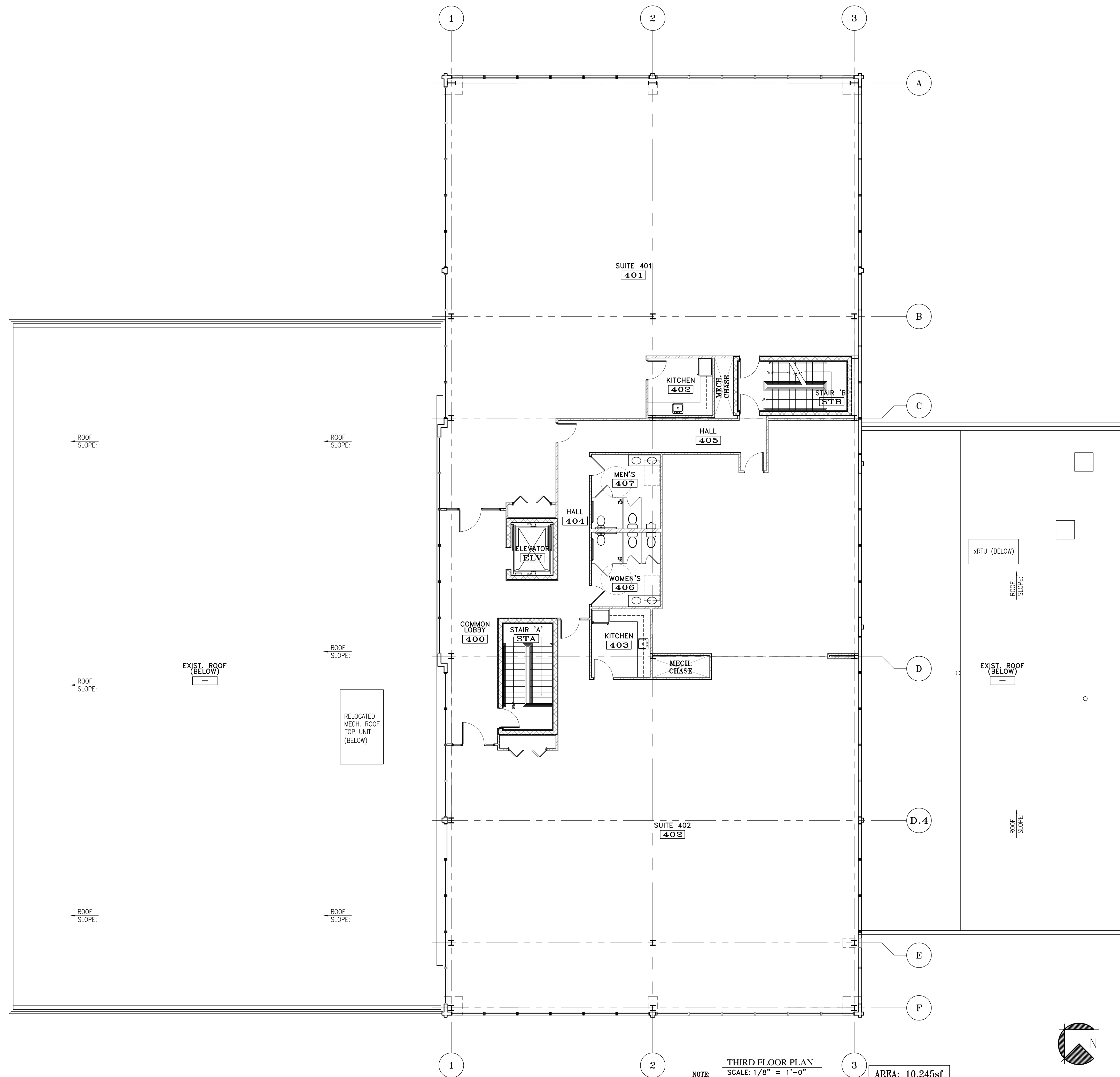
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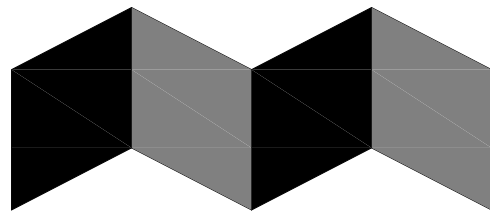
A1.4

A circle with a shaded sector and a shaded segment. The sector is defined by a central angle of 60° and has a radius of 10. The segment is the region bounded by the arc of the sector and the chord connecting its endpoints. The area of the segment is shaded with a cross-hatch pattern.



THIRD FLOOR PLAN
SCALE: 1/8" = 1'-0"
NOTE: ALL NEW INTERIOR PARTITIONS TO BE TYPE NA U.O.N

AREA: 10,245sf



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17 CHESTNUT STREET
PORTLAND, ME 04101
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FAX: 207.761.9595
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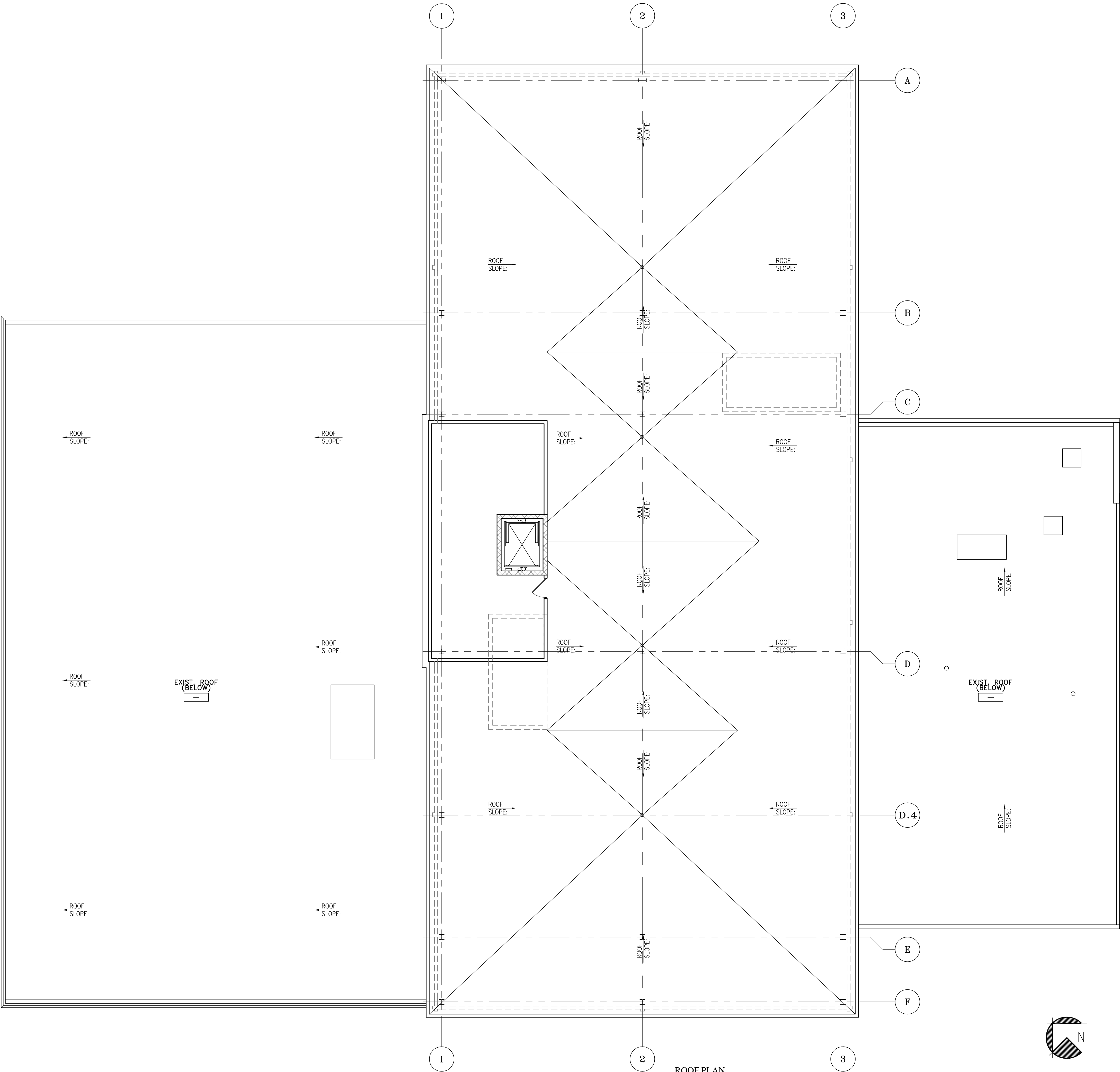
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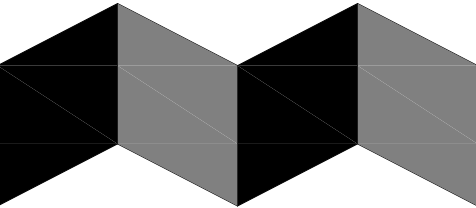
ROOF
PLAN

A1.5

07-02-18



ROOF PLAN
SCALE: 1/8" = 1'-0"



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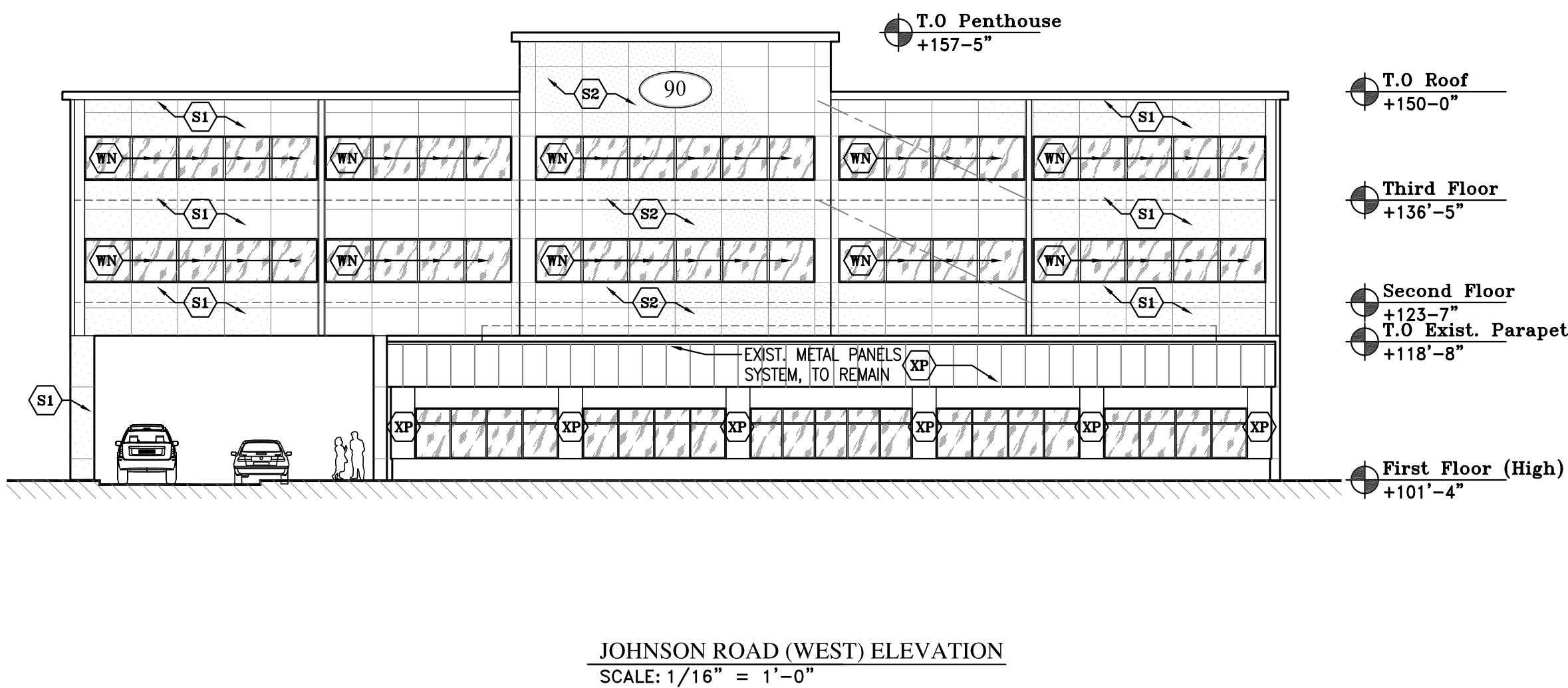
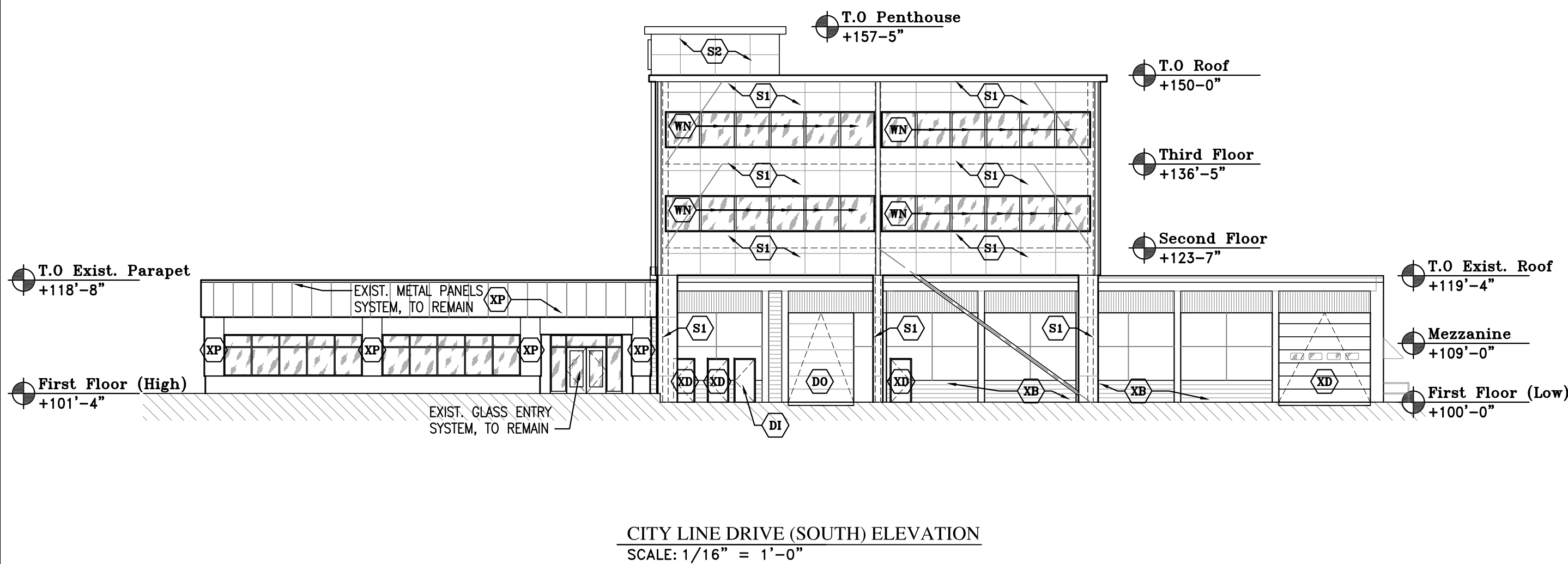
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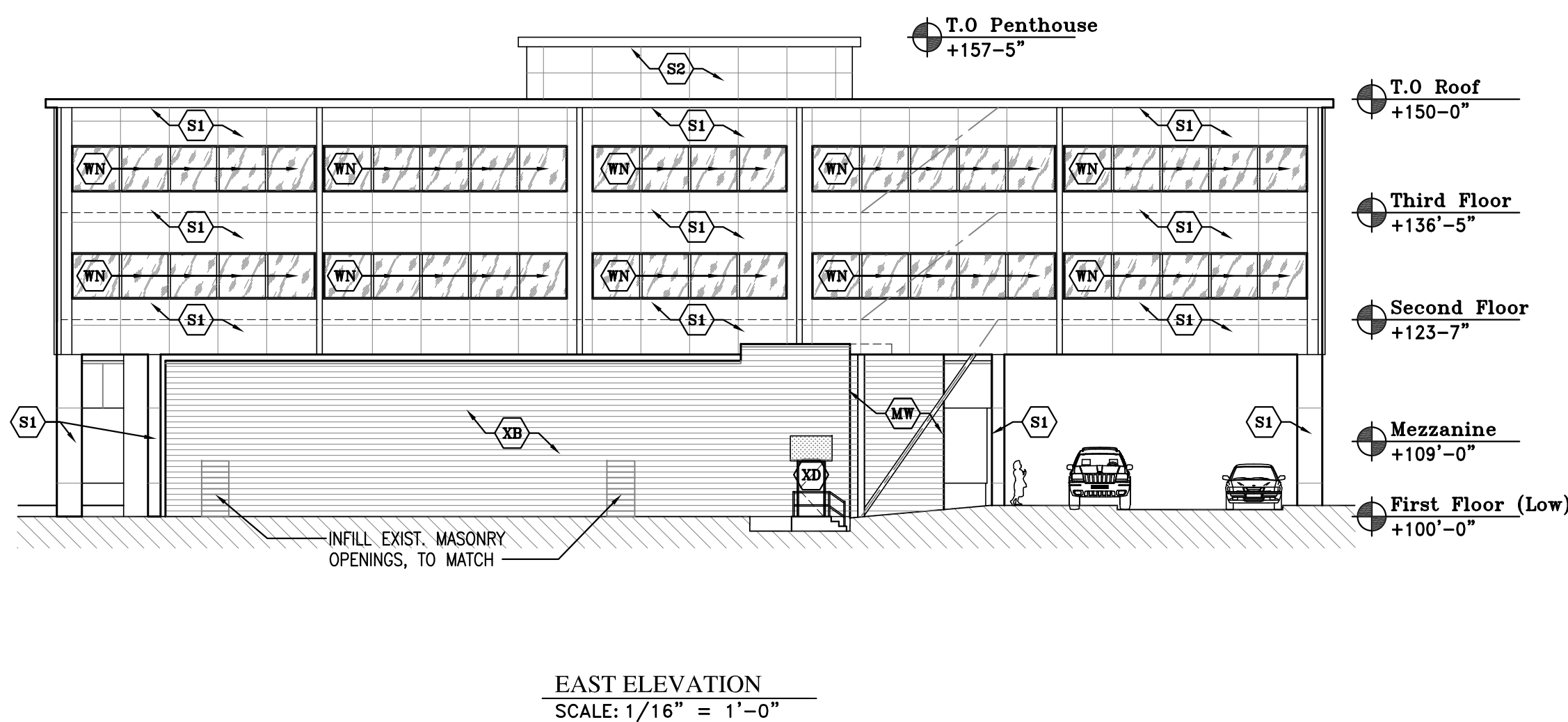
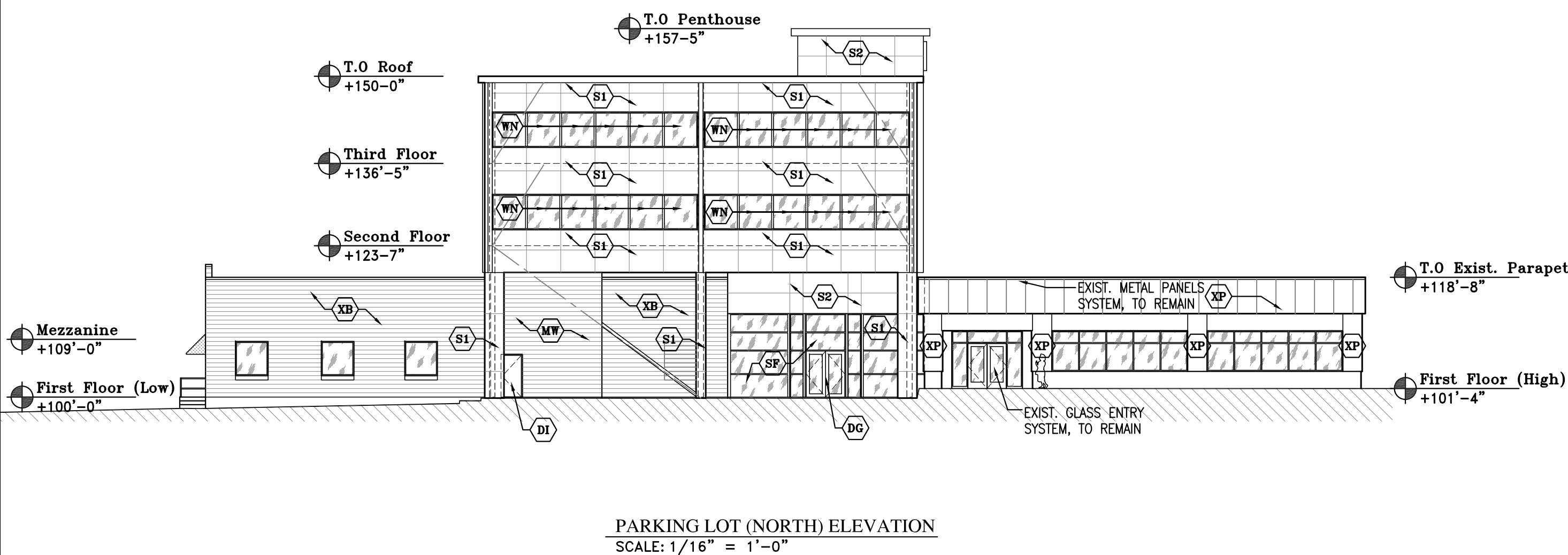
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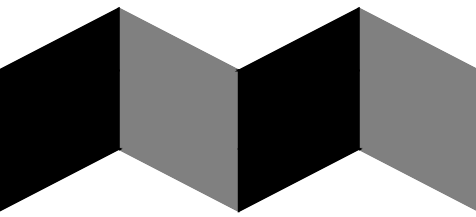
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EXTERIOR ELEVATIONS
A2.0



MATERIAL LEGEND:	
DG	INSULATED FULL GLASS DOOR(S)
DI	INSULATED EXTERIOR DOOR(S) - PAINT COLOR BY OWNER
DO	OVERHEAD DOOR SYSTEM - PAINT COLOR BY OWNER
MW	NEW CMU BLOCK PAINTED - PAINT COLOR BY OWNER
S1	SMOOTH METAL PANEL SIDING - "OMEGA" 1/4" DOUBLE FACED ALUMINUM PANELS - MAT SILVER
S2	SMOOTH METAL PANEL SIDING - "OMEGA" 1/4" DOUBLE FACED ALUMINUM PANELS - ROYAL BLUE
SF	STOREFRONT SYSTEM - "KAWNEER" INSULATED SOLARBAN 60, CLEAR ANODIZED ALUMINUM FRAME
WN	FIXED INSULATED WINDOWS - "KAWNEER" SOLARBAN, 60 WINDOWS, CLEAR ANODIZED ALUMINUM FRAME
XB	EXISTING BRICK/BLOCK - PAINT COLOR BY OWNER
XD	EXISTING DOOR/S - PAINT COLOR BY OWNER





ALPHAarchitects
17 CHESTNUT STREET
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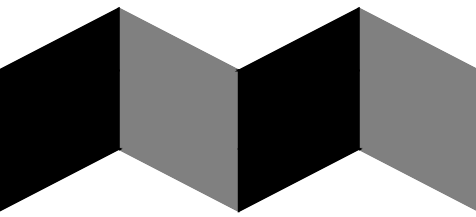
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A2.7

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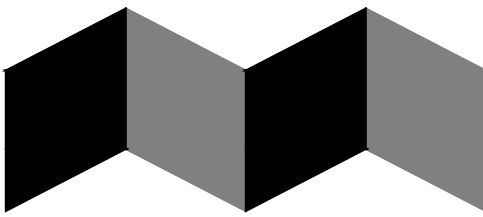
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A2.16



Memorandum

Planning and Urban Development Department

Planning Division



To: Sean Dundon, Chair, and Members of the Portland Planning Board

From: Matthew Grooms, Planner

Date: October 4, 2018

Re: IR-1 and IR-2 Text Amendment – Accessory Dwelling Units

Meeting Date: October 9, 2018

I. INTRODUCTION

The City of Portland is proposing a minor text amendment to two of the City's Island Residential zones, the IR-1 and IR-2 zones, to remove and/or edit conditional use requirements that properties with an accessory dwelling unit (ADU) be owner occupied and be limited to a minimum tenancy period of one (1) year. This proposal, as first suggested by the group Homestart, a 501 (c) 3 non-profit community-based committee of Peaks Island residents, is intended to facilitate the creation and maintenance of affordable housing opportunities within Portland's island communities.

Notice of this workshop appeared in the Portland Press Herald on September 28th and 29th, 2018, and notices were distributed electronically to the interested citizen list. At the time of the writing of this memo, no public comments were received.

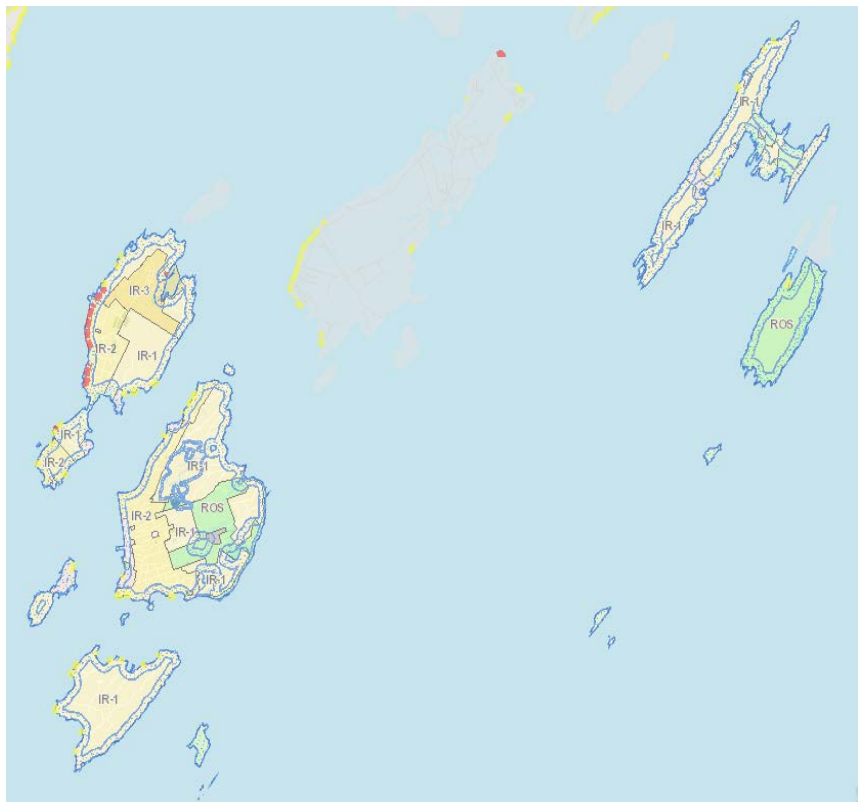


Figure 1: Locations of the IR-1 and IR-2 Zones, to be impacts by the proposed amendments

II. BACKGROUND

For the purposes of this discussion, an accessory dwelling unit (ADU) is a dwelling unit that exists as part of a single-family or two-family dwelling or on the same lot as the principal dwelling, that is subordinate in size and designed to maintain the appearance of either a single-family or two-family dwelling. The unit includes its own independent living facilities, including provision for sleeping, cooking and sanitation and is designed for residential occupancy by one or more people, independent of the primary dwelling unit(s).

The City had been contacted by HomeStart, a 501 (c) 3 nonprofit community-based committee of Peaks Island residents whose mission is “to work to create and maintain affordable housing opportunities for the residents of Peaks Island, Maine”, requesting changes to the ADU ordinance as related to Peaks Island. To support their goal, HomeStart has proposed four strategies for consideration:

- Improve the current provisions for Accessory Dwelling Units (ADU’s)
- Allow the space in older buildings that have been used residentially to be reconfigured to create additional dwelling units but only if at least half of the units are affordable to year-round residents.
- Reduce the side setback requirements and increase the coverage limits for building on smaller “lots of record” if the units will be affordable to year-round residents.
- Reduce the off-street parking required for affordable residential units

In March of 2018, city staff with the Division of Housing and Community Development, on behalf of the group HomeStart, presented a proposed text amendment to the City’s Housing Committee that addressed each of the aforementioned concepts. The proposed

amendment, which can be viewed in Attachment 1, included; reducing the square footage of accessory dwelling units from four hundred (400) to three hundred (300) square feet; removing the requirement that either the accessory or principal dwelling unit be owner-occupied; allowing the accessory unit to be located in an unattached accessory building; requiring the maximum rent to be affordable to households earning up to 115% area median income (AMI); and deed restricting the accessory unit for a term of twenty years through an Affordable Housing Agreement (AHA). These proposed changes are all worthy of further consideration, and have influenced the City’s Housing Committee to direct staff in developing a new, city-wide accessory dwelling unit (ADU) ordinance that would decrease the number of obstacles faced by property owners in developing ADUs and expand opportunities for their development. City-wide changes are currently under development and will be submitted as one of the limited policy changes proposed as part of Phase I of ReCode Portland. A web page with information about this subject is available at: <https://www.recodeportland.me/accessory-dwelling-units/>

In the meantime, in order to take advantage of short-term opportunities, HomeStart has requested that staff proceed with a smaller subset of amendments, which if approved, would go into effect prior to

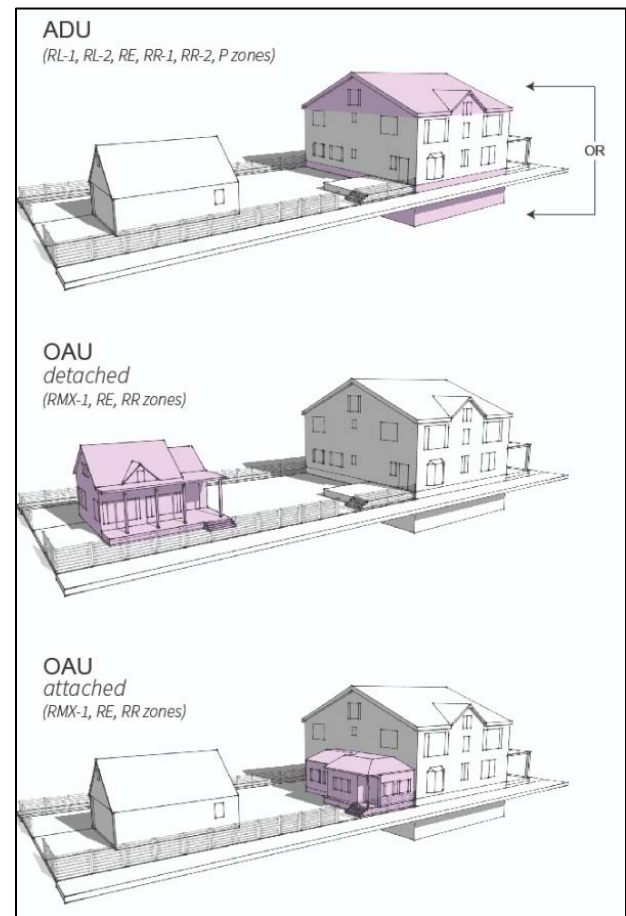


Figure 2: Example ADU Configurations. Note: The IR-1 and IR-2 zones only permit internal ADUs.

Source: City of Boulder, CO

consideration of the city-wide ADU ordinance. The City has agreed to sponsor these amendments as a means of increasing affordable housing supply within the City, with the understanding that these amendments would later be incorporated into the city-wide ADU ordinance if adopted.

III. PROPOSED TEXT AMENDMENTS

A. Existing Zoning – Purpose Statements

1. Division 7.1 IR-1 Island Residential Zone

The purpose of the IR-1 Island Residential zone is to provide for low intensity residential, recreation, and rural uses in the less developed areas of the islands, in order to preserve the rustic character of the islands, to protect groundwater resources and natural and scenic areas, and to permit only appropriate low intensity development in areas lacking adequate public facilities and services.

2. Division 7.2 IR-2 Island Residential Zone

The purpose of the IR-2 Island Residential zone is to protect the character of existing developed residential neighborhoods on the islands and to allow infill where there are adequate public services available. Expansion or extension of an existing IR-2 zone should be strictly limited, generally focused toward areas adjacent to existing village IR-2 areas, and restricted by such factors as adequacy of access, whether adequate water will be available for private use and for fire protection, and whether soils in the areas are adequate for subsurface water disposal or whether public sewers are available.

B. Proposed Amendments

1. Section 14-145.2(a)1. – IR-1 Text Amendment

1. *Accessory dwelling unit within and clearly subordinate to a principal single-family detached dwelling or legal multi-family dwelling, provided that:*
 - a. *The accessory unit shall be no more than thirty-five (35) percent of the gross habitable floor area of the building and shall have a minimum floor area of four hundred (400) square feet;*
 - b. *Lot area shall be seventy thousand (70,000) square feet, or on Peaks Island be an existing lawfully non-conforming lot as of May 1, 2015;*
 - c. *There shall be no open outside stairways or fire escapes above the ground floor;*
 - d. *Any additions or exterior alterations such as façade materials, building form, roof pitch and exterior doors shall be designed to be compatible with the architectural style of the building and preserve the single-family appearance of the building. The exterior design of new construction including façade materials, building form, roof pitch and exterior doors shall have a single-family appearance;*
 - e. *A lower level dwelling unit shall have a minimum two-thirds of its floor-to-ceiling height above the average adjoining ground level;*
 - f. ~~*Either the accessory unit or the principal dwelling unit shall be occupied by the owner of the lot on which the principal building is located, except for bonafide temporary absences;*~~

- g. All sanitary waste shall be disposed of by a public sewer, subsurface sewerage system or other method in compliance with state and local regulations;
- h. For accessory units created on Peaks Island on existing lawfully non-conforming lots as of May 1, 2015:
 - i. Shall remain under common ownership with the primary unit of the lot;
 - ii. Shall not be sold as condominium units or otherwise separated from the ownership of the pre-existing unit of the site;
 - iii. Shall be rented to households earning up to 100% of AMI and be subject to income verification as further outlined in implementing regulations;
 - iv. Shall be the occupant's primary residence as defined in the City's Inclusionary Zoning Implementation Guidelines
 - v. Shall be rented for periods of no less than six months ~~on an annual basis~~ and may not be used for short-term, seasonal or weekly rentals; and
 - vi. Shall be built within the principal building or as an attachment in accordance with subsection (d).

2. Section 14-145.9(a)1. – IR-2 Text Amendment

- 1. Accessory dwelling unit within and clearly subordinate to a principal single-family detached dwelling or legal multi-family dwelling, provided that:
 - a. The accessory unit shall be no more than thirty-five (35) percent of the gross habitable floor area of the building and shall have a minimum floor area of four hundred (400) square feet;
 - b. Lot area shall be thirty thousand (30,000) square feet, or on Peaks Island be an existing lawfully non-conforming lot as of May 1, 2015;
 - c. There shall be no open outside stairways or fire escapes above the ground floor;
 - d. Any additions or exterior alterations such as façade materials, building form, roof pitch and exterior doors shall be designed to be compatible with the architectural style of the building and preserve the single-family appearance of the building. The exterior design of new construction including façade materials, building form, roof pitch and exterior doors shall have a single-family appearance;
 - e. A lower level dwelling unit shall have a minimum two-thirds of its floor-to-ceiling height above the average adjoining ground level;
 - f. Both ~~Either~~ the accessory unit ~~and~~ ~~or~~ the principal dwelling unit shall be the occupant's primary residence as defined in the City's Inclusionary Zoning Implementation Guidelines ~~occupied by the owner of the lot on which the principal building is located, except for bonafide temporary absences;~~
 - g. All sanitary waste shall be disposed of by a public sewer, subsurface sewerage system or other method in compliance with state and local regulations;
 - h. For accessory units created on Peaks Island on existing lawfully non-conforming lots as of May 1, 2015:
 - i. Shall remain under common ownership with the primary unit of the lot;
 - ii. Shall not be sold as condominium units or otherwise separated from the ownership of the pre-existing unit of the site;

- iii. Shall be rented to households earning up to 100% of AMI and be subject to income verification as further outlined in implementing regulations;*
- iv. Shall be rented for periods of no less than six months ~~on an annual basis~~ and may not be used for short-term, seasonal or weekly rentals; and*
- v. Shall be built within the principal building or as an attachment in accordance with subsection (d).*

3. Discussion of Proposed Text Amendments

As stated in the introduction, the goal of HomeStart with their initial proposal was to revamp the Island ADU requirements to facilitate the creation and maintenance of new affordable housing that would be suitable to year-round residents. To achieve this, they advocated for removal of the requirement that either the principal or accessory unit be ‘owner-occupied’, which would enable both units to be ‘rentable’, providing additional flexibility for both providers of affordable housing and for potential tenants.

In place of requiring that one of the units be owner-occupied, the staff are instead suggesting that both the principal and accessory units be the occupant’s primary residence. To further this aim, the existing seasonal and weekly rentals prohibition for the accessory unit are being expanded to include all short-term rentals with a tenancy period of less than six months.

The existing ordinances require that ADUs be rented on an annual basis for full-time residents. With this proposed amendment, that period of time would be reduced to six months, in order to provide both property owner and tenant options for flexibility. HomeStart has informally expressed concern about this change, indicating that such a reduction would benefit landlords though not tenants looking for stable, year-round housing. Staff does not feel strongly that this change should be adopted, but is proposing it based on the idea that many permanent residents seek lease terms of less than a year, and that terms as long as six months are unlikely to be attractive to seasonal renters. At the workshop on October 9th, the staff will be seeking Board feedback on this particular suggestion.

Aside from changes to the IR-1 and IR-2 zones, the staff may also pursue a change to Division 20, the City’s Off-Street Parking Requirements, which would specifically articulate that no off-street parking is required for an accessory dwelling unit. This change has been suggested by HomeStart, and has further been discussed in relation to a city-wide ADU ordinance.

IV. COMPREHENSIVE PLAN

The City’s ordinance states that any rezoning must be consistent with the City’s Comprehensive Plan. In forming its recommendation to the City Council, the Board will need to make a finding on whether the proposal is consistent with the Comprehensive Plan. As seen below, the staff have identified below a number of the specific Comprehensive Plan goals and policies which are suggested as being relevant to the proposed text amendments to the IR-1 and IR-2 zones.

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.



As currently written, the IR-1 and IR-2 zones are specifically concerned with maintaining and enhancing the uniquely rural and rustic appearance of housing in Portland's island communities. At the same time, the state's housing goal is "to encourage and promote affordable decent housing for all Maine citizens", which would include full-time residents within Maine's island communities. The proposed text amendment, intended to relax restrictions on ADUs, is an ideal solution to these disparate challenges and achieves multiple aims of the City's Comprehensive Plan, as seen below.

1. Build on Existing Programs
 - a. Reinforce existing housing tools, policies, and programs while continuing to explore emerging best practices
 - b. Continue to implement best practices in workforce and affordable housing development such as the Housing Trust Fund, inclusionary zoning and other tools.
2. Remove Housing Barriers
 - a. 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
 - b. Assess the impact of current parking requirements on housing development, and evaluate the suitability of fee-in-lieu programs for some neighborhoods
 - c. Allow for a range of housing models in City codes, whether small units, co-housing, or others that may suit changing needs and demographics
3. Promote Sustainability
 - a. Encourage rehabilitation of existing historic buildings and materials
4. Support Age-Friendly Housing Options
 - a. Support programs and tools that facilitate aging safely in place
 - b. Create, promote, and facilitate safe, affordable, and practical housing solutions that will meet the evolving needs of Portland residents as they age
5. Adapt Affordable Housing

- a. Pursue new opportunities for increased energy efficiency, increased densities, mixed incomes, and greater connectivity to surrounding neighborhoods
6. Support Island Communities
 - a. Support land use tools that encourage year-round residences in existing and new housing on Portland's islands, while maintaining their unique character and environment.

Accessory dwelling units at present, are permitted as a conditional use within almost all of Portland's residential zones. Recognized as a means of increasing the affordable housing supply, residential density, and opportunities for multi-generational families to occupy one property, ADU ordinances have been adopted in cities nation-wide and are a prominent, non-subsidy based affordable housing tool. This text amendment builds upon that framework in a manner that is tailored to Portland's island communities. Whereas the existing language focuses heavily on preservation of the unique and historic housing stock and development patterns, the proposed amendments are for the benefit of year-round island residents who seek stable and affordable housing that is currently limited by standards of the existing ordinance, namely the requirement that either the principal or accessory unit be owner-occupied.

V. PUBLIC COMMENT

Staff has received no public comment on the proposed text amendments to date.

VI. NEXT STPES

The Planning Board will hold a workshop on this proposal on Tuesday October 9, 2018, with a follow-up public hearing tentatively scheduled for Tuesday, October 23, 2018. The staff are seeking input from members of the Board and public on these proposed changes, and based upon those suggestions, will prepare a final draft of the ordinances and recommendation to the Planning Board.

VII. ATTACHMENTS

1. Housing Committee Report – March 2018
2. Proposed Text Amendments to Portland Land Use Code, Div. 7.1 IR-1 Island Residential Zone
3. Proposed Text Amendments to Portland Land Use Code, Div. 7.2 IR-2 Island Residential Zone



TO: Councilor Duson, Chair
Members of the Housing Committee

FROM: Victoria Volent, Housing Program Manager

DATED: March 19, 2018

SUBJECT: HomeStart Proposed Text Amendments

Introduction

HomeStart is a 501(c) 3 nonprofit community-based committee of Peaks Island residents whose mission is "to work to create and maintain affordable housing opportunities for the residents of Peaks Island, Maine". To support their goal, HomeStart has proposed four strategies for consideration:

- Improve the current provisions for Accessory Dwelling Units (ADU's)
- Allow the space in older buildings that have been used residentially to be reconfigured to create additional dwelling units but only if at least half of the units are affordable to year round residents
- Reduce the side setback requirements and increase the coverage limits for building on smaller "lots of record" if the units will be affordable to year-round residents
- Reduce the off-street parking required for affordable residential units

Homestart has suggested these strategies to build on recommendations they made in 2015. Their 2015 suggestions informed the package of "encourage and ensure" zoning changes made at that time, which included the inclusionary zoning ordinance, but also some changes to relax regulations of affordable ADU's on Peaks Island and the R-5 zone on the mainland.

Division 7.1 IR-1 Island Residential Zone

The purpose of the IR-1 island residential zone is to provide for low intensity residential, recreational, and rural uses in the less developed areas of the islands, in order to preserve the rustic character of the islands, to protect groundwater resources and natural and scenic areas, and to permit only appropriate low intensity development in areas lacking adequate public facilities and services. Division 7.1 IR – 1 includes sections 14-145.1 through 14-145.6.

Division 7.2 IR-2 Island Residential Zone

The purpose of the IR-2 island residential zone is to protect the character of existing developed residential neighborhoods on the islands and to allow infill where there are adequate public services available. Expansion or extension of an existing IR-2 zone should be strictly limited, generally focused toward areas adjacent to existing village IR-2 areas, and restricted by such factors as adequacy of access, whether adequate water will be available for private use and for fire protection, and whether soils in the area are adequate for subsurface water disposal or whether public sewers are available. Division 7.2 IR-2 includes sections 14-145.7 through 14-145.22

Accessory Dwelling Units

The proposed changes to Division 7.1 IR-1 section 14-145.3 (a) 1 include; reducing the square footage of accessory dwelling units from four hundred (400) to three hundred (300) square feet; removing the requirement that either the accessory unit or the principal dwelling unit shall be occupied by the owner of the lot; allowing the accessory unit to be located in an unattached accessory building; requiring the maximum rent to be affordable to households earning up to 115% AMI; and deed restricting the accessory unit for a term of twenty years through an Affordable Housing Agreement.

Reconfiguration of large, older residential buildings

The changes to Division 7.1 IR-1 section 14-145.5 (a), and Division 7.2 IR-2 section 14-145-8 are proposed amendments to allow the reconfiguration of large (1,200 square feet of gross floor area), older (pre 1985) residential buildings to include one or more additional dwelling units in the principal building and/or in an existing accessory building. The proposed amendments also provide for; minimum lot, and building standards; maximum rent and sale prices; twenty year deed restrictions; and a provision that at least fifty percent of the dwelling units in the reconfigured building(s) be occupied by a household meeting the income restrictions outlined in the City's Inclusionary Zoning Ordinance.

The amendment to section 14-145.5 (a) Minimum Lot Size would also allow the reconfiguration of large, older residential buildings on lots served by both on-site water and sewage disposal. Under these conditions, the minimum lot size requirement would be 20,000 square feet.

Division 25. Space and Bulk Regulations and Exceptions

The requirements of this article are subject to the Space and Bulk Regulations and Exceptions of Division 25. Division 25 includes section 14-433 Lots of Record and Accessory Dwelling Structure Setbacks for Existing Buildings.

Development of "lots of record"

The proposed change to section 14-433 is the inclusion of an amendment designed to enhance feasible development of small, vacant lots if they meet specific requirements. The amendments only pertain to lots of record as of July 15, 1985 located in the IR-1 or IR-2 Zone on Peaks Island intended for use as a single family residence. The dwelling units would be occupied by households earning up 120% of the Area Median Income (AMI) and deed restricted for twenty years through an Affordable Housing Agreement.

Zone	Min. lot size	Street Frontage	Set-backs	Max. lot coverage
IR-1	40,000 SF with public water; 60,000 SF without public water	n/a if meets applicable yard and min. lot dimensions	30' - front 30' - rear 20' - side	20%
IR-2	20,000 SF with both off-site water and sewage	n/a if meets applicable yard and min. lot dimensions	25' – front 25' – rear 20' - side	20%
Proposed IR-1 and IR-2 amendments	5,000 SF if served by both public sewer and water; 10,000 SF if served by on-site sewage system and public water	45'	10' – rear 10' - side	Less than 40%; unless subject to shoreland zoning then 20%

Section 14-433 is further proposed for amendment by adding a new subsection that allows two adjacent lots of records as of July 15, 1985 located in the IR-1 or IR-2 Zone of Peaks Island to be used as a two-family rental or homeownership dwelling unit. At least one unit would be occupied by a household earning up to 120% of the Area Median Income (AMI) and deed restricted for twenty years.

Zone	Min. lot size	Street Frontage	Set-backs	Max. lot coverage
Proposed IR-1 and IR-2 amendment	10,000 SF with both public sewer and water; 20,000 SF is served by on-site sewage and public water	95'	15' – rear 15' - side	Less than 40%; unless subject to shoreland zoning then 20%

Off Street Parking Requirements

The proposed amendment to section 14-332.1 would add a subsection to reduce the parking requirement for affordable, deed restricted housing units in the IR-1, and IR-2 zone from two spaces per unit to one space per unit. The proposed amendment to Section 14.332.1 (f) would allow one parking space for each dwelling unit that is deed restricted as affordable housing.

Conclusion

Portland's Comprehensive Plan, *Portland's Plan 2030*, acknowledges the City of Portland is actively engaged in efforts to encourage housing preservation and creation, for all income levels and household sizes, through policy initiatives and public/ nonprofit partnerships. The proposals presented by HomeStart in their report *Suggested Amendments to the Portland Zoning Ordinance to Facilitate the Development of More Affordable, Year-Round Housing on Peaks Island* is in keeping with the Comprehensive Plan's directive to create housing for all income levels through policy initiatives. Further, within the Housing Chapter of the Comprehensive Plan is the recommendation to support island communities by "support(ing) land use tools that encourage year-round residences in existing and new housing on Portland's islands, while maintaining their unique character and environment".

Attachments:

HomeStart Suggested Amendments to the Portland Zoning Ordinance (revised Oct 15, 2017)

HomeStart Overview of Draft Amendments (June 28, 2017)

HomeStart Rationale for HomeStart's Suggested Zoning Ordinance Amendments (Aug 29, 2017)

Suggested Amendments to the Portland Zoning Ordinance to Facilitate the Development of More Affordable, Year-Round Housing on Peaks Island

HomeStart has identified four concepts for possible amendments to the City of Portland’s Zoning Ordinance to facilitate the development of year-round housing that is more affordable. The objective in proposing these amendments is to create opportunities for the creation of affordable, year-round housing by removing obstacles in the current zoning requirements that regulate residential uses on Peaks Island. The four concepts are:

- Reduce the off-street parking required for affordable residential units
- Improve the existing Accessory Dwelling Unit ordinance based on community feedback since its enactment 3 years ago
- Based on community requests to make better use of existing housing , allow larger homes built before 1985 to be reconfigured to create additional dwelling units but only if at least half of the units are affordable to year-round residents
- Reduce the side setback requirements and increase the coverage limits for single family homes on smaller “lots of record” if the units will be affordable to year-round residents

In addition, per community request, wording has been added to all proposed amendments that specifies that no new affordable housing may be used for seasonal, weekly or daily rentals.

The HomeStart Zoning Advisory Committee (ZAC) developed draft amendments to revise the Zoning Ordinance to address these four concepts. The Board of HomeStart reviewed the draft amendments and has voted to recommend them to the Peaks Island Council with some minor revisions.

Draft Zoning Ordinance Amendments

Here are HomeStart’s proposed ordinance amendments to address the four concepts. Since these are changes to the existing ordinance, the proposed revisions are shown in underline and strike through format. When text is proposed to be added to the ordinance, it is underlined. And when existing text is proposed to be deleted, it is struck through.

1. Accessory Dwelling Unit (ADUs) – The following amendments are designed to make the ADU provisions that were adopted a few years ago more useable:

I-R1 Zone Amendment:

Amend Sec. 14-145.3(a)1. to read:

1. Accessory dwelling unit within, ~~except as provided in g.v. below,~~ and clearly subordinate to a principal single-family detached dwelling or legal multi-family dwelling., provided that:

- a. The accessory unit shall be no more than thirty-five (35) percent of the gross habitable floor area of the building and shall have a minimum floor area of ~~three~~ four hundred (3400) square feet;
- b. Lot area shall be seventy thousand (70,000) square feet, or on Peaks Island be an existing lawfully non-conforming lot as of May 1, 2015;
- c. There shall be no open outside stairways or fire escapes above the ground floor;
- d. Any additions or exterior alterations such as facade materials, building form, roof pitch and exterior doors shall be designed to be compatible with the architectural style of the building and preserve the single-family appearance of the building. The exterior design of new construction including facade materials, building form, roof pitch and exterior doors shall have a single-family appearance;

e. A lower level dwelling unit shall have a minimum two-thirds of its floor-to-ceiling height above the average adjoining ground level;

~~f. Either the accessory unit or the principal dwelling shall be occupied by the owner of the lot on which the principal building is located, except for bonafide temporary absences;~~

~~fg.~~ All sanitary waste shall be disposed of by a public sewer, subsurface sewerage system or other method in compliance with state and local regulations; and

~~gh. For Properties containing~~ accessory units ~~created~~ on Peaks Island on existing lawfully non-conforming lots as of May 1, 2015 shall comply with the following additional requirements:

- i. The primary unit and the accessory unit shall ~~Shall~~ remain under common ownership ~~with the primary unit on the lot;~~
- ii. Neither unit shall ~~Shall not~~ be sold as a condominium unit ~~s~~ or otherwise separated from the ownership of the entire property ~~pre-existing unit on the site;~~
- iii. One of the units shall be occupied by a household ~~Shall be rented households~~ earning up to 100% of AMI and be subject to income verification as set forth in the City's Inclusionary Zoning Implementation Guidelines for Developers of Rental Housing as further outlined in implementing regulations;
- iv. The accessory unit shall be occupied ~~Shall be rented as the occupant's primary residence as defined in the City's Inclusionary Zoning Implementation Guidelines and may not be rented out for short or long term periods, including seasonal, weekly or daily rentals, to other households on an annual basis;~~
- v. The accessory unit shall ~~Shall~~ be built within the principal building, ~~or~~ as an attachment to the principal building, or in an accessory building in accordance with subsection (d);
- vi. The maximum rent for the accessory unit shall not exceed one hundred fifteen percent (115%) of the Affordable Monthly Rent determined in accordance with the City's Inclusionary Zoning Implementation

Guidelines for Developers of Rental Housing:

vii. The accessory unit shall be subject to an Affordable Housing Agreement as set forth in the City's Inclusionary Zoning Implementation Guidelines for Developers of Rental Housing for a term of not less than twenty (20) years, and

viii. The owner of the property shall provide the occupant of the affordable unit with a written description of the occupancy requirements for the unit.

I-R2 Zone Amendment:

Amend Sec. 14-145.9(a)1. to read:

1. Accessory dwelling unit within, ~~except as provided in g.v. below,~~ and clearly subordinate to a principal single-family detached dwelling or legal multi-family dwelling., provided that:

a. The accessory unit shall be no more than thirty-five (35) percent of the gross habitable floor area of the building and shall have a minimum floor area of ~~three~~ four-hundred (~~3400~~) square feet;

b. Lot area shall be thirty thousand (30,000) square feet, or on Peaks Island be an existing lawfully non-conforming lot as of May 1, 2015;

c. There shall be no open outside stairways or fire escapes above the ground floor;

d. Any additions or exterior alterations such as facade materials, building form, roof pitch and exterior doors shall be designed to be compatible with the architectural style of the building and preserve the single-family appearance of the building. The exterior design of new construction including facade materials, building form, roof pitch and exterior doors shall have a single-family appearance;

e. A lower level dwelling unit shall have a minimum two-thirds of its floor-to-ceiling height above the average adjoining ground level;

~~f. Either the accessory unit or the principal dwelling shall be occupied by the owner of the lot on which the principal building is located, except for bonafide temporary absences;~~

~~fg.~~ All sanitary waste shall be disposed of by a public sewer, subsurface sewerage system or other method in compliance with state and local regulations; and

~~gh. For Properties containing~~ accessory units ~~created~~ on Peaks Island on existing lawfully non-conforming lots as of May 1, 2015 shall comply with the following additional requirements:

i. ~~The primary unit and the accessory unit shall~~ Shall remain under common ownership ~~with the primary unit on the lot;~~

ii. ~~Neither unit shall~~ Shall not be sold as a condominium units or otherwise separated from the ownership of the entire property ~~pre-existing unit on the site;~~

iii. ~~One of the units shall be occupied by a household~~ Shall be rented ~~households~~ earning up to 100% of AMI and be subject to income verification as set forth in the City's Inclusionary Zoning Implementation Guidelines for Developers of Rental Housing as further outlined in

implementing regulations;

iv. The accessory unit shall be occupied Shall be rented as the occupant's primary residence as defined in the City's Inclusionary Zoning Implementation Guidelines and may not be rented out for short or long term periods, including seasonal, weekly or daily rentals, to other households on an annual basis;

v. The accessory unit shall Shall be built within the principal building, or as an attachment to the principal building, or in an accessory building in accordance with subsection (d);

vi. The maximum rent for the accessory unit shall not exceed one hundred fifteen percent (115%) of the Affordable Monthly Rent determined in accordance with the City's Inclusionary Zoning Implementation Guidelines for Developers of Rental Housing;

vii. The accessory unit shall be subject to an Affordable Housing Agreement as set forth in the City's Inclusionary Zoning Implementation Guidelines for Developers of Rental Housing for a term of not less than twenty (20) years, and

viii. The owner of the property shall provide the occupant of the affordable unit with a written description of the occupancy requirements for the unit.

2. Reconfiguration of large, older residential buildings – The following amendments allow the existing floor area in large, older buildings in both the I-R1 and I-R2 Districts to be reconfigured to create more dwelling units as long as they meet certain requirements. The provisions for the two districts are slightly different recognizing the difference in the lot sizes in the two districts:

I-R1 Zone Amendment:

Amend Sec. 14-145.5(a) by adding a new subsection 9. which shall read:

9. Notwithstanding the provisions Sec. 14.145-2 Permitted use and subsection 1 of Sec. 14-145.5(a)1, a property on Peaks Island existing as of April 1, 2017 that meets the following requirements may be reconfigured to create one or more additional dwelling units in the principal building and/or in an existing accessory building:

a. The lot was developed and used as a residential property prior to April 1, 1985;

b. The principal building has at least one thousand two hundred (1,200) square feet of gross floor area;

c. The lot has a minimum of six thousand five hundred (6,500) square feet of area if the lot is served by the public water system and/or the public sewer system and twenty thousand (20,000) square feet of area if the lot is served by both on-site water supply and sewage disposal;

d. The lot is or will be served by the public sewer systems or an on-site subsurface sewage disposal system meeting the requirements of the Maine Subsurface Wastewater Disposal Rules for the proposed use;

e. The property does not discharge any stormwater to the sanitary sewer system or any such discharge will be corrected as part of the reconfiguration of the building;

f. The reconfiguration of the property to create additional dwelling unit(s) shall not

expand the exterior building envelop of the existing structures except as follows:

1)Minor additions with not more than ten percent (10%) of the existing floor area of the building are permitted to accommodate additional access to the building and/or to comply with local, state and/or federal safety and accessibility requirements, and

2)The installation of windows and dormers is permitted provided that the alterations maintain the character of the building;

g. The reconfiguration shall maintain the character of the structure and except as provided for in f. shall not significantly alter the exterior appearance of the structure;

h. The dwelling units in the reconfigured building(s) may be rented or may be sold as condominium units or otherwise separated from the ownership of the entire property;

i. At least fifty percent (50%) of the dwelling units in the reconfigured building(s) shall be occupied by a household meeting the income requirements set forth in the City's Inclusionary Zoning Implementation Guidelines for Developers of Rental Housing if the unit(s) will be rented or the City's Inclusionary Zoning Implementation Guidelines for Developers of Homeownership Housing if the unit(s) will be sold;

j.The affordability requirement of i. shall apply for a minimum of twenty (20) years and shall be subject to verification as set forth in the City's guidelines;

k.All affordable units in the reconfigured building(s) shall be the occupant's primary residence as defined in the City's Inclusionary Zoning Implementation Guidelines and may not be rented out for short or long term periods, including seasonal, weekly or daily rentals, to other households

l.The maximum rent for the units occupied by income qualified households shall not exceed one hundred fifteen percent (115%) of the Affordable Monthly Rent determined in accordance with the City's Inclusionary Zoning Implementation Guidelines for Developers of Rental Housing;

m.The maximum sales price for units occupied by income qualified households shall be based on the City's Inclusionary Zoning Implementation Guidelines for Developers of Ownership Housing; and

n.If the affordable unit(s) is rented, the owner of the property shall provide the occupant of the affordable unit with a written description of the occupancy requirements for the unit.

I-R2 Zone Amendment:

Amend Sec. 14-145.11(a) by adding a new subsection 8. which shall read:

8.Notwithstanding the provisions Sec. 14.145-8 Permitted use and subsection 1 of Sec. 14-145.11(a)1, a property on Peaks Island existing as of April 1, 2017 that meets the following requirements may be reconfigured to create one or more additional dwelling units in the principal building and/or in an existing accessory building:

a.The lot was developed and used as a residential property prior to April 1, 1985;

b.The principal building has at least one thousand two hundred (1,200) square feet of gross floor area;

c.The lot has a minimum of six thousand five hundred (6,500) square feet of area;

d. The lot is or will be served by the public sewer systems or an on-site subsurface

sewage disposal system meeting the requirements of the Maine Subsurface Wastewater Disposal Rules for the proposed use;

e. The property does not discharge any stormwater to the sanitary sewer system or any such discharge will be corrected as part of the reconfiguration of the building;

f. The reconfiguration of the property to create additional dwelling units shall not expand the exterior building envelop of the existing structures except as follows:

1) Minor additions with not more than ten percent (10%) of the existing floor area of the building are permitted to accommodate additional access to the building and/or to comply with local, state and/or federal safety and accessibility requirements, and

2) The installation of windows and dormers is permitted provided that the alterations maintain the character of the building;

g. The reconfiguration shall maintain the character of the structure and except as provided for in f. shall not significantly alter the exterior appearance of the structure;

h. The dwelling units in the reconfigured building(s) may be rented or may be sold as condominium units or otherwise separated from the ownership of the entire property;

i. At least fifty percent (50%) of the dwelling units in the reconfigured building(s) shall be occupied by a household meeting the income requirements set forth in the City's Inclusionary Zoning Implementation Guidelines for Developers of Rental Housing if the unit(s) will be rented or the City's Inclusionary Zoning Implementation Guidelines for Developers of Homeownership Housing if the unit(s) will be sold;

j. The affordability requirement of i. shall apply for a minimum of twenty (20) years and shall be subject to verification as set forth in the City's guidelines;

k. All affordable units in the reconfigured building(s) shall be the occupant's primary residence as defined in the City's Inclusionary Zoning Implementation Guidelines and may not be rented out for short or long term periods, including seasonal, weekly or daily rentals, to other households;

l. The maximum rent for the units occupied by income qualified households shall not exceed one hundred fifteen percent (115%) of the Affordable Monthly Rent determined in accordance with the City's Inclusionary Zoning Implementation Guidelines for Developers of Rental Housing;

m. The maximum sales price for units occupied by income qualified households shall be based on the City's Inclusionary Zoning Implementation Guidelines for Developers of Ownership Housing; and

n. If the affordable unit(s) is rented, the owner of the property shall provide the occupant of the affordable unit with a written description of the occupancy requirements for the unit.

3. Development of "lots of record" – The following amendments are designed to make it more feasible to develop small vacant lots if they meet certain requirements:

Amend Section 14-433 by adding a new subsection 4. to read:

4. In addition to the provisions of subsection 3. a lot of record as of July 15, 1985 that is located in the I-R1 or I-R2 Zone on Peaks Island may be used for a single-family home provided that the lot and the proposed home meets all of the following requirements:

- a. The lot contains a minimum of five thousand (5,000) square feet of area if served by the public sewer system or ten thousand (10,000) square feet if served by an on-site sewage disposal system meeting the requirements of the Maine Subsurface Wastewater Disposal Rules for the proposed use;
- b. The lot has a minimum of forty-five (45) feet of street frontage;
- c. The side and rear yards will be a minimum of ten (10) feet;
- d. The lot coverage will be less than forty percent (40%) unless the lot is subject to shoreland zoning in which case the maximum coverage shall be twenty percent (20%);
- e. The home will be served by the public water system;
- f. The home shall be occupied by a household earning up to 120% of AMI and be subject to income verification as set forth in the City's Inclusionary Zoning Implementation Guidelines for Developers of Homeownership Housing;
- g. The home shall be occupied as the occupant's primary residence as defined in the City's Inclusionary Zoning Implementation Guidelines and may not be rented out for short or long term periods, including seasonal, weekly or daily rentals, to other households;
- h. The home shall be subject to an Affordable Housing Agreement as set forth in the City's Inclusionary Zoning Implementation Guidelines for Developers of Homeownership Housing for a term of not less than twenty (20) years.

Amend Section 14-433 by adding a new subsection 5. to read:

5. In addition to the provisions of subsection 3. two adjacent lots of record as of July 15, 1985 that are located in the I-R1 or I-R2 Zone on Peaks Island may be used for a two-family home in which the units are side-by-side provided that the combined lots and the proposed building meets all of the following requirements:

- a. The combined lots contain a minimum of ten thousand (10,000) square feet of area if served by the public sewer system or twenty thousand (20,000) square feet if served by an on-site sewage disposal system meeting the requirements of the Maine Subsurface Wastewater Disposal Rules for the proposed use;
- b. The combined lots have a minimum of ninety-five (95) feet of street frontage;
- c. The side and rear yards will be a minimum of fifteen (15) feet;
- d. The lot coverage will be less than forty percent (40%) unless the lot is subject to shoreland zoning in which case the maximum coverage shall be twenty percent (20%);
- e. The home will be served by the public water system;
- f. At least one of the units shall be occupied by a household earning up to 120% of AMI and be subject to income verification as set forth in the City's Inclusionary Zoning Implementation Guidelines for Developers of Homeownership Housing;
- g. Both units shall be occupied as the occupant's primary residence as defined in the City's Inclusionary Zoning Implementation Guidelines and may not be rented out for short or long term periods, including seasonal, weekly or daily rentals, to other households;
- h. If the units will be sold, the affordable unit shall be subject to an Affordable Housing Agreement as set forth in the City's Inclusionary Zoning Implementation Guidelines for Developers of Homeownership Housing for a term of not less than twenty (20) years;
- i. If the unit(s) will be rented, the affordable unit(s) shall be subject to an Affordable

Housing Agreement as set forth in the City's Inclusionary Zoning Implementation Guidelines for Developers of Rental Housing for a term of not less than twenty (20) years; and

j. If the affordable unit(s) is rented, the owner of the property shall provide the occupant of the affordable unit with a written description of the occupancy requirements for the unit.

4. Off-Street Parking Requirements – The following amendments propose reducing the parking requirement for affordable housing units in the I-R1, I-R2, and I-B Districts from two spaces per unit to one space per unit:

Amend Sec. 14.332.1 by adding a new subsection (l) to read:

(l) I-R1 and I-R2 Zones: Residential uses shall provide a minimum of one (1) parking space for each dwelling unit that meets the housing affordability provisions of the I-R1 or I-R2 Zones.

Amend Sec. 14.332.1 by revising subsection (f) to read:

(f) ~~I-BR1~~, *Island Business Zone*: Off-street parking shall be required at twenty-five (25%) percent of the required number of number of parking spaces for specified uses as provided in division 20 (off-street parking) of this article, except ~~that~~ residential uses shall meet the full parking requirement shall provide a minimum of one (1) parking space for each dwelling unit that meets the housing affordability provisions of the I-B Zone.

Overview of Draft Amendments to Facilitate the Development of More Affordable, Year-Round Housing on Peaks Island

Following HomeStart's February workshop on possible concepts for revising the Zoning Ordinance, HomeStart formed a Zoning Advisory Committee (ZAC). The concepts discussed at the February workshop were:

- Improve the current provisions for Accessory Dwelling Units
- Allow two-family homes but only if at least one of the units is affordable to year-round residents
- Allow larger single-family homes to be reconfigured to create additional units but only if at least half of the units are affordable to year-round residents
- Reduce the side setbacks for building a home on a smaller "lot of record" if the home will be affordable to year-round residents
- Reduce the off-street parking required for residential uses

The task of the ZAC was to develop draft amendments to revise the Zoning Ordinance to address these concepts based on the feedback from the workshop. This group met a number of times and has developed a set of possible ordinance amendments for further community review and input. The following sections provide an overview of the draft ordinance amendments – the full text of the draft amendments is available on HomeStart's website and will be discussed at the second community workshop on Thursday July 20th.

1. Accessory Dwelling Unit (ADUs) – The proposed amendments are designed to make the ADU provisions that were adopted a few years ago more useable. Here is an overview of the proposed changes:

- The minimum size of an ADU is reduced from 400 SF to 300 SF
- The owner of the property no longer has to live there
- The income and rent are tied to the City's affordable housing provisions

2. Reconfiguration of large, older residential buildings – The proposed amendments allow the existing floor area in large, older residential buildings in both the I-R1 and I-R2 Districts to be reconfigured to create more dwelling units as long as they meet certain requirements. The following is an overview of the provisions:

- The lot must have been developed and used for residential activity prior to 1985 and the building must have a minimum of 1,200 SF of floor area
- The lot must have a minimum of 6,500 SF if connected to the sewer and 20,000 SF if served by a septic system
- The space in both the principal building and any accessory buildings such as a garage can be used to create one or more additional dwelling units
- No stormwater can be discharged to the sewer system

- The building must maintain its character and can only have minimal changes to the exterior
- At least 50% of the units must be occupied as their permanent residence by residents meeting the income requirements of the City's affordable housing provisions

3. Development of "lots of record" – The proposed amendments are designed to make it more feasible to develop small vacant lots if they meet certain requirements. Here is an overview of the proposed amendments:

- Lots of record with a minimum of 5,000 Sf if connected to the sewer or 10,000 if served by a septic system can be developed as an affordable single-family home
- The side setbacks are reduced to 10 feet
- The portion of the lot that can be covered by impervious surface is increased to 40% outside of Shoreland areas where it stays at 20%
- The unit must be occupied by residents with an income of up to 120% of the AMI reflecting the higher cost of living on the island and be used as their permanent residence
- If there are two adjacent lots of record that could be developed using this provision, the lots can be combined and a side-by-side two-family home built on the combined lots
- At least one of the units in the two-family home must be occupied by residents with an income of up to 120% of the AMI and the requirements of the City's affordable housing provisions and used as their permanent residence

4. Off-Street Parking Requirements – The proposed amendments reduce the parking requirement for affordable housing units in the I-R1, I-R2, and I-B Districts from two spaces per unit to one space per unit

Rationale for HomeStart's Suggested Zoning Ordinance Amendments

Accessory Dwelling Units

Rationale for an ordinance amendment: The Land Use Code contains special provisions for accessory dwelling units (ADUs) in the I-R1 and I-R2 Zones on Peaks Island. However there are internal inconsistencies in the provisions and the existing provisions present obstacles for their use. As a result, no one has taken advantage of the provision to create an ADU. The suggested amendments are intended to correct the internal inconsistencies and make the provisions more usable.

Utilization of Existing Residential Properties

Rationale for an ordinance amendment: The I-R1 and I-R2 Districts contain some older larger residential properties. These homes may be oversized for the current owners or are buildings that are no longer needed for their prior use. These properties offer the potential to expand the year-round housing supply through their creative reuse by utilizing the existing floor area for the creation of additional but smaller dwelling units. The Portland ordinance treats all dwelling units the same – a large five bedroom single-family home is treated the same as a small studio or one-bedroom apartment even though the impacts are quite different. This is especially important in terms of water use and sewage loading which are highly correlated to the number of occupants in the unit. One bedroom units have fewer occupants on average than do four or five bedroom homes. Therefore it makes sense to allow the reconfiguration of the floor space in existing larger residential properties to create more but smaller units. For example a single-family home with 4 bedrooms could be converted into two units each with two bedrooms. This would not significantly change the sewage discharge but would give a property owner more options for what to do with the property.

Development of Lots of Record

Rationale for an ordinance amendment: The minimum lot size provisions in the I-R1 and I-R2 do not apply to “lots of record” existing as of 1985 that meet the requirements of Section 14-433. However the allowed development of smaller lots of record is constrained by the requirement that development on those lots still conform to the 1985 lot frontage requirement, the current setback requirements and the current maximum lot coverage requirements. The requirement for 20 foot side setbacks makes the typical small lot with 50 feet of frontage unable to utilize this provision. Similarly the 20% limit on lot coverage makes it difficult for many of the small “lots of record” to utilize this provision. These requirements are especially problematic for lots in the I-R2 Zone since these are the very lots that offer the greatest potential for expanding the supply of lower cost, year-round housing on Peaks Island.

Off-Street Parking Requirements

Rationale for an ordinance amendment: Division 20 of Chapter 14 Land Use of the Code of Ordinances establishes off-street parking requirements for uses within the City. Section 14-332 establishes a basic standard for parking for residential uses citywide of 2 spaces per dwelling unit for new construction and 1 additional space per unit when an additional dwelling unit or an accessory unit is created. The ordinance provides for some exceptions to this requirement and some reductions. The code currently recognizes that the use of cars on the islands differs from the mainland and exempts planned developments in the I-R3 District from providing off-street parking and allows reduced parking for nonresidential uses in the I-R1 (sic) Island Business District. Since the ownership and use of motor vehicles on the islands is significantly different than uptown, the off-street parking requirement for new affordable residential units in the IR-1 and IR-2 Districts should be reduced to 1 parking space per dwelling unit.

DIVISION 7.1. IR-1 ISLAND RESIDENTIAL ZONE

Sec. 14-145.1. Purpose.

The purpose of the IR-1 island residential zone is to provide for low intensity residential, recreational, and rural uses in the less developed areas of the islands in order to preserve the rustic character of the islands, to protect groundwater resources and natural and scenic areas, and to permit only appropriate low intensity development in areas lacking adequate public facilities and services.

(Ord. No. 27-85, § 1, 7-15-85)

Sec. 14-145.2. Permitted uses.

The following uses are permitted in the IR-1 island residential zone:

- (a) Single-family detached dwellings.
- (b) Planned residential unit development with a minimum gross area, as defined in section 14-47 (definitions) of this article, of at least five, (5) acres of contiguous land, consisting of detached dwellings. Minimum yard dimensions (section 14-145.5(c)), street frontage (section 14-145.5(b)), and lot width (section 14-145.5(e)) shall be reduced up to fifty (50) percent of what would otherwise be required. Minimum lot area (section 14-145.5(a)) shall be reduced up to fifty (50) percent provided there is an equivalent corresponding increase in common or public open space that is usable for passive or active recreational opportunities or that serves as a buffer between buildings or between the development and the surrounding neighborhood.

All area in such a development which is to be owned or used in common shall be governed and maintained as set forth in section 14-498(i)(3), article IV (subdivisions) of this chapter.

The density for a planned residential unit development shall not exceed one (1) dwelling unit per forty thousand (40,000) square feet of net area. Net area shall be determined by subtracting from the gross area of the

site the area of street rights-of-way, slopes of fifteen (15) percent or greater, wetland.

Such development shall be subject to review and approval by the Planning Board with respect to the requirements of article V (site plan) and article IV (subdivisions) of this chapter, whether or not such development is a subdivision within the meaning of article IV of this chapter as now enacted or as hereafter amended.

- (c) Agriculture.
- (d) Boat houses and store houses for fishing equipment.
- (e) Parking and storage of equipment related to agriculture or commercial fishing.
- (f) Accessory uses customarily incidental and subordinate to the location, function, and operation of principal uses, subject to the provisions of section 14-404 (accessory use) of this article, including but not limited to (a) home occupations, (b) temporary private tenting with one (1) tent accessory to a principal residential use provided that adequate water supplies and sanitation facilities are available in connection with the principal residential use, and (c) road side stands less than two hundred (200) square feet in floor area for the sale of agricultural products produced on the premises and the sale of fish and shellfish caught by the occupant of the dwelling or principal structure.
- (g) Handicapped family unit, as defined in section 14-47, for handicapped persons, plus staff.
- (h) Wind energy systems, as defined and allowed in Article X, Alternative Energy.

(Ord. No. 27-85, § 1, 7-15-85; Ord. No. 160-89, § 1, 12-11-89; Ord. No. 33-91, § 10, 1-23-91; Ord. No. 33-11/12, 1-18-12)

Sec. 14-145.3. Conditional uses.

The following uses are permitted only upon the issuance of a conditional use permit, subject to the provisions of section 14-474 (conditional uses) of this article and any special provisions, standards or requirements specified below:

(a) *Residential:*

1. Accessory dwelling unit within and clearly subordinate to a principal single-family detached dwelling or legal multi-family dwelling, provided that:
 - a. The accessory unit shall be no more than thirty-five (35) percent of the gross habitable floor area of the building and shall have a minimum floor area of four hundred (400) square feet;
 - b. Lot area shall be seventy thousand (70,000) square feet, or on Peaks Island be an existing lawfully non-conforming lot as of May 1, 2015;
 - c. There shall be no open outside stairways or fire escapes above the ground floor;
 - d. Any additions or exterior alterations such as facade materials, building form, roof pitch and exterior doors shall be designed to be compatible with the architectural style of the building and preserve the single-family appearance of the building. The exterior design of new construction including facade materials, building form, roof pitch and exterior doors shall have a single-family appearance;
 - e. A lower level dwelling unit shall have a minimum two-thirds of its floor-to-ceiling height above the average adjoining ground level;
 - f. ~~Both~~Either the accessory unit ~~and~~the principal dwelling shall be the occupant's primary residence as defined in the City's Inclusionary Zoning Implementation Guidelines~~occupied by the owner of the lot on which the principal building is located, except for bonafide temporary absences;~~
 - g. All sanitary waste shall be disposed of by a

public sewer, subsurface sewerage system or other method in compliance with state and local regulations; and

- h. For accessory units created on Peaks Island on existing lawfully non-conforming lots as of May 1, 2015:
 - i. Shall remain under common ownership with the primary unit on the lot;
 - ii. Shall not be sold as condominium units or otherwise separated from the ownership of the pre-existing unit on the site;
 - iii. Shall be rented households earning up to 100% of AMI and be subject to income verification as further outlined in implementing regulations;
 - iv. Shall be rented for periods of no less than six months on an annual basis and may not be used for short-term, seasonal or weekly rentals; and
 - v. Shall be built within the principal building or as an attachment in accordance with subsection (d).

(b) Institutional: Any of the following uses provided that, notwithstanding section 14-474(a) (conditional uses) of this article or any other provision of this Code, the Planning Board shall be substituted for the board of appeals as the reviewing authority:

- 1. Schools and other educational facilities including seasonal camps other than campgrounds;
- 2. Places of assembly, excluding yacht clubs and marinas;
- 3. Municipal uses, provided that outside storage and parking areas are suitably screened and landscaped to ensure compatibility with the surrounding neighborhood;

Such uses shall be subject to the following standards if the total land area is two (2) acres or more:

- a. In the case of expansion of existing such uses onto land other than the lot on which the principal use is located, it shall be demonstrated that the proposed use cannot reasonably be accommodated on the existing site through more efficient utilization of land or buildings, and will not cause significant physical encroachment into established residential area;
- b. The proposed use will not cause significant displacement or conversion of residential uses existing as of July 15, 1985, or thereafter; and
- c. In the case of a use or use expansion which constitutes a combination of the above listed uses with capacity for concurrent operations, the applicable minimum lot sizes shall be cumulative.

d. Article V (site plan) sections 14-522 and 14-523 notwithstanding, in the case of places of assembly the proposed use shall be subject to the requirements of article V (site plan) of this chapter; and

e. In the case of community halls:

i. The structure was in existence as of January 4, 2010.

ii. The structure was built for institutional or other non-residential uses;

iii. The structure is operated by, or operated subject to the control of, a not-for-profit entity in accordance with its not-for-profit purposes; and

iv. A parking management plan

is submitted for review and approval by the planning board; and

f. In the case of private club or fraternal organizations: any such establishment serving alcoholic beverages or in possession of a license for serving alcoholic beverages shall be located on a large lot, as specified in the minimum lot size provisions of this section.

(c) Other:

1. Utility substations including sewage and water pumping stations and standpipes, electric power substations, transformer stations, telephone electronic equipment enclosures, and other similar structures, provided that such uses are suitably screened and landscaped so as to ensure compatibility with the surrounding neighborhood;
2. Nursery schools and kindergarten;
3. Cemeteries;
4. Raising of domesticated animals, excluding pigs and reptiles, with no animals kept on any lot less than three (3) acres or closer than one hundred (100) feet to any street or lot line, except domesticated chickens as regulated in chapter 5, and provided that such use will not create any odor, noise, health or safety hazards, or other nuisance to neighboring properties;
5. Wharves, piers, docks, or landing ramps;
6. Campgrounds, excluding recreational vehicles, licensed by the State of Maine Department of Human Services provided that:
 - a. No tent shall be located within seventy-five (75) feet of the perimeter of site;
 - b. The land area of the park shall not be less than the equivalent of five thousand (5,000) square feet of land area per tent site

exclusive of the roadway network;

- c. Site plan review and approval by the Planning Board shall be required.

7. Day care facilities or home babysitting services not permitted as a home occupation under section 14-410, subject to the following conditions:

- a. The facility shall be located in a structure in which there is one (1) or more occupied residential units or in an existing accessory structure, unless the facility is located in a principal structure that has not been used as a residence in whole or in part within the five (5) years immediately preceding the application for a day care or home babysitting use or in a nonresidential structure accessory to the principal nonresidential use.
- b. The maximum capacity shall be twelve (12) children for facilities located in residential or existing structures accessory thereto, unless the additional standards in subsection v. are met. There shall be no maximum limit on the number of children in a facility located in a principal structure that has not been used as a residence in whole or in part within the five (5) years immediately preceding the application for a day care or home babysitting use, or in a nonresidential structure accessory thereto, provided that any such structure that serves more than twelve (12) children shall be subject to review under article V of this chapter.
- c. Outdoor play areas shall be screened and buffered from surrounding residences with landscaping and/or fencing to minimize visual and noise impacts.
- d. Solid waste shall be stored in covered containers. Such containers shall be screened on all four (4) sides.

- e. Day care facilities, nursery schools and kindergartens located either in structures that have been in residential use within the past five (5) years or in existing accessory structures and that serve between thirteen (13) and twenty-four (24) children shall meet the following additional standards:
 - i. The facility shall provide a minimum of seventy-five (75) square feet of outdoor play area per child;
 - ii. The play area shall be located in the side and rear yards only and shall not be located in front yards;
 - iii. Outside play areas shall be separated from abutting properties by a fence at least forty-eight (48) inches in height;
 - iv. A ten-foot wide landscaped buffer shall be required outside of the fenced play area, and shall be established in accordance with the landscaping standards of the City's Technical Standards and Guidelines;
 - v. The minimum lot size for a day care facility located in a residential or existing accessory structure and serving more than twelve (12) children shall be twenty thousand (20,000) square feet;
 - vi. *Off-street parking:* Off-street parking is required as provided in division 20 (off-street parking) of this article.
 - vii. The maximum number of children in a day care facility located in a residential or existing accessory structure shall be twenty-four (24); and
 - viii. Any additions or exterior alterations such as facade materials, building form, roof pitch, and exterior doors shall be

designed to be compatible with the architectural style of the building and preserve the residential appearance of the building.

8. Temporary wind anemometer towers, as defined in Sec 14-47, are permitted provided the following standards are met in addition to Sec 14-430:
 - a. Towers may be installed for the purpose of wind data collection for no more than two (2) years after the issuance of a Certificate of Occupancy for the tower. At the conclusion of the aforementioned two (2) years, the tower must be dismantled and removed from the site within sixty (60) days; and
 - b. Towers shall be constructed according to plans and specifications stamped by a licensed professional engineer, which shall be provided to the Board of Appeals with the application; and
 - c. Towers shall be set back from habitable buildings by a distance equal to 1.1 times the tower height; and
 - d. The applicant shall provide a safety report prepared and stamped by a licensed professional engineer to the Board of Appeals with their application for conditional use, which demonstrates how the proposed temporary wind anemometer tower is safe in terms of strength, stability, security, grounding, icing impacts and maintenance; and
 - e. The applicant shall provide evidence of commercial general liability insurance, such insurance to be satisfactory to Corporation Counsel and cover damage or injury resulting from construction, operation or dismantling of any part of the temporary wind anemometer tower; and

- f. Towers and associated guy wires shall be sited to minimize their prominence from and impacts on public ways (including pedestrian ways); and
- g. Towers shall be used for installing anemometers and similar devices at a range of heights from the ground to measure wind characteristics (speed, direction, frequency) and related meteorological data, but shall not be used for any other purpose; and
- h. A performance guarantee shall be required for the cost of removal of the tower, guy wires and anchors. This requirement may be satisfied by surety bond, letter of credit, escrow account or by evidence, acceptable to the City, or the financial and technical ability and commitment of the applicant or its agents to remove the facility at the end of the use period.

9. Wind energy systems, as defined and allowed in Article X, Alternative Energy.

(Ord. No. 27-85, § 1, 7-15-85; Ord. No. 160-89, § 2, 12-11-89; Ord. No. 133-96, § 8, 11-18-96; Ord. No. 153-08/09; Ord. No. 29-09/10, 8-3-09 emergency passage; Ord. No. 127-09/10, 1-4-10 emergency passage; Ord. 240-09/10, 6-21-10; Ord. No. 9 10/11, 8-2-10; Ord. No. 33-11/12, 1-18-12; Ord. 82-15/16, 10-19-2015)

Sec. 14-145.4. Prohibited uses.

Uses that are not expressly enumerated herein as either permitted uses or conditional uses are prohibited.

(Ord. No. 27-85, § 1, 7-15-85)

Sec. 14-145.5. Dimensional requirements.

In addition to the provisions of division 25 (space and bulk regulations and exceptions) of this article, lots in the IR-1 zone shall meet the following minimum requirements:

(a) *Minimum lot size*

- 1. Residential: Forty thousand (40,000) square feet for lots with public water; sixty thousand (60,000) square feet for lots without public

water; except as provided in section 14-433 (lots of record and accessory structure setbacks for existing buildings) and section 14-145.3(a)1 of this article.

2. Schools and other educational facilities: Forty thousand (40,000) square feet.
3. Places of assembly:

Large	30,000 sq. ft.
Medium	15,000 sq. ft.
Small	7,500 sq. ft.

4. Seasonal camps and campgrounds: Ten (10) acres.
5. Animal raising: Three (3) acres.
6. In issuing any permit for new development, the building or planning authority shall require that any lot located in the IR-1 zone shall be at least forty thousand (40,000) square feet in area when the lot is to be serviced by a subsurface wastewater disposal system, except those lots which are located in a subdivision approved by the Planning Board after June 8, 1968, and excluding Peaks Island.
7. Excluding Peaks Island from this subsection h., any property owner whose lot does not meet the minimum lot size requirements outlined in subsection g. of this section may, for purposes of this section only, merge two (2) or more separate lots on the same island in order to meet these requirements. Where the lots so merged are not contiguous, the property owner shall grant to the city as holder a conservation easement upon the lot or lots which will not contain the principal structure. The conservation easement shall contain both an existing legal description and a city assessor's chart, block and lot description. The Planning Authority shall be authorized to accept such conservation easements on behalf of the city. Said easement shall be recorded by the applicant in the registry of deeds. A copy of the recorded easement and copies

of the deeds for both lots shall be submitted to the Planning Authority prior to issuance of a building permit. The property over which the conservation easement has been granted shall be used for passive recreational and conservation purposes only, and shall be subject to the following restrictions:

- a. No structure shall be permitted on this property.
- b. No parking or storage of vehicles or machinery shall be permitted on this property at any time.
- c. No area of this property shall be paved.
- d. No exterior storage for commercial use shall be permitted on this property.
- e. The easement deed shall reference the lot which is benefited by this conservation easement. No conservation easement shall be used to benefit more than one (1) lot.

Conservation easements shall only be granted over lots which conform either to the provisions of section 14-433 or to the minimum lot sizes set forth in (a)1 of this section. Conservation easements shall not be granted over any lot which is encumbered by any other easement which prohibits all construction on that lot. A conservation easement may also name as a holder or grant a third-party right of enforcement to a nonprofit corporation or charitable trust, the purposes or powers of which include retaining or protecting the natural, scenic or open space values of real property; assuring the availability of real property for agricultural, forest, recreational or open space use; protecting natural resources; or maintaining or enhancing air or water quality of real property.

Nothing in this section shall be construed to allow an owner of a currently existing and developed lot to convey or permit a portion of

that lot to be used to fulfill the requirements of this section if such conveyance would render the existing lot nonconforming under the terms of this chapter. The lot upon which a building is to be constructed shall meet the minimum lot size requirements of section 14-433.

8. Where an existing subsurface wastewater disposal system serving an existing structure requires replacement, the replacement system shall meet the applicable requirements of CMR 241 Section 2-E. The land area requirements in subsection g. of this section shall not apply to such a replacement system.

For purposes of this subsection, the mean high tide mark shall be considered to be the shoreline lot line.

(b) Minimum street frontage:

One hundred (100) feet, except that a lot of record as described in section 14-433 (lots of record and accessory structure setbacks for existing buildings) and lots created after July 15, 1985, which are not part of a subdivision need not provide street frontage if access is available by means of a permanent easement or right-of-way which existed as of July 15, 1985. Such easement or right-of-way shall have a minimum width of sixteen (16) feet and a minimum travel width of eight (8) feet except that an easement or right-of-way providing access for three (3) or more lots or providing the only means of access to a parcel or parcels of three (3) acres or more, shall conform to the requirements contained within the City of Portland Technical Manual and meet the construction requirements of article III of chapter 25 (street acceptances) of this Code. Such easement or right-of-way shall be sufficient to permit municipal service delivery.

(c) Minimum yard dimensions:

Yard dimensions shall include setbacks of structures from property lines and setbacks of structures from one another. No structure shall occupy the minimum yard of another structure.

1. Front yard: Principal or accessory structures:
Thirty (30) feet.

2. Rear yard: Principal or accessory structures with ground coverage greater than one hundred (100) square feet: Thirty (30) feet.

Accessory detached structures with ground coverage of one hundred and forty-four (144) square feet or less: Ten (10) feet.

3. Side yard: Principal or accessory structures with ground coverage greater than one hundred (100) square feet: Twenty (20) feet.

Accessory detached structures with ground coverage of one hundred and forty-four (144) square feet or less: Fifteen (15) feet, except that the minimum distance from a principal structure may be five (5) feet.

4. Side yard on side streets: Principal or accessory structures: Twenty (20) feet.

(d) Maximum lot coverage: Twenty (20) percent of lot area.

(e) *Minimum lot width*: One hundred (100) feet.

(f) Maximum structure height:

1. Principal or accessory attached structure: Thirty-five (35) feet.
2. Accessory detached structure: Eighteen (18) feet.

(g) Maximum floor area for places of assembly on a collector or arterial road:

Large	Not limited
Medium	4,500 sq. ft.
Small	2,250 sq. ft.

(h) Maximum floor area for places of assembly not on a collector or arterial road:

Large	4,500 sq. ft.
Medium	2,250 sq. ft.
Small	1,125 sq. ft.

City of Portland
Code of Ordinances
Sec. 14-145.5

Land Use
Chapter 14
Rev. 3-7-2016

(Ord. No. 27-85, § 1, 7-15-85; Ord. No. 160-89, § 3, 12-11-89; Ord. No. 218-04/05, 5-2-05; Ord. No. 131-08/09, 12-15-08; Ord. No. 127-09/10, 1-4-10 emergency passage; Ord. No. 278-09/10, 7-19-10; Ord. No. 165-15/16, 3-7-2016)

Sec. 14-145.6. Other requirements

Other requirements include the following:

- (a) Off-street parking shall be required as provided in division 20 (off-street parking) of this article.
- (b) Shoreland and flood plain management regulations: Any lot or portion of a lot located in a shoreland zone as identified on the city shoreland zoning map or in a flood hazard zone shall be subject to the requirements of division 26 and/or division 26.5.
- (c) Storage of vehicles: Only one (1) unregistered motor vehicle may be stored outside on the premises and not for a period exceeding thirty (30) days.

(Ord. No. 27-85, § 1, 7-15-85; Ord. No. 15-92, § 12, 6-15-92)

IR-2 Draft Text Amendments – ATT. 3

DIVISION 7.2. IR-2 ISLAND RESIDENTIAL ZONE

Sec. 14-145.7. Purpose.

The purpose of the IR-2 island residential zone is to protect the character of existing developed residential neighborhoods on the islands and to allow infill where there are adequate public services available. Expansion or extension of an existing IR-2 zone should be strictly limited, generally focused toward areas adjacent to existing village IR-2 areas, and restricted by such factors as adequacy of access, whether adequate water will be available for private use and for fire protection, and whether soils in the area are adequate for subsurface water disposal or whether public sewers are available. IR-2 rezoning on substantially sized parcels should not be considered for those sites that should be more appropriately zoned I or IR-3.
(Ord. No. 28-85, § 1. 7.15-85)

Sec. 14-145.8. Permitted use.

The following uses are permitted in the IR-2 island residential zone:

- (a) Single-family detached dwellings.
- (b) Planned residential unit development with a minimum gross area, as defined in section 14-47 (definitions) of this article, of at least five (5) acres of contiguous land, consisting of detached dwellings. Minimum yard dimensions (section 14-145.11(c)), street frontage (section 14-145.11(b)), and lot width (section 14-145.11(e)) shall be reduced up to fifty (50) percent of what would otherwise be required. Minimum lot area (section 14-145.11(a)) shall be reduced up to fifty (50) percent, provided there is an equivalent corresponding increase in common or public open space that is usable for passive or active recreational opportunities or that serves as buffer between the buildings or between the development and the surrounding neighborhood.

All area in such a development which is to be owned or used in common shall be governed and maintained as set forth in section 14-498(i)(3), article IV (subdivisions) of this chapter.

The density for a planned residential unit development shall not exceed one (1) dwelling unit per twenty thousand (20,000) square feet of net area. Net area shall be determined by subtracting from the gross area of the site the area of street rights-of-way, slopes of fifteen (15) percent or greater, wetlands.

Such development shall be subject to review and approval by the Planning Board with respect to requirements of article V (site plan) and article IV (subdivisions) of this chapter, whether or not such development is a subdivision within the meaning of article IV of this chapter as now enacted or as hereafter amended.

- (c) Boathouses and storehouses for fishing equipment.
- (d) Parking and storage of equipment related to commercial fishing.
- (e) Accessory uses customarily incidental and subordinate to the location, function and operation of principal uses, subject to the provisions of section 14-404 (accessory use) of this article including but not limited to (a) home occupations, (b) private temporary tenting with one (1) tent accessory to a principal residential use, provided that adequate water supplies and sanitation facilities are available in connection with the principal residential use, and (c) roadside stands less than two hundred (200) square feet in floor area for the sale of agricultural products produced on the premises, and the sale of fish and shellfish caught by the occupant of the dwelling or principal structure.
- (f) Handicapped family unit, as defined in section 14-47, for handicapped persons plus staffs.
- (g) Wind energy systems, as defined and allowed in Article X, Alternative Energy.

(Ord. No. 28-85, § 1, 7-15-85; Ord. No. 161-89, § 1, 12-11-89; Ord. No. 33-91, § 11, 1-23-91; Ord. No. 33-11/12, 1-18-12)

Sec. 14-145.9. Conditional uses.

The following uses are permitted only upon the issuance of a conditional use permit, subject to the provisions of section 14-474 (conditional uses) of this article and any special

provisions, standards or requirements specified below:

(a) Residential:

1. Accessory dwelling unit within and clearly subordinate to a principal single-family detached dwelling or legal multi-family dwelling provided that:
 - a. The accessory unit shall be no more than thirty-five (35) percent of the gross floor area of the principal building and shall have a minimum floor area of four hundred (400) square feet;
 - b. Lot area shall be thirty thousand (30,000) square feet, or on Peaks Island be an existing lawfully non-conforming lot as of May 1, 2015;
 - c. There shall be no open outside stairways or fire escapes above the ground floor;
 - d. Any additions or exterior alterations such as facade materials, building form, roof pitch, and exterior doors shall be designed to be compatible with the architectural style of the building and preserve the single-family appearance of the building. The exterior design of new construction including facade materials, building form, roof pitch and exterior doors shall have a single-family appearance;
 - e. A lower level dwelling unit shall have a minimum two-thirds of its floor-to-ceiling height above the average adjoining ground level;
 - f. ~~Both~~Either the accessory unit ~~and~~the principal dwelling shall be the occupant's primary residence as defined in the City's Inclusionary Zoning Implementation Guidelines.~~occupied by the owner of the lot on which the principal building is located, except for bona fide temporary absences;~~ and

- g. All sanitary waste shall be disposed of by a public sewer, subsurface sewerage system or other method in compliance with state and local regulations; and
- h. For accessory units created on Peaks Island on existing lawfully non-conforming lots as of May 1, 2015:
 - i. Shall remain under common ownership with the primary unit on the lot;
 - ii. Shall not be sold as condominium units or otherwise separated from the ownership of the pre-existing unit on the site;
 - iii. Shall be rented to households earning up to 100% of AMI and are subject to income verification as further outlined in implementing regulations;
 - iv. Shall be rented for no less than six months on an annual basis and may not be used for short-term, seasonal or weekly rentals; and
 - v. Shall be built within the principal building or as an attachment in accordance with subsection (d)..

(b) Institutional: Any of the following uses provided that, notwithstanding section 14-474(a) (conditional uses) of this article or any other provision of this Code, the Planning Board shall be substituted for the board of appeals as the reviewing authority:

- 1. Schools and other educational facilities;
- 2. Places of assembly, excluding yacht clubs and marinas;
- 3. Municipal uses, provided that outside storage and parking areas are suitably screened and landscaped to ensure compatibility with the surrounding neighborhood;

Such uses shall be subject to the following standards if the total land area of the use is two (2) acres or more:

- a. In the case of expansion of existing such uses onto land other than the lot on which the principal use is located, it shall be demonstrated that the proposed use cannot reasonably be accommodated on the existing site through more efficient utilization of land or buildings, and will not cause significant physical encroachment into established residential area;
- b. The proposed use will not cause significant displacement or conversion of residential uses existing as of July 15, 1985, or thereafter; and
- c. In the case of a use or use expansion which constitutes a combination of the above-listed uses with capacity for concurrent operations, the applicable minimum lot sizes shall be cumulative; and
- d. Article V (site plan) sections 14-522 and 14-523 notwithstanding, in the case of places of assembly the proposed use shall be subject to the requirements of article V (site plan) of this chapter; and
- e. In the case of community halls:
 - i. The structure was in existence as of January 4, 2010.
 - ii. The structure was built for institutional or other non-residential uses;
 - iii. The structure is operated by, or operated subject to the control of, a not-for-profit entity in accordance with its not-for-profit purposes; and

iv. A parking management plan is submitted for review and approval by the planning board; and

f. In the case of private club or fraternal organizations: any such establishment serving alcoholic beverages or in possession of a license for serving alcoholic beverages shall be located on a large lot, as specified in the minimum lot size provisions of this section.

(c) Other:

1. Utility substations including sewage and water pumping stations and standpipes, electric power substations, transformer stations, telephone electronic equipment enclosures, and other similar structures, provided that such uses are suitably screened and landscaped so as to ensure compatibility with the surrounding neighborhood;
2. Nursery schools and kindergartens;
3. Cemeteries;
4. Wharves, piers, docks, or landing ramps;
5. Lodging houses, with more than two (2) but not more than nine (9) lodging rooms.
6. Day care facilities or home babysitting services not permitted as a home occupation under section 14-410, subject to the following conditions:
 - a. The facility shall be located in a structure in which there is one (1) or more occupied residential units or in an existing accessory structure, unless the facility is located in a principal structure that has not been used as a residence in whole or in part within the five (5) years immediately preceding the application for a day care or home babysitting use or in a nonresidential structure accessory to the principal nonresidential use.

- b. The maximum capacity shall be twelve (12) children for facilities located in residential or existing structures accessory thereto, unless the additional standards in subsection v. are met. There shall be no maximum limit on the number of children in a facility located in a principal structure that has not been used as a residence in whole or in part within the five (5) years immediately preceding the application for a day care or home babysitting use, or in a nonresidential structure accessory thereto, provided that any such structure that serves more than twelve (12) children shall be subject to review under article V of this chapter.
- c. Outdoor play areas shall be screened and buffered from surrounding residences with landscaping and/or fencing to minimize visual and noise impacts.
- d. Solid waste shall be stored in covered containers. Such containers shall be screened on all four (4) sides.
- e. Day care facilities, nursery schools and kindergartens located either in structures that have been in residential use within the past five (5) years or in existing accessory structures and that serve between thirteen (13) and twenty-four (24) children shall meet the following additional standards:
 - i. The facility shall provide a minimum of seventy-five (75) square feet of outdoor play area per child;
 - ii. The play area shall be located in the side and rear yards only and shall not be located in front yards;
 - iii. Outside play areas shall be separated from abutting properties by a fence at least forty-eight (48) inches in height;

- iv. A ten-foot wide landscaped buffer shall be required outside of the fenced play area, and shall be established in accordance with the landscaping standards of the City's Technical Standards and Guidelines;
 - v. The minimum lot size for a day care facility located in a residential or existing accessory structure and serving more than twelve (12) children shall be twenty thousand (20,000) square feet;
 - vi. *Off-street parking:* Off-street parking is required as provided in division 20 (off-street parking) of this article.
 - vii. The maximum number of children in a day care facility located in a residential or existing accessory structure shall be twenty-four (24); and
 - viii. Any additions or exterior alterations such as facade materials, building form, roof pitch, and exterior doors shall be designed to be compatible with the architectural style of the building and preserve the residential appearance of the building.
7. Temporary wind anemometer towers, as defined in Sec 14-47, are permitted provided the following standards are met in addition to Sec 14-430:
- a. Towers may be installed for the purpose of wind data collection for no more than two (2) years after the issuance of a Certificate of Occupancy for the tower. At the conclusion of the aforementioned two (2) years, the tower must be dismantled and removed from the site within sixty (60) days; and
 - b. Towers shall be constructed according to plans and specifications stamped by a

licensed professional engineer, which shall be provided to the Board of Appeals with the application; and

- c. Towers shall be set back from habitable buildings by a distance equal to 1.1 times the tower height; and
- d. The applicant shall provide a safety report prepared and stamped by a licensed professional engineer to the Board of Appeals with their application for conditional use, which demonstrates how the proposed temporary wind anemometer tower is safe in terms of strength, stability, security, grounding, icing impacts and maintenance; and
- e. The applicant shall provide evidence of commercial general liability insurance, such insurance to be satisfactory to Corporation Counsel and cover damage or injury resulting from construction, operation or dismantling of any part of the temporary wind anemometer tower; and
- f. Towers and associated guy wires shall be sited to minimize their prominence from and impacts on public ways (including pedestrian ways); and
- g. Towers shall be used for installing anemometers and similar devices at a range of heights from the ground to measure wind characteristics (speed, direction, frequency) and related meteorological data, but shall not be used for any other purpose; and
- h. A performance guarantee shall be required for the cost of removal of the tower, guy wires and anchors. This requirement may be satisfied by surety bond, letter of credit, escrow account or by evidence, acceptable to the City, or the financial and technical ability and commitment of the applicant or

its agents to remove the facility at the end of the use period.

8. Wind energy systems, as defined and allowed in Article X, Alternative Energy.

(Ord. No. 28-85, § 1, 7-15-85; Ord. No. 161-89, § 2, 12-11-89; Ord. No. 235-91, § 15, 2-4-91; Ord. No. 133-96, § 9, 11-18-96; Ord. No. 29-09/10, 8-3-09 emergency passage; Ord. No. 127-09/10, 1-4-10 emergency passage; Ord. No. 240-09/10, 6-21-10; Ord. No. 9 10/11, 8-2-10; Ord. No. 149-10/11 3-7-11; Ord. No. 33-11/12, 1-18-12; Ord. 82-15/16, 10-19-2015)

Sec. 14-145.10. Prohibited uses.

Uses that are not expressly enumerated herein as either permitted uses or conditional uses are prohibited.
(Ord. No. 28-85, § 1, 7-15-85)

Sec. 14-145.11. Dimensional requirements.

In addition to the provisions of division 25 (space and bulk regulations and exceptions) of this article, lots in an IR-2 zone shall meet the following minimum requirements:

(a) *Minimum lot size:*

1. Residential: Twenty thousand (20,000) square feet, except as provided in section 14-433 (lots of record and accessory structure setbacks for existing buildings) and section 14-145.9(a)1 of this article.
2. Schools and other educational facilities: Twenty thousand (20,000) square feet.
3. Places of assembly:

Large	30,000 sq. ft.
Medium	15,000 sq. ft.
Small	7,500 sq. ft.

4. Lodging houses: Thirty thousand (30,000) square feet for three (3) lodging rooms, plus ten thousand (10,000) square feet for each additional lodging room in excess of three (3).
5. In issuing any permit for new development, the building or planning authority shall require that

any lot located in an IR-2 zone shall be at least twenty thousand (20,000) square feet in area when the lot is to be serviced by a subsurface wastewater disposal system, except those lots which are located in a subdivision approved by the Planning Board after June 8, 1968, [and excluding Peaks Island].

6. [Excluding Peaks Island from this subsection 7.,] any property owner whose lot does not meet the minimum lot size requirements outlined in subsection f. of this section may, for purposes of this section only, merge two (2) or more separate lots on the same island in order to meet these requirements. Where the lots so merged are not contiguous, the property owner shall grant to the city as holder a conservation easement upon the lot or lots which will not contain the principal structure. The conservation easement shall contain both an existing legal description and a city assessor's chart, block and lot description. The Planning Authority shall be authorized to accept such conservation easements on behalf of the city. Said easement shall be recorded by the applicant in the registry of deeds. A copy of the recorded easement and copies of the deeds for both lots shall be submitted to the Planning Authority prior to issuance of a building permit. The property over which the conservation easement has been granted shall be used for passive recreational and conservation purposes only, and shall be subject to the following restrictions:

- a. No structure shall be permitted on this property.
- b. No parking or storage of vehicles or machinery shall be permitted on this property at any time.
- c. No area of this property shall be paved.
- d. No exterior storage for commercial use shall be permitted on this property.

- e. The easement deed shall reference the lot which is benefited by this conservation easement. No conservation easement shall be used to benefit more than one (1) lot.

Conservation easements shall only be granted over lots which conform either to the provisions of section 14-433 or to the minimum lot sizes set forth in (a)1 of this section. Conservation easements shall not be granted over any lot which is encumbered by any other easement which prohibits all construction on that lot.

A conservation easement may also name as a holder or grant a third-party right of enforcement to a nonprofit corporation or charitable trust, the purposes or powers of which include retaining or protecting the natural, scenic or open space values of real property; assuring the availability of real property for agricultural, forest, recreational or open space use; protecting natural resources; or maintaining or enhancing air or water quality of real property.

Nothing in this section shall be construed to allow an owner of a currently existing and developed lot to convey or permit a portion of that lot to be used to fulfill the requirements of this section if such conveyance would render the existing lot nonconforming under the terms of this chapter. The lot upon which a building is to be constructed shall meet the minimum lot size requirements of section 14-433.

- 7. Where an existing subsurface wastewater disposal system serving an existing structure requires replacement, the replacement system shall meet the requirements of CMR 241 Section 2-E. The land area requirements in subsection f. of this section shall not apply to such a replacement system.

For purposes of this subsection, the mean high tide mark shall be considered to be the shoreline lot line.

(b) *Minimum street frontage:*

Seventy (70) feet, except that a lot of record as described in section 14-433 (lots of record and accessory structure setbacks for existing buildings) and lots created after July 15, 1985, which are not part of a subdivision need not provide street frontage if access is available by means of a permanent easement or right-of-way which existed as of July 15, 1985. Such easement or right-of-way shall have a minimum width of sixteen (16) feet and a minimum travel width of eight (8) feet except that an easement or right-of-way providing access for three (3) or more lots or providing the only means of access to a parcel or parcels of three (3) acres or more, shall be a minimum thirty-two (32) feet wide and meet the construction requirements of article III of chapter 25 (street acceptances) of this Code. Such easement or right-of-way shall permit municipal service delivery.

(c) *Minimum yard dimensions:*

(Yard dimensions shall include setbacks of structures from property lines and setbacks of structures from one another. No structure shall occupy the minimum yard of another structure.)

1. Front yard: Principal or accessory structures: Twenty-five (25) feet except that a front yard need not exceed the average depth of front yards on either side of the lot.
2. Rear yard: Principal or accessory structures with ground coverage greater than one hundred (100) square feet: Twenty-five (25) feet.

Accessory detached structures with ground coverage of one hundred and forty-four (144) square feet or less: Ten (10) feet.

3. Side yard: Principal or accessory structures with ground coverage greater than one hundred (100) square feet: Twenty (20) feet.

Accessory detached structures with ground coverage of one hundred and forty-four (144)

square feet or less: fifteen (15) feet, except that the minimum distance from a principal structure may be five (5) feet.

4. Side yard on side streets: Principal or accessory structures: Twenty (20) feet.
5. Notwithstanding the foregoing, the width of one side-yard may be reduced to not less than ten feet in the case of a lot of record, existing as of June 5, 1957, and which contained a structure in use at that time and at all times subsequent thereto as a year-round, single-family residence, and which is served by public sewer and water, at the time of any expansion permitted by this section, where the reduction is necessary either to bring the use into compliance with health and safety codes or to improve a condition which the Board of Appeals determines constitutes a health or safety problem. Any alteration or expansion authorized by this section may only be situated in the rear yard and shall not encroach into the required setback more than the existing building does prior to the construction of such alteration or expansion. Any such alteration or expansion will be subject to the maximum lot coverage requirements applicable to this zone; and, cumulatively, during the lifetime of the structure, may not exceed forty percent (40%) of the combined floor area of the habitable rooms existing at the time of the first expansion permitted by this section. For the purposes of this section "floor area" and "habitable room" shall have the same meaning ascribed to them in Portland Municipal Code, §6-106, et seq., Housing Code, as it may be amended from time to time.

(d) *Maximum lot coverage:* Twenty (20) percent of lot area.

(e) *Minimum lot width:* Eighty (80) feet.

(f) Maximum structure height:

1. Principal or accessory attached structure: Thirty-five (35) feet. For Little Diamond Island only: Twenty (27) feet.

2. Accessory detached structure: Eighteen (18) feet.

(g) Maximum floor area for places of assembly on a collector or arterial road:

Large	Not limited
Medium	4,500 sq. ft.
Small	2,250 sq. ft.

(h) Maximum floor area for places of assembly not on a collector or arterial road:

Large	4,500 sq. ft.
Medium	2,250 sq. ft.
Small	1,125 sq. ft.

(Ord. No. 28-85, § 1, 7-15-85; Ord. No. 161-89, § 3, 12-11-89; Ord. No. 215-02, 4-17-02; Ord. No. 76-03/04, 10-20-03; Ord. No. 131-08/09, 12-15-08; Ord. No. 127-09/10, 1-4-10 emergency passage; Ord. No. 165-15/16, 3-7-2016)

Sec. 14-145.12. Other requirements.

Other requirements include the following:

(a) Off-street parking: Off-street parking shall be required as provided in division 20 (off-street parking) of this article.

(b) Shoreland and flood plain management regulations: Any lot or portion of a lot located in a shoreland zone as identified on the city shoreland zoning map or in a flood hazard zone shall be subject to the requirements of division 26 and/or division 26.5.

(c) Storage of vehicles: Only one (1) unregistered motor vehicle may be stored outside on the premises and not for a period exceeding thirty (30) days.
(Ord. No. 28-85, § 1, 7-15-85; Ord. No. 15-92, § 13, 6-15-92)

Proposed text amendments for IR-1 and IR-2

Elizabeth Remage-Healey <remagehealey@gmail.com>

Oct 7, 2018 10:46 PM

Posted in group: **Planning Board**

Members of the Planning Board:

As the president of Homestart, the affordable housing organization on Peaks Island, I am writing regarding the text amendments proposed for IR -1 and IR-2.

Homestart has worked for over 2 years to develop 4 minor changes to existing zoning on Peaks that support more affordable year round housing towards the goal of a healthy diverse mix of year round island residents. Our proposals have received wide community support, and we appreciate the help and support of Portland's Planning and Urban Development staff throughout this process. In particular we appreciate their effort to forward these text amendments to you regarding one of our items, Accessory Dwelling Units on the island ,even while the recode of ADU zoning in the rest of the city is still in process.

One part of their text amendment does concern us greatly however - the proposal to decrease the minimum rental period for an ADU from one year to 6 months. This would completely undercut our fundamental goal of creating year round affordable housing.

Several items to note:

1. We already have many options for less than one year rentals. Known as winter rentals, they are affordable until the tenants have to move out to make room for much higher paying summer renters. They do NOT support people making a home on Peaks.
2. The original Peaks ADU ordinance as well as our proposed changes were always specified for existing lots much smaller than current zoning of Peaks allows - but ONLY on the condition that a year round affordable unit be created.
3. The changes we proposed a year ago are described in the attachment. Please note the repeated mention of year round affordable housing.
4. Portland's Comprehensive Plan includes the goal of "support(ing) land use tools that encourage year round residences in existing and new housing on Portland's islands."

I don't know where the idea of 6 month minimum rental came from. I know that it did NOT come from any Peaks resident at any of our community meetings, Zoning Advisory Committee meetings or at the Peaks Island Council.

Planning Director Jeff Levine has indicated that he has no problem changing the minimum rental time back to one year. Please concur by restoring the one year minimum.

I am happy to answer any questions you may have at the Tuesday workshop.

Thank you.

Betsey Remage-Healey 10.7.18

Workshop today: ADU text Peaks Island

caron chess <caronchess2327@gmail.com>

Oct 9, 2018 12:10 PM

Posted in group: **Planning Board**

----- Forwarded message -----

From: **caron chess** <caronchess2327@gmail.com>

Date: Tue, Oct 9, 2018, 10:54 AM

Subject: ADU text Peaks Island

To: caron chess <caronchess2327@gmail.com>

Members of the Planning Board:

Renting on Peaks Island is a nightmare because it is near impossible to find year-round housing. I know this first-hand. I lived in a year-round rental that the landlord is selling.

I am fortunate that I could reach out to previous landlords, who had an opening. But I need to leave for the summer, moving all my belongings into storage.

But I am very fortunate. I hopefully will not need to move for more than month or two. Most winter rentals run from late September until maybe May. Starting as early as February, the island listservs are full of pleas for year-round housing so renters don't have to move off the island in May and find someplace to live until October.

This is an untenable situation for those who work on the island or have children. I personally know families who have had to leave after they lost their year-round rental. This means our school loses students. When our school loses students, our elementary school is at great risk of being closed by the Board of Ed.

I also know people who worked on the island and were vital members of our community. But they had to leave because they could not find year-round housing.

Also, the text Homestart submitted was the result of a lengthy participatory process, involving public meetings and an advisory committee. Six-month leases would never have been supported by Islanders.

If landlords can lease ADUs for less than a year, then ADUs become part of the seasonal problem, and not a solution for workforce housing. You must restore the previous text that stipulates ADUs must be year-round.

I also must raise the issue of purchases of properties as investments for rentals as limited as a day. As you can imagine, this places even more pressure on our horrible rental situation. As members of the Planning Board, you are quite familiar with this issue. But our solutions will need to be different than the rest of Portland. We do not have land for developers, but we do have a history of island families renting their homes for part of a summer. The solution may be limiting short-term rentals to those whose primary residence is on the Island. BUT Islanders will need to draft language with input from staff and you, as we did with ADUs.

I am happy to discuss this further at today's workshop.

Caron Chess

242 Island Ave, apt 4 Peaks Island. Caron Chess2327@gmail.com



PLANNING BOARD REPORT PORTLAND, MAINE

Proposed Text Amendments to the Land Use Code
Impact Fee Ordinance & Division 30
City of Portland, Applicant

Submitted to: Portland Planning Board Public Hearing Date: October 9, 2018	Prepared by: Nell Donaldson, Planning Division Report Prepared: October 5, 2018
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I. INTRODUCTION

Portland's Plan, the City's comprehensive plan, lays a strong foundation for future growth in the city over the next ten years. The plan speaks to where and how growth should be managed and suggests mechanisms for funding improvements associated with growth. Among these recommendations, *Portland's Plan* proposes impact fees – one time fees charged to development to pay for the infrastructure necessary to accommodate that development. Perceived through this lens, impact fees are fundamentally about planning for smart and sustainable growth in the city – a way to help ensure that there is adequate park, recreation facility, and trail capacity; multi-modal transportation capacity; and wastewater capacity to allow the city to grow as envisioned in *Portland's Plan*.

The City's Planning Division, with the assistance of the Department of Public Works and the Department of Parks, Recreation, and Facilities, began the process of exploring a city-wide system of impact fees for parks and recreation, transportation, and wastewater in the late winter of this year. In the time since, the *Impact Fee Study* has produced both draft fees and a draft ordinance, which have been shared and revised over multiple iterations. Altogether, the *Impact Fee Study* has been reviewed at two meetings of an informal stakeholder group convened for the study (see list of members in *Attachment 1*), three workshops of the Economic Development Committee, two workshops of the Planning Board, and one workshop of the City Council. The intent of this hearing is to provide an opportunity for the Planning Board to review the final draft impact fee ordinance, including a proposed fee schedule, and vote on a recommendation to forward this ordinance to the City Council.

2. FEE SCHEDULE

On September 20, the Planning Division, with its consultant, TischlerBise, presented a draft set of parks and recreation, transportation, and wastewater fee calculations to the Planning Board. These fee calculations were based on an analysis of projected growth, infrastructure demand associated with growth, and the cost of improvements necessary to accommodate that demand. As of October 3, TischlerBise has documented the methodology and assumptions for all fee calculations in a final draft report for the *Impact Fee Study* (*Attachment 2*).

It should be noted that these fees represent the second formal draft of the impact fee calculations, as the initial fee calculations, prepared in July, were revised based on feedback from the study's stakeholder group. It should also be noted that, in addition to gathering feedback on the second draft fee calculations from the Planning Board, Economic Development Committee, and City Council in late September, staff has shared the calculations with the stakeholder group and offered to meet with members of the group to review and discuss. No comments on the revised fees were received from the stakeholder group.

WHAT ARE IMPACT FEES?

What are impact fees?

Impact fees are charges paid by new development to fund the cost of providing municipal facilities to serve that development. This idea is premised on the concept that when development occurs, it can bring many benefits, but it also affects the existing infrastructure around it by adding more cars, bikes, and pedestrians to the streets, increasing sewer and stormwater flows into City systems, and infusing additional visitors into the City's parks and open spaces. In turn, these facilities require additional capital investment to provide sufficient capacity to accommodate new growth. As a result of this thinking, impact fees are widely used throughout the United States. Impact fees have been used in some communities in the United States for the past 50+ years.

Where are impact fees?

Although impact fees are particularly common in U.S. states that have experienced rapid population growth in the west and south, they are found in the majority of states nationwide. Concord and Manchester, NH have impact fees, as does Burlington, VT. In Maine, the legislature laid the foundation for impact fees with the Comprehensive Planning and Land Use Regulation Act of 1987. In the time since, communities across the state, mostly in southern Maine, have developed and implemented impact fee ordinances.

How may impact fees be used?

The uses of impact fees vary widely, depending on state enabling legislation, but in all cases impact fees **may only be used on capital projects to construct, expand, or replace infrastructure required to serve new development**. In Maine, impact fees may be used for transportation projects, public safety facilities, sewer and water systems, parks and open space, and school improvements. **Impact fees may not be used to pay for operations or maintenance, and may not be used to address existing deficiencies in these systems.**

How are impact fees generally derived?

Regardless of where impact fees are used, courts have established that there must be a rational nexus and rough proportionality between the type and scale of development and the fee imposed. Per guidance from the former Maine State Planning Office, "the expansion of the facility and/or service must be necessary and must be caused by the development; the fees charged must be based on the costs of the new facility/service apportioned to the new development; and the fees must benefit those who pay." Given these standards, in order for impact fees to be charged, a community must conduct an analysis that identifies growth-related infrastructure costs and apportions those costs to projected development, often by development type, on a square foot, unit, or per trip basis.

At the workshops in late September, staff received a number of questions and comments on the proposed second draft fees. These included the following questions:

A. How do the fees proposed in the ordinance relate to the 'true' cost of growth?

As discussed above, an original set of maximum defensible fee calculations was developed in the early summer of this year, based on estimated replacement costs and Capital Improvement Plan (CIP) requests, with the assistance of Parks, Recreation, and Facilities and DPW staff. The first draft fees were subsequently shared with the *Impact Fee Study* stakeholder group in late July. As a product of feedback from this group, staff, working with the consultant, made several modifications to the calculations' underlying assumptions. Some of these were necessary given shifting expectations about future facility expansion (e.g. eliminating the Expo from the parks and recreation fee calculations, modifying the wastewater fee credit to include future payments on debt service for existing stormwater projects). Other modifications were a product of a desire to bring the fee to a more tenable level (e.g. elimination of parks vehicles from the fee calculations, changes in assumptions about growth's share of infrastructure costs, changes in assumptions regarding outside funding for projects). Because these modifications were made, the second draft fees are lower and will not go as far as the original fees in terms of planning for future growth. However, it is expected that the fees will generate more revenue than is currently being collected in mitigation from development review projects.

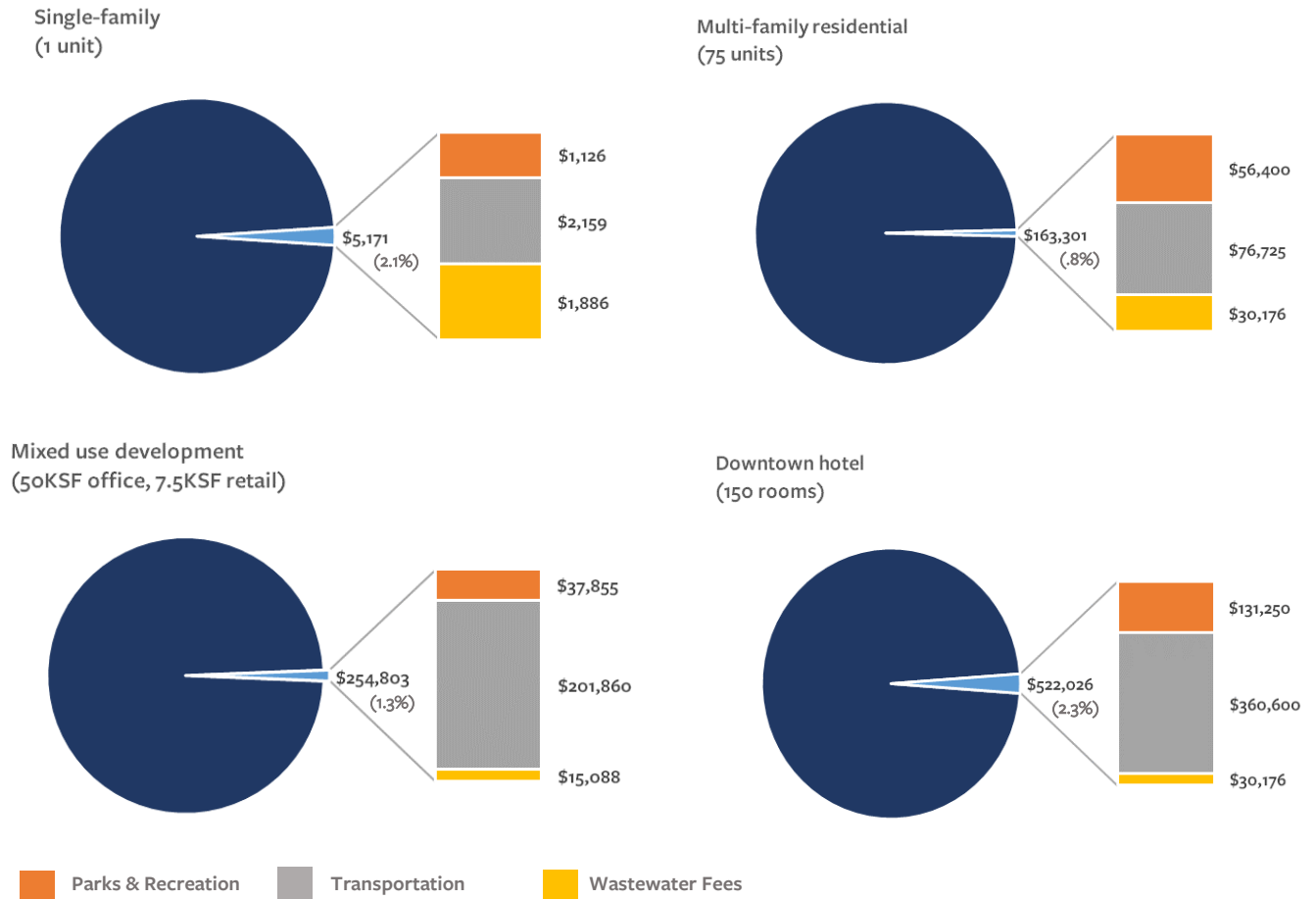


Figure 1: Proposed impact fees as a proportion of total estimated development costs (Note that wastewater fees are based on an estimated meter size.)

B. How will the fees as presented affect development costs? Will the fees have a disproportionate impact on small developments?

Following the development of the second draft fees, staff engaged Colliers International to examine six common development types in the City of Portland and analyze how impact fees as proposed in the ordinance would affect projected returns on investment (*Attachment 3*). This analysis showed that the effect on returns would generally be fairly minimal across the six development types modeled and that, in all cases studied, the cost of fees represents a nominal percentage of total development costs (less than 2.5%, see *Figure 1*). As the fee is designed to be proportional, this is generally true of both large and small projects.

C. How do fees compare to what projects pay in mitigation now?

As the Planning Board is aware, the City currently requires mitigation of project impacts through the development review process. As a product of this process, developers often make in-kind physical improvements. In other cases, developers are required to make financial infrastructure contributions proportionate to their impacts. These contributions are held in separate infrastructure accounts until they can be drawn down to pay for the improvement identified through the review process. For reference, an internal staff audit shows that, as mitigation of impacts for site plans approved between May of 2013 and May of 2018, the Planning Board and/or the Planning Authority required infrastructure contributions totaling just over \$1 million. (It should be noted that this figure does not include in-kind work completed by developers, easements or parkland dedications, and some substantial contributions yet to come, including that from the Portland Company redevelopment.) In comparison, TischlerBise's impact fee revenue projections, assuming

straight line growth, show a ten-year total of \$3.6 million for parks, \$13.3 million for transportation, and \$6.4 million for wastewater.

None of these questions were deemed to necessitate modifications to the second draft fees as proposed. As a result, the parks and recreation, transportation, and wastewater fees presented to the Board in late September have remained unchanged in the final draft ordinance presented here.

3. DRAFT IMPACT FEE ORDINANCE

The proposed impact fee ordinance (*Attachment 4*) was developed based on the state impact fee statute; guidance from the former Maine State Planning Office; review with Corporation Counsel, the Department of Permitting and Inspections, and Finance; as well as examples from comparable communities both in Maine and nationwide. The ordinance addresses not only the technical requirements of the statute but issues critical to the administration of impact fees:

- A. *Applicability.* The draft ordinance is written such that any development on a site that generates an increase in impact would be subject to impact fees. This would include new buildings; additions to existing buildings which result in net new residential units, non-residential square footage, or wastewater meters; and all changes of use which result in a net increase in impact per the impact fee schedule.
- B. *Impact fee schedule and basic guidelines for the calculation of the fee.* The draft ordinance includes impact fee schedules, as well as language designed to clarify methods for calculating fees for mixed-use development, redevelopment, additions, and changes of use. It should be noted that, for typical infill development and changes of use, the ordinance grants credits for existing uses at time of application.
- C. *Provisions for the modification of the fee amount.* The draft ordinance has been written to allow modifications to fee amounts in two instances:
 - a. The ordinance permits the Planning Board or Planning Authority to grant a credit against required impact fees for any infrastructure improvements made by a developer which are either related or equivalent to the projects for which impact fees are being collected. In these cases, the developer or applicant is required to provide cost estimates, prepared by a license professional engineer, and pay for any third party review required. Typical site plan improvements, such as sidewalks along a site frontage, are not considered eligible for credits.
 - b. Likewise, the draft ordinance includes language allowing the Planning Board to grant credits against required impact fees for developers that can provide evidence that a proposed use will have no or significantly-diminished demands on the capital facilities for which impact fees are being collected. As above, the developer is required to provide documentation and pay for any required third party reviews.
- D. *Fee reductions for affordable housing.* The draft ordinance includes a reference to Division 30, which establishes a schedule for fee reductions for affordable housing developments. It should be noted that this reference necessitates a minor amendment to Division 30, designed to extend affordable housing fee reductions to impact fees, which is also proposed here (*Attachment 5*). The concept of this fee reduction is a direct response to concerns regarding the effects of impact fees on the production of affordable housing. Guidance from the former State Planning Office suggests that fee waivers can be justified for affordable housing so long as there is a sound public policy basis and the fee is made whole by the municipality using funds from an alternate source. However, it should also be noted that Corporation Counsel has provided a memo speaking to the question of other use-specific waivers or carve outs, and these are generally not recommended (*Attachment 6*).
- E. *Administration of funds.* The draft ordinance language also addresses the timing of impact fee collection, accounting procedures, and procedure for refunds as necessary. Fees would be assessed at the time of

building permit to provide predictability for developers and paid at the time of certificate of occupancy to more closely link the fee payment with the occurrence of impacts.

In addition to addressing statutory requirements and administrative matters, where necessary, the final draft ordinance also attempts to respond to questions raised by Board members and Councilors in the late September workshops. These included:

A. How do the impact fee land use categories align with the categories in the land use code?

The land use categories represented in the impact fee schedules are purposefully designed to be broad. As part of their contract, TischlerBise will formalize a table categorizing existing uses from the land use code into impact fee categories. However, should a future proposed land use not fit the impact fee structure, the impact fee ordinance provides discretion to the Department of Permitting and Inspections, who will collect the impact fees, to assign the impact fees “applicable to the most nearly comparable type of land use listed in the impact fee schedule.”

B. How would refunds work?

Under the draft ordinance, if a project were not to go forward, refunds would be made to all current holders of properties for which impact fees have been collected, proportionate to that property's share of the impact fee revenue received for that project. Staff is currently discussing accounting for impact fees, including mechanisms for handling future refunds should they become necessary, with Permitting and Inspections and Finance.

C. Is there a way to exempt small projects?

Communities sometimes have ‘carve outs’ or exemptions built into their impact fee ordinances. However, fundamentally, fees must meet an equal protection test, and every carve out essentially undermines the fundamental premise that projects have impacts on system capacity, and to be equitable, the fee must be charged in a manner proportionate to those impacts, regardless of the project type. A memo from Corporation Counsel has been provided to address this issue (*Attachment 6*).

D. How often should impact fees be revisited?

TischlerBise has recommended a reassessment approximately every five years. The final draft ordinance does not specify a timeline, but explicitly allows for changes in the fee schedule “from time to time as warranted by new information or changed circumstances.”

E. What would the effective date be and how would impact fees be ‘phased in?’

As suggested in the last Planning Board workshop, staff has written the final draft ordinance to apply to all building permit applications submitted following the effective date of the ordinance, with the exception of building permits associated with a site plan approved as of the effective date. The rationale behind this approach is that any project that has received site plan approval as of the ordinance’s passage would have included an assessment of mitigation under the existing site plan review system.

4. DISCUSSION OF THE IMPACT FEE APPROACH

In addition to the technical questions on the fees and ordinance as noted above, the September workshops elicited a number of broader questions about impact fees. These included the following:

A. How do impact fees work in other places?

Generally, impact fees are promoted as an equitable way to address infrastructure demand associated with new growth, as well as a way to add predictability to the development review process. In addition, impact fees are often supported as a means of achieving some measure of economic efficiency; with impact fees, fee payers see direct economic benefit in terms of infrastructure investments that support their development, as

well as indirect benefits in terms of predictability in the permitting process and clarity in municipal capital infrastructure planning. As a result, impact fees have been used in the United States for the past fifty years, and are found in a majority of states nationwide. In Maine, impact fees are used in a number of communities, including York, Berwick, North Berwick, Scarborough, Saco, Windham, Gorham, Freeport, Brunswick, Lewiston, and Pownal. A comparison of fees across Maine is included in *Attachment 7*.

B. What happens if the market slows?

With parks impact fees, which are based on an incremental expansion model, the city is obligated to spend only what it collects to maintain levels of service as the community grows. With the transportation and wastewater fees, however, the city is obligated to construct the improvements for which the fee is collected regardless of how much money the city collects in sum total. This means that, should the city underperform when it comes to growth projections, the General Fund/Sewer Fund would need to cover a larger share of those capital projects than anticipated in the fee calculations. If the city overperforms, more capital projects would need to be added to the transportation and wastewater capital project lists (since we would need to create even more capacity in these systems than assumed during the *Impact Fee Study*.) With both the transportation and wastewater projects, the capital lists are based on existing CIP requests, ranked in terms of readiness, so as to avoid overextending the Department of Public Works. (For reference, altogether, the transportation capital projects included in the *Impact Fee Study* represent a total City cost of \$27 million over the next ten years, of which \$15 million is attributable to growth. The remainder would fall to the City's General Fund. In comparison, the city's FY2018 CIP includes \$8.3 million in transportation projects.) It is also important to note that DPW has stated that it has prioritized the implementation of all of the projects on the transportation and wastewater capital lists over the next ten years regardless of the implementation of an impact fee system.

C. How would impact fees affect land values?

Throughout the *Impact Fee Study*, there have been numerous discussions about the interaction between impact fees, property values, and taxes. Brendan O'Connell, the city's Finance Director, has prepared a memo to address broad questions about the increased tax revenue generated by recent development and how this relates to the City's financial picture more broadly (*Attachment 8*). With respect to the incidence of fees, studies have generally shown that, depending on market conditions, the cost of fees is absorbed by the primary land owner, the developer, or the end consumer, and is often distributed across all three. Guidance from the American Planning Association on this point (www.planning.org/policy/guides/adopted/impactfees) reads,

As a general matter, impact fees are capitalized into land values, and thus represent an exaction on the incremental value of the land attributable to the higher and better use made possible by the new public facilities. Some commentators have argued that, under certain circumstances, others may instead bear the incidence of the fee (these may include the original landowner, the developer, or the consumer). There has been little to demonstrate that the imposition of a fee system has stifled development. The fees supplement local government resources that otherwise have decreased because of diminished state and federal transfers of funds. Local governments have also used impact fees to delay or as a substitute for general property tax increases.

D. How would fees apply to parking lots and structured parking?

Because conventional transportation planning does not consider parking facilities to generate their own trips (instead, the land uses associated with parking are considered to generate trips), parking lots and structured parking would not be assessed a transportation impact fee under the proposed impact fee ordinance. In response to concerns about this approach, both staff and TischlerBise attempted to find research that quantifies induced demand associated with parking garages (i.e. the demand that could be attributed to a

garage alone, and not the associated land uses). Finding no quantitative analysis on which to base calculations, it is difficult to develop an impact fee for garages without running the risk of double counting – charging a garage and associated land uses for the same trips. As a result, staff has maintained the original approach with respect to parking garages.

E. How does the fee structure align with broader multi-modal and Transportation Demand Management objectives?

Because the capital projects which are the foundation of the transportation fee are all multi-modal - they are designed to create capacity by adding sidewalks, pedestrian lighting, bike lanes and paths, crosswalks and ADA accessibility, transit accommodations, and signal improvements that enhance efficiency - the transportation fee has been designed around the concept of person trips, trips taken by people associated with a land use regardless of mode. This means that some of the incentives built into the site plan process around shifting modes are not an option with the impact fee. It should be noted that this does not mean that those incentives will not continue to exist during the site plan process, when applicants are required to justify their proposed parking arrangement and, in many cases, develop a Transportation Demand Management plan. In addition, and as noted above, the proposed impact fee ordinance would also allow the City to implement multi-modal infrastructure improvements on the part of the City, which are of course critical in terms of supporting a broader range of transportation options.

F. Will impact fees have unintended consequences with respect to the City's broader policy objectives?

Impact fees are intended as a fair and equitable system for addressing public infrastructure improvements necessary to accommodate growth. For this reason, guidance from both the former State Planning Office and Corporation Counsel is clear that the idea of structuring or restructuring fees around particular land use policy goals should be approached carefully. Jen Thompson, Associate Corporation Counsel, writes,

The focus in an impact fee ordinance should be on accurately assessing the true impacts of development on capital facilities and assessing fees that are directly tied to that impact. When fees are preferentially imposed or particular kinds of development are exempted from fees based on other policy goals rather than on the impact of those uses on infrastructure, a municipality runs the risk of undermining the "nexus" that is established to justify the fee. Further, and as with all fees imposed by government, where similar uses have similar impacts it's important to take care that fees and regulations are being applied equally. If distinctions in applicability are going to be made, it is important that the reasons for treating one group differently than another are well-articulated and sound.

G. How would an impact fee system relate to the City's existing site plan ordinance, Traffic Movement Permit process, and system for addressing mitigation?

A clear advantage of impact fee systems is that they provide predictability, equity, and efficiency to the development review process. By and large, the proposed impact fee system would replace the existing negotiation that occurs around mitigation through the City's site plan ordinance. It is assumed that some analysis required under site plan review would continue to occur (e.g. in projects that trigger a TMP, traffic analysis is still expected, for instance), and that projects might continue to make off-site improvements in cases when those improvements are necessary for a project to proceed. In these cases, credits could be applied against the impact fee category for which such improvements are made. However, in general, the impact fee would generally replace the final step in the development review process whereby mitigation is assessed.

5. CONSISTENCY WITH *PORTLAND'S PLAN*

As noted above, the proposed impact fee ordinance is a direct product of *Portland's Plan*. The plan calls for an investigation into the “potential of a more robust framework for assessing development-related impacts” in the city to “generate additional funding [for facilities and services], while also adding clarity and predictability to existing [review] procedures” (*Portland's Plan*, 67).

Maybe more importantly, however, the proposed impact fee ordinance is also in many ways a means to achieving the vision of *Portland's Plan*. The capital transportation projects associated with the *Impact Fee Study* are about building multi-modal capacity in our nodes and on our corridors so that those targeted areas can continue to support sustainable growth. The expansion of our parks and facility capacity under an impact fee system is about providing access to these facilities as we grow and “connect the chain.” And the building of capacity in our wastewater system to accommodate growth will ensure that we can meet the environmental goals contained in *Portland's Plan*.

6. PUBLIC COMMENT

It should be noted that, in addition to feedback received through the stakeholder group, staff has received four public comments on the proposed impact fee ordinance (*Attachment 9*). These comments raise questions about the treatment of parking garages, how the ordinance would align with the city's smart growth goals, comparable communities with impact fees, the composition of the stakeholder group, and how a fee system would be implemented. Answers to these questions are generally addressed above.

7. RECOMMENDATION

The staff recommends that the Planning Board find that the proposed amendments to the land use code to create an Impact Fee Ordinance and amend Division 30 to include a fee reduction for affordable housing are consistent with *Portland's Plan* and recommends adoption to the City Council.

8. MOTION FOR THE BOARD TO CONSIDER

On the basis of the application, plans, reports and other information submitted by the applicant, findings and recommendations contained in the Planning Board Report for the public hearing on October 9, 2018, and on the basis of the testimony presented at the public hearing, the Planning Board finds that the proposed Impact Fee Ordinance and amendment to Division 30 [are or are not] consistent with *Portland's Plan* and therefore [recommends or does not recommend] adoption of these amendments to the City Council.

9. ATTACHMENTS

1. List of Stakeholder Group members
2. 2018 Impact Fee Study, TischlerBise, 10/3/18
3. Portland Impact Fee Analysis, Colliers International, 9/20/18
4. Proposed Draft Impact Fee Ordinance
5. Proposed Amendments to Division 30, 9/28/18
6. Memo from Jennifer Thompson, Associate Corporation Counsel, 10/4/18
7. Comparable Fee Study, TischlerBise
8. Impact Fee – Questions and Answers from Finance Director & Assessor, 8/12/18
9. Public Comment

***IMPACT FEE STUDY*STAKEHOLDER GROUP MEMBERS**

Quincy Hentzel	Chamber of Commerce
Paul Peck	Chamber of Commerce
Tim Soley	East Brown Cow
Vin Veroneau	J.B. Brown
Brad Fries	Northland Enterprises
Erin Cooperrider	New Height Group
Jonathan Culley	Redfern Properties
Tyler Norod	AVESTA
Mike Barton	Congress Group
Sarah Michniewicz	Bayside Neighborhood Association
James Loeber	India Street Neighborhood Association
Tom Hambrick	Stroudwater Village Association
Sean Dundon	City of Portland Planning Board
Greg Mitchell	City of Portland Economic Development
Chris Hall	Greater Portland Council of Governments
Kara Woldrik	Portland Trails



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PRE-FINAL

Prepared by:

TischlerBise
FISCAL | ECONOMIC | PLANNING

4701 Sangamore Road
Suite S240
Bethesda, Maryland 20816
800.424.4318
www.tischlerbise.com



TischlerBise
4701 Sangamore Road
Suite S240
Bethesda, Maryland 20816
800.424.4318

www.tischlerbise.com

October, 2018

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EXECUTIVE SUMMARY

Impact fees are one-time payments for new development's proportionate share of the capital cost of infrastructure. The following study addresses the City of Portland's Parks & Recreation, Transportation, and Wastewater facilities. Impact fees do have limitations and should not be regarded as the total solution for infrastructure funding. Rather, they are one component of a comprehensive funding strategy to ensure provision of adequate public facilities. Impact fees may only be used for capital improvements or debt service for growth-related infrastructure. They may not be used for operations, maintenance, replacement of infrastructure, or correcting existing deficiencies.

State of Maine Impact Fee Enabling Legislation

In 1987, impact fee enabling legislation was approved into Maine law when the Legislature enacted the Comprehensive Planning and Land Use Regulations Act of 1987. The statutory requirements for impact fees can be found in Title 30-A MRSA, Section 4354.

Additional Legal Guidelines

Both state and federal courts have recognized the imposition of impact fees on development as a legitimate form of land use regulation, provided the fees meet standards intended to protect against regulatory takings. Land use regulations, development exactions, and impact fees are subject to the Fifth Amendment prohibition on taking of private property for public use without just compensation. To comply with the Fifth Amendment, development regulations must be shown to substantially advance a legitimate governmental interest. In the case of impact fees, that interest is the protection of public health, safety, and welfare by ensuring development is not detrimental to the quality of essential public services. The means to this end are also important, requiring both procedural and substantive due process. The process followed to receive community input (i.e. stakeholder meetings, work sessions, and public hearings) provides opportunities for comments and refinements to the impact fees.

There is little federal case law specifically dealing with impact fees, although other rulings on other types of exactions (e.g., land dedication requirements) are relevant. In one of the most important exaction cases, the U. S. Supreme Court found that a government agency imposing exactions on development must demonstrate an "essential nexus" between the exaction and the interest being protected (see *Nollan v. California Coastal Commission*, 1987). In a more recent case (*Dolan v. City of Tigard*, OR, 1994), the Court ruled that an exaction also must be "roughly proportional" to the burden created by development.

There are three reasonable relationship requirements for impact fees that are closely related to "rational nexus" or "reasonable relationship" requirements enunciated by a number of state courts. Although the term "dual rational nexus" is often used to characterize the standard by which courts evaluate the validity of impact fees under the U.S. Constitution, TischlerBise prefers a more rigorous formulation that recognizes three elements: "need," "benefit," and "proportionality." The dual rational nexus test explicitly addresses only the first two, although proportionality is reasonably implied, and was specifically mentioned by the

U.S. Supreme Court in the Dolan case. Individual elements of the nexus standard are discussed further in the following paragraphs.

All new development in a community creates additional demands on some, or all, public facilities provided by local government. If the capacity of facilities is not increased to satisfy that additional demand, the quality or availability of public services for the entire community will deteriorate. Impact fees may be used to cover the cost of development-related facilities, but only to the extent that the need for facilities is a consequence of development that is subject to the fees. The Nollan decision reinforced the principle that development exactions may be used only to mitigate conditions created by the developments upon which they are imposed. That principle likely applies to impact fees. In this study, the impact of development on infrastructure needs is analyzed in terms of quantifiable relationships between various types of development and the demand for specific facilities, based on applicable level-of-service standards.

The requirement that exactions be proportional to the impacts of development was clearly stated by the U.S. Supreme Court in the Dolan case and is logically necessary to establish a proper nexus. Proportionality is established through the procedures used to identify development-related facility costs, and in the methods used to calculate impact fees for various types of facilities and categories of development. The demand for facilities is measured in terms of relevant and measurable attributes of development (e.g. persons per household).

A sufficient benefit relationship requires that impact fee revenues be segregated from other funds and expended only on the facilities for which the fees were charged. The calculation of impact fees should also assume that they will be expended in a timely manner and the facilities funded by the fees must serve the development paying the fees. However, nothing in the U.S. Constitution or the state enabling legislation requires that facilities funded with fee revenues be available exclusively to development paying the fees. In other words, benefit may extend to a general area including multiple real estate developments. Procedures for the earmarking and expenditure of fee revenues are discussed near the end of this study. All of these procedural as well as substantive issues are intended to ensure that new development benefits from the impact fees they are required to pay. The authority and procedures to implement impact fees is separate from and complementary to the authority to require improvements.

Proposed Maximum Defensible Impact Fee Methodologies

The impact fees are based on the actual level of service for Parks & Recreation, Transportation, and Wastewater facilities. The Parks & Recreation components includes parks, trails, and recreational facilities. The Parks Impact Fee is calculated for residential, nonresidential, and hotel development. It has been determined that along with residents, workers and visitors to Portland increase the demand on park & recreational facilities, thus the impact from nonresidential land uses and hotels needs to be offset. The Transportation and Wastewater fees are allocated to all residential and nonresidential development. A summary of methodologies used in the analysis is provided in Figure 1.

Figure 1. Summary of Impact Fee Methodologies

Fee Category	Service Area	Incremental Expasion	Plan-Based	Cost Recovery	Cost Allocation
Parks and Recreation	Citywide	Parks, Trails, Recreation Facilities	N/A	N/A	Population
Transportation	Citywide	N/A	Multimodal Facilities and Signals	N/A	Person Trips
Wastewater	Citywide	N/A	Wastewater Distribution and Treatment Facilities	N/A	Meter Size

Maximum Defensible Impact Fees

Figure 2 provides a schedule of the maximum defensible impact fee for Parks & Recreation, Transportation, and Wastewater. The fees represent the highest defensible amount for each type of residential and nonresidential unit, which represents new growth's fair share of the cost for capital facilities. To differentiate between housing units, two housing types are included: Single Family/Two-family and Multifamily. Housing types have varying household sizes and, consequently, a varying demand on City infrastructure and services. Thus, it is important to differentiate between housing types and size. A streamlined approach is used for nonresidential developments. This approach has no size thresholds and lessens the burden on smaller shop owners.

The City may adopt fees that are less than the amounts shown. However, a reduction in impact fee revenue will necessitate an increase in other revenues, a decrease in planned capital expenditures, and/or a decrease in levels of service.

Figure 2. Maximum Defensible Impact Fee

Development Type	Parks & Rec	Transportation	Wastewater
Residential (per housing unit/per water meter)			
Single Family/Duplex	\$1,126	\$2,159	\$1,886
Multifamily	\$752	\$1,023	\$1,886
Nonresidential (per 1,000 square feet/per water meter)			
Retail	\$534	\$8,248	\$4,715
Office	\$677	\$2,800	\$4,715
Industrial	\$363	\$1,130	\$4,715
Institutional	\$645	\$3,082	\$4,715
Accommodation (per hotel room/per water meter)			
Hotel	\$875	\$2,404	\$4,715

Note: a 5/8 inch meter is shown for residential development and a 1 inch meter is shown for nonresidential development, however, the wastewater fee will be assessed based on the development's meter size.

GENERAL METHODS FOR IMPACT FEES

There are three general methods for calculating impact fees. The choice of a particular method depends primarily on the timing of infrastructure construction (past, concurrent, or future) and service characteristics of the facility type being addressed. Each method has advantages and disadvantages in a particular situation and can be used simultaneously for different cost components.

Reduced to its simplest terms, the process of calculating impact fees involves two main steps: (1) determining the cost of development-related capital improvements and (2) allocating those costs equitably to various types of development. In practice, though, the calculation of impact fees can become quite complicated because of the many variables involved in defining the relationship between development and the need for facilities within the designated service area. The following paragraphs discuss three basic methods for calculating impact fees and how those methods can be applied to City of Portland.

Cost Recovery Method (past improvements)

Although not used in City of Portland, the rationale for recoupment, or cost recovery, is that new development is paying for its share of the useful life and remaining capacity of facilities already built, or land already purchased, from which new growth will benefit. This methodology is often used for utility systems that must provide adequate capacity before new development can take place.

Incremental Expansion Method (concurrent improvements)

The City of Portland Park and Recreation Impact Fee uses the incremental expansion method to document current level-of-service (LOS) standards for the infrastructure types included in the study, using both quantitative and qualitative measures. This approach assumes there are no existing deficiencies or surplus in infrastructure capacity. New development is only paying its proportionate share for growth-related infrastructure. Revenue will be used to expand or provide additional facilities, as needed, to accommodate new development. An incremental expansion cost method is best suited for public facilities that will be expanded in regular increments to keep pace with development.

Plan-Based Method (future improvements)

The Transportation and Wastewater Impact Fees use the plan-based method to allocate costs for a specified set of improvements to a specified amount of development. Improvements are typically identified in a long-range facility plan and development potential is identified by a land use plan. There are two basic options for determining the cost per demand unit: 1) total cost of a public facility can be divided by total service units (average cost), or 2) the growth-share of the public facility cost can be divided by the net increase in service units over the planning timeframe (marginal cost).

Evaluation of Possible Credits

Regardless of the methodology, a consideration of “credits” is integral to the development of a legally defensible impact fee methodology. There are two types of “credits” with specific characteristics, both of which should be addressed in impact fee studies and ordinances. The first is a credit due to possible double payment situations, which could occur when other revenues may contribute to the capital costs of

infrastructure covered by the impact fee. This type of credit is integrated into the impact fee calculation, thus reducing the fee amount. The second is a site-specific credit or developer reimbursement for construction of system improvements. This type of credit is addressed in the administration and implementation of the impact fee program.

Please note, calculations throughout this report are based on an analysis conducted using MS Excel software. Results are discussed in the memo using one- and two-digit places (in most cases). Figures are typically either truncated or rounded. In some instances, the analysis itself uses figures carried to their ultimate decimal places; therefore, the sums and products generated in the analysis may not equal the sum or product if the reader replicates the calculation with the factors shown in the report (due to the rounding of figures shown, not in the analysis).

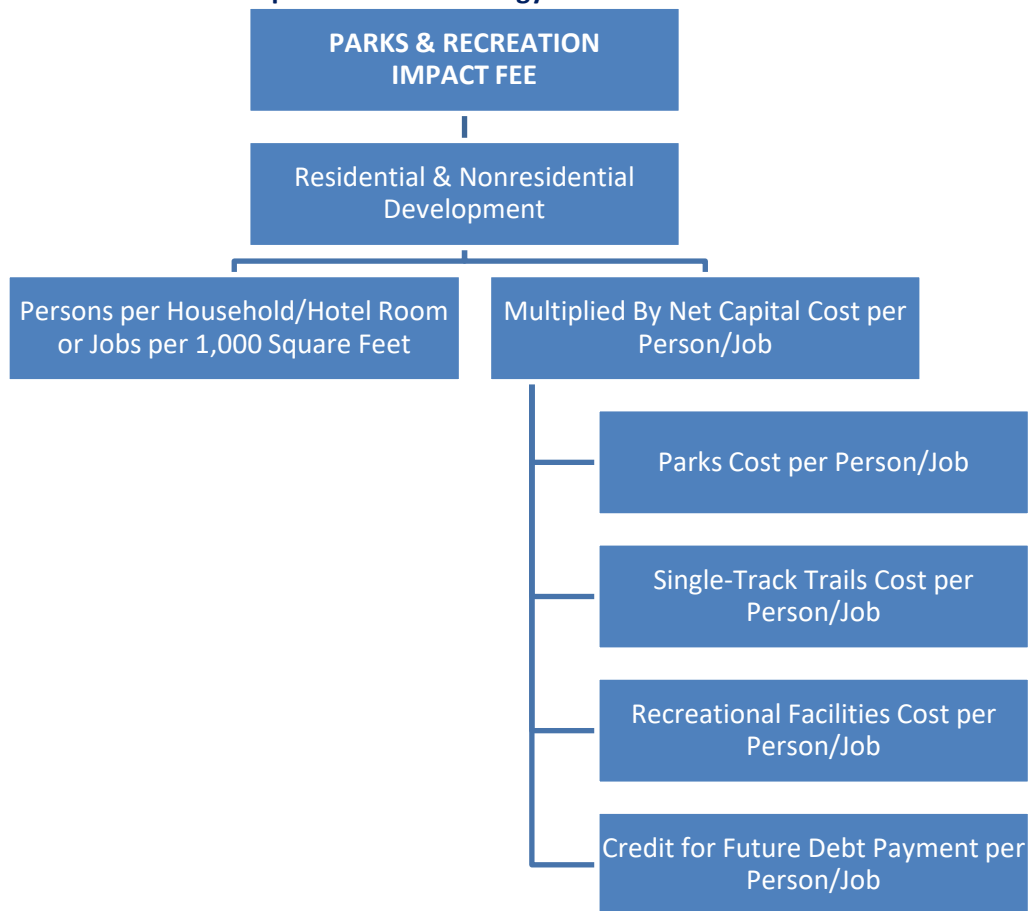
PARKS & RECREATION FACILITIES IMPACT FEE

The Parks & Recreation Impact Fee is based on the incremental expansion methodology. The impact fee methodology assumes the City will construct additional recreation improvements to serve future growth to maintain current levels of service incrementally over time. Parks and recreation capital improvements are allocated to residential, nonresidential, and hotel development. Furthermore, a credit is necessary to avoid double payments towards current debt obligations for park improvements. There are four components to the Parks & Recreation Impact Fee:

- Parks
- Single-Track Trails
- Recreational Facilities
- Credit for Future Debt Payments

Figure 3 diagrams the general methodology used to calculate the Parks & Recreation Impact Fee. It is intended to read like an outline, with lower levels providing a more detailed breakdown of the impact fee components. The Parks & Recreation Impact Fee for residential development is derived from the product of persons per housing unit (by type of unit) multiplied by the net capital cost per person. The fee for nonresidential development is derived from the product of jobs per 1,000 square feet multiplied by the net capital cost per job. The fee for hotel development is derived from the product of persons per hotel room multiplied by the net capital cost per person. The boxes in the next level down indicate detail on the components included in the fee.

Figure 3. Parks & Recreation Impact Fee Methodology



Parks & Recreation Level of Service and Cost Factors

The Parks & Recreation Impact Fee is based on an inventory of existing citywide parks and current values of recreation improvements and land in the City's park system. The use of existing standards means there are no existing infrastructure deficiencies. New development is only paying its proportionate share for growth-related infrastructure. Facilities and costs have been provided by the City of Portland staff.

An important aspect when determining the demand on City facilities is the additional demand from seasonal and visitor populations. From the Maine Office of Tourism, the Greater Portland and Casco Bay region saw 5.4 million visitors in 2016. As a result, it is not just permanent residents that are having an impact on facilities. In response, City infrastructure and operating service levels are sized to accommodate not just permanent residents, but seasonal residents and visitors as well. **In this analysis, peak population includes permanent residents, seasonal residents, and visitors (day and overnight visitors).** Further explain and calculations can be found in Appendix A.

To determine the demand on facilities from residential and nonresidential development, a days-of-impact proportionate share calculation is conducted. The proportionate share is based on cumulative impact days per year, with the peak population (residents and visitors) potentially impacting parks and recreation facilities 365 days per year and inflow commuters potentially impacting parks and recreation facilities 250 days per year (5 days per week multiplied by 50 weeks a year). Workers that live within the City are included in the peak population total.

Shown in Figure 4, residential and hotel development in the City accounts for 72 percent of the impact on park and recreational facilities. As a result of workers using park facilities, such as during break and lunch, nonresidential development accounts for 28 percent of the impact on facilities.

Figure 4. Impact Days Proportionate Share

Peak Population ¹	Inflow Commuters	Cumulative Impact Days per Year			Cost Allocation for Parks	
		Residential/Hotel ²	Nonresidential ³	Total	Residential/Hotel	Nonresidential
82,049	47,245	29,948,016	11,811,250	41,759,266	72%	28%

1. Includes permanent residents, seasonal residents, and visitors

2. Days per Year = 365

3. Days per Year = 250 (5 Days per Week x 50 Weeks per Year)

Source: U.S. Census Bureau, OnTheMap 6.1.1 Application and LEHD Origin-Destination Employment Statistics.

Current Inventory of Parkland and Improvements

Figure 5 lists the current inventory of parkland and park improvements in the City of Portland. There are 44.8 acres of neighborhood parks and 271.5 acres of destination parks. Every park is open to all the residents, workers, and seasonal and visitor populations. Included in the figure are average replacement costs for parkland and park improvements. This allows for a total replacement cost to be calculated.

Figure 5. Current Inventory of Parkland and Improvements

Park	Acres	Athletic Field	Baseball Field	Basketball Courts	Community Gardens	Dog Park Area	Multi-Purpose Field	Pickleball Courts	Picnic Tables	Playgrounds	Pools	Skate Park	Softball Fields	Splashpads	Tennis Courts	Volleyball
Neighborhood Parks																
Marada Adams Park	0.5									1.0						
Barrows Park/Sundial Park	0.5															
Bedford Park	0.5															
Belmeade Park	0.3								1.0							
Boyd Street Community Garden	1.8				1.0											
Clark Street Park	0.3									1.0						
Clark Street Community Garden	0.1				1.0											
City Acres Ballfield, Peaks Island	3.0		1.0													
Fessenden Park	0.5															
Fort Allen Park	5.0															
Fort Gorges	2.0															
Fort Sumner Park	1.3								3.0							
Fox Field	4.6	1.0		2.0					1.0	1.0						
Great Diamond Island Park	0.6									1.0						
Harbor View Memorial Park	4.8								1.0							
Heseltine Park	1.0								1.0	1.0						
Lincoln Park	2.0															
Longfellow Park	0.4															
Munjoy South	0.7			1.0						1.0						
Nason's Corner Park	2.6		1.0				1.0			1.0						
Oakleigh Park	1.3		1.0													
Peppermint Park	0.4									1.0				1.0		
Pleasant Street Park	0.7			1.0						1.0						
Post Office Park	0.2															
Quaker Park	0.8															
Stone Street Playground	0.2									1.0				1.0		
Stroudwater Park 1	0.8															
Stroudwater Park 2	1.0															
Stroudwater Playground	0.1									1.0						
Taylor Street Park	0.6			1.0						1.0						
Tommy's Park	0.2															
Trinity Park	0.1															
Trott Little John Park	4.5				1.0	1.0										
Tyng Tate Park	0.3			1.0						1.0						
Winslow Park	1.6															
Destination Parks																
Back Cove Park	34.0	1.0								1.0						
Deering Oaks Park	55.0		1.0	2.0			1.0	4.0	6.0	1.0				1.0	8.0	2.0
Dougherty Field	18.5	2.0	3.0		1.0					1.0	1.0	1.0		1.0		
Eastern Promenade Park	78.0		1.0	1.0	2.0				4.0	1.0			1.0		3.0	
Payson Park	48.0	1.0	2.0	1.0	1.0				3.0	1.0			2.0	1.0	4.0	
Riverton Trolley Park	19.0		1.0													
Western Promenade	19.0				1.0	1.0			2.0							
TOTAL	316.3	5.0	11.0	10.0	8.0	2.0	2.0	4.0	22.0	18.0	1.0	1.0	4.0	5.0	15.0	2.0
Average Replacement Cost	\$59,172	\$350,000	\$175,000	\$45,000	\$30,000	\$50,000	\$175,000	\$45,000	\$750	\$175,000	\$2,000,000	\$350,000	\$175,000	\$30,000	\$45,000	\$45,000
Total Replacement Cost	\$18,716,104	\$1,750,000	\$1,925,000	\$450,000	\$240,000	\$100,000	\$350,000	\$180,000	\$16,500	\$3,150,000	\$2,000,000	\$350,000	\$700,000	\$150,000	\$675,000	\$90,000

Source: City of Portland Parks and Recreation

Park Level of Service & Cost Analysis

To calculate the current level of service, the existing parkland acreage (316.3) is allocated to residential and nonresidential demand based on the percentage split of impact days. The residential park acres are divided by the current peak population of Portland (83,250) to calculate the level of service per person. The nonresidential park acres are divided by the current jobs in the City (67,270) to calculate the level of service per job. As a result, there are 2.74 parkland acres per 1,000 persons and 1.32 acres per 1,000 jobs.

Shown in Figure 6, the total value of park land is \$18,716,104 and park improvements are valued at \$12,126,500. The replacement costs are summed and divided by the acreage to find the cost per acre (\$97,511). The cost per person and cost per job factors are calculated by applying the level of service factors to the total replacement cost per acre (i.e. 2.74 acres per 1,000 persons x \$97,511 per acre = \$267 per person, rounded).

Figure 6. Parks Level of Service & Cost Analysis

Land Replacement Cost	\$18,716,104
Improvement Replacement Cost	\$12,126,500
Total Replacement Cost	\$30,842,604

Total Park Acres	316.3
Total Replacement Cost	\$30,842,604
Replacement Cost per Park Acre	\$97,511

Source: City of Portland Parks and Recreation; Assessor's Office

Residential Level-of-Service (LOS) Standard

Share of Impact Days	72%
Share of Park Acres	227.7
2018 Peak Population	83,250
LOS: Acre per 1,000 Persons	2.74

Nonresidential Level-of-Service (LOS) Standard

Share of Impact Days	28%
Share of Park Acres	88.6
2018 Jobs	67,270
LOS: Acre per 1,000 Jobs	1.32

Cost Analysis

Replacement Cost per Acre	\$97,511
LOS: Acre per 1,000 Persons	2.74
Replacement Cost Per Capita	\$267

Cost Analysis

Replacement Cost per Acre	\$97,511
LOS: Acre per 1,000 Jobs	1.32
Replacement Cost Per Job	\$129

Park Growth-Related Needs

To estimate the 10-year growth needs for parks, the current level of service (2.74 acres per 1,000 persons and 1.32 acres per 1,000 jobs) is applied to the population and job growth projected for the City of Portland. The City's peak population is projected to increase by 4,279 and the City's employment is projected to increase by 6,890 jobs over the next ten years (see Appendix A). Listed in Figure 7, there will need to be a total of 337.7 acres of parkland in the City to accommodate the growth, which results in a need of 20.8 new acres. By applying the average cost of improvements to parkland (\$97,511 per acre), the total expenditure for the growth is calculated (20.8 acres x \$97,511 = \$2,028,299).

Figure 7. 10-Year Parkland Needs to Accommodate Growth

Type of Infrastructure	Level of Service		Demand Unit	Unit Cost / Acre
Parks	Residential	2.74	per 1,000 persons	\$97,511
	Nonresidential	1.32	per 1,000 jobs	

Growth-Related Need for Park Improvements						
Year		Population	Jobs	Residential Acres	Nonresidential Acres	Total Acres
Base	2018	83,250	67,270	228.1	88.8	316.9
Year 1	2019	83,678	67,959	229.2	89.7	318.9
Year 2	2020	84,106	68,648	230.4	90.6	321.0
Year 3	2021	84,534	69,337	231.6	91.5	323.1
Year 4	2022	84,962	70,026	232.7	92.4	325.1
Year 5	2023	85,390	70,715	233.9	93.3	327.2
Year 6	2024	85,818	71,404	235.1	94.3	329.4
Year 7	2025	86,246	72,093	236.3	95.2	331.5
Year 8	2026	86,673	72,782	237.4	96.1	333.5
Year 9	2027	87,101	73,471	238.6	97.0	335.6
Year 10	2028	87,529	74,160	239.8	97.9	337.7
Ten-Year Increase		4,279	6,890	11.7	9.1	20.8
Projected Expenditure				\$1,140,879	\$887,350	\$2,028,229
Growth-Related Expenditure on Park Improvements						\$2,028,229

Trail Inventory and Level of Service

There are two distinct trails in Portland: Multiuse and Single-track. Multiuse trails are wide, paved trails that allow for a variety of activities to occur simultaneously (i.e. walking, biking, skateboarding). Single-track trails are unpaved trails that are only used for walking. After consultation with City staff, multiuse trails are considered a multimodal transportation facility, so they are included in the Transportation Impact Fee and not the Parks and Recreation Fee.

To calculate the current level of service for single-track trails, the existing trail length (36.2 miles) is allocated to residential and nonresidential demand based on the percentage split of impact days. The residential trail miles are divided by the current peak population of Portland (83,250) to calculate the level of service per person. The nonresidential trail miles are divided by the current jobs in the City (67,270) to

calculate the level of service per job. As a result, there are 0.31 trail miles per 1,000 persons and 0.15 miles per 1,000 jobs.

The average cost per mile (\$15,000) has been provided by the City of Portland Parks and Recreation staff. The replacement cost per person and replacement cost per job factors are calculated by applying the level of service factors to the average replacement cost per mile. For example, the cost per person is \$5 (0.31 miles per 1,000 persons x \$15,000 per mile = \$5 per person, rounded).

Figure 8. Trails Level of Service & Cost Analysis

Trail	Single-Track Trail (miles)
Citywide Passive Trails	36.2
Total	36.2

Source: City of Portland Parks and Recreation

Residential Level-of-Service (LOS) Standard

Share of Impact Days	72%
Share of Trail Miles	26.1
2018 Peak Population	83,250
LOS: Miles per 1,000 Persons	0.31

Nonresidential Level-of-Service (LOS) Standard

Share of Impact Days	28%
Share of Trail Miles	10.1
2018 Jobs	67,270
LOS: Miles per 1,000 Jobs	0.15

Cost Analysis

Costs per mile	\$15,000
LOS: Miles per 1,000 Persons	0.31
Replacement Cost per Person	\$5

Cost Analysis

Costs per mile	\$15,000
LOS: Miles per 1,000 Jobs	0.15
Replacement Cost per Job	\$2

Trail Growth-Related Needs

To estimate the 10-year growth needs for single-track trails, the current level of service (0.31 miles per 1,000 persons and 0.15 miles per 1,000 jobs) is applied to the population and employment growth projected for the City of Portland. The City's peak population is projected to increase by 4,279 and the City's employment is projected to increase by 6,890 jobs over the next ten years (see Appendix A). As shown Figure 9, an additional need of 2.3 miles of new single-track trails will be demanded by new development. By applying the average cost of trail improvements (\$15,000 per mile) the total expenditure for the growth is calculated (2.3 miles x \$15,000 per mile = \$34,500).

Figure 9. 10-Year Single-track Trail Needs to Accommodate Growth

Type of Infrastructure	Level of Service		Demand Unit	Unit Cost / Mile
Trails	Residential	0.31	per 1,000 persons	\$15,000
	Nonresidential	0.15	per 1,000 jobs	

Growth-Related Need for Trail Improvements						
Year		Population	Jobs	Residential Miles	Nonresidential Miles	Total Miles
Base	2018	83,250	67,270	25.8	10.1	35.9
Year 1	2019	83,678	67,959	25.9	10.2	36.1
Year 2	2020	84,106	68,648	26.0	10.3	36.3
Year 3	2021	84,534	69,337	26.2	10.4	36.6
Year 4	2022	84,962	70,026	26.3	10.5	36.8
Year 5	2023	85,390	70,715	26.4	10.6	37.0
Year 6	2024	85,818	71,404	26.6	10.7	37.3
Year 7	2025	86,246	72,093	26.7	10.8	37.5
Year 8	2026	86,673	72,782	26.8	10.9	37.7
Year 9	2027	87,101	73,471	27.0	11.0	38.0
Year 10	2028	87,529	74,160	27.1	11.1	38.2
Ten-Year Increase		4,279	6,890	1.3	1.0	2.3
		Projected Expenditure		\$19,500	\$15,000	\$34,500

Growth-Related Expenditure on Trail Improvements	\$34,500
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Recreational Facilities Inventory and Level of Service

There are five recreational facilities in the City of Portland's Park and Recreation system included in the impact fee analysis. The facilities total 111,273 square feet.

To calculate the current level of service for recreational facilities, the existing floor area is allocated to residential and nonresidential demand based on the percentage split of impact days. The residential floor area is divided by the current peak population of Portland (83,250) to calculate the level of service per person. The nonresidential floor area is divided by the current jobs in the City (67,270) to calculate the level of service per job. As a result, there are 0.96 square feet per person and 0.46 square feet per jobs.

The average cost per square foot (\$272) is calculated by dividing the total replacement cost of improvements by the total square feet of recreational facilities. The replacement cost per person and replacement cost per job factors are calculated by applying the level of service factor to the average replacement cost of per square foot (i.e. 0.96 square feet per person x \$291 per square foot = \$261 per person, rounded).

Figure 10. Recreational Facilities Level of Service & Cost Analysis

Recreational Facilities	Square Feet	Replacement Cost
East End Community Center	23,500	\$5,875,000
Peaks Island Community Center	2,000	\$550,000
Portland Ice Arena	29,273	\$3,125,896
Reiche Community Center	25,000	\$8,750,000
Riverton Community Center	31,500	\$11,970,000
Total	111,273	\$30,270,896

Source: City of Portland Parks and Recreation

Residential Level-of-Service (LOS) Standard

Share of Impact Days	72%
Share of Rec. Square Feet	80,117
2018 Peak Population	83,250
LOS: Square Feet per Person	0.96

Cost Analysis

Costs per Square Foot	\$272
LOS: Square Feet per Person	0.96
Replacement Cost per Person	\$261

Nonresidential Level-of-Service (LOS) Standard

Share of Impact Days	28%
Share of Rec. Square Feet	31,156
2018 Jobs	67,270
LOS: Miles per 1,000 Jobs	0.46

Cost Analysis

Costs per Square Foot	\$272
LOS: Miles per 1,000 Jobs	0.46
Replacement Cost per Job	\$125

Recreational Facility Growth-Related Needs

To estimate the 10-year growth needs for recreational facilities, the current level of service (0.96 square feet per person and 0.46 square feet per job) is applied to the population and employment growth projected for the City of Portland. The City's peak population is projected to increase by 4,279 and the City's employment is projected to increase by 6,890 jobs over the next ten years (see Appendix A). Listed in Figure 11, there will need to be a total of 118,141 square feet of recreational facilities in the City to accommodate the growth, which results in a need of 7,277 new square feet. By applying the average replacement cost for recreation facilities (\$272 per square foot), the total expenditure for the growth is calculated (7,277 square feet x \$272 = \$1,979,344).

Figure 11. 10-Year Recreational Facilities Needs to Accommodate Growth

Type of Infrastructure	Level of Service		Demand Unit	Unit Cost / Sq. Ft.
Recreational Facilities	Residential	0.96	per person	\$272
	Nonresidential	0.46	per jobs	

Growth-Related Need for Park Improvements						
Year		Population	Jobs	Residential Square Feet	Nonresidential Square Feet	Total Square Feet
Base	2018	83,250	67,270	79,920	30,944	110,864
Year 1	2019	83,678	67,959	80,331	31,261	111,592
Year 2	2020	84,106	68,648	80,741	31,578	112,319
Year 3	2021	84,534	69,337	81,152	31,895	113,047
Year 4	2022	84,962	70,026	81,563	32,212	113,775
Year 5	2023	85,390	70,715	81,974	32,529	114,503
Year 6	2024	85,818	71,404	82,384	32,846	115,230
Year 7	2025	86,246	72,093	82,795	33,163	115,958
Year 8	2026	86,673	72,782	83,206	33,480	116,686
Year 9	2027	87,101	73,471	83,617	33,797	117,414
Year 10	2028	87,529	74,160	84,027	34,114	118,141
Ten-Year Increase		4,279	6,890	4,107	3,170	7,277
Projected Expenditure				\$1,117,104	\$862,240	\$1,979,344

Growth-Related Expenditure on Park Improvements	\$1,979,344
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Parks & Recreation Credit

Currently, the City of Portland has existing debt obligations from past Parks and Recreation projects. The City of Portland's Finance Department delineated the purposes for each of the City's General Obligation Bonds and summed the future principal and interest payments for Parks and Recreation projects. In Figure 12, the Parks and Recreation annual share of payments to all the existing bonds is listed through 2028.

The total annual payment schedule allocated to residential and nonresidential growth based on the impact days proportional share split. The payments are divided by the City's peak population and total employment to find the debt cost per person and job. To account for the time value of money, annual payments per capita are discounted using a net present value formula based on the applicable discount (interest) rate. This results in a credit of \$60 per person and \$28 per job, rounded.

Figure 12. Park and Recreation Debt per Person & per Job**Residential Credit**

Fiscal Year	Payment	Projected Population	Payment/Person
Base Year	\$617,060	83,250	\$7.41
2019	\$715,720	83,678	\$8.55
2020	\$676,719	84,106	\$8.05
2021	\$628,339	84,534	\$7.43
2022	\$606,452	84,962	\$7.14
2023	\$554,947	85,390	\$6.50
2024	\$478,117	85,818	\$5.57
2025	\$461,771	86,246	\$5.35
2026	\$434,672	86,673	\$5.02
2027	\$386,672	87,101	\$4.44
2028	\$364,280	87,529	\$4.16
Total	\$5,924,749		\$69.62
		Discount Rate	3.00%
		Credit per Person	\$60

Source: City of Portland Finance Department

Nonresidential Credit

Fiscal Year	Payment	Projected Jobs	Payment/Job
Base Year	\$239,968	67,270	\$3.57
2019	\$278,336	67,959	\$4.10
2020	\$263,169	68,648	\$3.83
2021	\$244,354	69,337	\$3.52
2022	\$235,842	70,026	\$3.37
2023	\$215,813	70,715	\$3.05
2024	\$185,935	71,404	\$2.60
2025	\$179,578	72,093	\$2.49
2026	\$169,039	72,782	\$2.32
2027	\$150,372	73,471	\$2.05
2028	\$141,665	74,160	\$1.91
Total	\$2,304,071		\$32.81
		Discount Rate	3.00%
		Credit per Job	\$28

Source: City of Portland Finance Department

Parks & Recreation Impact Fee

Figure 13 shows the cost factors for each component of the City of Portland's Parks and Recreation Impact Fee. Impact fees for parks and recreation are based on household size for residential development (i.e., persons per housing unit), jobs per 1,000 square feet for nonresidential development, and persons per room for hotel development. The fee components are calculated per person and per job, so by multiplying the total cost per person by the household size, for example, calculates the maximum defensible fee for residential development.

The fees represent the highest amount defensible for residential and nonresidential development, which represents new growth's fair share of the cost for capital facilities. The City may adopt fees that are less than the amounts shown. However, a reduction in impact fee revenue will necessitate an increase in other revenues, a decrease in planned capital expenditures, and/or a decrease in levels of service.

Figure 13. Maximum Defensible Park & Recreation Impact Fee

Fee Component	Cost per Person	Cost per Job
Parks	\$267	\$129
Single-Track Trails	\$5	\$2
Rec. Facilities	\$261	\$125
Debt Service Credit	(\$60)	(\$28)
TOTAL	\$473	\$228

Residential (per housing unit)

Type of Unit	Persons per Household	Maximum Defensible Fee
Single Family/Duplex	2.38	\$1,126
Multifamily	1.59	\$752

Nonresidential (per 1,000 square feet)

Type of Unit	Jobs per 1,000 Square Feet	Maximum Defensible Fee
Retail & Service	2.34	\$534
Office	2.97	\$677
Industrial	1.59	\$363
Institutional	2.83	\$645

Nonresidential (per room)

Type of Unit	Persons per Room	Maximum Defensible Fee
Hotel	1.85	\$875

Revenue from Parks & Recreation Impact Fee

Revenue from the City's Parks & Recreation Impact Fee is estimated in Figure 14. There is projected to be an increase of 4,279 in peak population and 6,890 jobs in Portland by 2028. By multiplying the growth by the capital cost per person and per job, the projected revenue is calculated. In total, the impact fee will generate \$3.6 million in revenue. The revenue covers 89 percent of the capital costs generated by projected growth in the City of Portland. Revenue from the fee is expected to not cover all growth-related costs since the credit lessens the fee by about 11 percent.

Figure 14. Estimated Revenue from Parks & Recreation Impact Fee

	Total Cost to Maintain LOS	Cost Attributable to Growth
Parks	\$2,028,229	\$2,028,229
Single-Track Trails	\$34,500	\$34,500
Rec Facilities	\$1,979,344	\$1,979,344
Total Expenditures	\$4,042,073	\$4,042,073

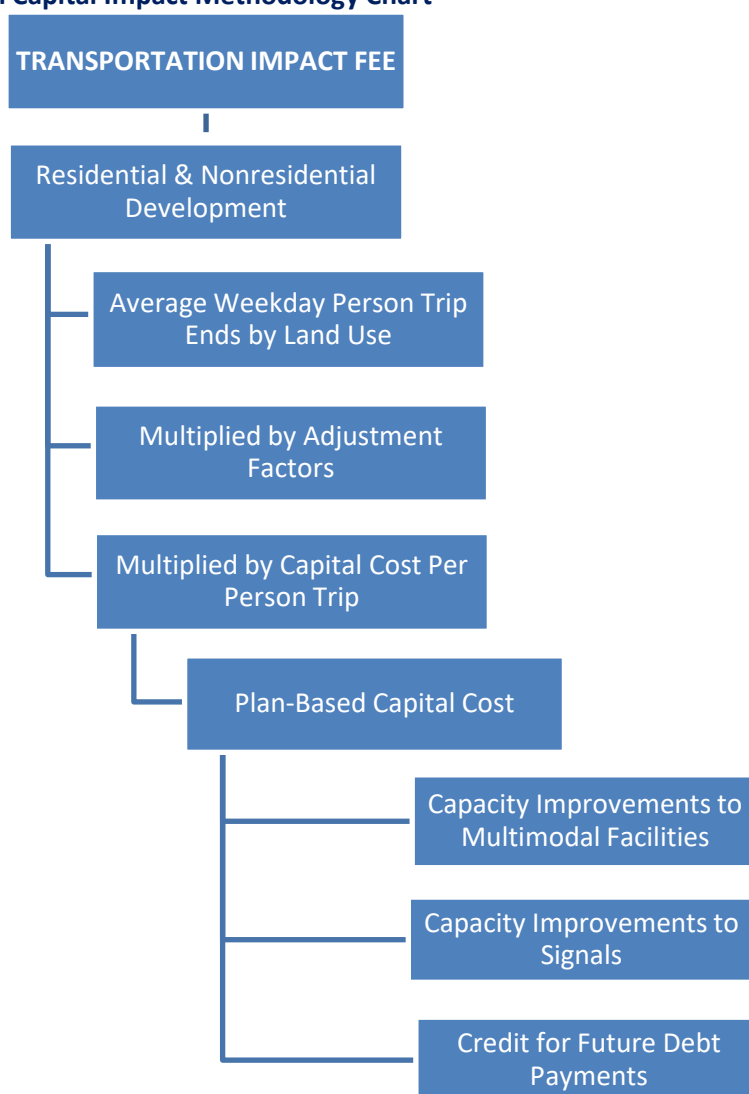
Projected Development Impact Fee Revenue

		Capital Cost per Person \$473	Capital Cost per Job \$228
Year		Population	Jobs
Base	2018	83,250	67,270
Year 1	2019	83,678	67,959
Year 2	2020	84,106	68,648
Year 3	2021	84,534	69,337
Year 4	2022	84,962	70,026
Year 5	2023	85,390	70,715
Year 6	2024	85,818	71,404
Year 7	2025	86,246	72,093
Year 8	2026	86,673	72,782
Year 9	2027	87,101	73,471
Year 10	2028	87,529	74,160
Ten-Year Increase		4,279	6,890
Projected Revenue =>		\$2,023,810	\$1,570,948
Projected Revenue =>			\$3,594,757
Total Expenditures =>			\$4,042,073
General Fund's Share =>			\$447,316

TRANSPORTATION FACILITIES IMPACT FEE

To calculate the City of Portland's Transportation Impact Fee, a **plan-based methodology** is used. The methodology for is shown in Figure 15. To calculate the impact amounts for residential and nonresidential development, trip generation rates by type of development are multiplied by the capital cost per person trip. The methodology includes trip adjustment factors for pass-by trips. The diagram reads like an outline, with lower levels providing a more detailed breakdown of the capital impact components. The capital cost of road improvements is based on three components: capacity improvements to multimodal facilities, improvements to signals, and a credit for future debt payments. Growth's share of future transportation projects needed within the next 10 years are allocated to the increase in person trips at the end of the 10-year planning horizon.

Figure 15. Transportation Capital Impact Methodology Chart



Person Trips

Portland is a unique community with residents and workers using varying modes to travel. In general, an impact fee study calculates future developments' impact on the City's transportation infrastructure. In suburban, greenfield communities that concentrate on roadway expansion to accommodate new vehicles, a development's impact is best estimated by calculating the new vehicle trips or vehicle miles traveled (VMT) generated by the development. However, based on the urban environment and residents' travel behaviors, a multimodal approach is necessary for the City of Portland. This is also consistent with the capital improvements identified in the City's Capital Improvement Plan. As such, the multimodal approach will calculate the daily person trips generated by the varying development types in the study. To encompass the varying modes of travel used in Portland, the methodology includes persons per vehicle trip, transit trip, and non-motorized trips.

In the base year, residential land uses generate 223,734 person trips (30 percent) and nonresidential land uses generate 511,437 person trips (70 percent) in the City of Portland. Through 2028, there will be an increase of 47,721 daily person trips in Portland. The increase in daily person trips will be applied to growth's share of the capital cost for transportation facilities to calculate the capital cost per person trip factor. Further explanation and calculations can be found in Appendix A.

Transportation Level of Service and Cost Factors

Below, the City of Portland's capital cost per person trip for multimodal facilities and signals are calculated. Additionally, a credit for debt payments on past transportation projects is necessary.

Need for Multimodal Improvements and Facilities

The City of Portland has determined that additional growth-related improvements are necessary to accommodate future transportation demand. Listed in Figure 16, there are ten multimodal projects in the City's Capital Improvement Plan that have some element of growth-related costs. In the last two columns of the figure, future growth's percentage share and dollar amount of each project is shown. In total, new growth's share of multimodal capital improvements equals \$7,265,000.

Found at the bottom of Figure 16, growth's cost is divided by the 10-year increase in person trips. This results in a capital cost per person trip of \$152, rounded.

Figure 16. Growth-Related Multimodal Projects

Project	Readiness	Length of Project (linear feet)	Total City Cost	Growth's Share	Growth's Cost
W. Commercial Street Path	High	5,000	\$750,000	50%	\$375,000
Thames Street	High	1,200	\$1,450,000	25%	\$362,500
Franklin Street: I-295 to Somerset	High	700	\$4,050,000	75%	\$3,037,500
Congress Square Intersection Construction	High	650	\$1,300,000	25%	\$325,000
Marginal Way: Hanover to Plowman	High	5,600	\$1,000,000	25%	\$250,000
Kennebec Street Realignment at Forest Avenue	High	450	\$500,000	50%	\$250,000
Somerset Street	High	1,800	\$1,500,000	50%	\$750,000
Forest Avenue (Morrill's Corner Intersections)	High	1,600	\$2,280,000	50%	\$1,140,000
Brighton Avenue	High	13,000	\$1,100,000	25%	\$275,000
Washington Avenue Rehabilitation	High	1,500	\$2,000,000	25%	\$500,000
TOTAL		31,500	\$15,930,000		\$7,265,000

Growth's Cost of Transportation Projects	\$7,265,000
10-Year Increase in Average Daily Person Trips	47,721
Capital Cost per Trip	\$152

Need for Signal Improvements and Facilities

Listed in Figure 17, there are two signal projects in the City's Capital Improvement Plan that have some element of growth-related costs. In the last two columns of the figure, future growth's percentage share and dollar amount of each project is shown. In total, new growth's share of signal capital improvements equals \$8,031,250.

Found at the bottom of Figure 17, growth's cost is divided by the 10-year increase in person trips. This results in a capital cost per person trip of \$168, rounded.

Figure 17. Growth-Related Signal Projects

Project	Readiness	Total Cost	Growth's Share	Growth's Cost
Modernize Signal Systems	High	\$9,375,000	75%	\$7,031,250
Arterial Street Crossings	High	\$2,000,000	50%	\$1,000,000
TOTAL		\$11,375,000		\$8,031,250

Growth's Cost of Transportation Projects	\$8,031,250
10-Year Increase in Average Daily Person Trips	47,721
Capital Cost per Trip	\$168

Transportation Credit

Currently, the City of Portland has existing debt obligations from past transportation projects. In Figure 18, the City of Portland's Finance Department delineated the purposes for each of the City's General Obligation Bonds and summed the future principal and interest payments for transportation projects.

The total annual payment schedule is divided by the City's projected person trips to find the debt per person trip factor. To account for the time value of money, annual payments per trip are discounted using a net present value formula based on the applicable discount (interest) rate. This results in a credit of \$41.00 per person trip, rounded.

Figure 18. Transportation Debt per Person Trip

Fiscal Year	Payment	Projected Ave. Daily Person Trips	Payment/Person Trip
Base Year	\$3,751,763	735,171	\$5.10
2019	\$4,314,139	739,943	\$5.83
2020	\$4,060,134	744,715	\$5.45
2021	\$3,772,123	749,487	\$5.03
2022	\$3,633,359	754,260	\$4.82
2023	\$3,323,658	759,032	\$4.38
2024	\$2,916,044	763,804	\$3.82
2025	\$2,815,726	768,576	\$3.66
2026	\$2,591,944	773,348	\$3.35
2027	\$2,374,976	778,120	\$3.05
2028	\$2,147,023	782,892	\$2.74
Total	\$35,700,889		\$47.24
		Discount Rate	3.00%
	Total Credit per Person Trip		\$41.00

Transportation Impact Fee

Figure 19 shows the cost factors for each component of the City of Portland's Transportation Impact Fee. Impact fees for transportation projects are based on person trips per unit for residential development, person trips per 1,000 square feet for nonresidential development, and person trips per room for hotel development. The fee components are calculated per person trip, so by multiplying the total cost per person by the trip generation factor calculates the maximum defensible fee.

The fees represent the highest amount defensible for residential and nonresidential development, which represents new growth's fair share of the cost for capital facilities. The City may adopt fees that are less than the amounts shown. However, a reduction in impact fee revenue will necessitate an increase in other revenues, a decrease in planned capital expenditures, and/or a decrease in levels of service.

Figure 19. Maximum Defensible Transportation Impact Fee

Input Variables	Cost per Trip for Multimodal Projects =>		\$152
	Cost per Trip for Signals =>		\$168
	Debt Service Credit per Trip =>		(\$41)
	Capital Cost per Person Trip		\$279
Development Type	Avg Wkdy Person Trip Ends	Trip Rate Adjustment	Maximum Defensible Fee
Residential (per housing unit)			
Single Family/Duplex	13.34	58%	\$2,159
Multifamily	6.32	58%	\$1,023
Nonresidential (per 1,000 square feet of floor area)			
Retail & Service	77.80	38%	\$8,248
Office	20.07	50%	\$2,800
Industrial	8.10	50%	\$1,130
Institutional	22.09	50%	\$3,082
Nonresidential (per room)			
Hotel/Motel	17.23	50%	\$2,404

Revenue from Transportation Impact Fee

Revenue from the City's Transportation Impact Fee is estimated in Figure 20. There is projected to be 2,870 new housing units and 2,773,000 square feet of nonresidential development in Portland by 2028. To find the revenue generated by residential and nonresidential development, the growth is multiplied by the corresponding impact fee. For example, future single family/Two-family residential development is projected to generate \$716,788 in revenue from the transportation impact fees (332 new housing units x \$2,159 = \$716,788). The revenue covers 87 percent of the capital costs generated by projected growth in the City of Portland. The revenue is expected to not cover all of growth's costs since the credit for future debt payments lessens the net capital cost per person trip by about 13 percent.

Note: revenue from hotel development is not estimated because of the difficulty of projecting new hotel rooms.

Figure 20. Estimated Revenue from Transportation Impact Fee

	Total Cost	Cost Attributable to Growth
Multimodal Projects	\$15,930,000	\$7,265,000
Signals	\$11,375,000	\$8,031,250
Total Expenditures	\$27,305,000	\$15,296,250

Projected Transportation Impact Fee Revenue

		Single Family/Duplex	Multifamily	Retail & Service	Office	Industrial	Institutional
Year		Housing Units	Housing Units	1,000 Sq. Ft.	1,000 Sq. Ft.	1,000 Sq. Ft.	1,000 Sq. Ft.
Base	2018	21,047	16,575	9,817	9,318	7,225	8,909
Year 1	2019	21,080	16,829	9,874	9,403	7,289	8,980
Year 2	2020	21,113	17,083	9,931	9,489	7,353	9,050
Year 3	2021	21,147	17,336	9,988	9,574	7,418	9,121
Year 4	2022	21,180	17,590	10,045	9,660	7,482	9,191
Year 5	2023	21,213	17,844	10,102	9,745	7,546	9,262
Year 6	2024	21,246	18,098	10,159	9,830	7,611	9,332
Year 7	2025	21,279	18,352	10,216	9,916	7,675	9,402
Year 8	2026	21,313	18,605	10,273	10,001	7,739	9,473
Year 9	2027	21,346	18,859	10,330	10,087	7,804	9,543
Year 10	2028	21,379	19,113	10,387	10,172	7,868	9,614
Ten-Year Increase		332	2,538	571	854	643	704
Transportation Impact Fee		\$2,159	\$1,023	\$8,248	\$2,800	\$1,130	\$3,082
Revenue Subtotal		\$716,788	\$2,596,374	\$4,709,608	\$2,391,200	\$726,590	\$2,169,728

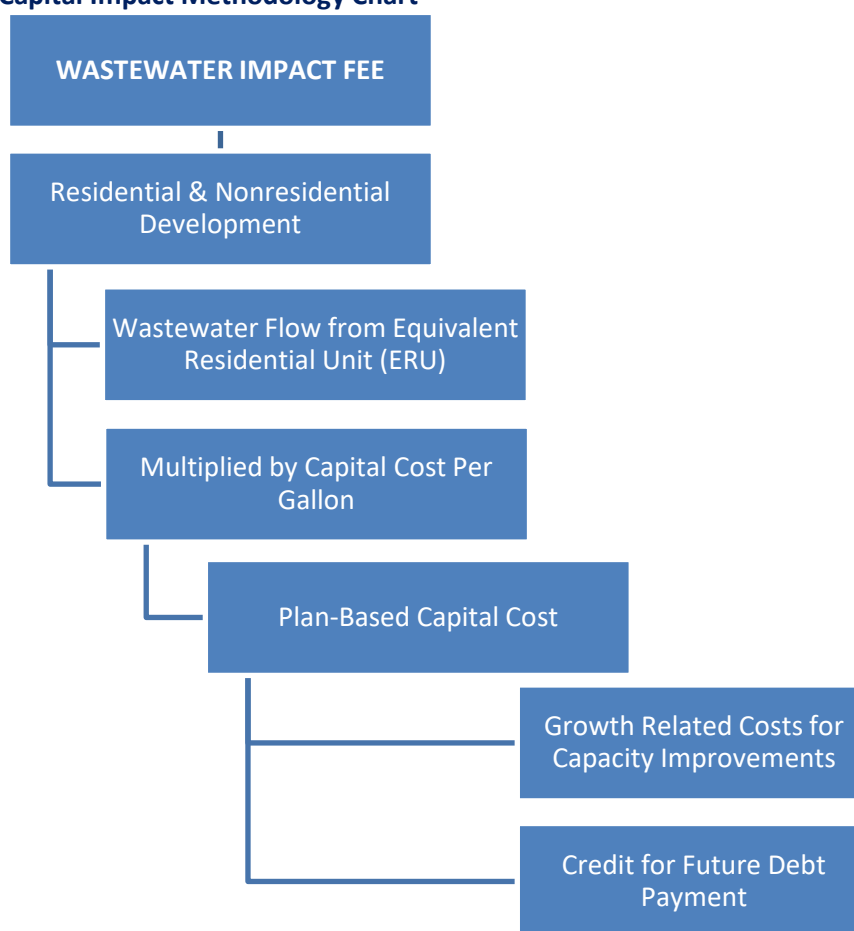
Source: TischlerBise analysis

Projected Revenue => **\$13,310,288**
 Total Expenditures => **\$15,296,250**
 General Fund's Share => **\$1,985,962**

WASTEWATER FACILITIES IMPACT FEE

To calculate the City of Portland's Wastewater Impact Fee, a **plan-based methodology** is used. The methodology for the fee is shown in Figure 21. To calculate the impact amounts for residential and nonresidential development, the wastewater flow for an Equivalent Residential Unit (ERU) is calculated. The ERU is set to the average flow of a wastewater account with a water meter of 5/8 inches. The diagram reads like an outline, with lower levels providing a more detailed breakdown of the fee impact components. The capital cost of wastewater improvements is based future growth's share of capital projects in the City of Portland's Capital Improvement Plan (CIP). Growth's share of future wastewater projects needed within the next 10 years are allocated to the increase in wastewater flow at the end of the 10-year planning horizon.

Figure 21. Wastewater Capital Impact Methodology Chart



Wastewater Level of Service and Cost Factors

Water and sewer account data has been provided by the Portland Water District and the City's Public Works Department. With the database, residential, commercial, industrial, and institutional wastewater usage is calculated. Additionally, with account data, the wastewater usage of an Equivalent Residential Unit (ERU) is calculated as well. The ERU is the estimate of the daily average wastewater usage from a household with a water meter that is 5/8 inches. In the impact fee calculation, a capacity ratio factor is applied when calculating the wastewater usage and resulting impact fee for developments with larger meters.

Current Wastewater Usage

Shown in Figure 22, on average there is a total of 5.7 million gallons per day of wastewater flowing through the City's sewer system from these four development types. The majority of the wastewater flows from residential development, but commercial development creates a significant demand as well.

Figure 22. City of Portland's Daily Wastewater Usage

Development Type	Base Year (gals/day)	%
Residential	2,933,364	52%
Commercial	1,998,656	35%
Industrial	542,244	10%
Institutional	187,205	3%
Total	5,661,470	100%

Source: City of Portland Public Works
Department

Equivalent Residential Unit (ERU)

The wastewater component of the impact fee study will use the average daily wastewater flow for residential units that have a 5/8-inch water meter to represent the Equivalent Residential Unit (ERU). To calculate the ERU, the wastewater account database is filtered by active residential accounts that use the City's sewer system. Additionally, the database is further limited by only year-round accounts. These accounts are occupied households that reside in Portland permanently. Year-round accounts are approximated by accounts that have activity every month. Illustrated in Figure 23, there is an average of 61 hundred cubic feet (HCF) of wastewater per year from a year-round, active residential account flowing into the City's sewer system. That equates to an average of 126 gallons per day, rounded.

Figure 23. Equivalent Residential Unit

Meter Size (inches)	Total Water (HCF)	Active Accounts	Annual Average per Account (HCF)	Annual Average (gallons)	Daily Average (gallons)
5/8	866,230	14,134	61	45,846	126

Source: City of Portland Public Works Department; TischlerBise analysis

Note: Provided data measured wastewater totals in hundred cubic feet (HCF), equal to 748.05 gallons

Need for Wastewater Improvements and Facilities

The City of Portland has determined that additional growth-related improvements are necessary to accommodate future wastewater flow. Listed in Figure 24, there are eight wastewater projects in the City's Capital Improvement Plan that have some element of growth-related costs. In the last two columns of the figure future growth's percentage share and dollar amount of each project is shown. In total, new growth's share of wastewater capital improvements and facilities equals \$8,944,750.

Found at the bottom of Figure 24, growth's cost is divided by the 10-year increase in wastewater flow. This results in a capital cost per gallon of \$22.19, rounded. Further explanation and calculations of the projected increase in wastewater flow can be found in Appendix A.

Figure 24. Growth-Related Wastewater Projects

Project Title	Total	Growth's Share	Growth's Cost
CSO - Close CSO #42	\$2,000,000	10%	\$200,000
CSO - Mackworth Street and Ocean Avenue Sewer Separation Project	\$6,850,000	10%	\$685,000
CSO - Dartmouth Street Sewer Separation Project	\$2,520,000	10%	\$252,000
CMOM - Inflow and Infiltration Program	\$4,050,000	50%	\$2,025,000
CMOM - Pump Station Rehabilitation	\$3,350,000	25%	\$837,500
Eastern Waterfront Sewer / Stormwater Extension & Outfall (Thames St)	\$1,025,000	85%	\$871,250
Franklin Street Storm Drain	\$5,300,000	75%	\$3,975,000
Warren Ave Storm Drain - 517 Warren Ave to 659 Warren Ave	\$990,000	10%	\$99,000
TOTAL	\$26,085,000		\$8,944,750

Growth's Cost of Wastewater Projects	\$8,944,750
10-Year Increase in Wastewater Flow (gallons)	403,049
Capital Cost per Gallon	\$22.19

Wastewater Credit

Currently, the City of Portland has existing debt obligations from past wastewater projects. In Figure 25, the City of Portland's Finance Department delineated the purposes for each of the City's General Obligation Bonds and summed the future principal and interest payments for wastewater projects.

The total annual payment schedule is divided by the City's projected wastewater flow to find the debt payment per gallon. To account for the time value of money, annual payments per gallon are discounted using a net present value formula based on the applicable discount (interest) rate. This results in a credit of \$7.22 per gallon, rounded.

Figure 25. Wastewater Debt Payment per Gallon

Fiscal Year	Payment	Projected Wastewater Flow (gals)	Payment/Gallon
Base Year	\$4,984,702	5,661,470	\$0.88
2019	\$5,301,355	5,701,775	\$0.93
2020	\$5,185,898	5,742,080	\$0.90
2021	\$5,039,052	5,782,385	\$0.87
2022	\$4,943,283	5,822,690	\$0.85
2023	\$4,435,393	5,862,995	\$0.76
2024	\$4,084,329	5,903,299	\$0.69
2025	\$4,023,542	5,943,604	\$0.68
2026	\$3,924,669	5,983,909	\$0.66
2027	\$3,833,159	6,024,214	\$0.64
2028	\$3,671,719	6,064,519	\$0.61
Total	\$49,427,101		\$8.47
		Discount Rate	3.00%
		Total Credit per Gallon	\$7.22

Wastewater Impact Fee

Figure 26 shows the cost factors for each component of the Wastewater Impact Fee. The impact fee for wastewater is based on the total capital cost per gallon and the Equivalent Residential Unit (ERU). For meters that are larger than 5/8 inches, a capacity ratio is applied. The water capacity for each meter size is provided by the American Water Works Association, see Appendix C. The maximum defensible fee for a 5/8-inch meter is \$1,886 (\$14.97 per gallon x 126 gallons per day = \$1,886, rounded).

The fees represent the highest amount defensible for each meter size, which represents new growth's fair share of the cost for capital facilities. The City may adopt fees that are less than the amounts shown. However, a reduction in impact fee revenue will necessitate an increase in other revenues, a decrease in planned capital expenditures, and/or a decrease in levels of service.

Figure 26. Maximum Defensible Wastewater Impact Fee

Growth Capital Cost per Gallon =>		\$22.19
Debt Service Credit per Gallon =>		(\$7.22)
Capital Cost per Gallon of Capacity =>		\$14.97
Max Daily Gallons per ERU =>		126
Meter Size (inches)	Capacity Ratio	Maximum Defensible Fee
All Development (per meter)		
5/8	1.00	\$1,886
3/4	1.50	\$2,829
1	2.50	\$4,715
1.5	5.00	\$9,430
2	8.00	\$15,088
3	16.00	\$30,176
6	50.00	\$94,300
8	80.00	\$150,880

Source: American Water Works Association, Principles of Water Rates, Fees, and Charges, M1, 7th ed., 2017;
TischlerBise analysis

Revenue from Wastewater Impact Fee

Revenue from the City's Wastewater Impact Fee is estimated in Figure 27. There is projected to be 4,279 new residents and 6,890 new jobs in Portland by 2028. To find the revenue generated by residential and nonresidential development, the growth is multiplied by the average daily wastewater flow per person or job and the capital cost per gallon. For example, future residential development is projected to generate \$2,254,793 in wastewater impact fees (4,279 new residents x 35.2 wastewater gallons x \$14.97 = \$2,254,793). The revenue covers 72 percent of the capital costs generated by projected growth in the City of Portland. The revenue is not expected to cover all growth-related costs since the credit for future debt payments lessens the net capital cost per gallon by about 30 percent.

Figure 27. Estimated Revenue from Wastewater Impact Fee

	Total Cost	Cost Attributable to Growth
Wastewater Facilities	\$26,085,000	\$8,944,750
Total Expenditures	\$26,085,000	\$8,944,750

Projected Wastewater Impact Fee Revenue

		Residential	Nonresidential
Year		Population	Jobs
Base	2018	83,250	67,270
Year 1	2019	83,678	67,959
Year 2	2020	84,106	68,648
Year 3	2021	84,534	69,337
Year 4	2022	84,962	70,026
Year 5	2023	85,390	70,715
Year 6	2024	85,818	71,404
Year 7	2025	86,246	72,093
Year 8	2026	86,673	72,782
Year 9	2027	87,101	73,471
Year 10	2028	87,529	74,160
Ten-Year Increase		4,279	6,890
Water Demand, per Pop./Job		35.2	40.6
Cost per Gallon		\$14.97	\$14.97
Revenue Subtotal		\$2,254,793	\$4,187,618

Source: TischlerBise analysis

Projected Revenue =>	<u>\$6,442,411</u>
Total Expenditures =>	<u>\$8,944,750</u>
General Fund's Share =>	<u>\$2,502,339</u>

IMPLEMENTATION AND ADMINISTRATION

Impact fees should be periodically evaluated and updated to reflect recent data. City of Portland will continue to adjust for inflation. If cost estimates or demand indicators change significantly, the City should redo the fee calculations.

Credits and Reimbursements

A general requirement that is common to impact fee methodologies is the evaluation of credits. A credit has been included in this fee study to avoid potential double payment situations arising from one-time impact fees plus on-going payment of other revenues that may also fund growth-related capital improvements.

Policies and procedures related to site-specific credits should be addressed in the resolution or ordinance that establishes the impact fees. Project-level improvements, required as part of the development approval process, are not eligible for credits against impact fees. If a developer constructs a system improvement included in the fee calculations, it will be necessary to either reimburse the developer or provide a credit against the fees due from that particular development. The latter option is more difficult to administer because it creates unique fees for specific geographic areas.

Service Area

An impact fee service area is a region in which a defined set of improvements provide benefit to an identifiable amount of new development. Within a service area, all new development of a type (single family, commercial, etc.) is assessed at the same impact fee rate. Land use assumptions and impact fees are each defined in terms of this geography, so that capital facility demand, projects needed to meet that demand, and capital facility cost are all quantified in the same terms. Impact fee revenue collected within a service area is required to be spent within that service area.

Implementation of a large number of small service areas is problematic. Administration is complicated and, because funds collected within the service area must be spent within that area multiple service areas, may make it impossible to accumulate sufficient revenue to fund any projects within the time allowed.

As part of our analysis of the City of Portland and the type of facilities and improvements included in the impact fee calculation, TischlerBise has determined that a citywide service area is appropriate.

APPENDIX A: LAND USE ASSUMPTIONS**Population and Housing Characteristics**

Impact fees often use per capita standards and persons per housing unit or persons per household to derive proportionate share fee amounts. Housing types have varying household sizes and, consequently, a varying demand on City infrastructure and services. Thus, it is important to differentiate between housing types and size.

When persons per housing unit (PPHU) is used in the fee calculations, infrastructure standards are derived using year-round population. In contrast, when persons per household (PPHH) is used in the fee calculations, the fee methodology assumes all housing units will be occupied, thus requiring seasonal or peak population to be used when deriving infrastructure standards. From the Maine Office of Tourism, the Greater Portland and Casco Bay region saw 5.4 million visitors in 2016. As a result, it is not just permanent residents occupying housing units in Portland. In response, City infrastructure and operating service levels are sized to accommodate not just permanent residents, but seasonal residents, seasonal workers, and visitors as well. Thus, TischlerBise recommends that fees for residential development in the City of Portland be imposed according to the persons per household (PPHH).

Persons per household (PPHH) will be held constant over the projection period since the study represents a “snapshot approach” of current levels of service and costs. Based on household characteristics, TischlerBise recommends using two housing unit categories for the impact fee study: (1) Single Family and (2) Multifamily. “Single family/Two-family” units include single family detached, single family attached, two-families, and mobile homes, as defined in the City’s land use code. Multifamily units include structures with more than 2 units. Figure 28 shows the US Census, American Community Survey 2016 5-Year Estimates data for the City of Portland. Single family/two-family units have a household size of 2.38 persons per unit and multifamily units have a household size of 1.59 persons per unit.

Additionally, single family/Two-family units have a vacancy rate of 9.8 percent and are 70 percent of the housing stock in Portland. Multifamily units have a vacancy rate of 9.4 percent and are 30 percent of the housing stock in Portland.

Figure 28. Persons per Household

Type of Structure	Persons	House-holds	Persons per Household	Housing Units	Persons per Housing Unit	Housing Mix	Vacancy Rate
Single Family/Duplex Unit ¹	50,010	21,052	2.38	23,338	2.14	69.8%	9.8%
Multifamily Unit ²	14,542	9,149	1.59	10,098	1.44	30.2%	9.4%
Total	64,552	30,201	2.14	33,436	1.93		9.7%

Source: TischlerBise analysis; U.S. Census Bureau, 2012-2016 American Community Survey, 5-Year Estimates

[1] Includes detached, attached, duplexes, and mobile home units.

[2] Includes structures with more than 2 units.

Base Year Population and Housing Units

Permanent Residents

Along with the population estimate for residents in single family and multifamily units, the American Community Survey provides population estimates for those residing in group quarters (i.e. student housing and military residents). Found in Figure 29, the household population and group quarters are considered the City's permanent population. In 2016 it is estimated that the permanent population was 66,627.

Figure 29. Permanent Population, 2016

Type of Structure	Persons	%
Single Family/Duplex Unit	50,010	75.1%
Multifamily Unit	14,542	21.8%
Group Quarters	2,075	3.1%
Total	66,627	100.0%

Source: U.S. Census Bureau, 2012-2016 American Community Survey, 5-Year Estimates

In the recently published *Portland's Plan 2030*, several population growth scenarios, modeled by the Greater Portland Council of Governments (GPCOG), are played out. The comprehensive plan shows that a medium-level growth scenario would result in a 2030 population of 71,374. Using this projection for the impact fee study, by 2030 the City of Portland is forecasted to have a permanent population of 71,374. To estimate the City's population in the interim years, a straight-line approach is used. Figure 30 illustrates the growth in permanent population. In the base year, 2018, there is estimated to be 67,305 permanent residents in Portland.

Figure 30. Base Year Permanent Population

	5-Year Increments							Total Increase
	2016	2017	Base Year 2018	2019	2020	2025	2030	
Permanent Population	66,627	66,966	67,305	67,644	67,983	69,679	71,374	4,747
Percent Increase		0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	7.1%

Source: U.S. Census Bureau, 2012-2016 American Community Survey, 5-Year Estimates; City of Portland Planning Department; TischlerBise analysis

Seasonal Residents

As mentioned, the impact fee study will be using a peak population of Portland because of the large tourism industry. It is assumed that City infrastructure and services are sized to serve a peak population not just the permanent population. In this case, two additional populations need to be calculated: seasonal and visitor. The seasonal population includes residents who have second homes in Portland and

the seasonal labor influx during peak tourism months. The visitor population includes overnight and day visitors.

To calculate the seasonal population, the study assumes full occupancy of the housing units in the city. From the US Census data, in 2016, there were 2,286 vacant single family/Two-family homes and 949 vacant multifamily homes. The seasonal population is calculated by multiplying the units by the corresponding the persons per household factor (PPHH). In 2016, there was a seasonal population of 6,950.

Figure 31. Seasonal Population, 2016

Type of Structure	Vacant Units	Persons per Household	Seasonal Population
Single Family/Duplex Unit ¹	2,286	2.38	5,441
Multifamily Unit ²	949	1.59	1,509
Total	3,235	2.15	6,950

Source: TischlerBise analysis; U.S. Census Bureau, 2012-2016

American Community Survey, 5-Year Estimates

[1] Includes detached, attached, duplexes, and mobile home units.

[2] Includes structures with more than 2 units.

Seasonal Visitors

The visitor population for Portland is found by first analyzing the state and regional totals. In 2016, there were 41.2 million visitors to Maine. The majority of the visitors came in the summer, resulting in the average daily number of visitors in the summer being 185 percent of the annual average.

Figure 32. State of Maine Visitor Totals, 2016

Season	Total Visitors	Average Daily Visitors	Percent of Annual Ave.
Winter	5,615,670	46,156	41%
Summer	25,328,066	208,176	185%
Fall	10,230,660	84,088	75%
Total	41,174,396	112,807	100%

Source: Maine Office of Tourism, 2016 Calendar Year Annual Report

According to the Maine Office of Tourism (MOT), there were 5,360,000 visitors (overnight and day visitors) to the Greater Portland and Casco Bay Region in 2016. Results of the MOT's visitor survey indicate that the Portland's Waterfront was the top attraction for 33 percent of overnight visitors and for 30 percent of day visitors. The study will use a conservative method and use these percentages to allocate the regional visitor total to the City of Portland.

In Figure 33 the City of Portland's daily peak visitor population is calculated. The estimated total of overnight visitors to Portland is 745,800. The estimated total of day visitors to Portland is 930,000. As a result, the total annual visitors to the City of Portland is 1,675,800, or an average of 4,591 per day. Found above, during the summer statewide, the visitor population spikes to 185 percent of the annual average. This factor is applied to the City's average to calculate the daily peak season visitor total. As a result, in 2016, it is estimated that the City of Portland's daily peak season visitor population was 8,473.

Figure 33. City of Portland Peak Season Visitor Population, 2016

Overnight Visitors to Region	2,260,000
City's Proportion of Region	33%
Overnight Visitors to Portland	745,800
Day Visitors to Region	3,100,000
City's Proportion of Region	30%
Day Visitors to Portland	930,000
Total Annual Visitors to Portland	1,675,800
Average Daily Visitors	4,591
Peak Season Multiplier	185%
Daily Peak Season Visitor Total	8,473

Source: Maine Office of Tourism, 2016;
TischlerBise Analysis

The study assumes that the visitor population will have a positive relationship and follow the permanent population's growth. From 2016 to 2018 there is a 1.02 percent increase in permanent population in Portland; this is applied to the visitor population to calculate the base year total. It is assumed that during the peak seasonal period the City's seasonal population (seasonal residents and workers) occupies the vacant housing units. As a result, the seasonal population is calculated based on housing growth, described in the next section of the report. In 2018, it is estimated that the peak population for the City of Portland is 83,250.

Figure 34. Base Year Peak Population

	2016	2017	Base Year 2018
Peak Population			
Permanent	66,627	66,966	67,305
Seasonal	6,950	7,168	7,386
Visitor	8,473	8,516	8,559
Total	82,049	82,650	83,250

Source: TischlerBise analysis

Base Year Housing Stock

To understand the housing growth in the City of Portland, the building permit data from the last five years is collected in Figure 35. Over the past 5 years there has been an increase of 1,435 housing units in Portland and, on average, there have been 33 single family/Two-family and 254 multifamily housing units constructed annually. It is assumed this trend will continue and the averages are used to project housing development in the City of Portland.

Figure 35. Permitted Housing Units

Housing Type	2013	2014	2015	2016	2017	Total	Average
Single Family/Duplex	26	53	23	38	26	166	33
Multifamily	168	97	187	611	206	1,269	254
Total	194	150	210	649	232	1,435	287

Source: City of Portland Planning Department

By examining parcel data provided by the City with a GIS (Geographic Information System) software, the base year housing stock is estimated in Figure 36. In total, 56 percent of the housing in the City of Portland is single family/Two-family and 44 percent multifamily. Consistent with the City's land use code, single family units include single family detached, single family attached, Two-familys, and mobile homes. Multifamily units include structures with 3 or more units.

Figure 36. Base Year Housing Stock (Housing Units)

Housing Type	Base Year 2018	%
Single Family/Duplex	21,047	56%
Multifamily	16,575	44%
Total	37,622	100%

Source: City of Portland GIS Data

Population and Housing Unit Projections

Illustrated in Figure 37, by using the projections from *Portland's Plan 2030* for permanent population, a growth of 3,391 residents is projected by 2028. The seasonal population is assumed to grow with housing development. The vacancy rates found in Figure 28 are assumed to hold through the projection period and the seasonal population is found by combining the estimated vacant units with the corresponding PPHH factor. Lastly, to project the daily peak visitor population growth, the annual percent increase in permanent population is applied. Overall, there is a peak population increase of 4,279. Of the total population in 2028, 81 percent is permanent, 9 percent is seasonal, and 10 percent is visitor population.

To project the housing unit growth in Portland, the five-year annual average of building permits is used (see Figure 35). Over the ten-year projection period, the housing stock in the city is estimated to increase by 2,870 units (88 percent multifamily units).

Figure 37. City of Portland Annual Residential Development Projections

	Base Year 2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total Increase
Peak Population												
Permanent	67,305	67,644	67,983	68,322	68,661	69,001	69,340	69,679	70,018	70,357	70,696	3,391
Seasonal	7,386	7,432	7,478	7,523	7,569	7,615	7,660	7,706	7,752	7,797	7,843	457
Visitor	8,559	8,602	8,645	8,688	8,731	8,775	8,818	8,861	8,904	8,947	8,990	431
Total	83,250	83,678	84,106	84,534	84,962	85,390	85,818	86,246	86,673	87,101	87,529	4,279
Housing Unit												
Single Family/Duplex	21,047	21,080	21,113	21,147	21,180	21,213	21,246	21,279	21,313	21,346	21,379	332
Multifamily	16,575	16,829	17,083	17,336	17,590	17,844	18,098	18,352	18,605	18,859	19,113	2,538
Total	37,622	37,909	38,196	38,483	38,770	39,057	39,344	39,631	39,918	40,205	40,492	2,870

Source: Portland's Plan 2030; TischlerBise analysis

Current Employment and Nonresidential Floor Area

The impact fee study will include nonresidential development as well. According to the U.S. Census Bureau's web application, OnTheMap, there were 65,203 jobs in Portland in 2015. The education, health care, and social assistance services accounted for the largest percentage of the total (26.2 percent).

Figure 38. Employment by Industry Sector, 2015

Industry Sector	Employment	%
Agriculture, forestry, fishing and hunting, and mining	18	0.0%
Utilities	395	0.6%
Construction	2,015	3.1%
Manufacturing	2,714	4.2%
Wholesale trade	2,478	3.8%
Retail trade	5,302	8.1%
Transportation and warehousing, and utilities	2,065	3.2%
Information	1,529	2.3%
Finance and insurance, and real estate and rental and leasing	8,114	12.4%
Professional, scientific, mgmt. , admin., and waste mgmt. services	11,893	18.2%
Educational services, and health care and social assistance	17,057	26.2%
Arts, entertainment, recreation, accommodation, and food services	7,354	11.3%
Other services, except public administration	2,475	3.8%
Public administration	1,794	2.8%
Total	65,203	100.0%

Source: U.S. Census Bureau, OnTheMap 2015

The fourteen industry sectors in Figure 38 have been compiled into four industries: retail, office, industrial, and institutional. The City of Portland's employment is pretty well dispersed between the industries, with the institutional and office industries accounting for the highest percentages of employment, Figure 39.

Figure 39. Employment by Industry, 2015

Industry	Jobs	%
Retail	12,656	19%
Office	24,011	37%
Industrial	9,685	15%
Institutional	18,851	29%
Total	65,203	100%

Source: U.S. Census Bureau, OnTheMap 2015

Since the breakdown is for 2015, a projection is necessary to estimate the job totals for the base year. To estimate the current employment in the City of Portland, employment projections from Portland Area Comprehensive Transportation System (PACTS) are used. Based on employment projections at the Traffic Analysis Zone (TAZ) level, PACTS forecast an employment increase of 27.5 percent from 2014 to 2040. The annual percent increase of the PACTS projection is used to calculate the employment growth in Figure 40. The breakdown by industry in Figure 39 is then applied to total increase to calculate the growth in each industry. In the base year, it is estimated that there are 67,270 jobs in Portland.

Figure 40. Base Year Employment

	2015	2016	2017	Base Year 2018
Employment				
Retail	12,656	12,790	12,923	13,057
Office	24,011	24,265	24,518	24,772
Industrial	9,685	9,787	9,890	9,992
Institution	18,851	19,050	19,249	19,449
Total	65,203	65,892	66,581	67,270

Source: Portland Area Comprehensive Transportation System (PACTS); TischlerBise analysis

Base year nonresidential floor area for the retail, office, industrial, and institutional industry sectors are calculated with GIS parcel data provided by City staff. In Figure 41, there is a total of 35.3 million square feet of nonresidential floor area in Portland in 2018, with all sectors accounting for at least 20 percent. Additionally, the figure lists the City's land use categories used to determine the floor area of each industry.

Figure 41. Base Year Nonresidential Floor Area

Industry	Nonresidential Sq. Ft.	%	Land Use Categories
Retail	9,816,540	28%	Multiuse Commercial, Retail & Personal Services
Office	9,317,766	26%	Office & Business Services, Communications, Commercial Condos
Industrial	7,224,665	20%	Manufacturing & Constr., Multiuse Ind., Transport, Warehouse, Wholesale
Institutional	8,909,498	25%	Charitable, Government, Scientific Inst., Religious, Other Exempt by Law
Total	35,268,468	100%	

Source: City of Portland GIS data

Employment and Nonresidential Floor Area Projections

To project nonresidential floor area, square feet per employee factors from the Institute for Transportation Engineer's Trip Generation (2017) are used. To estimate the factor for retail, the shopping center factor is used, for office the general office factor is used, for industrial the manufacturing factor is used, and for institutional the hospital factor is used (Figure 42).

Figure 42. Institute of Transportation Engineers Nonresidential Land Use Factors

ITE Code	Land Use	Demand Unit	Emp Per Dmd Unit	Sq Ft Per Emp
110	Light Industrial	1,000 Sq Ft	1.63	615
130	Industrial Park	1,000 Sq Ft	1.16	864
140	Manufacturing	1,000 Sq Ft	1.59	628
150	Warehousing	1,000 Sq Ft	0.34	2,902
254	Assisted Living	bed	0.61	na
320	Motel	room	0.13	na
520	Elementary School	1,000 Sq Ft	0.93	1,076
530	High School	1,000 Sq Ft	0.63	1,581
540	Community College	student	0.08	na
550	University/College	student	0.18	na
565	Day Care	student	0.19	na
610	Hospital	1,000 Sq Ft	2.83	354
620	Nursing Home	1,000 Sq Ft	2.28	438
710	General Office (avg size)	1,000 Sq Ft	2.97	337
760	Research & Dev Center	1,000 Sq Ft	3.42	292
770	Business Park	1,000 Sq Ft	3.08	325
820	Shopping Center (avg size)	1,000 Sq Ft	2.34	427

Source: Trip Generation, Institute of Transportation Engineers, 10th Edition (2017)

Found in Figure 43, job growth over the next ten years is projected to follow PACTS' annual percentage increase forecast. In total, 6,890 new jobs are projected by 2028. Each industry sector is projected to have an increase over 1,000 jobs, with office topping the four with an increase of 2,537 jobs.

To project floor area, the square foot per job factors are applied to the corresponding job totals. Over the next ten years, it is projected that there will be a growth of 2.8 million nonresidential square feet in the City of Portland. The office and institutional industries are projected to have the largest increases in floor area, both over 700,000 square feet.

Figure 43. Employment and Nonresidential Floor Area Projections

Industry	Base Year 2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total Increase
Employment												
Retail	13,057	13,191	13,325	13,458	13,592	13,726	13,860	13,993	14,127	14,261	14,395	1,337
Office	24,772	25,026	25,280	25,533	25,787	26,041	26,295	26,548	26,802	27,056	27,309	2,537
Industrial	9,992	10,094	10,197	10,299	10,401	10,504	10,606	10,708	10,811	10,913	11,015	1,023
Institution	19,449	19,648	19,847	20,046	20,245	20,445	20,644	20,843	21,042	21,241	21,441	1,992
Total	67,270	67,959	68,648	69,337	70,026	70,715	71,404	72,093	72,782	73,471	74,160	6,890
Nonresidential Floor Area (1,000 sq. ft.)												
Retail	9,817	9,874	9,931	9,988	10,045	10,102	10,159	10,216	10,273	10,330	10,387	571
Office	9,318	9,403	9,489	9,574	9,660	9,745	9,830	9,916	10,001	10,087	10,172	854
Industrial	7,225	7,289	7,353	7,418	7,482	7,546	7,611	7,675	7,739	7,804	7,868	643
Institution	8,909	8,980	9,050	9,121	9,191	9,262	9,332	9,402	9,473	9,543	9,614	704
Total	35,268	35,546	35,823	36,100	36,378	36,655	36,932	37,209	37,487	37,764	38,041	2,773

Source: Portland Area Comprehensive Transportation System (PACTS); City of Portland; TischlerBise analysis

Person Trip Generation

Portland is a unique community with residents and workers using varying modes to travel. In general, an impact fee study calculates future developments' impact on the City's transportation infrastructure. In suburban, greenfield communities that concentrate on roadway expansion to accommodate new vehicles, a development's impact is best estimated by calculating the new vehicle trips or vehicle miles traveled (VMT) generated by the development. However, based on the urban environment and residents' travel behaviors, a multimodal approach is necessary for the City of Portland. This is also consistent with the capital improvements identified in the City's Capital Improvement Plan. As such, the multimodal approach will calculate the daily person trips generated by the varying development types in the study. To encompass the varying modes of travel used in Portland, the methodology includes persons per vehicle trip, transit trip, and non-motorized trips.

Person Trip Methodology

According to the Institute of Transportation Engineers (ITE), there are several elements necessary to calculate person trips. The following equation is provided in the ITE's Trip Generation Handbook (2017):

$$\text{Person trips} = [(\text{vehicle occupancy}) \times (\text{vehicle trips})] + \text{transit trips} + \text{walk trips} + \text{bike trips}$$

To create a more streamlined approach, this study uses "non-motorized trips" as the sum of walk trip and bike trips. The Trip Generation Handbook outlines the general approach to calculating person trips (further detail of methodology used is described in following sections):

1. **Estimate vehicle trips generated by development type.**
 - a. This study uses the vehicle trip rates found in ITE's Trip Generation Manual (2017).
2. **Determine mode share and vehicle occupancy.**
 - a. Trip survey data from the National Household Transportation Survey (2017) is used to calculate needed factors.
3. **Convert vehicle trips to person trips.**
 - a. This conversion calculates the total person trips by combining the vehicle trip mode share and vehicle occupancy.
4. **Calculate the estimated person trips by mode.**
 - a. The mode share split is applied to the total person trip rate to calculate the specific person trip rate for vehicle, transit, and non-motorized trips per land use.

Residential Vehicle Trips

A customized vehicle trip rate is calculated for the single family and multifamily units in the City of Portland. In Figure 44, the most recent data from the American Community Survey is inputted into equations provided by the ITE to calculate the vehicle trip ends per housing unit factor. A single family/Two-family unit is estimated to generate 7.6 trip ends on an average weekday and a multifamily unit is estimated to generate 3.6 trip ends on an average weekday.

Figure 44. Customized Residential Vehicle Trip End Rates

	Vehicles Available (1)	Households (2)			Vehicles per Household by Tenure
		Single Family/Duplex	Multifamily Units	Total HHs	
Owner-occupied	23,000	12,312	680	12,992	1.77
Renter-occupied	17,976	8,740	8,469	17,209	1.04
TOTAL	40,976	21,052	9,149	30,201	1.36
Housing Units (6) =>		23,338	10,098	33,436	
Persons per Housing Unit =>		2.14	1.44	1.93	

	Persons (3)	Trip Ends (4)	Vehicles by Type of Housing	Trip Ends (5)	Average Trip Ends	Trip Ends per Housing Unit
Single Family/Duplex	50,010	154,055	30,926	202,330	178,192	7.60
Multifamily	14,542	33,220	10,050	39,892	36,556	3.60
TOTAL	64,552	187,275	40,976	242,222	214,748	6.40

(1) Vehicles available by tenure from Table B25046, 2012-2016 American Community Survey 5-Year Estimates.

(2) Households by tenure and units in structure from Table B25032, American Community Survey, 2012-2016.

(3) Persons by units in structure from Table B25033, American Community Survey, 2012-2016.

(4) Vehicle trips ends based on persons using formulas from Trip Generation (ITE 2017). For single family housing (ITE 210), the fitted curve equation is $\text{EXP}(0.89 \cdot \text{LN}(\text{persons}) + 1.72)$. To approximate the average population of the ITE studies, persons were divided by 286 and the equation result multiplied by 286. For multifamily housing (ITE 221), the fitted curve equation is $(2.29 \cdot \text{persons}) - 81.02$.

(5) Vehicle trip ends based on vehicles available using formulas from Trip Generation (ITE 2017). For single family housing (ITE 210), the fitted curve equation is $\text{EXP}(0.99 \cdot \text{LN}(\text{vehicles}) + 1.93)$. To approximate the average number of vehicles in the ITE studies, vehicles available were divided by 485 and the equation result multiplied by 485. For multifamily housing (ITE 220), the fitted curve equation is $(3.94 \cdot \text{vehicles}) + 293.58$ (ITE 2012).

(6) Housing units from Table B25024, American Community Survey, 2012-2016.

Nonresidential Vehicle Trips

Vehicle trip generation for nonresidential land uses are calculated by using ITE's average daily trip end rates found in their recently published 10th edition of Trip Generation. To estimate the trip generation in Portland, the weekday trip end per 1,000 square feet factors highlighted in Figure 45 are used. To estimate the trip generation for retail the shopping center factor is used, for office the general office factor is used, for industrial the manufacturing factor is used, and for institutional the hospital factor is used.

Figure 45. Institute of Transportation Engineers Nonresidential Land Use Factors

ITE Code	Land Use	Demand Unit	Wkdy Trip Ends Per Dmd Unit	Wkdy Trip Ends Per Employee
110	Light Industrial	1,000 Sq Ft	4.96	3.05
130	Industrial Park	1,000 Sq Ft	3.37	2.91
140	Manufacturing	1,000 Sq Ft	3.93	2.47
150	Warehousing	1,000 Sq Ft	1.74	5.05
254	Assisted Living	bed	2.60	4.24
320	Motel	room	3.35	25.17
520	Elementary School	1,000 Sq Ft	19.52	21.00
530	High School	1,000 Sq Ft	14.07	22.25
540	Community College	student	1.15	14.61
550	University/College	student	1.56	8.89
565	Day Care	student	4.09	21.38
610	Hospital	1,000 Sq Ft	10.72	3.79
620	Nursing Home	1,000 Sq Ft	6.64	2.91
710	General Office (avg size)	1,000 Sq Ft	9.74	3.28
760	Research & Dev Center	1,000 Sq Ft	11.26	3.29
770	Business Park	1,000 Sq Ft	12.44	4.04
820	Shopping Center (avg size)	1,000 Sq Ft	37.75	16.11

Source: Trip Generation, Institute of Transportation Engineers, 10th Edition (2017)

Mode Share and Vehicle Occupancy

Data from the National Household Travel Survey (NHTS) is used to approximate the percentage split of total person trips by transportation modes in the City of Portland. NHTS has been conducting stratified, random surveys for nearly 50 years with the aim to understand the modes and purposes of travel in the US. For this study, the most recent survey, 2017, is refined to create a database of survey responses that is both from similar cities to Portland and statistically significant. Initially, the national database of responses is refined by location and population, the results are limited to New England metropolitan statistical areas (ME, NH, VT, CT, MA, RI) with less than 1 million residents. The City of Portland is within the Portland-South Portland-Biddeford, Maine metropolitan statistical area that had a population of 523,874 in 2016 (US Census American Community Survey, 2016). The database is further filtered to only include responses from urban areas and urban clusters. Lastly, only responses for trips on weekdays are included. As a result, there are 2,656 NHTS responses in the database that are used to approximate the mode splits and vehicle occupancy.

Data from NHTS indicates the purpose of a trip which allows for the mode share and vehicle occupancy to be calculated for residential and nonresidential land uses separately. It is assumed that trips for residential and nonresidential purposes have different characteristics, so by calculating separately the analysis results in more accurate trip factors. There are 1,447 survey responses that are attributed to

residential and 1,209 responses attributed to nonresidential land uses. Both databases are well within a 95 percent confidence level with a confidence interval (margin of error) of less than 3.¹

The transportation mode split for residential purpose trips is listed in Figure 46. Of the 1,447 total trips, 86 percent are by vehicle, 1 percent transit, and 13 percent non-motorized. Additionally, during the vehicle trips there were 1,877 passengers, resulting in an average vehicle occupancy of 1.51 passengers per vehicle trip.

Figure 46. Residential Purpose Person Trips by Mode

Mode	Trips	%
Vehicle	1,246	86%
Transit	18	1%
Non-Motorized	183	13%
Total	1,447	100%

Source: National Household Travel Survey, 2017; TischlerBise analysis

The transportation mode split for nonresidential purpose trips is listed in Figure 47. Of the 1,209 total trips, 82 percent are by vehicle, 2 percent transit, and 16 percent non-motorized. Additionally, during the vehicle trips there were 1,669 passengers, resulting in an average vehicle occupancy of 1.69 passengers per vehicle trip.

Figure 47. Nonresidential Purpose Person Trips by Mode

Mode	Trips	%
Vehicle	989	82%
Transit	22	2%
Non-Motorized	198	16%
Total	1,209	100%

Source: National Household Travel Survey, 2017; TischlerBise analysis

¹ A confidence level expresses the certainty that the true mean of the population falls within the confidence interval, the margin of error of the results.

Vehicle Trip Ends to Find Total Person Trip Ends

The total person trip end rate for each land use can be calculated using the vehicle trip end rate, vehicle occupancy rate, and vehicle mode share. The following formula to calculate vehicle trip ends is provided in the ITE's Trip Generation Handbook (2017):

$$\text{Vehicle trip ends} = [(\text{person trip ends} \times (\text{vehicle mode share})) / (\text{vehicle occupancy})]$$

This is rearranged to calculate total person trips:

$$\text{Person trip ends} = [(\text{vehicle trip ends}) \times (\text{vehicle occupancy})] / (\text{vehicle mode share})$$

By inputting the vehicle trip rate, vehicle occupancy, and vehicle mode share factors found in earlier sections, the daily person trip rate for each land use is found. For example, the daily vehicle trip rate for a single family/Two-family housing unit is 7.60 (Figure 44), the vehicle occupancy is 1.51, and the vehicle mode share is 86 percent (Figure 46). By inputting these factors into the formula, a daily person trip end rate of 13.34 is calculated $[(7.60 \text{ vehicle trips} \times 1.51 \text{ occupancy rate}) / [86\% \text{ vehicle mode share}] = 13.34$. Figure 48 lists the calculated daily person trip end rate for each land use.

Figure 48. Daily Person Trip End Rate by Land Use

Development Type	Daily Vehicle Trip Ends	Vehicle Occupancy Rate	Vehicle Mode Share	Daily Person Trip Ends
Single Family/Duplex	7.60	1.51	86%	13.34
Multifamily	3.60	1.51	86%	6.32
Retail	37.75	1.69	82%	77.80
Office	9.74	1.69	82%	20.07
Industrial	3.93	1.69	82%	8.10
Institutional	10.72	1.69	82%	22.09

Source: Trip Generation, Institute of Transportation Engineers, 10th Edition (2017); National Household Travel Survey data, 2017; TischlerBise analysis

Residential Trips Adjustment Factors

A person trip end is the out-bound or in-bound leg of a trip. As a result, so to not double count trips, a standard 50 percent adjustment is applied to trip ends to calculate a person trip. For example, the out-bound trip from a person's home to work is attributed to the housing unit and the trip from work back home is attributed to the employer.

However, an additional adjustment is necessary to capture residents' work bound trips that are outside of the City. The trip adjustment factor includes two components. According to the NHTS (2009), home-based work trips are typically 31 percent of out-bound trips (which are 50 percent of all trip ends). Also, utilizing the most recent data from the Census Bureau's web application "OnTheMap", 49 percent of the City of Portland's workers travel outside the city for work. In combination, these factors account for 8 percent of additional production trips ($0.50 \times .31 \times 0.49 = 0.08$). Shown in Figure 49, the total adjustment factor for residential housing units includes attraction trips (50 percent of trip ends) plus the journey-to-work commuting adjustment (8 percent of production trips) for a total of 58 percent.

Figure 49. Trip Adjustment Factor for Commuters out of the City

Employed Portland Residents (2015)	35,405
Portland Residents Working in the City (2015)	17,958
Portland Residents Commuting Outside of the City for Work	17,447
Percent Commuting out of the City	49%
Additional Production Trips	8%
Standard Trip Adjustment Factor	50%
Residential Trip Adjustment Factor	58%

Source: U.S. Census, OnTheMap Application, 2015

To calculate nonresidential trips, the standard 50 percent adjustment is applied to office, industrial, and institutional. A lower trip adjustment factor is used for retail uses because this type of development attracts person trips while they pass-by. Pass-by trips do not generate further traffic as it is only a stop on a trip for ultimately a different purpose. For example, when someone stops at a convenience store on their way home from work, the convenience store is not their primary destination.

Person Trips by Mode

In Figure 50, the trip adjustment factor and mode share are applied to the person trip end rate of each land use to calculate the person trips. For example, for single family/Two-family housing units the trip adjustment factor is 58 percent and the vehicle mode share is 86 percent, resulting in a daily person trip rate of 6.66 for the vehicle mode ($13.34 \text{ person trip ends} \times 0.58 \text{ trip adjustment factor} \times 0.86 \text{ vehicle mode share} = 6.66 \text{ person trips}$).

Figure 50. Person Trips by Mode

Development Type	Person Trip Ends	Trip Adjustment Factor	Person Trips/Unit			
			Total	Vehicle	Transit	Non-motorized
Single Family/Duplex	13.34	58%	7.74	6.66	0.08	1.01
Multifamily	6.32	58%	3.67	3.16	0.04	0.48
Retail	77.80	38%	29.56	24.24	0.59	4.73
Office	20.07	50%	10.04	8.23	0.20	1.61
Industrial	8.10	50%	4.05	3.32	0.08	0.65
Institutional	22.09	50%	11.05	9.06	0.22	1.77

Source: Trip Generation, Institute of Transportation Engineers, 10th Edition (2017); National Household Travel Survey data, 2017; TischlerBise analysis

Note: Trip rates are shown per housing unit for residential land uses and per 1,000 square feet of floor area for nonresidential land uses.

Person Trip Projections

The base year person trip totals and trip projections are calculated by combining the person trip factors and the residential and nonresidential assumptions for housing stock and floor area. Found in Figure 51, in the base year, residential land uses generate 223,734 person trips (30 percent) and nonresidential land uses generate 511,437 person trips (70 percent) in the City of Portland. Through 2028, there will be an increase of 47,721 daily person trips in Portland with retail, multifamily, and office development being the three largest contributors to the increase.

In the base year, 83 percent of the person trips are by vehicle, 2 percent is by transit, and 15 percent is by non-motorized modes. The majority of the person trip increase over the 10-year projection period is from vehicles as well.

Figure 51. Total Daily Person Trip Projections

	Base Year 2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total Increase
Residential Person Trips												
Single Family/Duplex	162,904	163,161	163,418	163,675	163,932	164,189	164,446	164,703	164,960	165,216	165,473	2,570
Multifamily	60,830	61,762	62,693	63,625	64,556	65,487	66,419	67,350	68,282	69,213	70,145	9,314
Subtotal	223,734	224,922	226,111	227,299	228,488	229,676	230,865	232,053	233,241	234,430	235,618	11,884
Nonresidential Person Trips												
Retail	290,177	291,864	293,551	295,238	296,925	298,612	300,299	301,987	303,674	305,361	307,048	16,871
Office	93,550	94,408	95,266	96,124	96,982	97,840	98,698	99,555	100,413	101,271	102,129	8,579
Industrial	29,260	29,520	29,781	30,041	30,302	30,562	30,823	31,083	31,344	31,604	31,865	2,605
Institutional	98,450	99,228	100,006	100,785	101,563	102,341	103,119	103,897	104,676	105,454	106,232	7,782
Subtotal	511,437	515,021	518,604	522,188	525,772	529,356	532,939	536,523	540,107	543,690	547,274	35,837
Grand Total Person Trips	735,171	739,943	744,715	749,487	754,260	759,032	763,804	768,576	773,348	778,120	782,892	47,721

Person Trips by Transportation Mode

Total Vehicle Person Trips	611,790	615,750	619,711	623,672	627,632	631,593	635,554	639,514	643,475	647,436	651,396	39,607
Total Transit Person Trips	12,466	12,550	12,633	12,717	12,800	12,884	12,967	13,051	13,135	13,218	13,302	836
Total Non-Motorized Trips	110,915	111,643	112,371	113,099	113,827	114,555	115,283	116,011	116,738	117,466	118,194	7,279
Grand Total Person Trips	735,171	739,943	744,715	749,487	754,260	759,032	763,804	768,576	773,348	778,120	782,892	47,721

Source: Trip Generation, Institute of Transportation Engineers, 10th Edition (2017); National Household Travel Survey data, 2017; TischlerBise analysis

Base Year Wastewater Usage

Water and sewer account data has been provided by the Portland Water District (PWD) and the City's Department of Public Works. Within the database, residential, commercial, industrial, and institutional wastewater usage is calculated. Additionally, with account data, the wastewater usage of an Equivalent Residential Unit (ERU) is calculated as well. The ERU is the estimate of the daily average wastewater usage from a household with a water meter that is 5/8 inches. In the impact fee calculation, a capacity ratio factor is applied when calculating the wastewater usage and resulting impact fee for developments with larger meters.

Base Year Estimates

Shown in Figure 52, on average there is a total of 5.7 million gallons per day of wastewater flowing through the City's sewer system from these four development types. The majority of the wastewater flows from residential development, but commercial development creates a significant demand as well.

Figure 52. City of Portland Daily Wastewater Usage, 2018

Development Type	Base Year (gals/day)	%
Residential	2,933,364	52%
Commercial	1,998,656	35%
Industrial	542,244	10%
Institutional	187,205	3%
Total	5,661,470	100%

Source: City of Portland Public Works
Department

Equivalent Residential Unit

The wastewater component of the impact fee study will use the wastewater flow calculated for residential units that have a water meter of 5/8 inches to represent the Equivalent Residential Unit (ERU). To calculate the ERU, the wastewater account database is filtered by active residential accounts that use the City's sewer system. Additionally, the database is further limited by only year-round accounts. These accounts are occupied households that reside in Portland permanently. Year-round accounts are approximated by accounts that have activity every month. Illustrated in Figure 53, there is an average of 61 hundred cubic feet (HCF) of wastewater per year from a year-round active residential account flowing into the City's sewer system. That equates to an average of 126 gallons per day, rounded.

Figure 53. Equivalent Residential Unit

Meter Size (inches)	Total Water (HCF)	Active Accounts	Annual Average per Account (HCF)	Annual Average (gallons)	Daily Average (gallons)
5/8	866,230	14,134	61	45,846	126

Source: City of Portland Public Works Department; TischlerBise analysis

Note: Provided data measured wastewater totals in hundred cubic feet (HCF), equal to 748.05 gallons

Wastewater Projections

To project wastewater flows, it is assumed that the average consumptions will stay constant. As a result, the wastewater from residential accounts will increase at the same rate as the projected housing units and wastewater from nonresidential accounts will increase at the same rate as the projected growth in floor area for the respective industry. Over the next ten years, a total increase of 500,000 gallons per day is projected. Residential and commercial land uses account for the majority of the projected increase.

Figure 54. Wastewater Projections, Million Gallons Per Day (MGD)

Development Type	Base Year 2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Total Increase
Residential	2.93	2.96	2.98	3.00	3.02	3.05	3.07	3.09	3.11	3.13	3.16	0.22
Commercial	2.00	2.02	2.04	2.06	2.08	2.10	2.12	2.14	2.16	2.18	2.20	0.20
Industrial	0.54	0.55	0.55	0.56	0.56	0.57	0.58	0.58	0.59	0.59	0.60	0.06
Institutional	0.19	0.19	0.19	0.19	0.19	0.20	0.20	0.20	0.20	0.20	0.21	0.02
Total	5.66	5.71	5.76	5.81	5.86	5.91	5.96	6.01	6.06	6.11	6.16	0.50

Source: City of Portland Public Works Department; TischlerBise analysis

APPENDIX B: AFFORDABLE HOUSING ANALYSIS

This chapter estimates the effects of imposing the proposed impact fees on the affordability of housing in the City of Portland. The analysis will examine the current household income and housing expenses that burden an average household in the City. Next, the maximum defensible impact fees will be included in the cost burden analysis to identify the effect the fees will have on affordable housing in the City.

For this analysis, affordable housing is defined in as housing to families whose incomes do not exceed 80 percent of the median income of the City. The analysis uses the US Housing and Urban Development's (HUD) criteria that housing should be 30 percent or less of a household's income. The cost of housing is "moderately burdensome" if its cost burden is over 30 percent and "severely burdensome" if the ratio is over 50 percent.

Proposed Impact Fee

The impact fees found in Figure 55 are new development's fair share of the cost to provide additional parks & recreation, transportation, and wastewater facilities. The City may adopt fees that are less than the amounts shown. However, a reduction in impact fee revenue will necessitate an increase in other revenues, a decrease in planned capital expenditures, and/or a decrease in levels of service. The housing affordability analysis will assume a conservative condition for assessing the effect of the impact fee on affordable housing in the City of Portland (i.e. the maximum defensible impact fee amount). If the City were to choose a lower impact fee amount, the results presented in this report would improve.

Figure 55. Maximum Defensible Impact Fees

Development Type	Parks & Rec	Transportation	Wastewater	Total
Residential (per housing unit/per water meter)				
Single Family/Duplex	\$1,126	\$2,159	\$1,886	\$5,171
Multifamily	\$752	\$1,023	\$1,886	\$3,661

Note: a 5/8 inch meter is shown for residential development, however, the wastewater fee will be assessed based on the development's meter size.

Housing Stock

Listed in Figure 56, there are a total of 33,436 housing units in the City of Portland. Of the total, 90 percent are occupied. Additionally, the majority (70 percent) of the housing in the City is single family/Two-family units.

Figure 56. Housing Stock Characteristics

Type of Structure	Persons	House-holds	Persons per Household	Housing Units	Persons per Housing Unit	Housing Mix	Vacancy Rate
Single Family/Duplex Unit ¹	50,010	21,052	2.38	23,338	2.14	69.8%	9.8%
Multifamily Unit ²	14,542	9,149	1.59	10,098	1.44	30.2%	9.4%
Total	64,552	30,201	2.14	33,436	1.93		9.7%

Source: TischlerBise analysis; U.S. Census Bureau, 2012-2016 American Community Survey, 5-Year Estimates

[1] Includes detached, attached, duplexes, and mobile home units.

[2] Includes structures with more than 2 units.

Household Income

The purchasing power of Portland residents to secure housing is represented by personal income. Personal income includes all wages, tips, and bonuses from employment, as well as retirement income earned from a pension plan or retirement account. In the analysis, household income represents all residents living in the housing unit, no matter relationship. From the US Census Bureau American Community Survey, in 2016 the median annual household income for the City was \$65,571. By using the US Bureau of Labor Statistics' CPI Calculator, the current household income is estimated at \$68,560. The annual income for a household making 80 percent of the City's median is \$54,848, or \$4,571 per month.

Figure 57. Median Household Income

Median Annual Household Income (2016)	Median Annual Household Income (2018)	Household Income Factor	80% of Median Annual Income	Monthly Income
\$65,571	\$68,560	80%	\$54,848	\$4,571

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates; U.S. Bureau of Labor Statistics CPI Calculator

Cost of Homeownership

The analysis uses ten categories to calculate the baseline cost of homeownership in the City: purchase price; mortgage payment; property tax; stormwater management fee; water; sewer; gas; electricity; telephone, cable and internet; and homeowners insurance. The following section details the costs included.

Purchase Price

The median home value is used to estimate the purchase price of a home. The American Community Survey estimates that the median value of a home in the City in 2016 was \$248,000 (US Census Bureau, 2012-2016 American Community Survey 5-Year Estimates). With the US Bureau of Labor Statistics' CPI Calculator, the current home value is estimated to be \$259,306.

Mortgage Payment

A conventional, fixed-rate 30-year mortgage is assumed to estimate monthly costs of principle and interest on a home loan. The down payment for a loan is assumed to be 20 percent of the purchase price ($\$259,306 \times 20\% = \$51,861$). The loan amount for the mortgage is determined by subtracting the down payment from the purchase price ($\$251,617 - \$51,861 = \$207,445$). An interest rate of 4.35 percent is assumed for the home purchase based on a survey of competitive interest rates in Portland (www.bankrate.com). The monthly mortgage payment is \$1,033.

Property Tax

To calculate annual property tax, homes in the City that are assessed a property tax millage rate of 0.0225. The assessed value of a home in Portland is found by reducing the market rate (purchase price) by the Local Declared Ratio (89%) and the Maine Homestead Exemption Program (\$17,800). Thus, in this analysis the assessed value of an average home in Portland is \$212,982 ($\$259,306 \times 89\% - \$17,800 = \$212,982$). As a result, the annual property tax for the average valued home is \$4,788 ($\$212,982 \times 0.0225 = \$4,788$).

Stormwater Management Fee

In the City of Portland, the fee to operate and maintain the stormwater management system is \$12.60 per month for a housing unit.

Water Utility

By using data provided by the City of Portland and the Portland Water District, the average household uses 126 gallons of water per day or 512 cubic feet per month. Based on the water rates for a residential unit, the average water usage results in a monthly charge of \$19.09.

Wastewater Utility

By using data provided by the City of Portland and the Portland Water District, the average household generates 126 gallons of wastewater per day or 512 cubic feet per month. Based on the wastewater rates for a residential unit, the average wastewater generation results in a monthly charge of \$21.98.

Electricity Utility

By using data from the Central Maine Power company, the average household generates 552 kilowatts of electricity per month. Based on the electricity rates for a residential unit, the average electricity usage results in a monthly charge of \$45.30.

Gas Utility

By using data from the Governor's Energy Office and Unitil company, the average household uses 62.5 therms of gas per month (annualized average). Based on the gas rates for a residential unit, the average usage results in a monthly charge of \$54.43.

Telephone, Cable, and Internet Utilities

Comcast Xfinity is a provider of telephone, cable, and internet in the City of Portland. From their website, the three services costs \$80.00 per month (www.xfinity.com).

Homeowner's Insurance

Homeowner's insurance provides protection for the home and is generally required when a home has a mortgage. The average cost for homeowner's insurance in the City is estimated to be \$820 per year (www.insurance.com).

Monthly Payment

By compiling the month obligations, it is estimated that the monthly cost for homeownership is \$1,733. At the end of this chapter the monthly costs are listed in Figure A6.

Cost of Renting

The cost of renting a home in the City of Portland is estimated with data provided by the US Census Bureau. In 2016, the median gross rent (including all utilities and rental insurance) in the City was estimated to be \$969. With the US Bureau of Labor Statistics' CPI Calculator, the current cost of renting is estimated to be \$1,013.

Cost Burden Analysis

The cost burden for affordable housing is measured as the ratio between monthly payments for housing (including property tax, fee, utilities, and insurance) and monthly gross household income. An analysis was conducted for residents that purchase a home and residents that rent a home. A cost burden ratio of 30 percent is used as the threshold to determine housing affordability in the City of Portland.

Scenario 1: Baseline Conditions

Figure 58 summarizes the cost burden analysis for residents purchasing or renting a median valued home without the maximum defensible impact fees included. Based on the results, the cost burden for owner-occupied housing is above the threshold to be considered affordable for households whose income is 80 percent of the City's median income. The renter-occupied housing cost burden is below the limit of affordability for households whose income is 80 percent of the median income.

Figure 58. Scenario 1: Cost Burden Analysis without Proposed Impact Fee

Condition	Monthly Income	Monthly Cost	Cost Burden
Owner-Occupied	\$4,571	\$1,733	37.9%
Renter-Occupied	\$4,571	\$1,013	22.2%

Scenario 2: Baseline Condition + Proposed Impact Fee

In the second scenario, the maximum defensible impact fees are included into the cost burden analysis to identify the effects the fee has on housing affordability. Since the impact fees are based on housing type, the owner-occupied housing unit will be assessed the fee for single family units (\$5,171) and the renter-occupied housing unit will be assessed the fee for multifamily units (\$3,661).

The analysis takes a conservative approach and assumes the purchase price of the median home is raised by the increase in the impact fee. This ultimately increases the household's mortgage payment and property tax, see Figure 60. For renter-occupied housing units, the analysis assumes that the impact fee increase will be recouped by the landlord through an increase in monthly rent. The fee will be recouped over 30 years, thus increasing the monthly rent by \$10.

Figure 59 lists the monthly costs with the impact fees for owners and renters. The cost burden ratio for owner-occupied homes increases by 0.7 percentage points and for renter-occupied homes the cost burden ratio increases by 0.2 percentage points. Even with the increase, renter-occupied homes are still considered affordable for households who earn 80 percent of the median income.

Figure 59. Scenario 2: Cost Burden Analysis with Proposed Impact Fee

Condition	Monthly Income	Monthly Cost	Cost Burden
Owner-Occupied	\$4,571	\$1,763	38.6%
Renter-Occupied	\$4,571	\$1,023	22.4%

Impact Fee Effect on Affordable Housing

Condition	Change
Owner-Occupied	0.7%
Renter-Occupied	0.2%

Conclusion

This chapter estimates the effect on affordability of housing from imposing the maximum defensible impact fees. To calculate the effect, a household that earns 80 percent of the median income should have a cost burden ratio of 30 percent or less for housing. Currently, the cost burden of an owner-occupied home (single family/Two-family) is above the threshold, thus considered moderately burdensome. The cost burden of a renter-occupied home (multifamily) is below the threshold, thus considered affordable. **This analysis has concluded that the maximum defensible impact fees would only create a marginal increase in housing affordability in Portland. Additionally, with the impact fees, renter-occupied units are still well below the 30 percent threshold.**

As noted, this analysis takes a conservative approach by assuming that the impact fees are absorbed entirely by the home occupants. However, in some cases, impact fees result in land values to decrease placing the burden on land owners and not on the future home owners or renters.

Figure 60. Cost of Homeownership

Cost of Living Components	Monthly Payment Calculation	
	Scenario 1	Scenario 2
	Baseline Condition	Baseline Condition + Impact Fee
Purchase Price	\$259,306	\$264,477
Down Payment	\$51,861	\$52,895
Loan Amount	\$207,445	\$211,582
Loan Length (Years)	30	30
Loan Length (Months)	360	360
Yearly Interest Rate	4.35%	4.35%
Monthly Interest Rate	0.36%	0.36%
Monthly Payment	\$1,033	\$1,053
Property Tax - City (per month)	\$399	\$408
Stormwater Fee	\$13	\$13
Water, Sewer, Gas & Electric Utilities	\$141	\$141
Telephone, Cable & Internet Utilities	\$80	\$80
Homeowners Insurance	\$68	\$68
Monthly Cost	\$1,733	\$1,763

APPENDIX C: LAND USE ASSUMPTIONS

In determining the Wastewater Impact Fee for meters that are larger than the standard meter size for a single family home, 5/8 inches, a capacity ratio is calculated and then applied to the impact fee of a single family home. For example, the water flow capacity for the standard meter size serving a single family home is 20 gallons per minute (gpm). The water flow capacity for a 1.5-inch meter is 100 gpm. The capacity ratio is calculated by dividing the larger meter's capacity by the standard meter's capacity ($100/20 = 5.00$). To calculate the corresponding fee, the ratio is applied to the proposed impact fee for the 5/8 meter. The meter capacities shown in Figure 61 are from the American Water Works Association.

Figure 61. Water Meter Capacity Ratios

Meter Size (inches)	Meter Capacity	Capacity Ratio
5/8	20	1.00
3/4	30	1.50
1	50	2.50
1 1/2	100	5.00
2	160	8.00
3	320	16.00
6	1,000	50.00
8	1,600	80.00

Capacity ratios are based on meter capacity standards published by American Water Works Association, *Principles of Water Rates, Fees, and Charges*, M1, 7th ed., 2017

PORTLAND IMPACT FEE STUDY

CITY OF PORTLAND PLANNING DIVISION

September 18, 2018

I. Study Objectives & Assumptions



DRAFT

- The City of Portland engaged Colliers to evaluate the impact of the proposed schedule of impact fees (“Fees”) upon development in Portland
- Colliers prepared financials for several typical projects types: Multifamily, office, hotel, industrial, and retail
- Colliers analyzed each projects’ return with and without the proposed impact fees
- Colliers applied the Maximum Supportable Fee as determined by TischlerBise

II. Executive Summary

- The proposed fees will have minimal impact upon financial returns across a range of product types, reducing them (IRR and ROI) by less than 1%
- The fees are less than 2.5 percent of total development costs
- The proposed impact fees may be less than or greater than the actual, ad-hoc fees paid by some developments in the past
- Formalizing the fee schedule adds predictability, certainty, and may possibly shorten the permitting time for projects reducing costs
 - For example: One month of escalation of construction costs on a \$15m project is \$62,500/month
- This analysis does NOT account for costs incurred by developers related to design review, compliance with other City of Portland ordinances and/or policies (other than inclusionary zoning), or delays in the permitting process

II. Executive Summary

PORTLAND IMPACT FEE ANALYSIS

SUMMARY
9/20/2018

DRAFT

	Multifamily Rental	Multifamily Condominium	Downtown Hotel	Suburban Airport Hotel	Office + Retail	Industrial	Shopping Center
# of Residential Units	75 Units	50 Units					
# of Hotel Room Keys			150 Keys	200 Keys			
Office GSF					50,000 GSF		
Retail GSF					7,500 GSF		105,000 GSF
Industrial GSF						50,000 GSF	
Surface Parking GSF	24,375 GSF			65,000 GSF		16,250 GSF	325,000 GSF
Structured Parking GSF		16,250 GSF					
Development GSF (ex. Parking)	67,500 GSF	55,000 GSF	52,500 GSF	70,000 GSF	57,500 GSF	50,000 GSF	105,000 GSF

Total Development Cost (Without Impact Fee)	\$21,133,704	\$21,703,206	\$22,765,606	\$27,256,344	\$20,132,086	\$10,171,438	\$39,873,038
\$/Unit/Key/GFA (Without Impact Fee)	\$281,782.72/ Unit	\$434,064.12/ Unit	\$151,770.71/ Key	\$136,281.72/ Key	\$354.55/GSF	\$205.22/GSF	\$388.81/GSF

Estimated Impact Fee to Developer	\$163,301	\$118,926	\$522,026	\$685,976	\$254,803	\$89,738	\$952,286
Percent of TDC	0.77%	0.55%	2.29%	2.52%	1.27%	0.88%	2.39%

IRR (Without Impact Fee)	9.55%	11.60%	10.19%	10.95%	15.31%	9.04%	10.38%
IRR (With Impact Fee)	9.38%	11.39%	9.63%	10.33%	14.91%	8.84%	9.83%
Difference in IRR	0.17%	0.21%	0.56%	0.62%	0.40%	0.20%	0.55%

ROI (Without Impact Fee)	4.18%	33.17%	5.85%	6.46%	9.72%	5.38%	6.27%
ROI (With Impact Fee)	4.11%	32.43%	5.50%	6.01%	9.26%	5.26%	5.86%
Difference in ROI	0.07%	0.74%	0.35%	0.45%	0.47%	0.12%	0.41%

9/20/2018

A detailed development pro forma was prepared with the following assumptions

- 75 units with 75 surface parking spaces.
- 50,000 SF land area
- 900 GFA/unit
- 10% affordable at 100% AMI
- Wood frame construction
- \$282,000 TDC/unit
- Studio rent: \$1,500
- One BR rent: \$1,850
- Two BR rent: \$2,500

Multi-family (condo)



DRAFT

A detailed development pro forma was prepared with the following assumptions

- 50 units with 75 structured/covered parking spaces.
- 50,000 SF land area
- 1,100 GFA/unit
- 10% affordable at 120% AMI
- Wood frame construction over steel podium
- \$434,000 TDC/unit
- Average sale price: \$450/SF

A detailed development pro forma was prepared with the following assumptions

- 150 keys with no on-site parking.
- 20,000 SF land area
- 350 GFA/key
- Wood frame construction over steel podium
- \$152,000 TDC/key
- RevPAR \$135.00

A detailed development pro forma was prepared with the following assumptions

- 200 keys with 200 surface parking spaces
- 125,000 SF land area
- 350 GFA/key
- Wood frame construction over steel podium
- \$136,000 TDC/key
- RevPAR \$120.00

A detailed development pro forma was prepared with the following assumptions

- 50,000 GFA office
- 7,500 GFA retail
- No on-site parking
- 20,000 SF land area
- Steel/concrete construction
- \$355/SF TDC
- \$25.00/SF NNN Rent

A detailed development pro forma was prepared with the following assumptions

- 50,000 GFA industrial
- One surface parking space per 1,000 SF
- 125,000 SF land area
- Steel/concrete construction
- 205/SF TDC
- \$10.00/SF NNN Rent

Retail/Shopping Center



DRAFT

A detailed development pro forma was prepared with the following assumptions

- 60,000 GFA Grocery/Anchor
- 45,000 GFA other retail
- Three surface parking spaces per 1,000 SF
- 500,000 SF land area
- Steel/concrete construction
- \$389/SF TDC
- \$35.00/SF NNN Rent

Questions and Answers & Thank You



13 IMPACT FEES

13.1 AUTHORITY

This ordinance is enacted pursuant to the authority of 30-A M.R.S.A. § 4354 and 30-A M.R.S.A. § 3001.

13.2 PURPOSE

The purpose of these impact fee provisions is to ensure that new development in the City of Portland bears a proportional or reasonably-related share of the cost of new, expanded, or replacement infrastructure necessary to service that development through:

1. The payment of impact fees dedicated to funding improvements made necessary by development, or
2. The construction of improvements as provided for herein.

13.3 APPLICABILITY

The following shall be subject to impact fees:

1. Any new building or addition to existing buildings which results in net new residential dwelling units, non-residential building square footage, or water/wastewater meters, and
2. Any change of use which results in a net increase in impact fee per *Section 13.4.6*,

with the exception of municipal buildings, which shall be considered exempt.

13.4 CALCULATION OF IMPACT FEE

13.4.1 In General

Impact fees shall be calculated based on the impact fee schedule in effect at the time of submittal of a complete application for a building permit.

13.4.2 Determination of Use

The determination of the applicable land use category in the impact fee schedule shall be made by the Department of Permitting and Inspections with reference to the City of Portland's most recent *Impact Fee Study*. If the proposed development is of a type not listed in the impact fee schedule, then the impact fees applicable to the most nearly comparable type of land use listed in the impact fee schedule shall be used.

13.4.3 Mixed Use Development

In the event that there is more than one use within a building, impact fees shall be calculated separately for each use.

13.4.4 Redevelopment

In calculating the impact fee for a new building that involves the full or partial demolition of a building housing an existing, legally established use or uses, such new building shall be credited with an amount equal to the fee that would have been charged to the use or uses which occupied the structure at the time of demolition permit. If the impact fee calculation for the post-development condition is greater than the credit, the applicant shall pay the difference. If the impact fee calculation for the post-development condition is less than the credit, then the applicant shall not be required to pay an impact fee. The City shall not grant credits for demolitions not associated with new development or demolitions for which a permit was issued more than 12 months prior to the complete application for a building permit.

13.4.5 Building Additions

In calculating the impact fee for building additions, each developed property shall be credited with an amount equal to the fee that would have been charged to the existing use at the time of the addition of floor area. If the impact fee calculation for the post-development condition is greater than the credit, the applicant shall pay the difference. If the impact fee calculation for the post-development condition is less than the credit, then the applicant shall not be required to pay an impact fee.

13.4.6 Changes of Use

In calculating the impact fee for changes of use, each developed property shall be credited with an amount equal to the fee that would have been charged to the existing use at the time of application for building permit. If the impact fee calculation for the proposed use is greater than the credit, the applicant shall pay the difference. If the impact fee calculation for the proposed use is less than the credit, then the applicant shall not be required to pay an impact fee. The City shall not grant credits for uses which have been discontinued for a period of 12 months or more prior to the complete application for a building permit.

TABLE 13-1: PARKS & RECREATION AND TRANSPORTATION IMPACT FEE SCHEDULE¹

Land Use Type	Unit of Measure	Parks/Recreation Impact Fee	Transportation Impact Fee
Single-family/Two-family	per unit	\$1,126	\$2,159
Multi-family (3+ units)	per unit	\$752	\$1,023
Retail/Service	per 1,000 SF GFA	\$534	\$8,248
Office	per 1,000 SF GFA	\$677	\$2,800
Industrial	per 1,000 SF GFA	\$363	\$1,130
Institutional	per 1,000 SF GFA	\$645	\$3,082
Hotel/Motel	per room	\$875	\$2,404

¹ Land use types included in the impact fee schedule correspond to those in the city's most recent *Impact Fee Study*.

TABLE 13-2: WASTEWATER IMPACT FEE SCHEDULE

Meter Size	Capacity Ratio	Impact Fee
5/8 inch	1.00	\$1,886
3/4 inch	1.50	\$2,829
1 inch	2.50	\$4,715
1 1/2 inches	5.00	\$9,430
2 inches	8.00	\$15,088
3 inches	16.00	\$30,176
6 inches	50.00	\$94,300
8 inches	80.00	\$150,880



13.5 ANNUAL ADJUSTMENT OF IMPACT FEE

To account for inflation, there shall be an automatic annual increase in the impact fee schedule reflected in this ordinance every January 1 based on the change in the construction cost index as published by *Engineering News Record*. The fee adjustment shall be calculated by dividing the index amount published on January 1 of the current year by the index amount published on January 1, 2018 and multiplying the resulting ratio by each fee amount. Annual adjustments shall be made available for public reference.

13.6 MODIFICATION OF IMPACT FEES

- A. A required impact fee may be modified, in whole or in part, by formal vote of the Planning Board in cases when an applicant is otherwise before the Planning Board, or by the Planning Authority in all other cases, if the reviewing authority finds that:
1. The developer or property owner who would otherwise be responsible for the payment of the impact fee voluntarily agrees to make infrastructure improvements for which the impact fee would be collected or an equivalent improvement approved by the reviewing authority, or
 2. The developer or property owner is required, as part of a development approval by the City or a state or federal agency, to make or to pay for infrastructure improvements for which the impact fee would be collected or an equivalent improvement.

Credit amounts shall be determined based on plans, details, and cost estimates for the proposed infrastructure improvements for which the credit is requested. Such plans, details, and cost estimates shall be prepared by a licensed professional engineer and submitted at the time of site plan, subdivision, or building permit application. The applicant shall pay for any third-party review of plans, details, or cost estimates. On-site or immediately adjacent improvements providing direct service to a site as required under subdivision or site plan regulations shall not be considered eligible under this section.

- B. The Planning Board may by formal vote modify the payment of a required impact fee, in whole or in part, if it finds that documentation is provided to demonstrate that a proposed use will impose no or substantially-reduced demands on capital facilities for which impact fees have been adopted. Such documentation shall be prepared by a licensed professional engineer and include a written analysis of the demand for capital facilities generated by the proposed use based on industry standards and the most recent *Impact Fee Study*. Documentation shall be submitted at the time of site plan, subdivision, or building permit application. The applicant shall pay for any third-party review of plans, details, or cost estimates.

13.7 REDUCTION IN FEES FOR AFFORDABLE HOUSING

Any residential development including low-income or workforce housing units and qualifying as an eligible project under Division 30 shall receive a reduction of fees in accordance with *Section 14-486*.

13.8 COLLECTION OF IMPACT FEE

The City of Portland shall not issue any certificate of occupancy required under the Land Use Code until the applicant has paid any impact fees required by this ordinance.

13.9 SEGREGATION OF IMPACT FEES FROM GENERAL REVENUES

Impact fees collected pursuant to this ordinance shall be maintained in separate, non-lapsing impact fee accounts for each of the facilities for which impact fees are assessed, and shall be segregated from the City's general revenues. These accounts shall be dedicated for funding of the improvements for which the fee is collected, as determined through the City's most recent *Impact Fee Study*. Funds from these accounts shall be distributed to City departments solely for the purpose of capital projects identified in the City of Portland's most recent *Impact Fee Study*.

13.10 USE OF IMPACT FEES

Impact fees collected by the City pursuant to this ordinance may be used only for financing facility improvements which the City Council, through the City of Portland's most recent *Impact Fee Study*, has determined are made necessary by new development. The City Council has determined that fees imposed by schedules in this ordinance are reasonably related to the demands created by new

development. Impact fees collected pursuant to this ordinance shall be used exclusively for capital improvements, and the City of Portland shall expend funds collected from impact fees solely for the purposes for which they were collected.

13.11 REFUND OF UNUSED IMPACT FEES

Impact fees collected pursuant to this ordinance shall be used by the City according to the schedules for the completion of specific capital improvements as specified in the City of Portland's most recent *Impact Fee Study*, but in no event later than ten years after the date upon which the impact fee was collected. Any impact fees which are not so used and any impact fees collected which exceed the City's actual costs of implementing the infrastructure improvements for which such fees were collected shall be refunded. Refunds shall be paid to the owner of record of the property for which the impact fee was collected, determined as of the date the refund is made.

13.12 REVIEW AND REVISION

The impact fees established in this ordinance are based upon the best estimates of the costs of the construction of the facilities for which the fees are collected as determined through the City's most recent *Impact Fee Study*. The Council may, by amendments to this ordinance, change the amounts of the impact fees from time to time as warranted by new information or changed circumstances.

13.13 EFFECTIVE DATE

The provisions of this ordinance shall apply to all building permit applications submitted following the effective date of this ordinance, with the exception that any development for whom site plan approval

has been granted at the time of the effective date of this ordinance shall be considered exempt.

DIVISION 30. AFFORDABLE HOUSING

Sec. 14-485. Definitions.

...

Development fees means:

(a) The following fees, as described in this chapter: site plan review and inspection fees; subdivision review and inspection fees; [impact fees](#); and administrative fees; and

(b) Construction and permit fees as described in Chapter 6. "Development fees" does not include any fees charged for reviews conducted by a party other than the city.



Helen Donaldson <hcd@portlandmaine.gov>

Impact Fee Ordinance

Jennifer Thompson <jlt@portlandmaine.gov>
To: Helen Donaldson <hcd@portlandmaine.gov>

Thu, Oct 4, 2018 at 11:16 AM

Hi Nell -

I understand that, in connection with their consideration of a proposed impact fee ordinance, the Planning Board and City Council have raised questions about applicability and the extent to which excepting particular uses from the fees may be possible and/or advisable. Pasted below are excerpts from a white paper on impact fees issued by the former Maine State Planning Office, addressing those questions. That paper is available here: <https://www1.maine.gov/dacf/municipalplanning/docs/impactfeemanual.pdf>

As you'll see from these excerpts, however, the best practice, at least under Maine's statute, is to take care in crafting exceptions to impact fees. The focus in an impact fee ordinance should be on accurately assessing the true impacts of development on capital facilities and assessing fees that are directly tied to that impact. When fees are preferentially imposed on particular kinds of development are excepted from fees based on other policy goals rather than on the impact of those uses on infrastructure, a municipality runs the risk of undermining the "nexus" that is established to justify the fee. Further, and as with all fees imposed by government, where similar uses have similar impacts it's important to take care that fees and regulations are being applied equally. If distinctions in applicability are going to be made, it is important that the reasons for treating one group differently than another are well-articulated and sound.

All types of development that directly contribute to the demand for the improvements that the fee will be financing must pay an impact fee. The fee should be assessed to all of those developments, regardless of the level or review required or regardless of the status of the applicant, developer or occupant of the development. If the impact fee is paying for improvements to a facility that will be directly used by residential, commercial, and industrial uses, such as highway improvements, sewer facilities or public safety facilities, then the fee should be assessed on all three types of uses. On the other hand, if the fee will be used to finance a facility that will only be used by residents of the town, such as a recreation facility or school, then the fee should be collected from new residences only, and not commercial and industrial developments. If a fee is being collected from new residential structures, then all new residences that contribute to the demand for increased service or expansion of facilities should be assessed the fee. New homes on individual lots create the same amount of traffic or supply as many public school students as do homes in a subdivision. Therefore, a municipality should not be assessing impact fees solely on new subdivisions and not homes built on individual lots. Similarly, if a current resident wanted to build a new house, it would be impermissible to exempt the house from the fee based solely on residency.

*...
If impact fees are of concern regarding the price of housing, local ordinances should not waive those fees for moderately priced housing or housing reserved for low- and moderate-income families. Impact fees must be assessed on new development based on the impact the new development will have on the facility being improved. Unless there is a clear connection between the income of the occupant and the demand for service from the facility, then the impact fee should be assessed similarly on all similar housing units. In communities that are truly concerned about price of low- and moderate-income housing, an acceptable solution would be for the municipality to appropriate funds as part of the annual budget process to pay the impact fee for qualifying units. In this manner, the fee is paid into the special account regardless of the income of the residents, and all housing units are treated fairly.*

In addition to taking care to protect the "nexus" by making the fee applicable based on actual impact rather than on other policy objectives, it is important to be mindful of equal protection concerns. MMA says this about ensuring that fees imposed by a municipality comply with equal protection requirements: "A municipality may distinguish between different classes of users when setting fees by ordinance. It is not an automatic constitutional violation of equal protection if one class is required to pay more than another for the same privilege or if municipal services are provided to some, but not others. However, there must be a rational basis for the difference in treatment- the distinction must be reasonably related to a government interest (Ace Tire Co., Inc. v. Municipal Officers of City of Waterville, 302 A.2d 90 (Me. 1973); McNicholas v. York Beach Village Corp., 394 A.2d 264 (Me. 1978); Hefflefinger, Inc. v. City of Portland, 1999 ME 153, 739 A.2d 844).

I hope this is helpful. If you, the Board or the Council have any further questions, please do not hesitate to be in touch.

Best,

10/5/2018

City of Portland Mail - Impact Fee Ordinance

Jen

Jennifer L. Thompson
Associate Corporation Counsel
City of Portland
207.874.8915

Comparables

- o Impact fees from comparable communities nationwide compared to Portland's Maximum Defensible Fee

Development Type	Maximum Defensible Fee	Burlington, VT	Concord, NH	Freeport, ME	Bozeman, MT	Boulder, CO	Eugene, OR	National Averages (2015)*
Parks and Recreation (per housing unit/hotel room/1,000 square feet)								
Single Family/Duplex	\$1,126	\$1,486	\$1,094	-	-	\$5,603	\$4,246	\$2,812
Multifamily	\$752	\$743	\$664	-	-	\$3,936	\$2,686	\$2,099
Retail	\$534	\$418	-	-	-	-	\$413	n/a
Office	\$677	\$418	-	-	-	-	\$1,134	n/a
Industrial	\$363	\$422	-	-	-	-	\$694	n/a
Institutional	\$645	\$418	-	-	-	-	\$1,134	n/a
Hotel	\$875	\$418	-	-	-	-	\$1,697	n/a
Transportation (per housing unit/hotel room/1,000 square feet)								
Single Family/Duplex	\$2,159	\$386	\$2,110	\$1,500 for the first	\$4,497	\$216	\$2,113	\$3,256
Multifamily	\$1,023	\$196	\$1,450	2,500 GFA plus	\$3,053	\$149	\$1,226	\$2,201
Retail	\$8,248	\$736	\$3,330	\$300 for each	\$10,476	\$540	\$5,093	\$5,605
Office	\$2,800	\$676	\$1,700	additional 250	\$4,535	\$220	\$3,212	\$3,403
Industrial	\$1,130	\$262	\$1,090	GFA. Not	\$2,866	\$140	\$2,050	\$2,063
Institutional	\$3,082	\$676	\$2,207	exceeding	\$5,435	\$180	\$1,965	n/a
Hotel	\$2,404	\$676	\$1,817	\$30,000.	\$2,315	\$168	\$1,268	n/a
Wastewater (per meter)								
Single Family/Duplex	\$1,886	-	-	-	\$775	-	\$2,396	\$3,694
Multifamily	\$2,829	-	-	-	\$1,545	-	\$2,040	\$1,777
Retail	\$4,715	-	-	-	\$3,556	-	\$683	\$663
Office	\$4,715	-	-	-	\$3,556	-	\$1,036	\$640
Industrial	\$4,715	-	-	-	\$3,556	-	\$687	\$642
Institutional	\$4,715	-	-	-	\$3,556	-	\$2,163	n/a
Hotel	\$4,715	-	-	-	\$3,556	-	\$2,817	n/a

*Source: National Impact Fee Survey: 2015, Duncan Associates, November, 2015

Note: Single family units are assumed to be 2,000 square feet and multifamily units to be 1,000 square feet. A 5/8 inch meter is shown for single family development, 3/4 inch for multifamily development, and a 1 inch meter is shown for nonresidential development, however, the wastewater fee will be assessed based on the development's meter size. To estimate general transportation fees for Scarborough, ME the PM peak hour trip generation rates from Trip Generation, Institute of Transportation Engineers, 10th Edition (2017) are used.

Not shown in the figure are the additional impact fees the comparable communities assess including school, fire, and police.

Comparables

- o Impact fees from surrounding communities compared to Portland's Maximum Defensible Fee

Development Type	Maximum Defensible Fee	Brunswick ¹	Gorham ²	Saco ³	North Berwick	Berwick ⁴	Scarborough	Freeport	Sanford	York	Lewiston
Parks and Recreation (per housing unit/hotel room/1,000 square feet)											
Single Family/Duplex	\$1,126	\$197 (avg.)	\$1,715	\$1,700	\$500/bedro	\$1,988	-	-	-	-	-
Multifamily	\$752	\$142 (avg.)	\$1,108	-	\$500/bedro	\$1,317	-	-	-	-	-
Retail & Services	\$534	-	-	-	-	-	-	-	-	-	-
Office	\$677	-	-	-	-	-	-	-	-	-	-
Industrial	\$363	-	-	-	-	-	-	-	-	-	-
Institutional	\$645	-	-	-	-	-	-	-	-	-	-
Hotel	\$875	-	-	-	-	-	-	-	-	-	-
Transportation (per housing unit/hotel room/1,000 square feet)											
Single Family/Duplex	\$2,159	-	-	-	-	-	\$1,042/PM peak hour trip ends (Dunstan), \$990/PM peak hour trip ends (Haigis Pkwy).	\$1,500 for the first 2,500 GFA plus \$300 for each additional 250 GFA. Not to exceed \$30,000.	\$261 - \$1,013/PM peak hour trip, depending on location.	-	In certain areas based on traffic study
Multifamily	\$1,023	-	-	-	-	-					
Retail	\$8,248	-	-	-	-	-					
Office	\$2,800	-	-	-	-	-					
Industrial	\$1,130	-	-	-	-	-					
Institutional	\$3,082	-	-	-	-	-					
Hotel	\$2,404	-	-	-	-	-					
Wastewater (meter size, inches)											
5/8	\$1,886	-	-	\$2,700/185 gpd	-	-	Specialized sewer assessment for certain areas	-	-	\$2,500/unit or EDU	\$790
3/4	\$2,829	-	-		-	-		-	\$1,140		
1	\$4,715	-	-		-	-		-	\$2,020		
1.5	\$9,430	-	-		-	-		-	-		
2	\$15,088	-	-		-	-		-	\$8,075		
3	\$30,176	-	-		-	-		-	\$18,165		
6	\$94,300	-	-		-	-		-	\$72,650		
8	\$150,880	-	-		-	-		-	\$129,150		

[1] Brunswick has a graduated park impact fee based on size of unit. For purposes of comparison, single family and multifamily fees have been averaged.

[2] Gorham has a graduated park impact fee for multifamily units based on size of unit. For purposes of comparison, multi-family fees have been averaged.

[3] Saco charges separate recreation and open space fees, which have been combined here.

[4] Berwick has a graduated park and recreation impact fee for singlefamily and multifamily units based on number of bedrooms. Fees have been averaged.

**MEMORANDUM**

DISTRIBUTE TO: Members of the Economic Development Committee

FROM: Brendan T. O'Connell - Finance Director
Chris Huff - Assessor

DATE: August 12, 2018

SUBJECT: **Impact Fee - Questions and Answers from Finance Director & Assessor**

Several questions have been passed along from the Planning and Urban Development Department on behalf of residents and businesses in regards to impact fees, the existing tax levy and City budget, property valuation growth and the upcoming revaluation, and building permit fees and stormwater service charges. This memo is intended to summarize responses to many of the frequently asked questions ("FAQ").

Frequently Asked Impact Fee Questions for Finance and Assessors

1. I read the FY19 budget includes \$100M of new estimated valuation and I know property values continue to grow. Why are my impact fees necessary during a time when there is so much new value in the City of Portland? Isn't the existing growth enough to cover all City needs?
2. Will the upcoming revaluation help alleviate budget pressure and provide more tax dollars for City needs?
3. Building permit fees were increased recently. Wasn't this increase intended to fund some of the same things impact fees are intended to fund (i.e. growth related infrastructure)?
4. What about the Stormwater Service Charge? Was that created in response to growth-related infrastructure needs?

Question 1: I read the FY19 budget includes \$100M of new estimated valuation and I know property values continue to grow. Why are my impact fees necessary during a time when there is so much new value in the City of Portland? Isn't the existing growth enough to cover all City needs?

Property valuation has grown by \$100 million in the current year due to significant new projects breaking ground and continues our upward trajectory in overall valuation. This \$100 million of new property valuation creates an additional approximately \$1,133,000 in tax revenue for municipal use. While this may seem like a significant amount, it represents only a 0.128% overall increase to our FY18 valuation of approximately \$7.8 billion, and can only fund a fraction of the cost increases and budget challenges we face in FY19, many of which are outside of City control. These include the increases in Cumberland County tax (\$381k), increases in pension obligation bond debt service (\$872k and increasing by around \$1M annually through 2026), contractually obligated union compensation increases (approximately \$3.2M) and health insurance cost increases (\$2M). As you can see, the increase in valuation can only fund a fraction of the cost increases that are outside of City control.

Question 2: Will the upcoming revaluation help alleviate budget pressure and provide more tax dollars for the City needs?

Staff Response: No – the revaluation has no impact on total funds collected for the budget. Each year the City Manager will recommend a budget, calling for the required amount of tax dollars to be levied on property owners. The revaluation will have no impact on the dollar amount levied – the total amount of tax dollars required for City / School operations will be the same both before and after the revaluation. The revaluation will only impact how the dollars levied are split between City taxpayers. In general about 1/3 of the residents will pay more after the revaluation, 1/3 of the residents will pay the same amount, and 1/3 of the residents will pay less, but in total the amount of tax dollars collected will remain the same. When property values rise overall as a result of the revaluation, the mil rate will see a corresponding drop. For example, if total City property value increased 25% during the revaluation from \$8B to \$10B as a result of the revaluation (i.e. adjusting property values to their just values) the mil rate would then see a corresponding 25% percentage decrease.

EXAMPLE:

Pre-City Revaluation:

Total City Valuation: \$8,000,000,000

Mil Rate: \$20.00

*Total Tax Levy Needed for City/School Operations: \$160,000,000 (\$8,000,000,000 / 1000 * \$20.00)*

Post-City Revaluation:

Total City Valuation: \$10,000,000,000

Mil Rate: \$16.00 (drops because we still only need a tax levy of \$160,000,000)

*Total Tax Levy Needed for City/School Operations: \$160,000,000 (\$10,000,000,000 / 1000 * \$16.00)*

Question 3: Building permit fees were increased recently. Wasn't this increase intended to fund some of the same things impact fees are intended to fund (i.e. growth related infrastructure)?

Staff Response: In 2017 a separate Permitting & Inspections Department was created. The new Department was created in direct response to the 2016 City Council goal to create a more efficient permitting process, including online functionality. This new Department including significant levels new staff and a new Department Head, a new software system (EnerGov) and new policies and procedures, was funded by an increase in Building Permit fees. No part of the previous increase in building permit fees was intended to fund growth-related infrastructure. Additionally, there are no excess building permit revenues available to address growth-related infrastructure.

Question 4: What about the [Stormwater Service Charge](#)? Was that created in response to growth-related infrastructure needs?

Staff Response: No. The Stormwater Service Charge was created to fund and implement projects related to the Department of Environmental Protection ("DEP") mandate for combined sewer overflow requirements. Instituting a stormwater charge more fairly and equitably distributes costs among the users of the sewer and stormwater systems rather than putting the burden entirely on sewer users. Stormwater service charges will raise approximately \$7M towards the DEP mandate in FY19. The City estimates between \$20M and \$30M will be spent annually over the next 5-10 years to address the DEP mandate (revenues from both sewer fees and stormwater service charges will support this effort). There will be no excess of either Stormwater Service Charges or Sewer Fees to address growth related infrastructure needs.



Helen Donaldson <hcd@portlandmaine.gov>

Impact fees for parking garages?

Christian MilNeil <c.neal.milneil@gmail.com>

Wed, Sep 19, 2018 at 3:55 PM

To: hcd@portlandmaine.gov

Cc: Jeff Levine <jlevine@portlandmaine.gov>, planningboard@portlandmaine.gov

Thanks Nell, I understand where you are coming from w/r/t not charging impact fees to new parking garages, but I don't agree with the reasoning.

Parking garages are a land use and they are almost always subsidized – and subsidies for automobile use naturally generate more automobile trips.

We know intuitively and by observation that a 7-11 surrounded by a big, free parking lot generates more car traffic than a Rosemont Market, even though the square footages are roughly the same and the buildings' uses, from a zoning standpoint, are identical. The Bangor Savings Bank branch on Middle Street is the same land use as the Bangor Savings Bank branch on outer Brighton Avenue, but the Old Port location has virtually no impact to traffic because there is no parking there and it's been designed for walk-in traffic; the Brighton location does have a traffic impact because it's designed to privilege access for motorists. We drive to the Maine Mall because it's surrounded by parking lots, and we walk to Reny's because parking is scarce on Congress Street and the pedestrian and transit connections are excellent.

The planning department needs to bear in mind that impact fees have an important function beyond financing infrastructure projects: ideally, they could also offer a financial incentive for developers to reduce the impact of their projects; to build fewer parking lots and more transit-oriented, walkable neighborhoods where cars don't get used as much.

In its current form, the proposed ordinance will make smart growth even more expensive, and more development will go out to Westbrook and Scarborough instead, and we'll end up back at square one, with increasing traffic and none of the money we need to deal with it.

So, instead of assuming that every housing development is going to generate car traffic with a one-size-fits-all approach we have here, we could have a tiered system of impact fees such that a car-oriented development with lots of parking pays more, and a transit-oriented development that gives its tenants bus passes pays less (or not at all), and thus give developers a financial incentive to build more of the latter.

The city already acknowledges, through its transportation demand management policies, that developers can and do reduce their traffic impacts with project design and property management strategies; the prior use of TDM plans undermines the city's argument that traffic impacts are a blind function of land use multiplied by the dreary transportation mode shares of our status quo. In fact, developers' TDM plans themselves could be used as a better proxy for a development's traffic impacts, since the TDM plans explicitly set a developer's expectations for how their tenants will travel, and how much they will subsidize parking.

From a political point of view, a lot of Portlanders are upset about how much parking garage construction is happening right now downtown. It's a clear, visible demonstration of how the city and landlords are willing to spend lots of money to subsidize private parking, even as the city's public streets strain under increasing traffic congestion. This is a clear "tragedy of the commons" situation – every new parking space makes driving slightly more convenient for one motorist but incrementally increases congestion for everyone else – that demands a stronger public policy response. Impact fees would be a good place to start: a financial nudge to encourage developers to internalize the broader traffic impacts of their parking management decisions.

I'd appreciate it if you could share this message with the planning board as public comment tomorrow; I may try to attend the meeting in person as well.

A couple of other more technical points:

- Figure 24 in the memo seems to assume that the mode share for transit, walking and biking will remain constant (and miserably low) through 2028. Don't we have city goals that say we want more transit market share, and less motor vehicle use over time? Isn't shifting mode share the point of many of these infrastructure projects we want to fund? It's discouraging to see a city planning document assume failure in those ambitions, which some of us

consider pretty important!

- Mode share estimates in Table 19 seem to come from the FHWA's Household Travel Survey (<https://nhts.ornl.gov/>). We should be skeptical of those figures; that survey has a very small sample size (only 250 respondents from the entire state of Maine – [source](#)) that likely discounts Portland's uniquely high transit service and walkability relative to other small cities.

The U.S. Census Bureau's American Community Survey, by contrast, surveyed 15,423 households in Maine in its 2017 survey, so it's much, much more robust. The ACS estimates that Portland's citywide transit mode share for commuting trips is 3.2% – twice as high as TischlerBise's assumed mode share, and transit ridership is growing.

- Furthermore, we know from Census tract-level estimates that mode share also varies by neighborhood, significantly. Bayside (in Census Tract 6) has a transit mode share of 9.9% and a walk/bike share of 40% for commuting trips. By the logic of this memo, a project located in Bayside should pay a significantly lower impact fee than a project located in Riverton if we use the more reliable, more statistically robust ACS data.

Christian MilNeil

double u double u double u dot christianmilneil dot com

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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.



Helen Donaldson <hcd@portlandmaine.gov>

Questions on Impact Fee Presentation from 9/20/2018 Planning Board Workshop

Karen Snyder <karsny@yahoo.com>

Fri, Sep 21, 2018 at 10:18 AM

To: Helen Donaldson <hcd@portlandmaine.gov>, Planning Board <planningboard@portlandmaine.gov>, Planning and Urban Development <planning@portlandmaine.gov>

Cc: Jon Jennings <jpj@portlandmaine.gov>

Hi Nell,

I applaud the City's efforts in finally implementing something to offset some of the future development CIP (Capital Investment Project) growth funding instead of thinking that the property owners are suppose to fund via their property taxes this future CIP growth when all this new development is the direct cause for the reduction of their quality of life in this city especially on the Peninsula.

Based on the Planning Board workshop and the Economic Development Council meetings held this week regarding the new impact fee ordinance that is hopefully effective enough to offset around 50% of future CIPs related to current and future development growth, I do have additional questions regarding impact fee ordinance.

9/18/2018- Economic Development Council Meeting on Impact fees

https://www.portlandmaine.gov/AgendaCenter/ViewFile/Agenda/_09182018-2563

9/20/2018 - Planning Board Workshop on Impact Fees

[Agenda - 09/20/2018](#)

Question #1: How was this "stakeholder" group selected since it was made up of developers, residents, non-residents, Representatives from Bayside, India St, and Stroudwater, and Portland Trails? Who were the developers, residents and non-residents in this stakeholder group? The original hotel room impact fee was dramatically reduced by around 50% from the first presentation of impact fees, with single family resident impact fee reduction coming in second in reduction.

Question #2: I still don't understand why parking garages and parking lots are NOT included in this impact fee. The reason you gave last night is that wastewater is not applicable because parking lots don't have sewers even though there is stormwater runoff.

However, my understanding is that the 3 components for justifying charging impact fees are: Wastewater, Parks and Recreation, and Transportation.

Even though wastewater component may not be applicable but the transportation component I would have thought would be applicable. Parking garages and parking lots create more traffic congestions and transportation trips so how can parking garages and parking surface lots be excluded from the transportation impact fee equation, hence the impact fee all together?

Question #3: Tuck indicated last night that future developments would be applied impact fees if the site plans have not been approved yet, Maine Med will be excluded. Knowing how many site plans still slipped through during the Munjoy Hill moratorium, does this mean the following projects are NOT applicable to the impact fees as well? Please indicate yes or no for each project listed below.

Projects in question: Maine Med-NO, 58 [Fore St](#), 86 Newbury, [100 Fore St.](#), 383 Congress, 0 Hancock -Wex?

<http://portlandmaine.gov/314/Planning-Urban-Development>

[Portland Maine.gov](#) | [114 Planning and Development](#)

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Regards,
Karen Snyder
Mujoy Hill Property Owner



Helen Donaldson <hcd@portlandmaine.gov>

Impact fee ordinance concerns

Christian MilNeil <c.neal.milneil@gmail.com>

Mon, Sep 24, 2018 at 3:17 PM

To: Ethan Strimling <estrimling@portlandmaine.gov>, Belinda Ray <bsr@portlandmaine.gov>, sthibodeau@portlandmaine.gov, Brian Batson <bbatson@portlandmaine.gov>, jcosta@portlandmaine.gov, Kim Cook <kcook@portlandmaine.gov>, Pious Ali <pali@portlandmaine.gov>, Nick Mavodones <nmm@portlandmaine.gov>, Jill Duson <jduson@portlandmaine.gov>
Cc: "PBPAC@googlegroups.com" <pbpac@googlegroups.com>, HCD@portlandmaine.gov, Stuart O'Brien <sgo@portlandmaine.gov>

Mayor Strimling and honorable city councilors,

A lot of Portlanders are distressed about how much parking garage construction is happening right now downtown (with thousands of additional parking spaces in the planning pipeline).

These new garages are a concrete demonstration of how the city is failing in its transportation and climate goals. Landlords are willing to spend lots of money to subsidize private parking, even as the city's public streets strain under increasing congestion. It's a classic "tragedy of the commons" situation – every new parking space makes driving slightly more convenient for one motorist but incrementally increases congestion for everyone else – and it demands a stronger public policy response from the city.

Transportation impact fees could be an excellent way to tackle this issue: a financial nudge to encourage developers to internalize the broader traffic impacts of their parking management decisions.

However, in the current proposal drafted by the city's planning department, new parking garages will get a free ride.

We know intuitively and by observation that a 7-11 surrounded by a big, free parking lot generates more car traffic, while a new Rosemont Market makes more walking trips possible – even though the square footages are roughly the same and the buildings' uses, from a zoning standpoint, are identical. We drive to the Maine Mall because it's surrounded by free parking lots, and we walk to Reny's because parking is scarce on Congress Street and the pedestrian and transit connections are excellent.

These examples demonstrate that, if we want to manage the impacts of traffic from new development, we need to incentivize useful infill development that makes car trips less necessary, and we need to discourage subsidized parking.

The current draft impact fee ordinance does the opposite.

There's also a real financial risk to the city in giving parking garages a free pass. Under state law, by adopting the ordinance, the city is committing to build these capital projects whether or not the anticipated growth occurs.

In its current form, the proposed ordinance will make smart infill growth even more expensive, and thus even more development will sprawl out to cheaper suburbs like Westbrook and Scarborough instead. **If Portland builds more parking garages downtown and spends millions of dollars to increase road network capacity through these capital projects, we run the risk of getting all of the traffic from new suburban development, but not having sufficient new revenue from new in-town housing and offices to pay for it.**

By expanding the proposed fees to cover parking garages as well, smarter infill growth becomes more financially attractive and the city can mitigate this financial risk. Future developers will have a financial incentive to build lower ratios of parking to usable space, and encourage more of their tenants to walk, ride bikes or patronize our underutilized buses. In short, there's an opportunity here for the city to collect fees from a broader base of new development, while also establishing financial incentives that are aligned with the city's goals.

I also want to stress that I'm very glad the city is looking into the impact fees generally – I think it's an important tool for us to have in place. I'm just particularly concerned about the unintended effects of a parking garage loophole.

Thanks for your attention and your work on this.

9/27/2018

City of Portland Mail - Impact fee ordinance concerns

Christian MilNeil
45 Smith Street

[double u double u double u dot christianmilneil dot com](mailto:doubleu@doubleu.com)



Helen Donaldson <hcd@portlandmaine.gov>

Impact fee ordinance concerns

Zack Barowitz <zbarowitz@gmail.com>

Mon, Sep 24, 2018 at 3:30 PM

To: Portland Bicycle-Pedestrian Advisory Committee <PBPA@googlegroups.com>

Cc: Mayor <estrimling@portlandmaine.gov>, Belinda Ray <bsr@portlandmaine.gov>, Spencer Thibodeau <sthibodeau@portlandmaine.gov>, Brian Batson <bbatson@portlandmaine.gov>, Justin Costa <jcosta@portlandmaine.gov>, Kim Cook <kcook@portlandmaine.gov>, Pious Ali At Large <pali@portlandmaine.gov>, Nicholas Mavodones <nmm@portlandmaine.gov>, Jill Duson <jduson@portlandmaine.gov>, Helen Donaldson <HCD@portlandmaine.gov>, Stuart O'Brien <sgo@portlandmaine.gov>

Pursuant to Christian's large point (e.g., "These examples demonstrate that, if we want to manage the impacts of traffic from new development, we need to incentivize useful infill development that makes car trips less necessary, and we need to discourage subsidized parking.")

Urban density makes Land values and tax revenue are *far* greater in downtown Portland than in surrounding suburbs even if annual square foot rents are roughly equal. See [this](#) for example.

Thanks,
Zack

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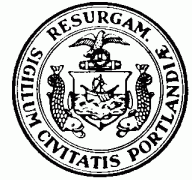
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PLANNING BOARD REPORT PORTLAND, MAINE

Capisic Meadows 8 Lot Subdivision

130 Bancroft Street

Level III Subdivision:

Project # PL000092-2018

WB Group, Inc, Applicant

Submitted to: Portland Planning Board: Public Hearing Date: October 9, 2018	Prepared by: Jean Fraser Date: October 5, 2018
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I. INTRODUCTION

Northeast Civil Solutions, Inc, on behalf of WB Group, Inc., has requested final approval to the Level III Subdivision application for an 8 lot subdivision that comprises the applicants lot and house, 7 new single family house lots within the adjacent wooded area, and a new dead-end street (approximately 400 linear feet) off of Bancroft Street.

The proposals were considered at a Planning Board Workshop on July 17, 2018 in the context of the subdivision ordinance standards. The project was considered broadly acceptable subject to receiving additional information to address legal questions and public comments.

The site totals 2.9 acres in area made up of several parcels, and is located in the R3 residential zone. The proposals include a new street to be constructed to City standards with a sidewalk on the south side, and a new detention basin on the western boundary that would connect with an existing drainage easement to Capisic Street.



The project involves the filling of 10,741 sq ft of forested freshwater wetlands that are in pockets throughout the site, and the project has obtained a MDEP Tier 1 NRPA Permit and Army Corps Permit that both approve this wetland fill ([Attachment H](#)).

Applicant: WB Group, Inc (Joshua Wagner, owner)

Consultants: Northeast Civil Solutions (Brandon Binette; Tony Panciocco; Jim Fisher)

II. REQUIRED REVIEWS AND WAIVER REQUESTS

Review	Applicable Standards
<i>Subdivision</i> – creation of 7 new lots combined with an existing lot (total 8)	<i>Section 14-497 – 14-499</i>
Waiver Requests	Applicable Standards
<i>Sidewalk Waiver</i> requested to allow for one sidewalk to be located on the south side of the proposed new street (Attachment M).	<i>Section 14-498 (b) Street Design 8a</i> requires that sidewalks be constructed on each side of each street in accordance with article III of Chapter 25.

Staff Recommendation: The waiver is supported, with the sidewalk as shown on the southern side of the proposed street (Attachment 4).

Note: the applicant has not requested a waiver from the requirement under 14-499 that all utility lines shall be placed underground unless otherwise approved by the Planning Board. Therefore per the DPW comments (Attachment 5) a suggested condition of approval requires that the relocated overhead line (that goes over the new street to a relocated pole) shall be placed underground.

III. PROJECT DATA

Existing Zoning	R3 Residential		
Existing Use	One single family lot and undeveloped woodlands		
Proposed Use	Eight single-family lots, including the existing lot owned by the applicant		
Parcel Size	117,258 sq ft		
	<i>Existing</i>	<i>Proposed</i>	<i>Net Change</i>
Wetland Area	21,796 sq ft	11,055 sq ft	10,741 sq ft
Impervious Surface Area	12,458 sq ft	41,120 sq ft	28,663 sq ft
Building Footprint	0 SF	0 SF (Buildings are not proposed at this time)	0 SF
Number of Residential Units	1	8 Lots	+7 new lots
Estimated Cost of Project	Awaiting Cost Estimate		

IV. EXISTING CONDITIONS

The proposal site is just under 3 acres and accessed from Bancroft Street between two existing homes. The site widens out to the southwest, going back about 400+ feet from Bancroft Street. There are existing homes along all of the boundaries, though not all are in close proximity.

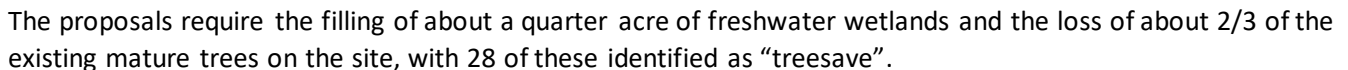
There is a private drainage easement running behind the Bancroft properties between the new street and Capisic Street. This easement dates from 1967 and benefits the development site (see further info below).

It is not known whether ledge is present on the site; if blasting is required the City has a comprehensive Blasting ordinance that would need to be followed.

Bancroft Street is a relatively quiet street linking Capisic Street with Brighton Avenue. The new access for the 7 new back land lots would enter Bancroft Street immediately behind the 25mph sign in the photo right.



The applicant proposes a new street named Benjamin Way, approximately 400 linear feet with a dead end and turnaround, that would serve the 7 new single family house lots located along it. A residual area is allocated for a new detention basin as shown in the draft Subdivision Plat (Plan 3) and Site Plan (Plan 4 and below). The street (with one sidewalk), stormwater system and sewers, three street lights, and street trees would be constructed by the applicant, and the lots would be sold for development in the future.



VI. PLANNING BOARD WORKSHOP SUMMARY

- What would be the maintenance responsibilities and costs that would fall to the HOA?

Page 3

- If the stormwater system (understood to be the responsibility of the Homeowners Association (HOA)) is not maintained adequately, what mechanism would ensure that this was done to avoid impacts to neighbors?

All projects that include a stormwater management system are required to enter into a Stormwater Maintenance Agreement (the generic template is in [Attachment 8](#) and the applicants draft for this project is in [Attachment Q](#)). This agreement gives the City the right to enter the site and undertake required maintenance, and then charge that cost back to the users. In addition, the City's Water Resources Division of DPW requires regular monitoring reports and has authority to take action if a site is violating codes. Lastly, a suggested condition of approval clarifies that future maintenance is a site plan condition, so legal action would also be possible under the site plan codes.

- Revise proposals to address concerns regarding safety and impacts of detention basin.
See information in the table below.

VII. PUBLIC COMMENT SUMMARY

A total of 164 notices of this Hearing were sent to neighbors and interested parties within 500 feet, and the legal notice appeared in the September 29th and October 1st, 2018 editions of the *Portland Press-Herald*. A Neighborhood meeting was held on June 19, 2018 and attended by 21 neighbors (see notes in [Attachment K](#)).

At the time of the Workshop the Planning office had received 13 public comments representing 12 neighbors, of which 9 were objections and 3 in support ([PC1- PC 13](#)). Since the Workshop a further 4 public comments have been received, bringing the total number of neighbors who object to 10.

At the Workshop six members of the public spoke, of which two amplified on their written objections, two raised new objections, and two supported the project. Supporters noted proximity of publicly accessible woodland to north, though raised concerns about the affordability of the new homes. Ms Harkins drew the Board's attention to an article regarding safety and maintenance of detention basin (PC15) which was forwarded to the applicant.

The table below summarizes the basis of the public comment objections, and how they have been addressed by the final proposals and additional information. Those in support of the project cited the benefits of having an updated drainage systems and the need for more housing.

<i>PUBLIC COMMENT ISSUE</i>	<i>HOW ADDRESSED</i>
Site layout • Shoe-horning in the 7 new lots (maybe 1-2 houses OK) • Inconsistent with City's commitment to preserving green space and wetland • Needs to be more affordable housing	The layout consistent with the existing pattern of housing in area. No variances or waivers have been requested except for having one sidewalk instead of two. The project conforms with zoning and technically the lot could be divided into more lots than is proposed.
Rights to use drainage easement across the three other properties	Three nearby property owners have a private drainage easement across their land which dates from 1967 and included in background deeds; also in the original subdivision plans & associated deeds related to the parcels that make up the site. The applicant has submitted a legal opinion (Attachment O) that documents this background and confirms that the applicant has the right to use, regrade and maintain this easement.
Maintenance of drainage system and easement out to Capisic Street • Whose responsibility • Who monitors • What if maintenance not done	A Homeowners Association (HOA) would be created and take on these responsibilities (with the applicant would be responsible until the HOA took over). A draft HOA document sets out the mechanism for carrying out these responsibilities, although staff recommend that it be revised to be clearer and broader.

<i>PUBLIC COMMENT ISSUE</i>	<i>HOW ADDRESSED</i>
More Traffic and need for three way stop	The City's Traffic Engineer reviewer does consider the proposal will create any safety issues and does not support the introduction of a stop at this location.
Wetland Impacts • One of last remaining freshwater wetlands in the city and some forested- once lost will never return • Note there is stream or part of the year • Wetland displaced and where will it go?	The applicant has received the required State permits to fill in about half of the existing wetlands, and the MDEP field report indicates that there is not a stream on the property (Attachment H). The remaining wetland areas will need to be protected; a suggested condition includes a re-quirement for them to be identified on the plat & deeds, and on the ground. Wetland water will flow into proposed stormwater system, which will more effectively drain the area in storm events.
Groundwater Impacts/Flooding • Rainfall causing more water back up since nearby development and more dense dev would make this worse • Already wet back yards and would wetlands just be displaced • Impact on quality of water- adversely impact Capisic Pond	The Stormwater Report confirms that the peak runoff rates will be the same or reduced compared to existing and that the detention pond will provide a short term holding area (24 hrs) for stormwater so it will not flood the area. The detention pond will also allow for treatment of the water before discharge so it will not affect any downstream water quality. A note on the Plat acknowledges the high groundwater and the need for future homes to be built on slabs or include sump pumps.
Detention Pond Impacts • Overflow and flood nearby back yards • Magnet for mosquitoes • Safety of the design (ref article PC15) • Vegetation needs to be suitable for water environment	The applicant has added 6 foot high chain link fencing (with gate) around the basin and noted that the design now includes covers to the outlets as recommended in PC15 (Attachment T). The detail of the planting has not been submitted, and a suggested condition requests that to be submitted for review and approval.
Open spaces • Proposal reduces open space • How is this allowed in wetlands of Redlon Park Woods (thought preserved by Portland Land Bank) • Erodes green space in neighborhood; these pockets of green space characterize Rosemont	This proposal is not within Redlon Park Woods (Redlon Woods), which is about 400+ feet from the site and included in the Land Bank holdings (see plan in Attachment 10). The final proposals include 28 "Treesaves" which comprise existing mature trees over 10dbh, and a condition requires that these be noted on the plat and in the lot deeds.
Construction time • Extended period of traffic and noise disruption • Ledge may be present- would there be blasting • Need study of impacts • Rat infestation has happened with previous sewer projects nearby	The applicant has submitted a preliminary Construction management Plan (CMP) (Attachment L). A suggested condition of approval requires the CMP to be finalized for review and approval to take account of these neighbor concerns and to address the Blasting ordinance.

VIII. STAFF REVIEW

A. RIGHT, TITLE AND INTEREST

The applicant has submitted the deeds in respect of to the eastern part of the site, and provided a Purchase and Sale Agreement for the parcel that makes up the western part of the site ([Attachment C](#)). In addition, the applicant has provided further evidence, via a formal legal opinion, that he has the rights to grade, use and maintain the private drainage easement between the site and Capisic Street ([Attachment O](#)).

Since the Workshop a question was raised by reviewers regarding the paper street (Kenilworth Street) which was understood to underlay the proposed new street (Benjamin Way). Kenilworth Street is recorded as being

statutorily vacated ([Attachment 10](#)) and the question was whether there were any parties with rights in the street other than the applicant and the party with whom he has a P&S. The applicant's agent has provided additional information that confirms there would not be any other parties with an interest ([Attachment S](#)).

Related to this, reviewers requested that the applicant confirm that he would give the fee interest in the new street to the City as part of the dedication and City acceptance process; this was submitted (also in [Attachment S](#).)

B. ZONING ANALYSIS

The proposed subdivision is located in the R3 residential zone and all of the proposed lots meet and exceed the dimensional standards of that zone. Staff have consulted with the Zoning Administrator to confirm that all of the lots meet the lot width requirement of 65 feet. The applicant has included zoning information on the plat and site plan.

C. SUBDIVISION REVIEW (14-497(a). Review Criteria

14-496. Subdivision Plat Requirements: The applicant has submitted a draft Subdivision Plat ([Plan P3](#)) which will need revisions to address review comments, including references to the HOA and Stormwater Agreements and inclusion of the treesaves.

1. *Will Not Result in Undue Water and Air Pollution (Section 14-497 (a) 1), and Will Not Result in Undue Soil Erosion (Section 14-497 (a) 4)*

The proposal does not appear to raise any concerns regarding this standard.

2. *Sufficient Water Available (Section 14-497 (a) 2 and 3)*

The applicant has provided a letter from the Portland Water District ([Attachment J](#)) confirming the district's ability to serve the proposed project. The Fire Department has confirmed that the applicant does not need to install a new hydrant in proposed subdivision ([Attachment 3](#)).

3. *Will Not Cause Unreasonable Traffic Congestion (Section 14-497 (a) 5)*

The Traffic Engineering reviewer has confirmed that the project is not expected to create unacceptable safety of traffic mobility issues ([Attachment 1](#)). He has also confirmed that the suggestion of a three-way stop (where the new street meets Bancroft) is not warranted by the traffic levels or speeds.

4. *Will Provide for Adequate Sanitary Sewer and Stormwater Disposal (Section 14-497 (a) 6), and Will Not Cause an Unreasonable Burden on Municipal Solid Waste and Sewage (Section 14-497 (a) 7)*

The applicant has submitted a wastewater capacity application and the Department of Public Works has confirmed that there is adequate sewer capacity ([Attachment J](#)). Since the proposed street will be built to City standards and accepted by the City Council, solid waste and snow removal will then be handled by the City.

The proposed stormwater system provides stormwater flow control and treatment. It includes large conduits through the lots, a new detention basin with two filtration units within the subdivision site, and an outflow to a culvert in Capisic Street via the private drainage easement swale. The applicant has addressed the comments, questions and concerns of reviewers, the Planning Board, and neighbors in the Comment Response letter ([Attachment P](#)) and revised Plan Set.

The City's records indicate that the 30 foot drainage easement out to Capisic Street, that runs across three properties at the corner of Bancroft and Capisic Streets, is not a City easement. Further research has confirmed that it was established as a private drainage easement in 1967 to benefit the site now proposed for the new 7 lots. The applicant was requested to confirm that he had the rights to use, grade and maintain this private drainage easement and has submitted a legal opinion that confirms that he has these rights ([Att. O](#)).

The applicant proposes the establishment of a Homeowners Association (HOA) to be responsible for maintaining the elements of the stormwater system (pipes on private property, detention pond and drainage channel) and securing the funding for this from the eight individual lot owners. The draft HOA documents have been submitted ([Attachment R](#)) and reflect this intention. The City's Associate Corporation Counsel and Peer Engineer have pointed out that they currently do not include the whole of the stormwater system and that the applicant would need to be party to those documents as he would be responsible until the HOA was fully established ([Attachments 2 and 6](#)).

The City's Peer Engineer Reviewer Lauren Swett provided detailed comments at the time of the PB Workshop and the applicant has addressed those comments (Attachments P, Q, R and Plan Set). The Peer Engineer reviewer has confirmed that the proposals meet the City's standards subject to revisions to the Stormwater Maintenance Agreement and HOA documents to ensure that they clarify the extent of the stormwater system and its maintenance requirements (Attachment 2) .

5. Scenic Beauty, Natural, Historic, Habitat and other Resources (Section 14-497 (a) 8)

The proposed additional 7 lots would be located on undeveloped land to the rear of the lots owned by the applicant and P&S party on the Bancroft Street frontage. The undeveloped land is primarily woodland and freshwater forested wetland, as can be seen on the Boundary Survey (Attachment 2). The Survey has been updated since the PB Workshop to locate mature trees, and identifies approximately 80 trees over 10dbh on the site, along with 21,796 sq ft of freshwater wetland.

At the Neighborhood meeting and PB workshop the applicant indicated that significant trees would be retained, and the final proposals include 28 treesaves (over 10dbh) in addition to the planting of two street trees per lot that is a subdivision requirement (see Landscape Plan below and at Plan P5).



Staff are concerned that the Landscape Plan does not include screen planting or treesaves for Lots A and 1-4 and that the submissions do not include detailed planting proposals for the detention basin itself or around it. The basin is proposed to have a 6 foot high chain link fence and staff recommend reconsideration to find a more attractive options that still provides the safety and security function. A suggested condition of approval reflects these concerns.

The public comments included a concern that the development of this site would result in the loss of local open space and some had thought this site was part of the Land Bank holdings. Staff note:

- that the lots are considerably larger than the minimum set out in the R3 zoning, and that has allowed for the tree save designations for about 28 existing mature trees; and
- that the Land Bank holdings of several acres of wetland and woods, known as Redlon Woods, are about 400+ feet to the north east of the proposal site, and are included in the Land Bank holdings and available for informal walking and mountain biking. The Land Bank Plan and detailed entry for Redlon Woods is included in Attachment 10.

6. Comprehensive Plan (Section 14-497 (a) 9)

The proposal in conformance with the housing policies of the adopted Comprehensive Plan.

7. Financial Capability (Section 14-497 (a) 10)

he applicant has submitted a letter from Bath Savings Institution (Attachment D) indicating the applicant has the financial capability to finance the project.

8. Wetland and Groundwater Impacts, Flood-Prone Area

The applicant has submitted a *Wetland Summary Report* (Attachment G) and intends to fill 10,741 sf (approximately half of the total) of the wetlands, and has received a Tier I NRPA permit from MDEP and Army Corps Permit for this extent of fill (Attachment H.). The applicant has explained that the layout has minimized the impacts on the wetland.

Staff recommend that a condition of approval require the Plat, HOA and lot deed documents to refer to the preservation of the remaining wetlands, and that the edges of the remaining wetland be marked on the ground by feno markers or similar, as has been required for several other Portland subdivisions.

SUBDIVISION REVIEW - 14-498. Technical and Design Standards; & 14-499. Required Improvements

The Subdivision ordinance sets out detailed requirements for the proposed street. Reviewers, including the Department of Public Works (DPW), consider the proposals to be acceptable except in respect of the following:

- The turnaround needs to have “no parking” signs to ensure it is available for large vehicles to turn around at the end of the proposed dead end street;
- The new street needs to be paved to the end of the ROW without the proposed guardrails; and
- The overhead electrical utility line between the relocated pole and the applicants home shall be underground to meet the ordinance 14-499 requirement that all utility lines shall be placed underground unless otherwise approved by the Planning Board.

Regarding the Subdivision requirement (14-498) for sidewalks on both sides of the new street, the DPW supports a waiver to allow for one sidewalk on the south side of the street as shown in the proposals (Attachment 4). The proposed motion for the waiver identifies the two waiver criteria that have been met.

IX. STAFF RECOMMENDATION

Staff recommends approval to the proposed subdivision at 130 Bancroft Street, subject to the suggested conditions of approval.

X. PROPOSED MOTIONS

On the basis of the application, plans, reports and other information submitted by the applicant, findings and recommendations contained in Planning Board Report for # PL000092-2018 Capisic Meadows subdivision (130 Bancroft Street) relevant to the Subdivision ordinance and other regulations, and the testimony presented at the Planning Board hearing, the Planning Board finds the following:

1. SUBDIVISION SIDEWALK WAIVER

The Planning Board finds that based on the recommendations of the DPW City Engineer (Attachment 4) that two of the following criteria **do/do not** apply, (namely 3 and 6 as noted below) and therefore **waives/does not waive** the requirement for a sidewalk along the north side of Benjamin Way within the proposed 8 lot subdivision:

SIDEWALK WAIVER CRITERIA:

3. *A safe alternative-walking route is reasonably and safely available, for example, by way of a sidewalk on the other side of the street that is lightly traveled.*
6. *Strict adherence to the sidewalk requirement would result in the loss of significant site features related to landscaping or topography that are deemed to be of a greater public value.*

2. SUBDIVISION PLAN

That the Planning Board finds that the plan plan **is/is not** in conformance with the subdivision standards of the land use code and **approves/does not approve** the application, subject to the following conditions of approval:

Prior to the signing of the plat by the Planning Board

1. The applicant shall submit a final subdivision plat for review and approval by Corporation Counsel, the Department of Public Works, and the Planning Authority, and
 - a. Includes the subdivision name (as approved to be Capisic Meadows), streetname (as approved to be Benjamin Way), and Waiver as approved; and
 - b. Addresses the review comments of William Scott dated 9.28.18 and all other comments, including but not limited to: reference to the Stormwater Maintenance Agreement, HOA documents and other agreements that clarify the stormwater system maintenance responsibilities, treesave locations, marking of the MDEP approved area of wetland filling; and relevant conditions.
2. The applicant shall submit a revised plan set, including the site plan and landscape plan, for review and approval by the Planning Authority, that revises the proposals as listed below:
 - a. To show the proposed planting in and around the detention basin;
 - b. To introduce additional screen planting, particularly for Lots A and 1-4;
 - c. To propose options for a more attractive fence around the detention basin;
 - d. To revise the street turnaround to include "no parking" signs;
 - e. To revise the new street to extend the paving to the end of the ROW without the proposed guardrails;
 - f. To revise the overhead electrical utility line between the relocated pole and the applicants home so that it is underground, to meet the ordinance 14-499 requirement that all utility lines shall be placed underground unless otherwise approved by the Planning Board.

Prior to the release of the signed subdivision plat for recording

3. That the following shall be finalized to the satisfaction of the Corporation Counsel, Department of Public Works and the Planning Authority prior to the release of the signed subdivision plat:
 - a. Stormwater Maintenance Agreement;
 - b. Homeowners Association (HOA) documents;
 - c. Individual lot deeds;
 - d. Any other required easements.

4. That the draft Stormwater Management Agreement and draft HOA documents shall be revised to address the comments of the Associate Corporation Counsel dated 10.4.18 and Peer Engineer dated 10.5.18.
5. That the applicant shall include in the individual lot deeds a detailed description of the location of all wetlands, treesaves and stormwater systems including culverts on private property, swale protection, and associated restrictions against filling, altering or disturbing the same and associated maintenance and other requirements.

Prior to the commencement of construction

6. That the applicant shall mark the line around the areas of preserved wetland with permanent markers such as FENO markers, placed every 25 ft and all corners and to bear the engraved wording "Do not fill, alter or disturb beyond this point"; the Subdivision Plat and deeds to identify the location and purpose of such markers and clarify that such markers are not to be removed and that no further filling is to take place beyond the markers.
7. The applicant shall submit a revised Construction Management Plan for review and approval by the Planning Authority and the Department of Public Works, and shall take account of the neighbor concerns as outlined in the public comments on this project.
8. That the applicant shall provide evidence to the Planning Authority that they have complied with all requirements of the Blasting Ordinance if any blasting is required during construction.

Prior to the return of the Performance Guarantee

9. That the applicant shall apply for the street to be accepted by the City of Portland when the project is completed, and is subject to the City's legal and technical process for street acceptance. The applicant shall convey the fee interest for the new street to the City of Portland and submit a revised boundary survey and complete set of record drawings to the Department of Public Works and the Planning Authority for review and approval prior to the completion and prior to the acceptance by the City.

Ongoing

10. The developer/contractor/subcontractor must comply with conditions of the construction stormwater management plan and sediment and erosion control plan dated September 2018 prepared by Northeast Civil Solutions and based on City standards and state guidelines. The owner/operator of the approved stormwater management system and all assigns shall comply with the conditions of Chapter 32 Stormwater including Article III, Post Construction Stormwater Management, which specifies the annual inspections and reporting requirements.
11. That the stormwater management system, including associated drainage swales, culverts, detention pond and fencing/planting, and area of the private drainage easement, shall be maintained as set out in the submitted O&M documents in perpetuity.

Attachments to Report

1. Traffic Review Comments
2. Peer Engineer Comments
3. Fire Department Comments
4. DPW comments - Sidewalk Waiver
5. DPW comments - Utilities
6. Legal Comments HOA Docs and Stormwater Main Agreement
7. City Arborist Comments (not received at time of Memo completion)

8. Stormwater Maintenance Agreement Template
9. City Records re former Kenilworth Street
10. Land Bank Commission Info on Redlon Woods Holdings
11. Survey Comments on Plat

Public Comment - in Workshop Memo July 17, 2018

- PC1 Peter Carpenter 6-5-18
PC2 Douglas Babkirk 6-5-18
PC3 Jeff Emerson 6-7-18
PC4 Doug Babkirk 6-7-18
PC5 Jacqueline Harkins 6-8-18
PC6 Oliver and Ellen Griswold 6-8-18
PC7 Judy Gailen 6-13-18
PC8 Ken & Kari Doiran 6-13-18
PC9 Sarah Delisle 6-14-18
PC10 Estelle Heures 7-6-18
PC11 Caleb Oconnell 7-9-18
PC12 Diane Herrick 7-10-18
PC13 Jacqueline Harkins 7-3-18

Public Comment - since Workshop Memo July 17, 2018

- PC14 Mary Foley 7-16-18
PC15 JHarkins pond info to PB 7.18.18
PC16 Jeff Emerson 10-2-18
PC17 Jacqueline Harkins 10-4-18

Applicant's Submittal

As to Workshop on July 17, 2017 except where updated

- A. Cover Letter
- B. Agent Authorization
- C. Right, Title and Interest
- D. Financial Capacity
- E. Technical Ability
- F. Traffic Evaluation
- G. Wetland Report
- H. State Permits approving wetland fill (updated)
- I. Storm Man Rpt Insp & Main – Fi;terra OM Guide (updated)
- J. Utility Letters (updated)
- K. Neighborhood Meeting info & Notes
- L. Construction Management Plan
- M. Sidewalk Waiver Request
- N. Response to comments 7.11.18

Applicant's Submittal

Since Workshop on July 17, 2017

- O. Legal Opinion on rights to use Drainage Easement
- P. City Comment Response Letter 9.7.18
- Q. Stormwater Maintenance Agreement (draft)
- R. Capisic Meadows HOA Bylaws (draft)
- S. Applicants confirmation giving land for street & background info
- T. Info re revisions to the detention pond design

Plans (final)

1. Cover Page
2. Boundary Survey
3. Subdivision Plat
4. Site Plan- Layout
5. Landscape Plan
6. Grading Plan
7. Utility Plan
8. Erosion Control
9. Erosion Control notes & details
10. Details (6 sheets)
11. Road Profile
12. Pre-Development Drainage
13. Post-Development Drainage



Jean Fraser <jf@portlandmaine.gov>

Bancroft Subdivision - Preliminary Traffic Comments1 message

Tom Errico <thomas.errico@tylin.com>

Wed, Jul 11, 2018 at 4:20 PM

To: Jean Fraser <jf@portlandmaine.gov>

Cc: Keith Gray <kgray@portlandmaine.gov>, Jeremiah Bartlett <JBartlett@portlandmaine.gov>, Bruce Hyman <bhyman@portlandmaine.gov>, "Jeff Tarling (JST@portlandmaine.gov)" <JST@portlandmaine.gov>

Hi Jean – I have reviewed the project application materials and offer the following preliminary traffic comments.

- The applicant has conducted a traffic assessment and I find the conclusions to be acceptable. The project is not expected to create unacceptable safety or traffic mobility issues.
- The applicant is requesting a waiver for the provision of sidewalks on both sides of the proposed subdivision road. I support the waiver given impact to wetlands and landscape resources and that a reasonable alternative exists (the proposed sidewalk). It is not clear which side of the street the sidewalk should be located. The applicant should provide comparison information, particularly wetland impacts, in making a decision on sidewalk location.

If you have any questions, please contact me.

Best regards,

Thomas A. Errico, PE
Senior Associate
Traffic Engineering Director

TYLIN INTERNATIONAL

12 Northbrook Drive

Falmouth, ME 04105

+1.207.781.4721 main

+1.207.347.4354 direct

+1.207.400.0719 mobile

+1.207.781.4753 fax

thomas.errico@tylin.com

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Jean Fraser <jf@portlandmaine.gov>

RE: Bancroft

1 message

Lauren Swett <lswett@woodardcurran.com>
To: Jean Fraser <jf@portlandmaine.gov>

Fri, Oct 5, 2018 at 10:55 AM

Hi Jean,

I am comfortable with the responses provided to all of my comments.

My only addition comment for this project is with regards to the description of the "Stormwater System" as provided in both the Homeowner's Association and the Stormwater Agreement. In both documents, the following wording is used:

"drainage swale and detention pond (hereinafter collectively referred to as the "Stormwater System")"

I think this should be expanded to include specific reference to the culverts, i.e. just adding "drainage swale, culverts, and detention pond". The HOA refers to the stormwater agreement, and that refers to the correct plan, so it should be adequately covered.

Let me know if you need any additional information from me, but I think this should be good with that small change.

Thanks,

Lauren

From: Jean Fraser <jf@portlandmaine.gov>
Sent: Friday, October 5, 2018 9:57 AM
To: Lauren Swett <lswett@woodardcurran.com>
Subject: Bancroft

Lauren

This is what I have so far. The applicant has listed your comments in the September Response Letter (also attached).



Jean Fraser <jf@portlandmaine.gov>

Bancroft Street

1 message

Lauren Swett <lswett@woodardcurran.com>

Fri, Jul 13, 2018 at 7:11 AM

To: Jean Fraser <jf@portlandmaine.gov>

Cc: Keith Gray <kgray@portlandmaine.gov>

Hi Jean,

I've taken a quick look at the additional information that the Applicant uploaded yesterday. Based on what they've provided, the meeting that we had on July 10, and the public comments I have reviewed, I have the following comments:

- The Applicant has provided additional information with regards to maintenance of the stormwater systems proposed throughout the site. They have noted that the Homeowners Association will be responsible for the maintenance, and HOA documents will be provided for review. Please note that a Stormwater Maintenance Agreement with the City of Portland will also be required.
- The Applicant has received their DEP wetland permit, and they have worked with the Army Corps on design changes to ensure their approval. The Applicant has noted that these design changes include upsizing of many of the culverts on site, and these changes impact the HydroCAD. The HydroCAD has not yet been uploaded to Eplan, but I will review that material when it is provided after the Workshop. I don't anticipate any issues as the pipes capacity will increase.
- The existing drainage easement was discussed as part of the meeting on July 10, and that Applicant noted that they would do further research into that easement, and provide additional information. They have addressed this in their July 11 response to comments, and note that per the City's request, they will be cleaning out this area. Following the workshop, additional information should be provided on the grading and drainage plan to show the extent of clearing in this area.

In general, the Applicant has been responsive to comments, and they are providing for adequate management of stormwater from their site, and from off-site areas within the project area.

If you have any questions, please let me know. I started to mark some of my comments as resolved on Energov, but I will wait until after the Workshop when they provide their updated HydroCAD and complete updated plan set.

Thanks,

Lauren

Lauren Swett, P.E.*

Technical Manager

Woodard & Curran

41 Hutchins Drive

Portland, Maine 04102



PLAN CORRECTIONS REPORT PL-000092-2018 FOR CITY OF PORTLAND

PLAN ADDRESS: 130 Bancroft St
Portland, ME 04102

PARCEL: 193 E026001

APPLICATION DATE: 05/02/2018

SQUARE FEET: 0.00

DESCRIPTION: 8 Lot Subdivision

EXPIRATION DATE:

VALUATION: \$0.00

CONTACTS

Name

Company

Address

Agent/Representative

Michael Skolnick

Northeast Civil Solutions

381 Payne Road
Scarborough, ME 04074

Corrections Required

City Arborist

Jeff Tarling

Civil Engineering - Third Party Reviewer

Lauren Swett

v.1.00 - Not Resolved

Correction: General

The Applicant has submitted a copy of the NRPA Application to the DEP for proposed wetland fill.

Corrective Action: Copies of all final permit approvals should be forwarded to the City upon receipt.

Correction: General

The stormwater inspection and maintenance plan should include provisions for the requirements of Chapter 32 of the City of Portland Code of Ordinances, as well as inspection and maintenance requirements for the proposed Filterra Units and Detention Pond.

Corrective Action: Update the stormwater inspection and maintenance plan.

Correction: General

The Applicant has stated that the lot impervious areas were included in the HydroCAD model, however the narrative report indicates that there will be 0.62-acres of new impervious area and the model indicates that there will be only 0.48-acres of new impervious area.

Corrective Action: Clarify the amount of impervious surface that has been modeled, and confirm that it includes all impervious surface anticipated to drain to the pond.

Correction: General

Note that the standard detail for Sidewalk Ramp Detectable Warning Panels was revised in October 2017. The acceptable material is now uncoated cast iron.

Corrective Action: Please revise the detail.

Correction: General

The Grading and Drainage Plan indicates that SD-7 will be a 15-inch pipe, but the HydroCAD model indicates that it is 18-inches. The dimensions of the emergency spillway are also inconsistent between the plans and the model.

Corrective Action: The Applicant should clarify and ensure that the drawings and the model are consistent.

Correction: General

Proposed details include a "Type B Underdrain Installation Detail – Alternative A" that shows underdrain along the roadside edge under curbing; however, the proposed grading and drainage plan does not show locations or discharge points for proposed underdrain.

Corrective Action: Clarify the use of underdrain on the site.

Correction: General

A construction management plan has not been provided.

Corrective Action: Provide a construction management plan using the City's template which is available online

<http://www.portlandmaine.gov/DocumentCenter/View/18030>

Correction: General

All piping installation within the proposed roadway is required to be in conformance with the City's Technical Manual, Section 2 Sanitary Sewer and Stormdrain. This includes material types and installation. Note that the City of Portland requires HDPE stormdrain pipe to be ADS HP triple-wall pipe. Refer to figure II-12 for the typical pipe trench installation.

Corrective Action: Update the plans and details to be in conformance with the City's standards.

Correction: General

We have reviewed the Grading and Drainage Plan, and there are a few areas where the grading is not detailed enough to show that water will not be directed towards the building foundations. Specifically on Lots 5, 6, and 7. Additional spot grades are also recommended in the area between Lots 2 and 3, the area in front of Lot 4 and the area adjacent to the retaining wall at the edge of the detention pond to clearly define grading such that ponding will not occur.

Corrective Action: Provide updated Grading and Drainage Plan.

Correction: General

Filtterra units are proposed for installation within the future City Right Of Way. The Applicant should discuss the maintenance of these systems with the City of Portland Department of Public works to determine if they will be maintained by the City or if maintenance will be required by the owners. In addition, a system of culverts extends through the site, both over private property and the City Right Of Way, to a stormwater pond that is located on private property. Responsibility of maintenance of all stormwater systems should be clearly established, and Stormwater Maintenance Agreements are required in conformance with the City's Chapter 32.

Corrective Action: Provide Stormwater Maintenance Agreements.

Fire	Robert Thompson
Planning	Jean Fraser
Public Works Engineering	Keith Gray
Public Works Water Resources Engineering	Doug Roncarati
Traffic - Third Party Reviewer	Tom Errico
Transportation/Planning	Bruce Hyman
Zoning	Pool Zoning

Conditions Required

Fire: Sprinkler One- and Two-Family

General Condition

All homes will be required to be sprinklered.

Life Safety: Fire Dept Access

General Condition

Fire Department access to all homes is acceptable.

General Condition

A 30 x 30 turnaround is required at the dead end of the road.

Life Safety: General

General Condition

The fire hydrant at the end of the road must be removed. No fire hydrant is required for this project.



Jean Fraser <jf@portlandmaine.gov>

Re: 130 Bancroft subdivision (PL 00092-2018)

1 message

Robert Thompson <rmt@portlandmaine.gov>
To: Jean Fraser <jf@portlandmaine.gov>

Tue, Oct 2, 2018 at 12:35 PM

Hi Jean,

Their original proposal had a fire hydrant at the end of the road, which I requested they remove.

This project does not require a fire hydrant.

Thank you,
Mike

On Tue, Oct 2, 2018 at 11:36 AM, Jean Fraser <jf@portlandmaine.gov> wrote:

Mike

At Dev Rev last week you said you would check to see whether they need a hydrant (as this is going to a hearing with report being finalized on thursday this week)

According to their most recent response letter, you requested that they remove a hydrant that was shown on the original submissions:

EXTRACT FROM THEIR MOST RECENT RESPONSE LETTER:**Fire Department**

11. All homes will be required to be sprinkled.
We have added a note to the Subdivision Plan indicating that all homes will be required to be sprinklered.
12. Fire Department access to all homes is acceptable.
No response required.
13. A 30 x 30 turnaround is required at the dead end of the road.
The turnaround has been drawn as 30 x 30.
14. The fire hydrant at the end of the road must be removed. No fire hydrant is required for this project.
The hydrant has been removed from the plans.

Please let me know if we need to advise them differently.

thanks



Jean Fraser <jf@portlandmaine.gov>

Fwd: DPW sign off needed for Bancroft Subdivision Hearing Report goes to PB this week for 10/9 vote

1 message

Jean Fraser <jf@portlandmaine.gov>
To: "Fraser, Jean" <jf@portlandmaine.gov>

Thu, Oct 4, 2018 at 3:18 PM

DPW COMMENTS 10.3.18

----- Forwarded message -----

From: **Keith Gray** <kgray@portlandmaine.gov>

Date: Wed, Oct 3, 2018 at 4:15 PM

Subject: Re: DPW sign off needed for Bancroft Subdivision Hearing Report goes to PB this week for 10/9 vote

To: Jean Fraser <jf@portlandmaine.gov>

Cc: Caitlyn C Abbott <cabbott@portlandmaine.gov>, Errico, Thomas <thomas.errico@tylin.com>, Bruce Hyman <bhyman@portlandmaine.gov>, Barbara Barhydt <bab@portlandmaine.gov>

Hello,

We are in support of the sidewalk waiver for the proposed subdivision. The applicant is proposing a sidewalk on one side of the dead end street to serve the adjoining residents. There are no existing sidewalks for connectivity on Bancroft Street and residence on the opposite side of the proposed street can cross safely to reach the sidewalk. The addition of another sidewalk would further impact wetlands, increase the impervious area and require additional maintenance.

Thank you,
Keith

Keith D. Gray, PE
City Engineer
Engineering Services Manager
Dept. of Public Works
City of Portland Maine

207.874.8834
kgray@portlandmaine.gov



Jean Fraser <jf@portlandmaine.gov>

Fwd: DPW sign off needed for Bancroft Subdivision Hearing Report goes to PB this week for 10/9 vote

1 message

Jean Fraser <jf@portlandmaine.gov>
To: "Fraser, Jean" <jf@portlandmaine.gov>

Thu, Oct 4, 2018 at 3:54 PM

DPW COMMENTS RE NOT SUPPORTING WAIVER FROM SUBDIVISION REQUIREMENT TO PLACE ELECTRICAL SERVICES UNDERGROUND

----- Forwarded message -----

From: **Keith Gray** <kgray@portlandmaine.gov>

Date: Thu, Oct 4, 2018 at 3:01 PM

Subject: Re: DPW sign off needed for Bancroft Subdivision Hearing Report goes to PB this week for 10/9 vote

To: Jean Fraser <jf@portlandmaine.gov>

The applicant should be required to install underground electric.

Keith D. Gray, PE
City Engineer
Engineering Services Manager
Dept. of Public Works
City of Portland Maine

207.874.8834

kgray@portlandmaine.gov

On Thu, Oct 4, 2018 at 1:45 PM Jean Fraser <jf@portlandmaine.gov> wrote:

Sorry to continue - they are retaining (relocating) the existing OHU (elec) on Bancroft (but it will string across the new street) to the existing home in the subdivision (the applicant's home) so technically not in compliance with the subdivision standards. See attached.

thanks
Jean

**41041-UTILITY 9-7-18.pdf**

421K



Jean Fraser <jf@portlandmaine.gov>

Fwd: 130 Bancroft - (to hearing) Homeowners Assn Docs & Stormwater Main Agreement

1 message

Jean Fraser <jf@portlandmaine.gov>
To: "Fraser, Jean" <jf@portlandmaine.gov>

Thu, Oct 4, 2018 at 3:31 PM

***Associate Corporation Counsel comments re
submitted HOA documents and Stormwater Maintenance Agreement***

----- Forwarded message -----

From: **Jennifer Thompson** <jlt@portlandmaine.gov>

Date: Thu, Oct 4, 2018 at 10:31 AM

Subject: Re: 130 Bancroft - (to hearing) Homeowners Assn Docs & Stormwater Main Agreement

To: Jean Fraser <jf@portlandmaine.gov>

Hi Jean - I agree that the whole of the system that is to be maintained by the HOA should be referenced in these By Laws. With respect to the agreement, I agree that this will need to be redrafted and initially signed by the owner of the property, not a non-existent HOA. By its terms, it will bind the owner's successors and assigns, including the HOA but we'll need to have the owner sign it initially.

Jennifer L. Thompson
Associate Corporation Counsel
City of Portland
207.874.8915

STORMWATER DRAINAGE SYSTEM MAINTENANCE AGREEMENT

For SUBDIVISIONS

IN CONSIDERATION OF the site plan and subdivision approval granted by the Planning Board of the City of Portland to the proposed _____ (name of developments and project number) shown on the Subdivision Plat (Exhibit A) recorded in Cumberland Registry of Deeds in Plan Book ____, Page ____ submitted by _____, and associated Grading, Drainage & Erosion Control Plan (*insert correct name of plan*) (Exhibit B) prepared by _____ (engineer/agent) of _____(address) dated and pursuant to a condition thereof, _____ (name of owner), a Maine limited liability company with a principal place of business in Portland, Maine, and having a mailing address of _____, the owner of the subject premises, does hereby agree, for itself, its successors and assigns (the “Owner”), as follows:

Maintenance Agreement

That it, its successors and assigns, will, at its own cost and expense and at all times in perpetuity, maintain in good repair and in proper working order the _____ (*details of the system such as underdrained subsurface sand filter BMP system, rain gardens, storm drain pipes, underdrain pipes, catch basins*), (hereinafter collectively referred to as the “stormwater system”), as shown on the _____ Plan in Exhibit B and in strict compliance with the approved Stormwater Maintenance and Inspection Agreement (*insert correct name of document*) prepared for the Owner by _____ (copy attached in Exhibit C) and Chapter 32 of the Portland City Code.

Owner of the subject premises further agrees, at its own cost, to keep a Stormwater Maintenance Log. Such log shall be made available for inspection by the City of Portland upon reasonable notice and request.

Said agreement is for the benefit of the said City of Portland and all persons in lawful possession of said premises and abutters thereto; further, that the said City of Portland and said persons in lawful possession may enforce this Agreement by an action at law or in equity in any court of competent jurisdiction; further, that after giving the Owner written notice and a stated time to perform, the said City of Portland, by its authorized agents or representatives, may, but is not obligated to, enter upon said premises to maintain, repair, or replace said stormwater system in the event of any failure or neglect thereof, the cost and expense thereof to be reimbursed in full to the said City of Portland by the Owner upon written demand. Any funds owed to the City under this paragraph shall be secured by a lien on the property.

This Agreement shall also not be construed to allow any change or deviation from the requirements of the subdivision and/or site plan most recently and formally approved by the Planning Board of the City of Portland.

This agreement shall bind the undersigned only so long as it retains any interest in said premises, and shall run with the land and be binding upon the Owner's successors and assigns as their interests may from time to time appear.

The Owner agrees to record a copy of this Agreement in the Cumberland County Registry of Deeds within thirty (30) days of final execution of this Agreement. The Owner further agrees to provide a copy of this Agreement to any successor or assign and to forward to the City an Addendum signed by any successor or assign in which the successor or assign states that the successor or assign has read the Agreement, agrees to all its terms and conditions and the successor or assign will obtain and forward to the City's Department of Public Services and Department of Planning and Urban Development a similar Addendum from any other successor or assign.

For the purpose of this agreement and release "Owner" is any person or entity who is a successor or assign and has a legal interest in part, or all, of the real estate and any building. The real estate shown by chart, block and lot number in the records on file in the City Assessor's office shall constitute "the property" that may be entered by the City and lienied if the City is not paid all of its costs and charges following the mailing of a written demand for payment to the owner pursuant to the process and with the same force and effect as that established by 36 M.R.S.A. §§ 942 and 943 for real estate tax liens.

Any written notices or demands required by the agreement shall be complete on the date the notice is attached to one or more doors providing entry to any buildings and mailed by certified mail, return receipt requested or ordinary mail or both to the owner of record as shown on the tax roles on file in the City Assessor's Office.

If the property has more than one owner on the tax rolls, service shall be complete by mailing it to only the first listed owner. The failure to receive any written notice required by this agreement shall not prevent the City from entering the property and performing maintenance or repairs on the stormwater system, or any component thereof, or lienied it or create a cause of action against the City.

Dated at Portland, Maine this _____ day of _____, 2014.

(name of company)

(representative of owner, name and title)

STATE OF MAINE
CUMBERLAND, ss.

Date: _____

Personally appeared the above-named _____ (name and title), and acknowledged the foregoing instrument to be his free act and deed in his said capacity.

Before me,

Notary Public/Attorney at Law

Print name: _____

Exhibit A: Subdivision Plat as recorded

Exhibit B: Approved Grading and Drainage Plan (name of the plan showing the Stormwater System in detail)

Exhibit C: Approved Stormwater Maintenance and Inspection Agreement

KENILWORTH STREET

STATUTORY VACATION

Short Street Off Bancroft St. & 294' Northeasterly of Capisic Street

1/2

August 11, 2009

It appears that a Kenilworth Street was not accepted, and may be Statutorily Vacated.

Kenilworth Street is a 50' x 80' street located 294' +/- northeasterly of Capisic Street, as measured along the southeasterly line of Bancroft Street, and runs approximately 80' southeasterly from Bancroft Street.

Kenilworth Street was created by an approved subdivision plan titled "Plan of Emerson Woods - Portland, Maine - made for Cheney Realty" dated 4/5/1973 by Robert P. Titcomb, Registered Land Surveyor, and recorded at the Cumberland County Registry of Deeds in Plan Book 94, Page 19.

Kenilworth Street, as created by the Emerson Woods plan, does not connect with Kenilworth Street, the accepted street which runs off the southerly line of Brighton Avenue.

Kenilworth Street is not listed on the City of Portland City Council Order #84 titled "Order Excepting Streets From Deemed Vacation", as passed on September 3, 1997 and recorded in the Cumberland County Registry of Deeds in Deed Book 13326, Page 19. **Omission of the unaccepted portion of Kenilworth Street from the City Council Order #84 may possibly be deemed a STATUTORY VACATION** as the City Council did not file another Order Excepting Streets From Deemed Vacation prior to or on September 29, 1997. An Attorney should be consulted further on the subject of title and any claims of title.

William B. Clark, Jr. PLS 2100 City of Portland - DPW Engineering

KENILWORTH STREET

STATUTORY VACATION

Portion of Kenilworth St Running 360 ' +/- Northeasterly from Pomeroy St

May 3, 2011

1/2

It appears that the most southwesterly portion of Kenilworth Street was not accepted, and may be Statutorily Vacated.

Kenilworth Street was accepted in two sections in 1925 and 1930 for a total distance of 800' running southwesterly from Brighton Avenue. The remaining 360' +/- has not been accepted by the City of Portland.

Kenilworth Street was created by a subdivision plan titled "Plan of Brighton - Portland, Maine - made for George T. Edwards" dated August 1902 by Clifford C. Legrow, Civil Engineer, and recorded at the Cumberland County Registry of Deeds in Plan Book 11, Page 109.

Kenilworth Street is not listed on the City of Portland City Council Order #84 titled "Order Excepting Streets From Deemed Vacation", as passed on September 3, 1997 and recorded in the Cumberland County Registry of Deeds in Deed Book 13326, Page 19. **Omission of the unaccepted portion of Kenilworth Street from the City Council Order #84 may possibly be deemed a STATUTORY VACATION** as the City Council did not file another Order Excepting Streets From Deemed Vacation prior to or on September 29, 1997. There may be private rights in Kenilworth Street. An Attorney should be consulted further on the subject of title and any claims of title.

William B. Clark, Jr. PLS 2100 City of Portland - DPW Engineering

KENILWORTH STREET

STATUTORY VACATION

Portion of Kenilworth St Running 360' +/- Northeasterly from Pomeroy St

2/2



Name

KENILWORTH ST.

Section

To

DATE

DESCRIPTION

BOOK

PAGE

June 1, 1925
June 2, 1930

Brighton Ave. to Rockland Ave.
From Rockland Ave. S'ly.

$$V \frac{56}{185}$$

Laying out
" "

$$V \frac{51}{417}$$

2

80

80

Street Record

E-63 is Redlon Woods



Land Bank notes from 2017 state:

Land Bank Commission Project Initiatives 2018

Complete the acquisition of parcels in Redlon Park. The Land Bank Commission is currently constructing a transaction to purchase, accept the donation of, and use TAPC acquired parcels of several contiguous undeveloped parcels in Redlon Park, known as “Redlon Woods”. Redlon Woods consists of several acres of open space surrounded by Brighton Avenue, Stevens Avenue, Capisic Street and Bancroft Street. Those parcels slated for purchase or donation have been appraised and the Land Bank Commission is making a recommendation to the City Council with respect to these

In Exhibit A: Description of Current Land Bank Registry Existing Holdings (Open Space)

E-63 Redlon Woods. This wooded area, located in the Rosemont neighborhood, features an interesting mix of woodlands, wetlands and ledge outcroppings, as well as some popular informal walking and mountain biking trails. The desire to protect this open space was the impetus behind the creation of the Land Bank Commission in 1999. Long-term protection of Redlon Woods has involved and will continue to require collaboration between the Land Bank Commission, City, neighboring property owners, local NGOs and other open space preservation advocates

130 Bancroft Street
Subdivision Plan Review
Bill Scott
September 28, 2018

1. I assume that this is going to be offered to the City as a public street. If that's the case:
 - a. An elevation benchmark shall be established on at least one of the new street monuments, and it shall be shown and described on the As-built Plan for this project;.
 - b. At least two of the new street monuments shall be labeled with state plane coordinates on a revised copy of the Subdivision Plan.
2. Does the new street have a name yet? If so, please add it to the plan.
3. There should be a note added to the plan to identify who's responsible for the storm water maintenance agreement, and stating that the agreement will be recorded in the Registry of Deeds.
4. A monument needs to be added at the PC on the proposed street in front of Lot A. It will replace an existing rebar that 's shown on the plan.
5. I spoke with John Perron at NCS earlier this month about the monument locations. I suggested installing all of them on the street line instead of on three-foot offset for this project.



SURVEYING ENGINEERING LAND PLANNING

Northeast Civil Solutions

INCORPORATED

www.northeastcivilsolutions.com

41041

April 30, 2018

City of Portland, Planning and Development
389 Congress Street
Portland, Maine 04101

**RE: Level III Subdivision Review – Preliminary Submission (130-144 Bancroft Street)
WB Group, Inc. – Capisic Meadows – 8 Lot Subdivision**

To whom it may concern;

On behalf of WB Group Inc., Northeast Civil Solutions, Inc.(NCS) is pleased to submit the attached application and associated materials for Preliminary Review review by staff and the Planning Board for a proposed 7 lot residential subdivision located off of Bancroft Street. The proposed development will feature 7 new single family residential lots. The developer will construct the proposed road, stormwater facilities and associated grading for the entirety of the residential subdivision. The developer does not intend on building the individual houses.

The proposed subdivision will be located at properties identified as 130 & 144 Bancroft Street. The property is comprised of approximately 2.9 acres of land, mostly forested land (with the exception of lawn, patio and pool area of an existing single family dwelling which will be removed). The land has been fully surveyed, has been delineated for wetlands. Currently zoned Residential 3 (R-3), the proposed residential subdivision is an allowed use in the area pursuant to municipal review for subdivision and site plan.

The development will be accessed by a single paved road and feature a road, Benjamin Way, intended to be accepted as a city street. The proposed access road will feature vertical curbing on both sides with a sidewalk extending down northerly side (please see waiver request for duel sidewalks). All utilities will be extended from Bancroft Street down the proposed right-of-way (ROW) to service the proposed subdivision (please see attached ability to serve letters). A fire hydrant will be placed at the end of the proposed ROW servicing the entirety of the subdivision; meanwhile the street will be built to city standards allowing for compatible for emergency vehicle access. Stormwater from the proposed roadway will be collected and treated with the use of two stormwater Filterra units. Additional site runoff will be directed to a detention pond for peak control. The detention pond will be located near the front portion of the lot. The proposed project will also require a Tier I wetland dill permit from the DEP for 11,318 SF of wetland fill or wetland impacts.

Each of the proposed subdivision lots will provide off-street parking to service the single family residential dwellings via a paved driveway. Runoff will be directed to the proposed ponds via an open stormwater system which will be implemented throughout the development. Please see the attached Stormwater Report for further details.

WB Group, Inc. and NCS will conduct a neighborhood meeting as required for all applicable abutters to the property, at which we fully explained the proposed project to those in attendance. The impact to the surrounding residents will be minimal (there is no intention at this time for any vehicular connection to Redlon Park road), and most of the other properties in the vicinity are either previously existing residentially develop or undeveloped. Traffic counts have already been completed, and a traffic report will be included with all other submission materials for Planning Board review in the near future. The proposed development is constant with the city's master plan.

Having already met with City staff, NCS would like to meet with the Planning Board to discuss this project in somewhat greater detail and solicit comments from Board members. Ideally, we propose to meet with the Planning Board during the course of this spring/summer for preliminary and final project approval, with the intent to begin construction in the upon approval. We look forward to presenting this project to the Board.

Please contact us if you have any questions or comments. Thank you.

Sincerely,
Northeast Civil Solutions, Inc.

A handwritten signature in black ink, appearing to read "Michael Skolnick", with a stylized flourish at the end.

Michael Skolnick
Land Use Regulatory Specialist

CC: Tony Panciocco, P.E., NCS
Joshua Wagner, Owner, WB Group, Inc.



LEVEL II and LEVEL III APPLICATION SUBMISSION CHECKLIST

Submit each Tab as one PDF file and bookmark the items as noted below

Please confirm by electronically checking the boxes to the left

Tab 1 – 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.

Submit each Tab as one PDF file and bookmark the items as noted below

Tab 2 - 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

Tab 3 - 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
Tab 4 - 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

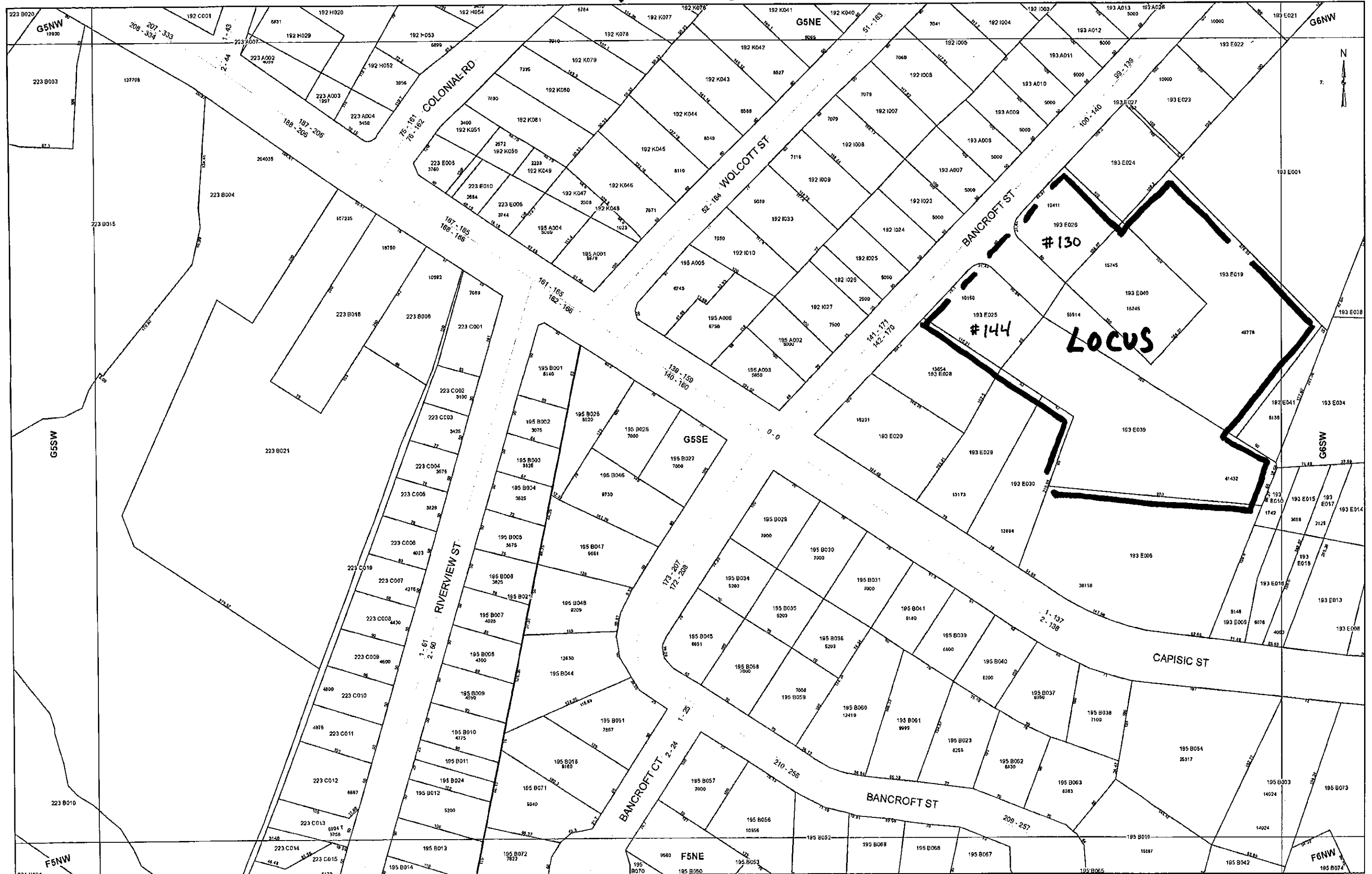
Tab 5 - PUBLIC INFRASTRUCTURE AND SAFETY			
Check list		Assess/Provide/Document:	
Yes	NA	Plan	Consistency with City Master Plans (14-526 (c) 1) - Identify consistency with master plans - Proposed easements, rights and improvements to connect or continue off-premises public infrastructure, as applicable
☒	☐	☐	
Yes	NA	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
☒	☐	☒	
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
☒	☐	☒	
Tab 6 - SITE DESIGN			
Check list		Assess/Provide/Document:	
Yes	NA	Plan	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	Plan	Shadows (14-526 (d) 2), if applicable Shadow analysis of impacts on publicly accessible open space (Technical Manual, Section 11)
☐	☒	☐	
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
☐	☒	☐	
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
Tab 7 - 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	
☒	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

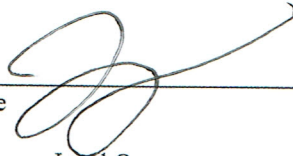
PORTLAND



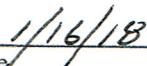
January 15, 2018

To Whom It May Concern:

I, Josh Wagner, authorize Northeast Civil Solutions, Inc. to sign any and all applications, permit requests, and other paperwork in conjunction with obtaining final municipal and state approvals for the project located at 130 & 144 Bancroft Street in Portland, Maine.



Signature
Josh Wagner, Land Owner



Date

PURCHASE AND SALE AGREEMENT - LAND ONLY

("days" means business days unless otherwise noted, see paragraph 20)

May 25, 2018
Offer Date

May 25, 2018 Effective Date
Effective Date is defined in Paragraph 20 of this Agreement.

1. PARTIES: This Agreement is made between Joshua Wagner ("Buyer") and Ken + Keri Doiron ("Seller").
2. DESCRIPTION: Subject to the terms and conditions hereinafter set forth, Seller agrees to sell and Buyer agrees to buy ☒ all ☐ part of (if "part of" see para. 22 for explanation) the property situated in municipality of Portland, County of Cumberland, State of Maine, located at Bancroft St and described in deed(s) recorded at said County's Registry of Deeds Book(s) 29467, Page(s) 255 Less House lot
3. PURCHASE PRICE/EARNEST MONEY: For such Deed and conveyance Buyer agrees to pay the total purchase price of \$ 58,000. Buyer ☒ has delivered; or ☐ will deliver to the Agency within _____ days of the Effective Date, a deposit of earnest money in the amount \$ 2000. Buyer agrees that an additional deposit of earnest money in the amount of \$ _____ will be delivered _____. If Buyer fails to deliver the initial or additional deposit in compliance with the above terms Seller may terminate this Agreement. This right to terminate ends once Buyer has delivered said deposit (s). The remainder of the purchase price shall be paid by wire, certified, cashier's or trust account check upon delivery of the Deed.

This Purchase and Sale Agreement is subject to the following conditions:

4. ESCROW AGENT/ACCEPTANCE: Ken + Keri Doiron ("Agency") shall hold said earnest money and act as escrow agent until closing; this offer shall be valid until May 25, 2018 (date) 5:00 ☐ AM ☒ PM; and, in the event of non-acceptance, this earnest money shall be returned promptly to Buyer.

5. TITLE AND CLOSING: A deed, conveying good and merchantable title in accordance with the Standards of Title adopted by the Maine Bar Association shall be delivered to Buyer and this transaction shall be closed and Buyer shall pay the balance due and execute all necessary papers on See Appendix (closing date) or before, if agreed in writing by both parties. If Seller is unable to convey in accordance with the provisions of this paragraph, then Seller shall have a reasonable time period, not to exceed 30 calendar days, from the time Seller is notified of the defect, unless otherwise agreed to in writing by both Buyer and Seller, to remedy the title. Seller hereby agrees to make a good-faith effort to cure any title defect during such period. If, at the later of the closing date set forth above or the expiration of such reasonable time period, Seller is unable to remedy the title, Buyer may close and accept the deed with the title defect or may terminate this Agreement in which case the parties shall be relieved of any further obligations hereunder and any earnest money shall be returned to the Buyer.

6. DEED: The property shall be conveyed by a Warranty deed, and shall be free and clear of all encumbrances except covenants, conditions, easements and restrictions of record which do not materially and adversely affect the continued current use of the property.

7. POSSESSION: Possession of premises shall be given to Buyer immediately at closing unless otherwise agreed in writing.

8. RISK OF LOSS: Until the closing, the risk of loss or damage to said premises by fire or otherwise, is assumed by Seller. Buyer shall have the right to view the property within 24 hours prior to closing for the purpose of determining that the premises are in substantially the same condition as on the date of this Agreement.

9. PRORATIONS: The following items, where applicable, shall be prorated as of the date of closing: rent, association fees, (other) None. Real estate taxes shall be prorated as of the date of closing (based on municipality's fiscal year). Seller is responsible for any unpaid taxes for prior years. If the amount of said taxes is not known at the time of closing, they shall be apportioned on the basis of the taxes assessed for the preceding year with a reapportionment as soon as the new tax rate and valuation can be ascertained, which latter provision shall survive closing. Buyer and Seller will each pay their transfer tax as required by State of Maine.

10. DUE DILIGENCE: Buyer is encouraged to seek information from professionals regarding any specific issue or concern. Neither Seller nor Licensee makes any warranties regarding the condition, permitted use or value of Sellers' real property. This Agreement is subject to the following contingencies, with results being satisfactory to Buyer:

CONTINGENCY	YES	NO	FULL RESOLUTION	OBTAINED BY	TO BE PAID FOR BY
1. SURVEY Purpose: _____	☐	☐	within _____ days	_____	_____
2. SOILS TEST Purpose: _____	☐	☐	within _____ days	_____	_____
3. SEPTIC SYSTEM DESIGN Purpose: _____	☐	☐	within _____ days	_____	_____
4. LOCAL PERMITS Purpose: _____	☐	☐	within _____ days	_____	_____
5. HAZARDOUS WASTE REPORTS Purpose: _____	☐	☐	within _____ days	_____	_____
6. UTILITIES Purpose: _____	☐	☐	within _____ days	_____	_____
7. WATER Purpose: _____	☐	☐	within _____ days	_____	_____
8. SUB-DIVISION APPROVAL Purpose: _____	☒	☐	within <u>60</u> days	_____	_____
9. DEP/LURC APPROVALS Purpose: _____	☐	☐	within _____ days	_____	_____
10. ZONING VARIANCE Purpose: _____	☐	☐	within _____ days	_____	_____
11. HABITAT REVIEW/ WATERFOWL Purpose: _____	☐	☐	within _____ days	_____	_____
12. REGISTERED FARMLAND Purpose: _____	☐	☐	within _____ days	_____	_____
13. MDOT DRIVEWAY/ ENTRANCE PERMIT Purpose: _____	☐	☐	within _____ days	_____	_____
14. DEED RESTRICTION Purpose: _____	☐	☐	within _____ days	_____	_____
15. TAX STATUS* Purpose: _____	☐	☐	within _____ days	_____	_____
16. BUILD PACKAGE Purpose: _____	☐	☐	within _____ days	_____	_____
17. OTHER Purpose: _____	☐	☐	within _____ days	_____	_____

* If the land is enrolled in the Maine Tree Growth Tax program, Seller agrees to provide Buyer with the current Forest Management and Harvest Plan within _____ days. ☐ Yes ☒ No

Further specifications regarding any of the above:

Unless otherwise specified above, all of the above will be obtained and paid for by Buyer. Seller agrees to cooperate with Buyer and shall give Buyer and Buyer's agents and consultants reasonable access to the property in order to undertake the above investigations. If the result of any investigation or other condition specified herein is unsatisfactory to Buyer, Buyer will declare the Agreement null and void by notifying Seller in writing within the specified number of days, and any earnest money shall be returned to Buyer. If the result of any investigation or other condition specified herein is unsatisfactory to Buyer, and Buyer wishes to pursue remedies other than voiding the Agreement, Buyer must do so to full resolution within the time period set forth above; otherwise this contingency is waived. If Buyer does not notify Seller that an investigation is unsatisfactory within the time period set forth above, this contingency is waived by Buyer. In the absence of inspection(s) mentioned above, Buyer is relying completely upon Buyer's own opinion as to the condition of the property.

11. FINANCING: Buyer's obligation to close:

- ☒ is not subject to a financing contingency. Buyer has provided Seller with acceptable proof of the funds.
- ☐ is not subject to a financing contingency. Buyer shall provide proof of the funds acceptable to Seller within _____ days. If such proof is unacceptable to Seller, Seller may terminate this Agreement no later than _____ days from receipt. If proof of funds is not provided within such time period, Seller may terminate this Agreement which right shall end once such proof is received, however Seller retains the agreed upon time period to terminate if such proof is unacceptable. If Seller terminates in either case, the earnest money shall be returned to Buyer.
- ☐ is subject to financing as follows:
- Buyer's obligation to close is subject to Buyer obtaining a _____ loan of _____ % of the purchase price, at an interest rate not to exceed _____ % and amortized over a period of _____ years. Buyer is under a good faith obligation to seek and obtain financing on these terms. If such financing is not available to Buyer as of the closing date, Buyer is not obligated to close and may terminate this Agreement in which case the earnest money shall be returned to Buyer.
 - Buyer to provide Seller with letter from lender showing that Buyer has made application for loan specified in (a) and, subject to verification of information, is qualified for the loan requested within _____ days from the Effective Date of the Agreement. If Buyer fails to provide Seller with such letter within said time period, Seller may terminate this Agreement and the earnest money shall be returned to Buyer. This right to terminate ends once Buyer's letter is received.
 - Buyer hereby authorizes, instructs and directs its lender to communicate the status of the Buyer's loan application to Seller, Seller's licensee and Buyer's licensee.
 - After (b) is met, if the lender notifies Buyer that it is unable or unwilling to provide said financing, Buyer is obligated to provide Seller with written documentation of the loan denial within two days of receipt. After notifying Seller, Buyer shall have _____ days to provide Seller with a letter from another lender showing that Buyer has made application for loan specified in (a) and, subject to verification of information, is qualified for the loan requested. If Buyer fails to provide Seller with such letter within said time period, Seller may terminate this Agreement and the earnest money shall be returned to Buyer. This right to terminate ends once Buyer's letter is received.
 - Buyer agrees to pay no more than _____ points. Seller agrees to pay up to \$ _____ toward Buyer's actual pre-pays, points and/or closing costs, but no more than allowable by Buyer's lender.
 - Buyer's ability to obtain financing ☐ is ☐ is not subject to the sale of another property. See addendum ☐ Yes ☐ No.
 - Buyer may choose to pay cash instead of obtaining financing. If so, Buyer shall notify Seller in writing including providing proof of funds and the Agreement shall no longer be subject to financing, and Seller's right to terminate pursuant to the provisions of this paragraph shall be void.

12. BROKERAGE DISCLOSURE: Buyer and Seller acknowledge they have been advised of the following relationships:

_____ of _____
Licensee MLS ID Agency MLS ID
is a ☐ Seller Agent ☐ Buyer Agent ☐ Disc Dual Agent ☐ Transaction Broker
_____ of _____
Licensee MLS ID Agency MLS ID
is a ☐ Seller Agent ☐ Buyer Agent ☐ Disc Dual Agent ☐ Transaction Broker

If this transaction involves Disclosed Dual Agency, the Buyer and Seller acknowledge the limited fiduciary duties of the agents and hereby consent to this arrangement. In addition, the Buyer and Seller acknowledge prior receipt and signing of a Disclosed Dual Agency Consent Agreement.

13. PROPERTY DISCLOSURE FORM: Buyer acknowledges receipt of Property Disclosure Form.

14. DEFAULT/RETURN OF EARNEST MONEY: Buyer's failure to fulfill any of Buyer's obligations hereunder shall constitute a default and Seller may employ all legal and equitable remedies, including without limitation, termination of this Agreement and forfeiture by Buyer of the earnest money. Seller's failure to fulfill any of Seller's obligations hereunder shall constitute a default and Buyer may employ all legal and equitable remedies, including without limitation, termination of this Agreement and return to Buyer of the earnest money. Agency acting as escrow agent has the option to require written releases from both parties prior to disbursing the earnest money to either Buyer or Seller. In the event that the Agency is made a party to any lawsuit by virtue of acting as escrow agent, Agency shall be entitled to recover reasonable attorney's fees and costs which shall be assessed as court costs in favor of the prevailing party.

15. MEDIATION: Earnest money or other disputes within the jurisdictional limit of small claims court will be handled in that forum. All other disputes or claims arising out of or relating to this Agreement or the property addressed in this Agreement (other than requests for injunctive relief) shall be submitted to mediation in accordance with generally accepted mediation practices. Buyer and Seller are bound to mediate in good faith and to each pay half of the mediation fees. If a party fails to submit a dispute or claim to mediation prior to initiating litigation (other than requests for injunctive relief), then that party will be liable for the other party's legal fees in any subsequent litigation regarding that same matter in which the party who failed to first submit the dispute or claim to mediation loses in that subsequent litigation. This clause shall survive the closing of the transaction.

16. PRIOR STATEMENTS: Any representations, statements and agreements are not valid unless contained herein. This Agreement completely expresses the obligations of the parties and may only be amended in writing, signed by both parties.

17. HEIRS/ASSIGNS: This Agreement shall extend to and be obligatory upon heirs, personal representatives, successors, and assigns of the Seller and the assigns of the Buyer.

18. COUNTERPARTS: This Agreement may be signed on any number of identical counterparts, such as a faxed copy, with the same binding effect as if the signatures were on one instrument. Original, faxed or other electronically transmitted signatures are binding.

19. NOTICE: Any notice, communication or document delivery requirements hereunder may be satisfied by providing the required notice, communication or documentation to or from the parties or their Licensee. Only withdrawals of offers and counteroffers will be effective upon communication, verbally or in writing.

20. EFFECTIVE DATE/BUSINESS DAYS: This Agreement is a binding contract when the last party signing has caused a paper or electronic copy of the fully executed agreement to be delivered to the other party which shall be the Effective Date. Licensee is authorized to fill in the Effective Date on Page 1 hereof. Except as expressly set forth to the contrary, the use of the term "days" in this

Agreement, including all addenda made a part hereof, shall mean business days defined as excluding Saturdays, Sundays and any observed Maine State/Federal holidays. Deadlines in this Agreement, including all addenda, expressed as "within x days" shall be counted from the Effective Date, unless another starting date is expressly set forth, beginning with the first day after the Effective Date, or such other established starting date, and ending at 5:00 p.m. Eastern Time on the last day counted. Unless expressly stated to the contrary, deadlines in this Agreement, including all addenda, expressed as a specific date shall end at 5:00 p.m. Eastern Time on such date.

21. CONFIDENTIALITY: Buyer and Seller authorize the disclosure of the information herein to the real estate licensees, attorneys, lenders, appraisers, inspectors, investigators and others involved in the transaction necessary for the purpose of closing this transaction. Buyer and Seller authorize the lender and/or closing agent preparing the entire closing disclosure and/or settlement statement to release a copy of the closing disclosure and/or settlement statement to the parties and their licensees prior to, at and after the closing.

22. OTHER CONDITIONS:

23. GENERAL PROVISIONS:

- A copy of this Agreement is to be received by all parties and, by signature, receipt of a copy is hereby acknowledged. If not fully understood, contact an attorney. This is a Maine contract and shall be construed according to the laws of Maine.
- Seller acknowledges that State of Maine law requires buyers of property owned by non-resident sellers to withhold a prepayment of capital gains tax unless a waiver has been obtained by Seller from the State of Maine Revenue Services.
- Buyer and Seller acknowledge that under Maine law payment of property taxes is the legal responsibility of the person who owns the property on April 1, even if the property is sold before payment is due. If any part of the taxes is not paid when due, the lien will be filed in the name of the owner as of April 1 which could have a negative impact on their credit rating. Buyer and Seller shall agree at closing on their respective obligations regarding actual payment of taxes after closing. Buyer and Seller should make sure they understand their obligations agreed to at closing and what may happen if taxes are not paid as agreed.
- Buyer acknowledges that Maine law requires continuing interest in the property and any back up offers to be communicated by the listing agent to the Seller.
- Whenever this Agreement provides for earnest money to be returned or released, agency acting as escrow agent must comply with Maine Real Estate Commission rules which may require written notices or obtaining written releases from both parties.

24. ADDENDA: ☒ Yes Explain: SEE ATTACHED ☐ No

25. ELECTRONIC SIGNATURES: Pursuant to the Maine Uniform Electronic Transactions Act and Digital Signature Act, the parties authorize and agree to the use of electronic signatures as a method of signing/initialing this Agreement, including all addenda. The parties hereby agree that either party may sign electronically by utilizing an electronic signature service.

Buyer's Mailing address is 130 Bancroft St Portland ME 04102

BUYER [Signature] 5/25/2018 DATE BUYER _____ DATE _____

Seller accepts the offer and agrees to deliver the above-described property at the price and upon the terms and conditions set forth and agrees to pay agency a commission for services as specified in the listing agreement.

Seller's Mailing address is 144 Bancroft St Portland ME 04102

SELLER [Signature] 5/25/18 DATE SELLER [Signature] 5/25/18 DATE

COUNTER-OFFER

Seller agrees to sell on the terms and conditions as detailed herein with the following changes and/or conditions:

The parties acknowledge that until signed by Buyer, Seller's signature constitutes only an offer to sell on the above terms and the offer will expire unless accepted by Buyer's signature with communication of such signature to Seller by (date) _____ (time) _____ AM _____ PM.

SELLER _____ DATE _____ SELLER _____ DATE _____

The Buyer hereby accepts the counter offer set forth above.

BUYER _____ DATE _____ BUYER _____ DATE _____

EXTENSION:

The time for the performance of this Agreement is extended until _____ DATE _____

SELLER _____ DATE _____ SELLER _____ DATE _____

BUYER _____ DATE _____ BUYER _____ DATE _____



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Page 4 of 4 - P&S-LO

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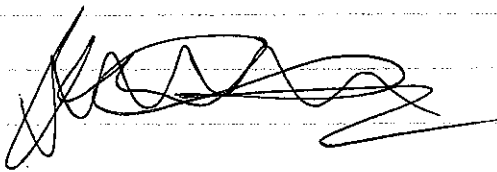


Addenda

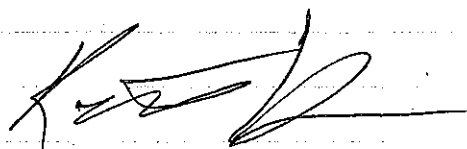
Seller grants Buyer a construction
licence to change the grading on
the side and rear of their house lot

Closing to take place within 10 Business Days
of City Approval

House lot described book 34724 page 100



Buyer



Seller



Mike Skolnick

Subject: FW: Capisic Meadows - intent to sell to WB Group Inc.

From: Josh Wagner [<mailto:joshwagner4545@yahoo.com>]

Sent: Monday, April 09, 2018 7:23 AM

To: Jim Fisher

Subject: Capisic Meadows - intent to sell to WB Group Inc.

To whom it may concern,

I Joshua Wagner intend to transfer the necessary land need for a 7 lot development off Bancroft St. to WB Group Inc.

Joshua Wagner
207.831.4545

Mike Skolnick

Subject: FW: FW: Pool and Deck - Doiron

----- Forwarded Message -----

From: Doiron, Ken <kdoiron@ptc.com>

To: Josh Wagner <joshwagner4545@yahoo.com>

Sent: Sunday, April 8, 2018, 8:15:03 PM EDT

Subject: FW: Pool and Deck - Doiron

Kenneth and Kari Doiron have the intent to sell a portion of our land to WB Group Inc. defined by the attached plans created by Northeast Civil Solutions with Final Purchase and Sale Agreement defining boundary lines and grading upon City of Portland approval with no major design plan changes.

Regards,

Ken Doiron

Mobile: 1 (207) 400-6086

QUITCLAIM DEED with COVENANT (LONG FORM)

KNOW ALL BY THESE PRESENTS,

THAT WE EDWARD C. BROOKS, and ROSE MARIE BROOKS, both of Portland, Cumberland County, Maine in consideration of ONE DOLLAR and other valuable consideration paid by KARI A. DOIRON and KENNETH J. DOIRON, both of Lebanon, York County, Maine, and whose mailing address is 247 Smith Road, Lebanon ME 04027, the receipt whereof we do hereby acknowledge, do hereby REMISE, RELEASE and FOREVER QUITCLAIM unto Kari A. Doiron and Kenneth J. Doiron, as JOINT TENANTS and not as tenants-in-common, their heirs and assigns forever, the land and buildings in Portland, Cumberland County, Maine, more fully described on Exhibit A attached to this instrument.

TO HAVE AND TO HOLD the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to Kari A. Doiron and Kenneth J. Doiron, as joint tenants and not as tenants-in-common, their heirs and assigns, to them and their use and behoof forever.

AND WE DO COVENANT with the Grantees, their heirs and assigns, that we and our heirs shall and will warrant and defend the same to Kari A. Doiron and Kenneth J. Doiron, their heirs and assigns forever, against the lawful claims and demands of all persons claiming by, through, or under us.

IN WITNESS WHEREOF, Edward C. Brooks and Rose Marie Brooks have hereunto set their hands and seals this March 30, 2012.

SIGNED, SEALED AND DELIVERED
IN PRESENCE OF:

[Signature]
(Witness)

Edward C. Brooks
EDWARD C. BROOKS

[Signature]
(Witness)

Rose Marie Brooks
ROSE MARIE BROOKS

STATE OF MAINE
CUMBERLAND, ss.

March 30, 2012

Then personally appeared Edward C. Brooks and Rose Marie Brooks acknowledged the foregoing instrument to be their free act and deed.

Before me:

Carly Smith
Notary Public/Attorney at Law

CARLY R. SMITH
ATTORNEY AT LAW, STATE OF MAINE
AUTHORIZED TO TAKE ACKNOWLEDGEMENTS
PURSUANT TO 4 MRSA SEC 1056
NOTARY PRINT NAME:

Carly Smith

EXHIBIT A

Property Location: 144 Bancroft Street, Portland, Cumberland County, Maine

Municipal Assessor's Map 193 Block E Lot 39

A certain lot or parcel of land with any improvements thereon, located in Portland, Cumberland County, Maine, adjacent to the parcel first above described and being more particularly bounded and described as follows:

Beginning at an iron pin found at the southeasterly corner of land now or formerly owned by Edward C. Brooks and Rose M. Brooks (formerly premises owned by Richard P. Masters et ux.; reference is made to deed recorded at Book 3855, Page 86 of the Cumberland County Registry of Deeds);

Thence in a southeasterly direction along land now or formerly of Stuart B. Herrick, Jr., a distance of 350 feet, more or less, to an iron pin found at the southerly corner of Parcel 3 as shown on Plan of Property made for Stuart B. Herrick, Jr., Bancroft Street, Portland, Maine dated July 31, 1986 drawn by R. P. Titcomb Associates, Inc.;

Thence South 38° 44' 24" West a distance of 65.00 feet to a point and land now or formerly of Vincent L. Devlin (Book 3725, Page 18):

Thence North 67° 44' 05" West along land now or formerly of said Devlin a distance of 272.00 feet to a point and land now or formerly of James T. King, et ux. (Book 6437, Page 38);

Thence North 37° 54' 38" East along land now or formerly of said King a distance of 65.00 feet to an iron pin found;

Thence North 37° 54' 36" East along land now or formerly of said King a distance of 35.14 feet to an iron pin found;

Thence North 39° 49' 28" West a distance of 110.00 feet to the southwesterly corner of said land now or formerly of Edward C. Brooks and Rose M. Brooks;

Thence North 56° 33' 16" East along the southerly side of said Brooks land a distance of 84.47 feet to the point of beginning.

Meaning and intending to convey, and hereby conveying, the same premises described in the Quitclaim Deed without Covenant of Stuart B. Herrick, Jr. to Edward C. Brooks and Rose Marie Brooks, dated November 23, 1997, and recorded in the Cumberland County Registry of Deeds, Book 13465 Page 155.

Received
Recorded Register of Deeds
Apr 02, 2012 09:12:56A
Cumberland County
Pamela E. Lovley

DEED OF SALE BY PERSONAL REPRESENTATIVE

KNOW ALL MEN BY THESE PRESENTS

THAT, **DANIEL W. BOUTIN** of Portland, County of Cumberland, State of Maine, duly appointed and acting personal representative of the Estate of Stuart B. Herrick, Jr., deceased (testate), as shown by the probate records of the County of Cumberland, Maine, Docket No. 2008-0252, by the power conferred by the Probate Code, and every other power, for consideration paid, grants to **JOSHUA WAGNER** of Portland, County of Cumberland, State of Maine, whose mailing address is 130 Bancroft Street, Portland, Maine 04102, the real property in Portland, County of Cumberland, State of Maine, described on Exhibit A attached hereto.

WITNESS my hand and sale this 23rd day of August, 2010.

Signed, Sealed and Delivered
in presence of

Mary A. Kiene

~~Estate of~~ **Stuart B Herrick, Jr**

DW

Daniel W. Boutin
Personal Representative

STATE OF MAINE
CUMBERLAND, SS.

August 23, 2010

Then personally appeared the above-named Daniel W. Boutin in his said capacity and acknowledged the foregoing instrument to be his free act and deed.

Before me,

Mary A. Kiene

Notary Public/~~Attorney-at-Law~~

MARY A KIENE

MAINE REAL ESTATE TAX PAID

EXHIBIT A

A certain lot or parcel of land located on the southeasterly side of Bancroft Street in the City of Portland, County of Cumberland, and State of Maine; said lot being bounded and described as follows:

Beginning at a point located at the southerly corner of land now or formerly of Thomas R. Lussier and Melody M. Lussier as described in a deed recorded in the Cumberland County Registry of Deeds in Book 13795, Page 93. Thence:

- 1) N 60° 18' 30" E by said land of Lussier a distance of Eighty-Eight and 83/100 (88.83) feet to a point located at the westerly corner of land now or formerly of Chabad Lubavitch of Maine, Inc. as described in a deed recorded in said Registry in Book 21417, Page 198.
- 2) S 28° 05' 18" E by said land of Chabad Lubavitch of Maine, Inc. a distance of Two Hundred Eighty-Six and 03/100 (286.03) feet to a point located on the northwesterly sideline of land now or formerly of Richard Marino as described in a deed recorded in said Registry in Book 22771, Page 251.
- 3) S 38° 44' 24" W by said land of Marino a distance of One Hundred Seventy-Seven and 67/100 (177.67) feet to a 5/8" reinforcing rod with identification cap number 2271 set at the easterly corner of land now or formerly of Edward C. Brooks and Rose Marie Brooks as described in a deed recorded in said Registry in Book 13465, Page 155.
- 4) N 41° 20' 13" W by said land of Brooks a distance of Three Hundred Forty-Nine and 59/100 (349.59) feet to a point located at the easterly corner of other land of said Brooks as described in a deed recorded in said Registry in Book 6741, Page 39.
- 5) N 29° 41' 30" W by said other land of Brooks a distance of Eighty-Eight and 84/100 (88.84) feet to a 5/8" reinforcing rod with identification cap number 2271 set at a point of curvature.
- 6) Northwesterly, westerly and southwesterly by said land of Brooks along a tangential curve to the left an arc distance of Thirty-One and 42/100 (31.42) feet to a 5/8" reinforcing rod with identification cap number 2271 set on the southeasterly sideline of Bancroft Street; said curve having a radius of Twenty (20.00) feet.
- 7) N 60° 18' 30" E by said Bancroft Street a distance of Ninety and 00/100 (90.00) feet to a rail road spike set on the northwesterly sideline of land now or formerly of Dianne Herrick as described in a deed recorded in said Registry in Book 4560, Page 246. Said land being shown as Parcel 1 on a plan entitled "Estate of Stuart B. Herrick, Jr." by Titcomb Associates dated August 13, 2008 and revised February 25, 2009.
- 8) Southwesterly, southerly and southeasterly, by said land of Herrick, along a non-tangential curve to the left a distance of Thirty-One and 42/100 (31.42) feet to a 5/8" reinforcing rod with identification cap number 2271 set; said curve having a radius of Twenty and 00/100 (20.00) feet and a chord bearing S 15° 18' 30" W over a distance of Twenty-Eight and 28/100 (28.28) feet.

9) S 29° 41' 30" E by said land of Herrick and by other land of said Herrick as described in a deed recorded in said Registry in Book 6305, Page 307, being shown as Parcel 2 on said plan, a distance of Two Hundred Thirty and 00/100 (230.00) feet to a 5/8" reinforcing rod with identification cap number 2271 set.

10) N 60° 18' 30" E by said land of Herrick a distance of One Hundred Four and 97/100 (104.97) feet to a 5/8" reinforcing rod with identification cap number 2271 set.

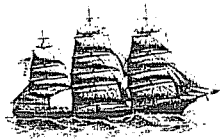
11) N 29° 41' 30" W by said land of Herrick a distance of One Hundred Fifty and 00/100 (150.00) feet to the point of beginning.

Said parcel contains 55, 914 square feet (1.28 acres) and being a portion of land now or formerly of the heirs of Stuart B. Herrick, Jr. as described in a deed recorded in said Registry in Book 6258, Page 53.

Meaning and intending to convey Parcel 3 as described in Plan of Property of Bancroft Street, said plan dated 8/13/2008 and prepared by Titcomb Associates, and recorded on 7/14/2010 in Plan Book 210, Page 220 of the Cumberland County Registry of Deeds. Said parcel being a portion of the land described in a deed from Robert J. Cheney to Stuart B. Herrick, Jr., dated August 24, 1983 and recorded in Book 6258, Page 53 of the Cumberland County Registry of Deeds. Reference is also made to a corrective deed from Cheney Realty Co. to Stuart B. Herrick, Jr., dated November 18, 1986 and recorded in Book 7509, Page 292 of said registry of deeds. Stuart B. Herrick, Jr. died on February 7, 2008. Daniel W. Boutin, Esq. was appointed as the Personal Representative of the Estate of Stuart B. Herrick, Jr. by the Cumberland County Register of Probate on March 7, 2008.

Also conveying another strip of land as shown on the City of Portland's Assessor's Map as Lot 193-E-27.

Received
Recorded Register of Deeds
Aug 27, 2010 11:45:03A
Cumberland County
Pamela E. Lovley



Benj. F. Packard

Bath Savings Institution

Since 1852

April 11, 2018

City of Portland
Planning Division
389 Congress Street
Portland, ME 04101

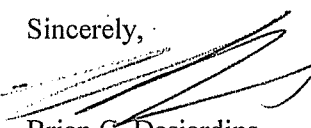
Re: WB Group

To whom it may concern:

Bath Savings is aware of the Wagner Subdivision that WB Group is proposing and the cost infrastructure cost of approximately \$270,000. Based on Joshua Wagner and WB Group's existing deposit relationship with Bath Savings, I can verify Joshua Wagner and WB Group have sufficient funds available at this time and the financial capacity to complete the proposed project.

Please let me know if you have any questions.

Sincerely,



Brian C. Desjardins
Vice President/Commercial Lender

List of Consultants

Northeast Civil Solutions, Inc. – Engineering, Surveying and Land Planning
381 Payne Road
Scarborough, ME 04074

Longview Partners, LLC – Wetland Delineation
6 Second Street
Buxton, Maine 04093

Traffic Solutions – Traffic Analysis
235 Bancroft Street
Portland, ME 04102



Traffic Solutions
William J. Bray, P.E.
235 Bancroft Street
Portland, ME 04102
(207) 774-3603
(207) 400-6890 mobile
trafficsolutions@maine.rr.com

April 2, 2018

Traffic Assessment

For Proposed

Bancroft Street Subdivision

Portland, Maine

INTRODUCTION

Josh Wagner is proposing to subdivide a 2.93-acre parcel of property located at 130/144 Bancroft Street creating a total of seven single-family house lots. Access to the property is provided with construction of a “new” dead-end street intersecting Bancroft Street adjacent to the existing Wagner home. The proposed subdivision street will be constructed to City standards and, with completion, the City will be petitioned for acceptance of the street.

This document determines daily and peak hour trip generation of the proposed project for both peak commuter time periods, examines current roadway safety trends in the general vicinity of the proposed project, and reviews vehicle sight distance.

SITE TRAFFIC

Site Trip Generation: Daily and peak hour trip generation was determined for the proposed project based upon trip tables presented in the ninth edition of the Institute of Transportation Engineers (ITE) “**TRIP GENERATION**” handbook. The ITE publication provides numerous land use categories and the average volume of trips generated by each category.

The following trip rate was used to calculate trip generation for the proposed project:

Land Use #210 – Single-Family Detached Housing

Weekday	= 9.52 trips per dwelling unit
AM Peak Hour	= 0.75 trips per dwelling unit
PM Peak Hour	= 1.00 trips per dwelling unit

Accordingly, the proposed 7 single-family homes can be expected to generate a total of 67 trips during a typical weekday; 5 trips in the morning peak hour and 7 trips in the evening peak hour.

Site Trip Distribution: The Institute of Transportation Engineers handbook also provides the following directional distribution rates for a single-family house lot:

AM Peak Hour	= 25% enter site and 75% exit site
PM Peak Hour	= 63% enter site and 37% exit site

Based upon the noted directional distribution patterns, 1 trip during the morning peak hour and 4 trips in the evening peak hour will enter the site and the remaining trips (4 AM trip and 3 PM trips) will exit.

EXISTING SAFETY CONDITIONS

The Maine Department of Transportation's (MaineDOT) Accident Records Section provided the latest three-year (2014 through 2016) crash data for the 0.29 mile section of Bancroft Street between Capisic Street and Rockland Avenue.

2014 -2016 Traffic Accident Summary

<u>Location</u>	<u>Total Crashes</u>	<u>Critical Rate Factor</u>
1. Capisic Street @ Bancroft Street	2	0.60
2. Bancroft Street btw. Capisic Street and Rockland Avenue	1	0.54

The MaineDOT considers any roadway intersection or segment a high crash location if both of the following criteria are met:

- ***8 or more accidents***
- ***A Critical Rate Factor greater than 1.00***

As the data presented in the table shows, the incidence of traffic crashes is very low; well below MaineDOT's threshold criteria for identification of a high crash location.

SIGHT DISTANCE

The Maine Department of Transportation's Highway Entrance and Driveway Rules require the following sight distances for a non-mobility roadway:

Sight Distance Standards

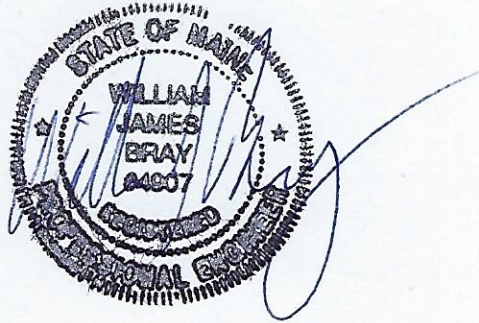
Speed Limit	Sight Distance
25 mph	200 feet
30	250
35	305
40	360
45	425
50	495
55	570

Bancroft Street is currently posted with a regulatory speed limit of 25 mph, which requires an unobstructed sightline of 200 feet. Field measurements determined for both directions of travel exceed 350-feet, a distance well in excess of the required design standards.

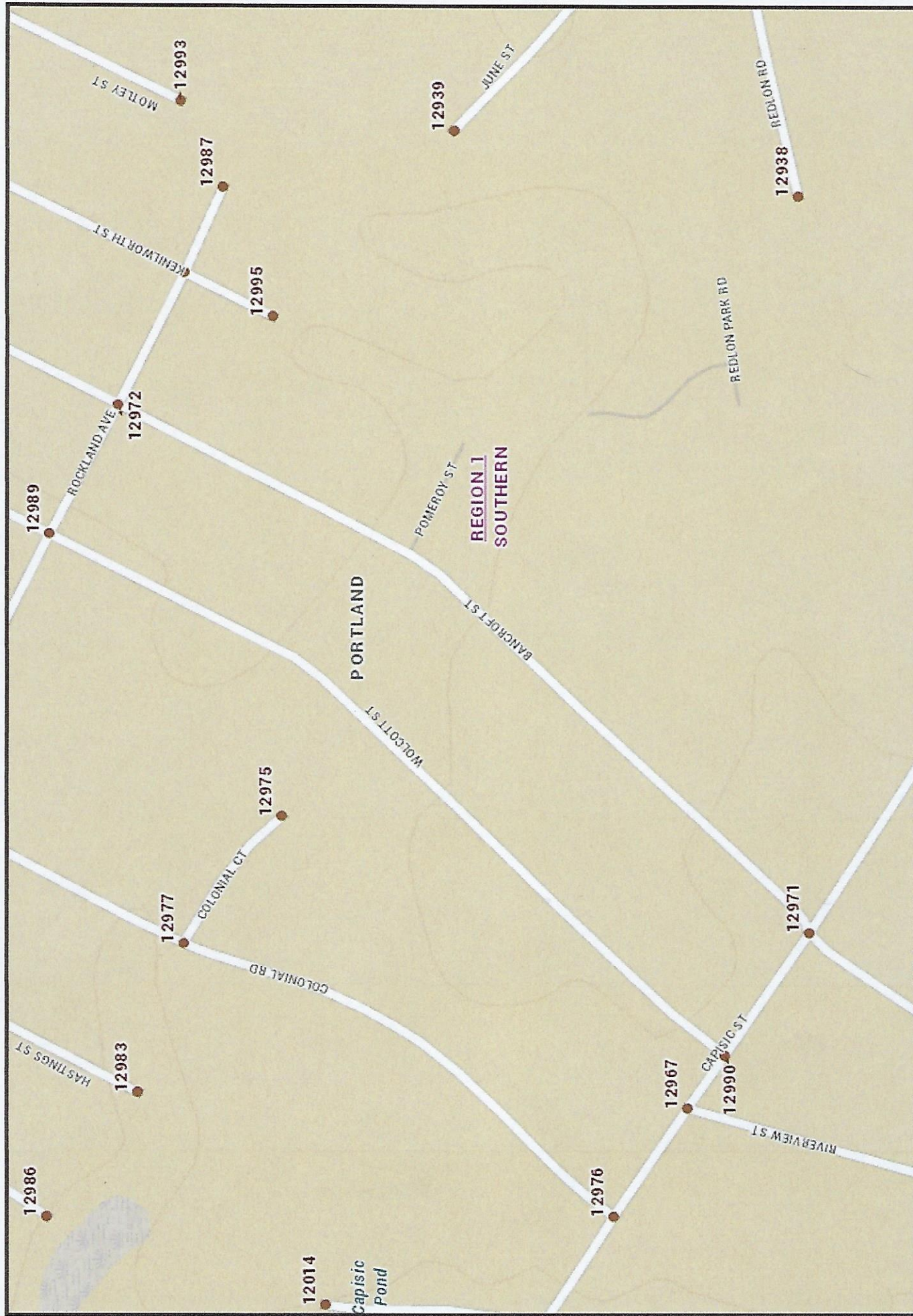
CONCLUSIONS

- The residential subdivision project can be expected to generate **67** daily trips; five (**5**) trips in the morning peak hour and **7** trips during the afternoon peak commuter hour.

- The Maine Department of Transportation's most recent three-year (2014 to 2016) accident safety audit completed for the section of Bancroft Street between Capisic Street and Rockland Avenue shows a total of 3 crashes have occurred over the 0.29-mile section of Bancroft Street.
- Vehicle sightlines measured in both directions from the proposed subdivision road onto Bancroft Street meet and exceed, by a considerable margin, the non-mobility highway sight distance standard for a posted speed limit of 25mph.



DEFAULT TITLE FROM MAP DOCUMENT



Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary Report

Report Selections and Input Parameters

REPORT SELECTIONS

☒ Crash Summary I ☐ Section Detail ☒ Crash Summary II ☐ 1320 Public ☐ 1320 Private ☐ 1320 Summary

REPORT DESCRIPTION

Bancroft St in Portland

REPORT PARAMETERS

Year 2014, Start Month 1 through Year 2016 End Month: 12

Route: **0560033**

Start Node: **12971**

Start Offset: **0**

☐ Exclude First Node

End Node: **12972**

End Offset: **0**

☐ Exclude Last Node

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary I

Nodes														
Node	Route - MP	Node Description	U/R	Total Crashes	K	A	B	C	PD	Percent Annual M Injury	Ent-Veh	Crash Rate	Critical Rate	CRF
12971	0560033 - 0.16	Int of BANCROFT ST, CAPISIC ST	2	2	0	0	0	1	1	50.0	2.713	0.25	0.42	0.00
												Statewide Crash Rate:	0.14	
12972	0560033 - 0.45	0503385 POR,BANCROFT ST,ROCKLAND AVE.	2	0	0	0	0	0	0	0.0	0.141	0.00	0.44	0.00
												Statewide Crash Rate:	0.14	
Study Years: 3.00		NODE TOTALS:		2	0	0	0	1	1	50.0	2.854	0.23	0.41	0.57

Maine Department Of Transportation - Traffic Engineering, Crash Records Section

Crash Summary I

Sections																		
Start Node	End Node	Element	Offset Begin - End	Route - MP	Section U/R Length	Total Crashes	K	Injury A	Crashes B	Crashes C	Percent PD	Injury	Annual HMVM	Crash Rate	Critical Rate	CRF		
12971	12972	187581	0 - 0.29	0560033 - 0.16	0.29	2	1	0	0	0	0	1	0.0	0.00042	787.28	1454.15	0.00	
Int of BANCROFT ST, CAPIRIC ST				RD INV 05 60033	Statewide Crash Rate: 400.79													
Study Years:		3.00		Section Totals:	0.29		1	0	0	0	0	1	0.0	0.00042	787.28	1454.12	0.54	
				Grand Totals:	0.29		3	0	0	0	1	2	33.3	0.00042	2361.83	1715.94	1.38	



Wetland Summary Report

Prepared for
Northeast Civil Solutions

130 Bancroft Street
Portland, Maine
January, 2018

6 Second Street
Buxton, Maine
207-693-8799

WETLAND SUMMARY
prepared for Northeast Civil Solutions
130 Bancroft Street
Portland, Maine

Longview Partners, LLC was contracted in late fall of 2016 to identify and flag wetlands on the subject property. Alpha-numeric flags were placed on-site, generally at intervals of 30'-50' along wetlands identified, for location by survey onto the base plan by Northeast Civil Solutions.

Wetlands were identified using the 'three-parameter' approach outlined in the U.S. Army Corps of Engineers, Wetland Delineation Manual Version 1987 (with Regional Supplements). Criteria must be met for all three parameters of hydrophytic vegetation, hydric soils, and hydrology in one location in order for an area to be included as wetlands.

The majority of the wetlands on-site consist of forested, freshwater wetlands that occur in narrow, "fingered" swales within the gently rolling landscape. These enter the subject property from the abutting properties to the southeast and east, and contain areas of runoff that concentrate at the lowest elevations of the swales. Lowest portions of the wetland swales then drain into the ditchline system created at the rear of the existing single family dwelling, lawn and swimming pool that pre-exists the redevelopment of the site.

No vernal pool habitat was observed on the project site, and Maine Dept. of Environmental Protection (MDEP) staff visited the site and found no streams within the property. (see Field Determination Form by Audie Arbo, 8/23/16).

Per MDEP, Natural Resources Protection Act standards, no setbacks are generally required the wetlands on the subject property.



DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF LAND RESOURCES

8/23/2016

FIELD DETERMINATION FORM

CONTACT ID 11294

CONTACT

PETER BLAKE
281 VERANDA ST
PORTLAND, ME 04103
2014001450

PROPERTY OWNER

JOHN WAGNER
130 BANCROFT STREET
PORTLAND, ME 04102

STAFF ARBO, AUDIE LEE

DIRECTIONS

Read St to Stevens Ave to Brighton to Bancroft

SITE TOWN PORTLAND
MAP LOT

MEMO

On August 23, 2016, I met with Peter Blake at 130 Bancroft Street in Portland. I was asked to inspect the property for protected natural resources and indicate what permits may be required for a development proposal on the site. The landowner is looking to develop the 13-acre parcel with multiple lots. The property contains freshwater wetlands as defined by the Natural Resources Protection Act (NRPA), 38 M.R.S. §480-B(4). Up to 4,300 square feet of the wetland, in total, may be altered on the property without obtaining a permit from the Department, pursuant to NRPA, 38 M.R.S. §480-Q(17). All wetland impact on the property since September 29th, 1995 is counted towards the 4,300 square foot total. Any alteration above 4,300 square feet will require a Tier Permit for wetland alteration from the Department. The application materials can be found at the following link: <http://www.maine.gov/dep/land/nrpa/index.html>.

As discussed on site, a Tier permit may be required for the proposed development. A Tier 1 permit would be required for proposed wetland alteration up to 14,999 square feet. A Tier 2 permit would be required for wetland alteration from 15,000 to 43,560 square feet. A Tier 3 permit is required for alterations above 43,560 square feet. The applicant must demonstrate project need and purpose and evidence of avoidance and minimization of wetland impacts in the design proposal.

I recommend you hire a wetland delineator or other qualified professional to perform a wetland survey and to provide a wetland boundary map. I have determined that there are no streams on the property next to the existing lawn area.

Erosion control devices must be installed and maintained on the project site during any soil disturbance activity. A Stormwater Management Law PBR or Maine Construction General Permit "NOI" and "NOT" must be filed with the Department if more than 1 acre of area is going to be disturbed on the project site at any given time during construction.

NAME: _____

1

RECEIVED 8/16/2016

SITE VISIT 8/23/2016

COMPLETED 8/23/2016

Mike Skolnick

From: James Logan <longviewpartners213@gmail.com>
Sent: Friday, March 30, 2018 7:55 AM
To: Mike Skolnick
Subject: Re: 130-144 Bancroft - 7 Lot Subdivision

Hello Mike,

The wetlands, as represented on the plan entitled "Grading and Drainage Plan" prepared by Northeast Civil Solutions, are depicted as I mapped them in the field. Feel free to call me at 207-693-8799 for more information.

Best,

Jim

On Thu, Mar 29, 2018 at 1:45 PM, Mike Skolnick <mike.skolnick@northeastcivilsolutions.com> wrote:

Jim,

Can you please take a look at the attached plan and reply with a quick response indicating that the wetlands are shown as you mapped for DEP. They need us to include this within our submission package for Tier 1 permitting.

Please let us know if there is any further information you may need.

Michael Skolnick

Land Use Regulatory Specialist

(p) [207.883.1000](tel:207.883.1000)
(f) [207.883.1001](tel:207.883.1001)

Northeast Civil Solutions, Inc.
381 Payne Road
Scarborough, ME 04074

A DBE Certified Company

SURVEYING • ENGINEERING • LAND PLANNING

www.northeastcivilsolutions.com

--

James Logan, CSS/LSE

Longview Partners, LLC

6 Second Street Buxton, ME 04093

207-693-8799



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

IN THE MATTER OF

JOSH WAGNER) NATURAL RESOURCES PROTECTION ACT
Portland, Cumberland County) FRESHWATER WETLAND ALTERATION
BANCROFT SUBDIVISION AND ROAD) WATER QUALITY CERTIFICATION
L-27901-TC-A-N (approval)) FINDINGS OF FACT AND ORDER

Project Description: The applicant proposes to fill 10,741 square feet of forested freshwater wetlands to construct an eight-lot residential subdivision that will include an access road, driveways, and a detention pond for stormwater as shown on a set of plans, the first of which is titled "Wetland Impacts," prepared by Northeast Civil Solutions, and dated May 3, 2018. The applicant has avoided and minimized wetland impacts to the greatest extent practicable by proposing 2H:1V fill side slopes within wetland areas, crossing wetland areas at the narrowest locations and by installing no less than four culverts under driveways and the access road to maintain wetland hydrological connectivity. According to the Department's Geographic Information System (GIS), there are no mapped essential or significant wildlife habitats associated with the project site. The Stormwater Management Law application required for this project will be reviewed under municipal review authority by the City of Portland. The proposed project is located off Bancroft Street in City of Portland.

Permit for:	☒ Tier 1
DEP Decision:	☒ Approved ☐ Denied (see attached letter)
CORPS Action:	☒ The Corps has been notified of your application. The following are subject to Federal screening: (1) projects with previously authorized or unauthorized work, in combination with a Tier 1 permit for a single and complete project, which total more than 15,000 square feet of altered area; (2) projects with multiple state permits and/or state exemptions which apply to a single and complete project that total more than 15,000 square feet of altered area; and (3) projects that may impact a vernal pool, as determined by the State of Maine or the Corps. If your activity is listed above, <i>Corps approval is required for your project</i> . For information regarding the status of your application contact the Corps' Maine Project Office at (207) 623-8367.

Standard Conditions:

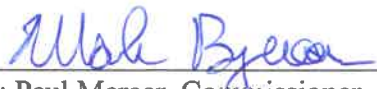
- 1) If construction or operation of the activity is not begun within four (4) years from the date signed, this permit shall lapse and the applicant shall reapply to the Department for a new permit. This permit is transferable only with prior approval from the Department. If the activity is associated with a larger project, starting any aspect of that project constitutes start of construction.
- 2) The project shall be completed according to the plans in the application. Any change in the project plans must be reviewed and approved by the Department.
- 3) Properly installed erosion control measures shall be installed prior to beginning the project, and all disturbed soil should be stabilized immediately upon project completion.

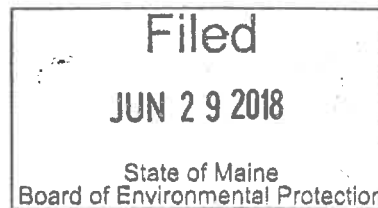
- 4) A copy of this approval will be sent to the City of Portland. Department approval of your activity does not supersede or substitute the need for any necessary local approvals.

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 28TH DAY OF JUNE, 2018.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: 
For: Paul Mercer, Commissioner



PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

JH/L27901AN/ATS#83116



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.

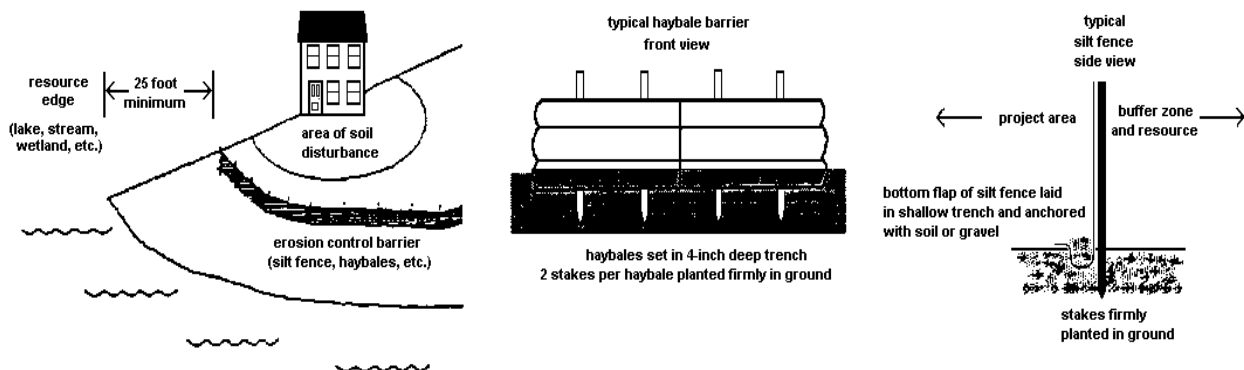


STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
 17 STATE HOUSE STATION, AUGUSTA, MAINE 04333

Erosion Control for Homeowners

Before Construction

1. If you have hired a contractor, make sure you discuss your permit with them. Talk about what measures they plan to take to control erosion. Everybody involved should understand what the resource is, and where it is located. Most people can identify the edge of a lake or river. However, the edges of wetlands are often not so obvious. Your contractor may be the person actually pushing dirt around, but you are both responsible for complying with the permit.
2. Call around to find where erosion control materials are available. Chances are your contractor has these materials already on hand. You probably will need silt fence, hay bales, wooden stakes, grass seed (or conservation mix), and perhaps filter fabric. Places to check for these items include farm & feed supply stores, garden & lawn suppliers, and landscaping companies. It is not always easy to find hay or straw during late winter and early spring. It also may be more expensive during those times of year. Plan ahead -- buy a supply early and keep it under a tarp.
3. Before any soil is disturbed, make sure an erosion control barrier has been installed. The barrier can be either a silt fence, a row of staked hay bales, or both. Use the drawings below as a guide for correct installation and placement. The barrier should be placed as close as possible to the soil-disturbance activity.
4. If a contractor is installing the erosion control barrier, double check it as a precaution. Erosion control barriers should be installed "on the contour", meaning at the same level or elevation across the land slope, whenever possible. This keeps stormwater from flowing to the lowest point along the barrier where it can build up and overflow or destroy the barrier.



During Construction

1. Use lots of hay or straw mulch on disturbed soil. The idea behind mulch is to prevent rain from striking the soil directly. It is the force of raindrops hitting the bare ground that makes the soil begin to move downslope with the runoff water, and cause erosion. More than 90% of erosion is prevented by keeping the soil covered.
2. Inspect your erosion control barriers frequently. This is especially important after a rainfall. If there is muddy water leaving the project site, then your erosion controls are not working as intended. You or your contractor then need to figure out what can be done to prevent more soil from getting past the barrier.

3. Keep your erosion control barrier up and maintained until you get a good and healthy growth of grass and the area is permanently stabilized.

After Construction

1. After your project is finished, seed the area. Note that all ground covers are not equal. For example, a mix of creeping red fescue and Kentucky bluegrass is a good choice for lawns and other high-maintenance areas. But this same seed mix is a poor selection for stabilizing a road shoulder or a cut bank that you don't intend to mow. Your contractor may have experience with different seed mixes, or you might contact a seed supplier for advice.
2. Do not spread grass seed after September 15. There is the likelihood that germinating seedlings could be killed by a frost before they have a chance to become established. Instead, mulch the area with a thick layer of hay or straw. In the spring, rake off the mulch and then seed the area. Don't forget to mulch again to hold in moisture and prevent the seed from washing away or being eaten by birds or other animals.
3. Keep your erosion control barrier up and maintained until you get a good and healthy growth of grass and the area is permanently stabilized.

Why Control Erosion?

To Protect Water Quality

When soil erodes into protected resources such as streams, rivers, wetlands, and lakes, it has many bad effects. Eroding soil particles carry phosphorus to the water. An excess of phosphorus can lead to explosions of algae growth in lakes and ponds called blooms. The water will look green and can have green slime in it. If you are near a lake or pond, this is not pleasant for swimming, and when the soil settles out on the bottom, it smothers fish eggs and small animals eaten by fish. There many other effects as well, which are all bad.

To Protect the Soil

It has taken thousands of years for our soil to develop. Its usefulness is evident all around us, from sustaining forests and growing our garden vegetables, to even treating our septic wastewater! We cannot afford to waste this valuable resource.

To Save Money (\$\$)

Replacing topsoil or gravel washed off your property can be expensive. You end up paying twice because State and local governments wind up spending your tax dollars to dig out ditches and storm drains that have become choked with sediment from soil erosion.



DEP INFORMATION SHEET

Appealing a Department Licensing Decision

Dated: March 2012

Contact: (207) 287-2811

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) in an administrative process before the Board of Environmental Protection ("Board"); or (2) in 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.A. § 3451(4)) or a general permit for an offshore wind energy demonstration project (38 M.R.S.A. § 480-HH(1)) or a general permit for a tidal energy demonstration project (38 M.R.S.A. § 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.A. §§ 341-D(4) & 346, the *Maine Administrative Procedure Act*, 5 M.R.S.A. § 11001, and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 CMR 2 (April 1, 2003).

HOW LONG YOU HAVE 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 after 30 calendar days of the date on which the Commissioner's decision was filed with the Board will be rejected.

HOW TO SUBMIT AN APPEAL TO THE BOARD

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, c/o Department of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017; faxes are acceptable for purposes of meeting the deadline when followed by the Board's receipt of mailed original documents within five (5) working days. Receipt on a particular day must be by 5:00 PM at DEP's offices in Augusta; materials received after 5:00 PM are not considered received until the following day. The person appealing a licensing decision must also send the DEP's Commissioner a copy of the appeal documents and if the person appealing is not the applicant in the license proceeding at issue the applicant must also be sent a copy of the appeal documents. All of the information listed in the next section must be submitted at the time the appeal is filed. Only the extraordinary circumstances described at the end of that section will justify evidence not in the DEP's record at the time of decision being added to the record for consideration by the Board as part of an appeal.

WHAT YOUR APPEAL PAPERWORK MUST CONTAIN

Appeal materials must contain the following information at the time submitted:

1. *Aggrieved Status.* The appeal must explain how the person filing the appeal has standing to maintain an appeal. This requires an explanation of how the person filing the appeal 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.* Specific references and facts regarding the appellant's issues with the decision must be provided in the notice of appeal.
3. *The basis of the objections or challenge.* If possible, specific regulations, statutes or other facts should be referenced. This may include citing omissions of relevant requirements, and errors believed to have been made in interpretations, conclusions, and relevant requirements.
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 arguments specifically raised in the written notice of appeal.
6. *Request for hearing.* The Board will hear presentations on appeals at its regularly scheduled meetings, unless a public hearing on the appeal is requested and granted. A request for public hearing on an appeal must be filed as part of the notice of appeal.
7. *New or additional evidence to be offered.* The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered by the Board in an appeal only when the evidence is relevant and material and that the person seeking to add information to the record can show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process or that the evidence itself is newly discovered and could not have been presented earlier in the process. Specific requirements for additional evidence are found in Chapter 2.

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, made easily accessible by DEP. Upon request, the DEP will make the material available during normal working hours, provide space to review the file, and provide 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 questions regarding applicable requirements.
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. 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, including 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, and any materials submitted in response to the appeal will be sent to Board members with a recommendation from DEP staff. Persons filing appeals and interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. 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, a 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.A. § 346(1); 06-096 CMR 2; 5 M.R.S.A. § 11001; & 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. Failure to file a timely appeal will result in the Board's or the Commissioner's decision becoming final.

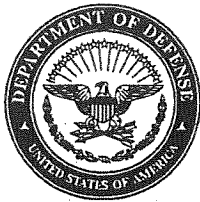
An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S.A. § 346(4).

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

JOSH WAGNER
130 BANCROFT STREET
PORTLAND, MAINE 04101

CORPS PERMIT # NAE-2018-01383
CORPS GP ID# 18-418
STATE ID# L-27901-TC-A-N

DESCRIPTION OF WORK:

Fill approximately 10,741 s.f. (0.25 ac.) of freshwater wetlands off 130 & 144 Bancroft Street at Portland, Maine (Cumberland County) in order to construct an access road and associated infrastructure for a seven-lot subdivision. This work is shown on the attached plans entitled "JOSH WAGNER, BANCROFT SUBDIVISION" in seven sheets dated "5/1/18" and "5/3/18" respectively.

LAT/LONG COORDINATES: 43.663543° N -70.302686° 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 enclosed Federal Permit, the Maine General Permit (GP). 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 38 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: _____, TIER 1: X, TIER 2: _____, TIER 3: _____, LURC: _____, DMR LEASE: _____, NA: _____

III. FEDERAL ACTIONS:

JOINT PROCESSING MEETING: 6/29/2018 LEVEL OF REVIEW: CATEGORY 1: _____ CATEGORY 2: X

AUTHORITY (Based on a review of plans and/or State/Federal applications): SEC 10 _____, 404 X, 10/404 _____, 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 978-318-8676 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


COLIN M. GREENAN
PROJECT MANAGER
MAINE PROJECT OFFICE

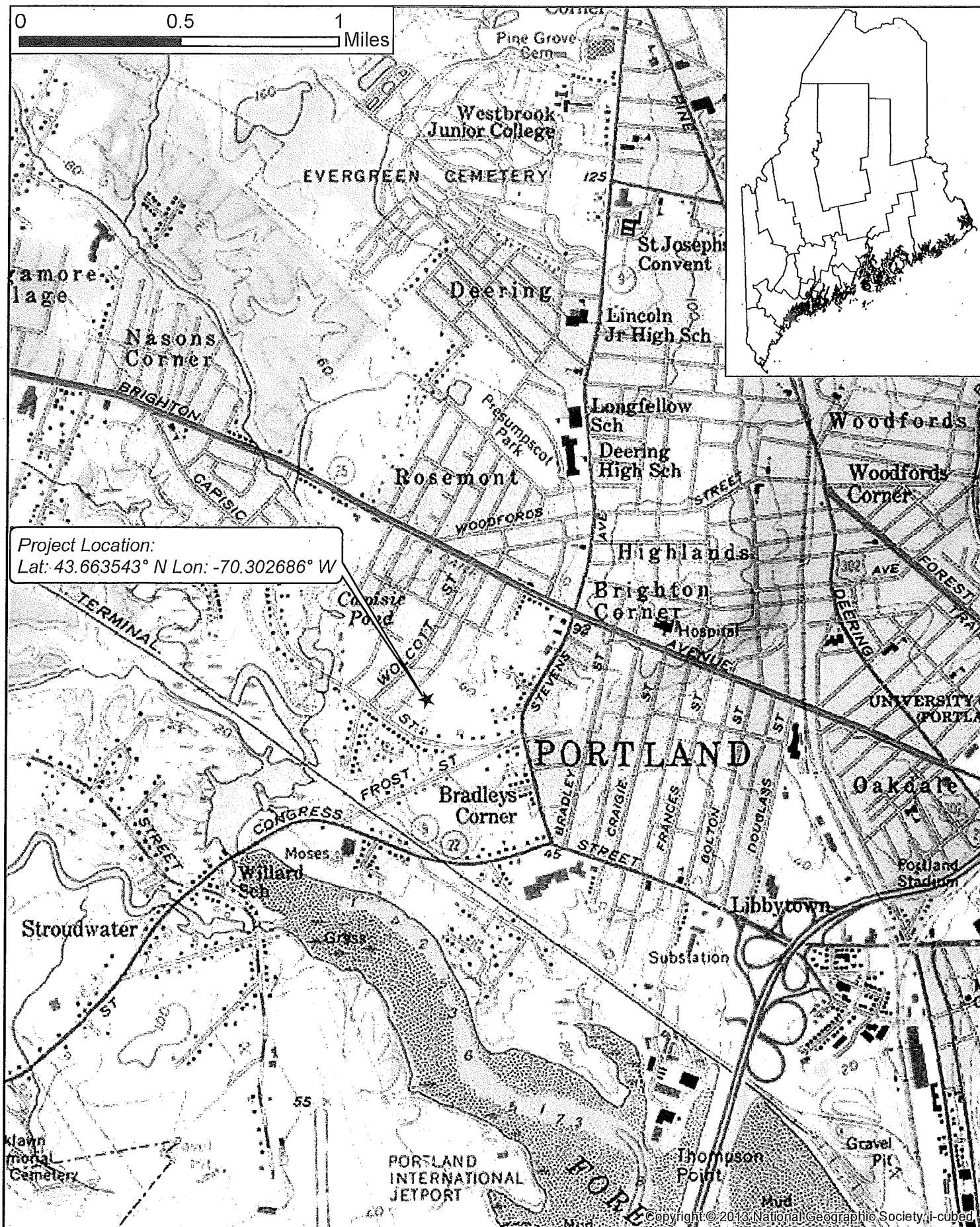

FRANK J. DEL GIUDICE
CHIEF, PERMITS & ENFORCEMENT BRANCH
REGULATORY DIVISION
DATE 8/2/18



US Army Corps
of Engineers®
New England District

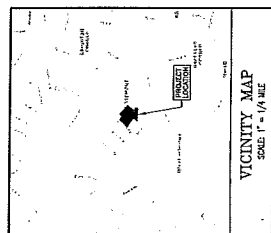
PLEASE NOTE THE FOLLOWING ADDITIONAL CONDITIONS FOR
DEPARTMENT OF THE ARMY
GENERAL PERMIT
NO. NAE-2018-01383

1. 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.
2. 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(s)** 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 and any required mitigation (but not mitigation monitoring, which requires separate submittals).
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 soils resulting from the construction shall be promptly seeded and mulched in order to achieve vegetative stabilization.
5. The 36-in. dia. wetland crossing culverts shall be embedded at least 6 in. with natural bottoms for hydraulic and ecological connectivity. If future inspections discover wetland damage likely due to lack of hydraulic connectivity, the Permittee shall take necessary measures to correct this deficiency.
6. No tree cutting shall occur between June 1st and July 31st of any year in order to minimize potential impacts to federally listed northern long eared bats.

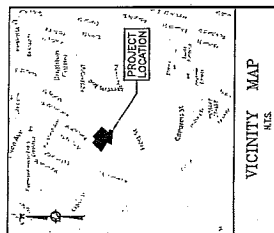


Josh Wagner, 130 & 144 Bancroft Street
Portland, Maine
USGS 7.5 QUAD: Portland West, ME

CORPS PERMIT NO. NAE-2018-01383

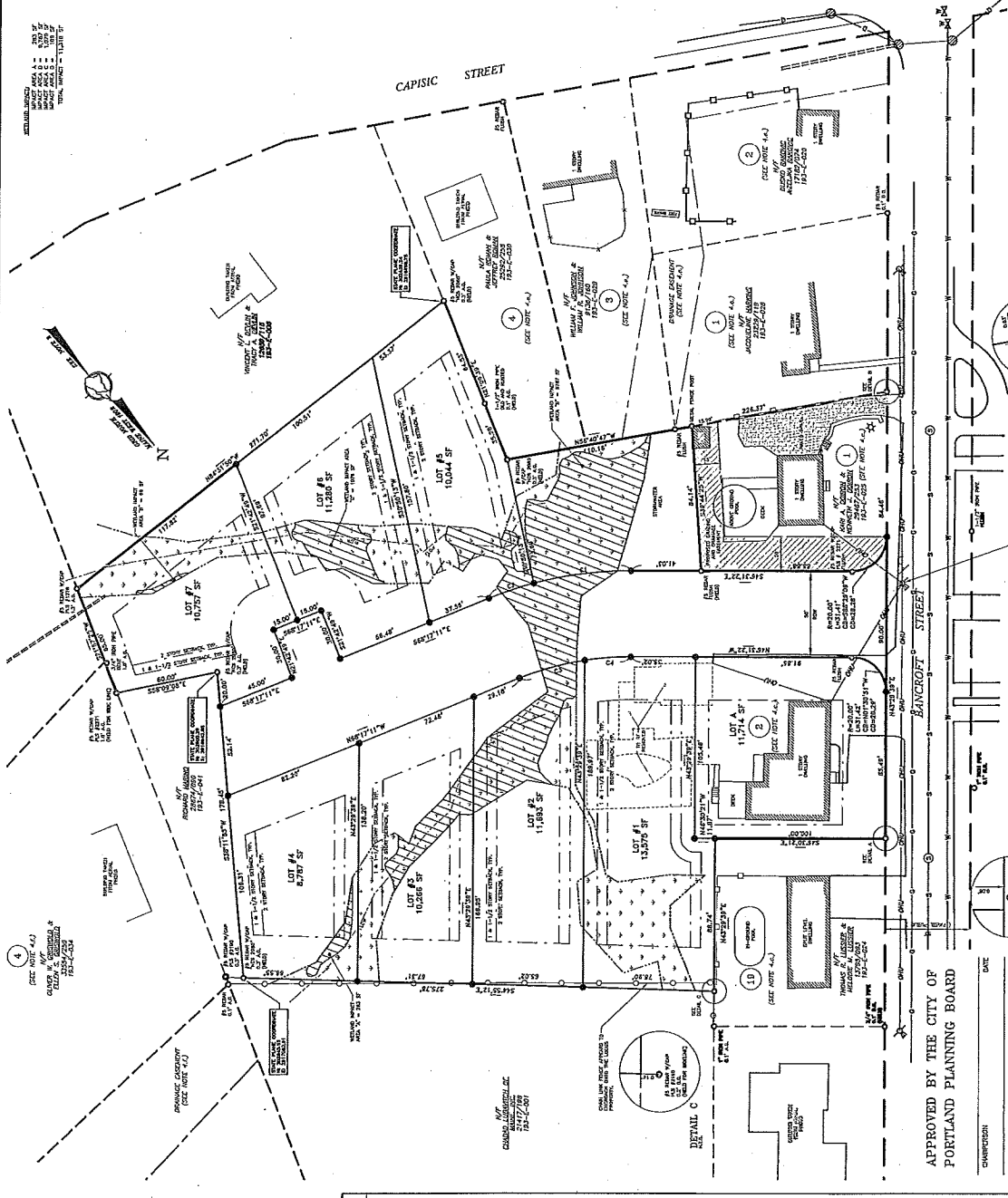
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JOSH WAGNER, BANCROFT SUBDIVISION
PORTLAND, MAINE
NAE-2018-01383
SHEET 1 of 7 (rev'd 5/1/18)



SUBDIVISION NOTES

- 1-1. REPLICATES
- 1-2. SURVEYOR / ENGINEER: JOSH WAGNER, INC.
- 1-3. DATE: MAY 1, 2018
- 1-4. PROJECT: PORTLAND PLANNING BOARD
- 1-5. SHEET: 2 OF 7
- 1-6. SCALE: 1" = 40'
- 1-7. ELEVATIONS AND CONTIGUOUS AREAS BASED ON CITY OF PORTLAND DATUM.
- 1-8. SEE PLAN FOR THE SUBDIVISION.



APPROVED BY THE CITY OF
PORTLAND PLANNING BOARD

DATE: _____

CHAMBERLAIN: _____

PROJECT LOCATION: 125-1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-1053-1054-1055-1056-1057-1058-1059-1060-1061-1062-1063-1064-1065-1066-1067-1068-1069-1070-1071-1072-1073-1074-1075-1076-1077-1078-1079-1080-1081-1082-1083-1084-1085-1086-1087-1088-1089-1090-1091-1092-1093-1094-1095-1096-1097-1098-1099-1100-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-1121-1122-1123-1124-1125-1126-1127-1128-1129-1130-1131-1132-1133-1134-1135-1136-1137-1138-1139-1140-1141-1142-1143-1144-1145-1146-1147-1148-1149-1150-1151-1152-1153-1154-1155-1156-1157-1158-1159-1160-1161-1162-1163-1164-1165-1166-1167-1168-1169-1170-1171-1172-1173-1174-1175-1176-1177-1178-1179-1180-1181-1182-1183-1184-1185-1186-1187-1188-1189-1190-1191-1192-1193-1194-1195-1196-1197-1198-1199-1200-1201-1202-1203-1204-1205-1206-1207-1208-1209-1210-1211-1212-1213-1214-1215-1216-1217-1218-1219-1220-122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WETLAND
IMPACT AREA
"D" = 73 S.F.

PROPOSED TREE
LINE/LIMIT OF
DISTURBANCE
(TYP.)

LOT #4
FFE = 70.0

LOT #7
FFE = 67.50

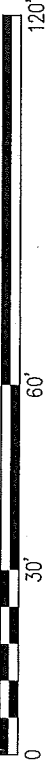
WETLAND
IMPACT AREA
"A" = 242 S.F.

PROPOSED RIP RAP
INLET/OUTLET
PROTECTION (TYP.)
(SEE DETAIL)

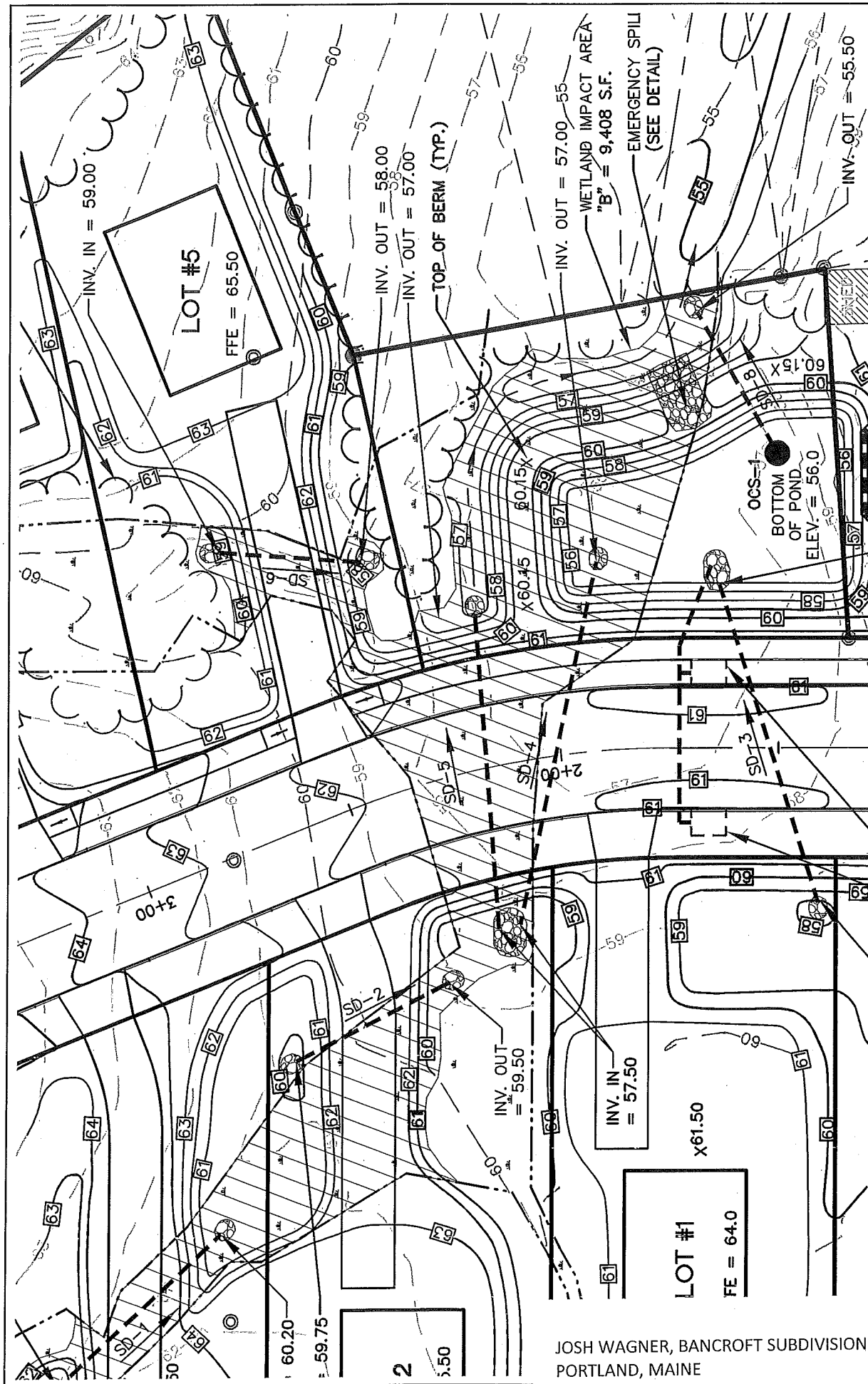
WETLAND IMPACT:

IMPACT AREA "A" = 242 SF
IMPACT AREA "D" = 73 SF

HORIZONTAL SCALE 1" = 30'



 Northeast Civil Solutions INCORPORATED 381 PAYNE ROAD, SCARBOROUGH, MAINE 04074 tel 207.653.1000 fax 207.653.1001 e-mail info@northeastcivilsolutions.com	
PROJECT: 130-144 BANCROFT STREET DATE: MAY 3, 2018	
WETLAND IMPACTS SHEET: 1 OF 3	



JOSH WAGNER, BANCROFT SUBDIVISION
 PORTLAND, MAINE
 NAE-2018-01383
 SHEET 4 of 7 (rev'd 5/3/18)

WETLAND IMPACT:

IMPACT AREA "B" = 9,408 SF

HORIZONTAL SCALE 1" = 30'



WETLAND IMPACTS

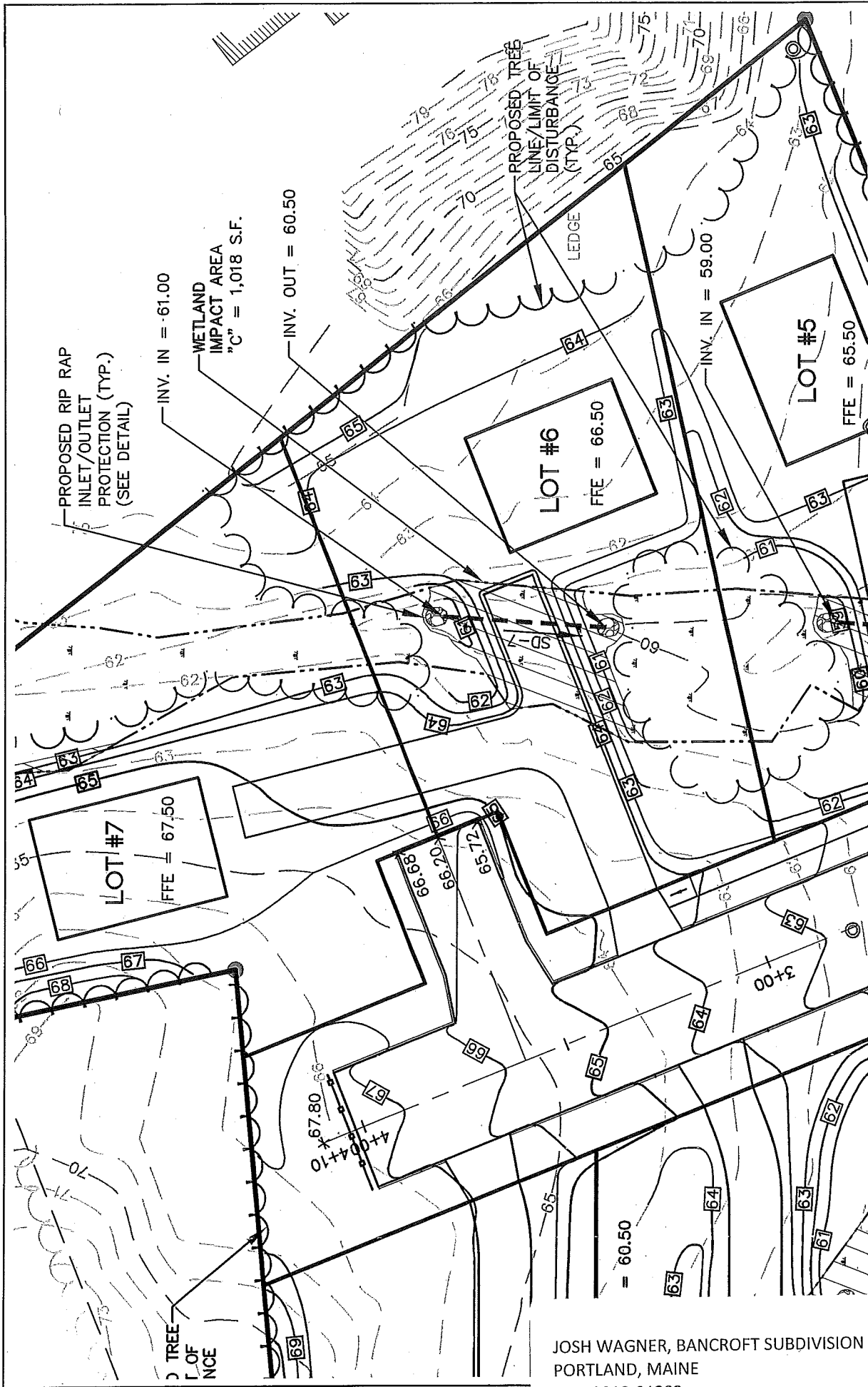
130-144 BANCROFT STREET
 PORTLAND, MAINE 04105

DATE: MAY 3, 2018
 SHEET: 2 of 3



Northeast Civil Solutions
 INCORPORATED
 351 PAYNE ROAD, SCARBOROUGH, MAINE 04074
 Tel: 207.653.1000 Fax: 207.653.1001
 Email: info@northeastcivilsolutions.com

EDUND PROJECT: 1000V10041 WAGNER PORTLAND/PLANSET/1041 WETLAND IMPACTS.DWG



WETLAND IMPACT:

IMPACT AREA "C" = 1,018 SF

HORIZONTAL SCALE 1" = 30'

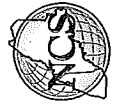


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 PORTLAND, MAINE
 NAE-2018-01383
 SHEET 5 of 7 (rev'd 5/3/18)

WETLAND IMPACTS

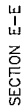
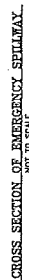
130-144 BANCROFT STREET
 PORTLAND, MAINE 04103

DATE: MAY 1, 2018
 SHEET: 3 of 3



Surveying Engineering Land Planning
 INCORPORATED
 381 PAYNE ROAD, SCARBOROUGH, MAINE 04074
 Tel: 207.883.1000 Fax: 207.883.1001
 Email: info@northeastcivilsolutions.com

EVAND PROJECT 1400341041 WAGNER PORTLAND/PLANSET 1041 WETLAND IMPACTS.DWG

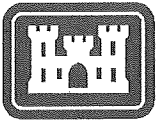
FTIBC LONG SIDE CURB INLETFT18C SHORT SIDE CURB INLETFTB/C SQUARE CURB INLET

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**FILTERRA INTERNAL BYPASS CURB (FTIBC)
CONFIGURATION DETAIL**

JOSH WAGNER, BANCROFT SUBDIVISION
PORTLAND, MAINE
NAE-2018-01383
SHEET 6 of 7 (rev'd 5/1/18)



**US Army Corps
of Engineers®**
New England District

**GENERAL PERMIT
WORK-START NOTIFICATION FORM**
(Minimum Notice: Two weeks before work begins)

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-2018-01383) was issued to Josh Wagner. The permit authorized the permittee(s) to fill approximately 10,741 s.f. (0.25 ac.) of freshwater wetlands off 130 & 144 Bancroft Street at Portland, Maine (Cumberland County) in order to construct an access road and associated infrastructure for a seven-lot subdivision.

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 MEGP 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-2018-01383

Name of Permittee: Josh Wagner

Permit Issuance Date: _____

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

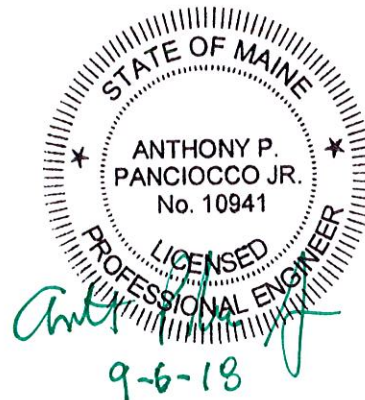
() _____
Telephone Number

CAPISIC MEADOWS SUBDIVISION
BANCROFT STREET
PORTLAND, MAINE

STORMWATER MANAGEMENT
REPORT
REV. 1
SEPTEMBER 2018

Prepared for:

WB Group, Inc.
130 Bancroft Street
Portland, ME 04101



Northeast Civil Solutions, Inc.
381 Payne Road
Scarborough, ME 04074

Project # 41041

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APPENDICES

Appendix A	HydroCAD Output: Pre-Development
Appendix B	HydroCAD Output: Post-Development
Appendix C	Stormwater Quality Calculations
Appendix D	Filtterra Sizing Calculations
Appendix E	Fema Firm Map
Appendix F	Capisic Brook Watershed Map

1) PROJECT DESCRIPTION

This Stormwater Management Report has been prepared for WB Group, Inc., to present the stormwater runoff results for a proposed 8 lot residential subdivision located off Bancroft Street in Portland. The properties are identified on the City of Portland Tax Assessor's Map 193, Block E, parcels 19, 25, 26, 39 & 40. The property occupies approximately 2.69 acres.

The site generally drains in a southwesterly direction to a drainage easement at the southerly edge of the property. Runoff is conveyed around residential properties to an open ended culvert inlet at the corner of Bancroft Street and Capisic Street. At this point runoff enters the drainage infrastructure in Capisic Street and is conveyed westerly down Capisic Street to a discharge point at Capisic Pond. Capisic Pond is tributary to the Fore River

There is a large offsite watershed to the east, which includes a portion of Redlon Park Subdivision that directs runoff onto the project property. The offsite runoff is conveyed across the subject property through drainage ways to the culvert inlet at the intersection of Capisic and Bancroft Streets.

The development of this site will require Maine Department of Environmental Protection (MDEP) Tier I wetland fill permit, for wetland fills in the amount of 10,741 S.F. Approved MDEP and Army Corps wetland fill permits are attached with this submission. Though this project is tributary to Capisic Pond it is not located in the Capisic Brook Watershed, as such this project is not located in an Urban Impaired Stream Watershed. See attached Capisic Brook Watershed Management Plan map with our project identified.

The development of the site will result in the following:

Proposed new impervious area (on previously vegetated surface)	= 0.65 acres
Proposed disturbed area	= 2.27 acres

2) STORMWATER NARRATIVE

2.1 SITE LOCATION

The project site is located at 130 Bancroft Street in Portland. The project has frontage on Bancroft Street and a new road access will be provided from Bancroft Street. The property is currently mostly lawn area, and woodlands.

2.2 RECEIVING WATERS

Runoff from the project drains southwesterly across the property to an open culvert inlet. Runoff is then conveyed within the drainage infrastructure in Capisic Street to Capisic Pond. Capisic Pond is tributary to the Fore River.

2.3 HISTORIC FLOODING

The project site is not located with a floodplain as indicated on the Flood Insurance Rate Maps for the City of Portland Maine, Panel 12 of 17, Community panel number 230051 0012 C dated December 8, 1998 and Panel 13 of 17, Community panel number 230051 0013 B dated July 17, 1986.

2.4 METHODOLOGY AND MODELING ASSUMPTIONS

Runoff and routing calculations have been performed for the watershed areas affected by the proposed development. Times of concentration and runoff curve number calculations Service (NRCS) Technical Release 55, (TR-55). Time of concentration calculations have been amended where the values given by the TR-55 method is less than six minutes. In these cases a standard minimum value of six minutes has been used to keep this parameter within the acceptable working range of the model. Each Tc path and corresponding length and slope is identified in the pre and post development drainage area plan. The TR-20 based HydroCAD (version 10.0) modeling software has been utilized to perform the complex runoff and routing calculations.

Design rainfall has been modeled using the SCS Type III hydrograph for 24-hour duration storm events. The rainfall depth for each return period is taken from the Stormwater Management for Maine: Best Management Practices, Appendix H. The rainfall depth values utilized in the stormwater model are indicated in the table below.

24-Hour Rainfall Depths for Cumberland County			
Stormwater Management for Maine: Best Management Practices Appendix H			
Frequency	2-Year	10-Year	25-Year
Rainfall Depth	3.1	4.6	5.8

2.5 SOILS

Soil types in the area of the project were identified using the NRCS Web Soil Survey. The curve numbers (CN) utilized in this analysis relate to the ground cover that was observed on the site. Soils identified on the site (or within close proximity) are identified in the Table below. These soil boundaries have been identified on the Pre and Post Development Watershed Maps. Additionally, onsite wetland areas were modeled as Hydrologic Soil group D soils.

Soil Types	Symbol	HSG
Belgrade very fine sandy loam, 0%-8% slopes	BgB	B
Hollis fine sandy loam, 3%-8% slopes	HrB	D

Walpole fine sandy loam	Wa	A/D
Windsor loamy sand, 0%-8% slopes	WmB	A

2.6 PERMITTING REQUIREMENTS

The City of Portland Technical Manual Section 5 Stormwater Management Plans for New Development states that, “Except as provided in below, the following development proposals shall submit a stormwater management plan pursuant to the regulations of Maine DEP Chapter 500 Stormwater Management Rules, including General and Flooding standards”: Since this project is a subdivision that will create more than 1,000 square feet of new impervious area and will create more than 10,000 square feet of new non-impervious developed area it will be required to provide a Stormwater Management plan.

As this project will not create one or more acres of new impervious surface area, review by the MDEP under the Stormwater Management Law, Stormwater Permit is not required. As such the project will be required to meet the MDEP’s (Chapter 500 Stormwater Management Rules).

The project has received a Tier I NRPA wetland fill permit for wetland impacts in the amount of 10,741 square feet.

Basic Standards: The basic standards require that grading and other construction activities on the site do not impede or otherwise alter drainage ways to create an unreasonable adverse impact on a protected natural resource. The basic standards will be met by the implementation of an Erosion and Sedimentation Control Plan addressing erosion and sediment during construction and post-construction stabilization of the site.

The Erosion and Sedimentation Control Plan was developed following Best Management Practice (BMP) guidelines and has been placed directly on the design plans for reference during construction.

General Standards: The general standards consist of Best Management Practice (BMP) standards. The BMP standards require a project’s stormwater management system to include treatment measures that will mitigate the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. This must be achieved by using one or more MDEP approved methods to control runoff from no less than 95% of the proposed impervious area and no less than 80% of the proposed developed area associated with a project.

The project will meet the linear portion requirement of MDEP Chapter 500 which states, “For a linear portion of a project, treatment may be reduced to no less than 75% of the linear portion’s impervious area and no less than 50% of the linear portion’s developed area”.

As this project will not create one acre or more of new impervious surface area, it will not be subject to MDEP Stormwater Permit Review. The project will be required to meet the Chapter 500 General and Flooding Standards per City of Portland Technical manual.

Flooding Standard: MDEP requires that projects which create 3 acres or more of impervious area and 20 acres or more of developed area or otherwise require review pursuant to the Site Location of Development Law must control the peak flow of runoff from the site to pre-development rates during the 2-year, 10-year and 25-year, 24-hour storms. As this project does not meet the above criteria, the Flooding Standard does not apply for MDEP approvals.

As part of the City of Portland's Technical manual the project will be required to meet the Flooding Standard.

2.7 PROPOSED BMPs

Two Filterra treatment units have been proposed at the low point of the proposed roadway to treat runoff from new roadway surface. The units will have an internal bypass to divert larger storms to an adjacent detention basin for flooding control. The Filterras have been sized in accordance with MDEP Chapter 500 rules.

The owner of the property is not intending to build the houses on this project and as such is not required to provide water quality treatment for the lot impervious areas. The lot impervious areas were included in the modeling to properly model runoff from the site.

2.8 PROJECT IMPACTS

The development of this project will result in the creation of approximately 0.65 acres of new impervious surface area and 2.27 acres of disturbed area.

3) STORMWATER QUANTITY ANALYSIS

3.1 PRE-DEVELOPMENT CONDITIONS

Under pre-development conditions the site is modeled with five Subcatchment areas (See Plan Set for Pre-Development Drainage Area Plan) three onsite Subcatchment areas and two offsite Subcatchment areas. The offsite areas direct offsite runoff onto the project property. The onsite and offsite Subcatchment areas drain to four points of analysis, Study Point 1, Study Point 2, Study Point 3 and Study Point 4 . The analysis encompasses approximately 13.78 acres of land area.

3.2 POST- DEVELOPMENT CONDITIONS

Under the post-development condition the site area is further divided into 8 subcatchment areas to allow for the effects of localized storage to be calculated. The runoff from the subcatchment areas drains to the same four points of analysis, Study Point 1, Study Point 2, Study Point 3 and Study Point 4. The analysis encompasses approximately 13.78 acres of drainage area. As such, a direct comparison can be made of the pre-development and post-development runoff values at each Study Point.

The watershed areas and times of concentration of the post-development watersheds vary from the existing conditions based on the proposed site development and grading. The Table below summarizes the results of the hydrologic analysis of the project under pre-development and post-development conditions.

3.3 STORMWATER QUANTITY SUMMARY

Stormwater Runoff Summary Table Pre-Development vs. Post-Development										
<u>Study Point</u>	Total Watershed Area (Ac)		Avg. Weighted Curve No. (Cn)		Peak Rates of Runoff (cfs)					
					2-Year		10-Year		25-Year	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
SP-1	1.98	2.02	80	80	6.0	2.6	11.7	6.5	16.4	10.1
SP-2	2.99	2.95	64	72	6.7	6.3	15.0	13.7	22.9	21.9
SP-3	4.95	4.95	81	81	4.7	4.7	9.0	9.0	12.6	12.6
SP-4	3.86	3.86	55	55	0.2	0.2	1.6	1.6	3.3	3.3

4) STORMWATER QUALITY ANALYSIS

Water quality treatment is provided for runoff from the majority of the new Roadway areas associated with the project. Two proposed Filterra units provide treatment for 85% of the new roadway impervious area and 85% of the new roadway developed area. The proposed treatment meets the Chapter 500 treatment requirements for the project site.

5) CONCLUSIONS

The runoff and routing calculations demonstrate that the development will result in a decrease in the peak rate of runoff at Study Points SP-1 and Study Point SP-2 during the 2-year, 10-year and 25-year storm events.

Study Point SP-3 and Study Point, SP-4 remain unchanged from the pre to post development condition.

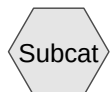
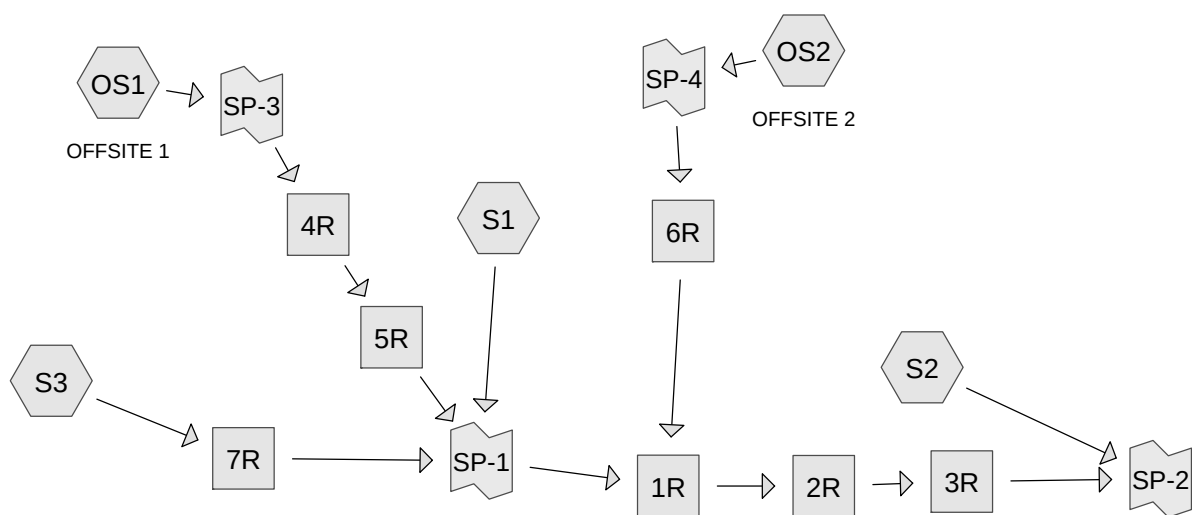
Stormwater runoff from this site will be treated to meet the MDEP Basic and General Standards for stormwater quality treatment for the project site. The project will provide treatment for 85% of the new roadway impervious areas and 85% of the new roadways developed area, meeting Chapter 500 Stormwater requirements.

The proposed project is designed to fit the topography and natural features of the site to the maximum extent practical. Stormwater runoff from the development will be captured, detained and treated in a series of BMPs and discharged to the same locations as the pre-development conditions.

An Erosion and Sedimentation Control Plan will be implemented to address erosion and sediment control during construction and the post-construction stabilization of the site. These construction requirements have been developed following BMP guidelines and have been placed directly on the design plans for construction reference.

APPENDIX A

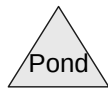
PRE-DEVELOPMENT HYDROCAD OUTPUT



Subcat



Reach



Pond



Link

Routing Diagram for 41041 PRE

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Summary for Subcatchment OS1: OFFSITE 1

Runoff = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (ac)	CN	Description
0.943	98	Paved parking, HSG D
0.405	80	>75% Grass cover, Good, HSG D
3.603	77	Woods, Good, HSG D
4.951	81	Weighted Average
4.008		80.95% Pervious Area
0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (ac)	CN	Description
0.582	98	Paved parking, HSG D
1.923	30	Woods, Good, HSG A
0.969	77	Woods, Good, HSG D
0.231	39	>75% Grass cover, Good, HSG A
0.157	80	>75% Grass cover, Good, HSG D
3.862	55	Weighted Average
3.280		84.93% Pervious Area
0.582		15.07% Impervious Area

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Type III 24-hr 2-YR Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Subcatchment S1:

Runoff = 1.4 cfs @ 12.20 hrs, Volume= 0.133 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (ac)	CN	Description
0.194	98	Paved parking, HSG D
0.010	39	>75% Grass cover, Good, HSG A
0.277	80	>75% Grass cover, Good, HSG D
0.668	77	Woods, Good, HSG D
1.149	81	Weighted Average
0.955		83.12% Pervious Area
0.194		16.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
3.0	117	0.0170	0.65		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
0.5	50	0.0200	1.84	5.76	Trap/Vee/Rect Channel Flow, C-D Bot.W=10.00' D=0.25' Z= 10.0 ' ' Top.W=15.00' n= 0.040
0.7	121	0.0240	2.69	8.42	Trap/Vee/Rect Channel Flow, D-E Bot.W=10.00' D=0.25' Z= 10.0 ' ' Top.W=15.00' n= 0.030
14.2	363	Total			

Summary for Subcatchment S2:

Runoff = 0.9 cfs @ 12.32 hrs, Volume= 0.128 af, Depth= 0.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

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Type III 24-hr 2-YR Rainfall=3.10"

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Area (ac)	CN	Description
* 0.108	98	Exposed Ledge, HSG A
0.092	98	Paved parking, HSG D
0.297	39	>75% Grass cover, Good, HSG A
0.508	80	>75% Grass cover, Good, HSG D
0.693	30	Woods, Good, HSG A
1.295	77	Woods, Good, HSG D
2.993	64	Weighted Average
2.793		93.32% Pervious Area
0.200		6.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
1.7	111	0.0450	1.06		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.0	128	0.0290	2.15	5.10	Trap/Vee/Rect Channel Flow, C-D Bot.W=7.00' D=0.25' Z= 10.0 ' ' Top.W=12.00' n= 0.040
0.5	59	0.0160	1.90		Shallow Concentrated Flow, D-E Grassed Waterway Kv= 15.0 fps
3.4	184	0.0050	0.90	2.37	Trap/Vee/Rect Channel Flow, E-F Bot.W=8.00' D=0.25' Z= 10.0 ' ' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	Trap/Vee/Rect Channel Flow, F-G Bot.W=5.00' D=0.50' Z= 3.0 ' ' Top.W=8.00' n= 0.030
17.5	680	Total			

Summary for Subcatchment S3:

Runoff = 0.9 cfs @ 12.22 hrs, Volume= 0.083 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
6,926	80	>75% Grass cover, Good, HSG D
29,316	77	Woods, Good, HSG D
36,242	78	Weighted Average
36,242		100.00% Pervious Area

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Type III 24-hr 2-YR Rainfall=3.10"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		Shallow Concentrated Flow, C-D Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Reach 1R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 0.96" for 2-YR event
 Inflow = 6.0 cfs @ 12.44 hrs, Volume= 0.862 af
 Outflow = 6.0 cfs @ 12.47 hrs, Volume= 0.862 af, Atten= 0%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 1.52 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 0.51 fps, Avg. Travel Time= 3.2 min

Peak Storage= 388 cf @ 12.45 hrs
 Average Depth at Peak Storage= 0.18'
 Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
 Side Slope Z-value= 10.0 '/' Top Width= 40.00'
 Length= 98.0' Slope= 0.0102 '/'
 Inlet Invert= 57.00', Outlet Invert= 56.00'

**Summary for Reach 2R:**

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 0.96" for 2-YR event
 Inflow = 6.0 cfs @ 12.47 hrs, Volume= 0.862 af
 Outflow = 6.0 cfs @ 12.51 hrs, Volume= 0.862 af, Atten= 0%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.74 fps, Min. Travel Time= 1.2 min
 Avg. Velocity = 0.98 fps, Avg. Travel Time= 3.5 min

Peak Storage= 447 cf @ 12.49 hrs
 Average Depth at Peak Storage= 0.22'
 Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

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Type III 24-hr 2-YR Rainfall=3.10"

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8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
Side Slope Z-value= 10.0 '/' Top Width= 28.00'
Length= 204.0' Slope= 0.0049 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

**Summary for Reach 3R:**

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 0.96" for 2-YR event
Inflow = 6.0 cfs @ 12.51 hrs, Volume= 0.862 af
Outflow = 6.0 cfs @ 12.53 hrs, Volume= 0.862 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.35 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 2.1 min

Peak Storage= 262 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 103.0' Slope= 0.0097 '/'
Inlet Invert= 55.00', Outlet Invert= 54.00'

**Summary for Reach 4R:**

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 1.39" for 2-YR event
Inflow = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af
Outflow = 4.6 cfs @ 12.45 hrs, Volume= 0.574 af, Atten= 1%, Lag= 3.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.53 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 5.2 min

Peak Storage= 488 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

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Type III 24-hr 2-YR Rainfall=3.10"

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8.00' x 0.50' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 18.00'
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 64.00', Outlet Invert= 62.00'

**Summary for Reach 5R:**

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 1.39" for 2-YR event
Inflow = 4.6 cfs @ 12.45 hrs, Volume= 0.574 af
Outflow = 4.6 cfs @ 12.49 hrs, Volume= 0.574 af, Atten= 1%, Lag= 2.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.55 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.49 fps, Avg. Travel Time= 4.2 min

Peak Storage= 368 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 0.50' Flow Area= 22.5 sf, Capacity= 117.9 cfs

40.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 10.0 '/' Top Width= 50.00'
Length= 123.0' Slope= 0.0325 '/'
Inlet Invert= 62.00', Outlet Invert= 58.00'

**Summary for Reach 6R:**

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.22" for 2-YR event
Inflow = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af
Outflow = 0.2 cfs @ 12.88 hrs, Volume= 0.071 af, Atten= 5%, Lag= 13.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.63 fps, Min. Travel Time= 7.5 min
Avg. Velocity = 0.35 fps, Avg. Travel Time= 13.4 min

Peak Storage= 106 cf @ 12.76 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00' Flow Area= 11.0 sf, Capacity= 45.5 cfs

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Type III 24-hr 2-YR Rainfall=3.10"

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8.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 283.0' Slope= 0.0177 '/'
Inlet Invert= 63.00', Outlet Invert= 58.00'

**Summary for Reach 7R:**

Inflow Area = 0.832 ac, 0.00% Impervious, Inflow Depth = 1.20" for 2-YR event
Inflow = 0.9 cfs @ 12.22 hrs, Volume= 0.083 af
Outflow = 0.8 cfs @ 12.27 hrs, Volume= 0.083 af, Atten= 2%, Lag= 3.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.99 fps, Min. Travel Time= 1.7 min
Avg. Velocity= 0.31 fps, Avg. Travel Time= 5.5 min

Peak Storage= 87 cf @ 12.24 hrs
Average Depth at Peak Storage= 0.04'
Bank-Full Depth= 0.25' Flow Area= 6.3 sf, Capacity= 18.7 cfs

20.00' x 0.25' deep channel, n= 0.030 Short grass
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 102.0' Slope= 0.0294 '/'
Inlet Invert= 60.00', Outlet Invert= 57.00'

**Summary for Link SP-1:**

Inflow Area = 6.932 ac, 16.40% Impervious, Inflow Depth = 1.37" for 2-YR event
Inflow = 6.0 cfs @ 12.44 hrs, Volume= 0.790 af
Primary = 6.0 cfs @ 12.44 hrs, Volume= 0.790 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 13.92% Impervious, Inflow Depth = 0.86" for 2-YR event
Inflow = 6.7 cfs @ 12.51 hrs, Volume= 0.990 af
Primary = 6.7 cfs @ 12.51 hrs, Volume= 0.990 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 1.39" for 2-YR event
Inflow = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af
Primary = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-4:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.22" for 2-YR event
Inflow = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af
Primary = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment OS1: OFFSITE 1

Runoff = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (ac)	CN	Description
0.943	98	Paved parking, HSG D
0.405	80	>75% Grass cover, Good, HSG D
3.603	77	Woods, Good, HSG D
4.951	81	Weighted Average
4.008		80.95% Pervious Area
0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (ac)	CN	Description
0.582	98	Paved parking, HSG D
1.923	30	Woods, Good, HSG A
0.969	77	Woods, Good, HSG D
0.231	39	>75% Grass cover, Good, HSG A
0.157	80	>75% Grass cover, Good, HSG D
3.862	55	Weighted Average
3.280		84.93% Pervious Area
0.582		15.07% Impervious Area

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Type III 24-hr 10-YR Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Subcatchment S1:

Runoff = 2.7 cfs @ 12.20 hrs, Volume= 0.252 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (ac)	CN	Description
0.194	98	Paved parking, HSG D
0.010	39	>75% Grass cover, Good, HSG A
0.277	80	>75% Grass cover, Good, HSG D
0.668	77	Woods, Good, HSG D
1.149	81	Weighted Average
0.955		83.12% Pervious Area
0.194		16.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
3.0	117	0.0170	0.65		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
0.5	50	0.0200	1.84	5.76	Trap/Vee/Rect Channel Flow, C-D Bot.W=10.00' D=0.25' Z= 10.0 '/' Top.W=15.00' n= 0.040
0.7	121	0.0240	2.69	8.42	Trap/Vee/Rect Channel Flow, D-E Bot.W=10.00' D=0.25' Z= 10.0 '/' Top.W=15.00' n= 0.030
14.2	363	Total			

Summary for Subcatchment S2:

Runoff = 3.0 cfs @ 12.27 hrs, Volume= 0.331 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

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Type III 24-hr 10-YR Rainfall=4.60"

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Area (ac)	CN	Description
* 0.108	98	Exposed Ledge, HSG A
0.092	98	Paved parking, HSG D
0.297	39	>75% Grass cover, Good, HSG A
0.508	80	>75% Grass cover, Good, HSG D
0.693	30	Woods, Good, HSG A
1.295	77	Woods, Good, HSG D
2.993	64	Weighted Average
2.793		93.32% Pervious Area
0.200		6.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
1.7	111	0.0450	1.06		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.0	128	0.0290	2.15	5.10	Trap/Vee/Rect Channel Flow, C-D Bot.W=7.00' D=0.25' Z= 10.0 ' ' Top.W=12.00' n= 0.040
0.5	59	0.0160	1.90		Shallow Concentrated Flow, D-E Grassed Waterway Kv= 15.0 fps
3.4	184	0.0050	0.90	2.37	Trap/Vee/Rect Channel Flow, E-F Bot.W=8.00' D=0.25' Z= 10.0 ' ' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	Trap/Vee/Rect Channel Flow, F-G Bot.W=5.00' D=0.50' Z= 3.0 ' ' Top.W=8.00' n= 0.030
17.5	680	Total			

Summary for Subcatchment S3:

Runoff = 1.7 cfs @ 12.21 hrs, Volume= 0.165 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
6,926	80	>75% Grass cover, Good, HSG D
29,316	77	Woods, Good, HSG D
36,242	78	Weighted Average
36,242		100.00% Pervious Area

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Type III 24-hr 10-YR Rainfall=4.60"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		Shallow Concentrated Flow, C-D Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Reach 1R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 1.95" for 10-YR event
 Inflow = 12.9 cfs @ 12.43 hrs, Volume= 1.758 af
 Outflow = 12.9 cfs @ 12.46 hrs, Volume= 1.758 af, Atten= 0%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.00 fps, Min. Travel Time= 0.8 min
 Avg. Velocity = 0.63 fps, Avg. Travel Time= 2.6 min

Peak Storage= 634 cf @ 12.44 hrs
 Average Depth at Peak Storage= 0.28'
 Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
 Side Slope Z-value= 10.0 '/' Top Width= 40.00'
 Length= 98.0' Slope= 0.0102 '/'
 Inlet Invert= 57.00', Outlet Invert= 56.00'

**Summary for Reach 2R:**

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 1.95" for 10-YR event
 Inflow = 12.9 cfs @ 12.46 hrs, Volume= 1.758 af
 Outflow = 12.8 cfs @ 12.49 hrs, Volume= 1.758 af, Atten= 0%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 3.47 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 1.19 fps, Avg. Travel Time= 2.9 min

Peak Storage= 756 cf @ 12.47 hrs
 Average Depth at Peak Storage= 0.33'
 Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

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Type III 24-hr 10-YR Rainfall=4.60"

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8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
Side Slope Z-value= 10.0 '/' Top Width= 28.00'
Length= 204.0' Slope= 0.0049 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

**Summary for Reach 3R:**

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 1.95" for 10-YR event
Inflow = 12.8 cfs @ 12.49 hrs, Volume= 1.758 af
Outflow = 12.8 cfs @ 12.50 hrs, Volume= 1.758 af, Atten= 0%, Lag= 1.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.99 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.99 fps, Avg. Travel Time= 1.7 min

Peak Storage= 442 cf @ 12.49 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 103.0' Slope= 0.0097 '/'
Inlet Invert= 55.00', Outlet Invert= 54.00'

**Summary for Reach 4R:**

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 2.63" for 10-YR event
Inflow = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af
Outflow = 8.9 cfs @ 12.43 hrs, Volume= 1.087 af, Atten= 1%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.86 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 4.4 min

Peak Storage= 770 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

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Type III 24-hr 10-YR Rainfall=4.60"

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8.00' x 0.50' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 18.00'
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 64.00', Outlet Invert= 62.00'

**Summary for Reach 5R:**

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 2.63" for 10-YR event
Inflow = 8.9 cfs @ 12.43 hrs, Volume= 1.087 af
Outflow = 8.9 cfs @ 12.46 hrs, Volume= 1.087 af, Atten= 0%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.00 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.59 fps, Avg. Travel Time= 3.5 min

Peak Storage= 548 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 0.50' Flow Area= 22.5 sf, Capacity= 117.9 cfs

40.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 10.0 '/' Top Width= 50.00'
Length= 123.0' Slope= 0.0325 '/'
Inlet Invert= 62.00', Outlet Invert= 58.00'

**Summary for Reach 6R:**

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.79" for 10-YR event
Inflow = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af
Outflow = 1.6 cfs @ 12.57 hrs, Volume= 0.254 af, Atten= 1%, Lag= 6.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.31 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 0.52 fps, Avg. Travel Time= 9.1 min

Peak Storage= 345 cf @ 12.51 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 1.00' Flow Area= 11.0 sf, Capacity= 45.5 cfs

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8.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 283.0' Slope= 0.0177 '/'
Inlet Invert= 63.00', Outlet Invert= 58.00'

**Summary for Reach 7R:**

Inflow Area = 0.832 ac, 0.00% Impervious, Inflow Depth = 2.38" for 10-YR event
Inflow = 1.7 cfs @ 12.21 hrs, Volume= 0.165 af
Outflow = 1.7 cfs @ 12.25 hrs, Volume= 0.165 af, Atten= 2%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.29 fps, Min. Travel Time= 1.3 min
Avg. Velocity= 0.38 fps, Avg. Travel Time= 4.5 min

Peak Storage= 136 cf @ 12.23 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.25' Flow Area= 6.3 sf, Capacity= 18.7 cfs

20.00' x 0.25' deep channel, n= 0.030 Short grass
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 102.0' Slope= 0.0294 '/'
Inlet Invert= 60.00', Outlet Invert= 57.00'

**Summary for Link SP-1:**

Inflow Area = 6.932 ac, 16.40% Impervious, Inflow Depth = 2.60" for 10-YR event
Inflow = 11.7 cfs @ 12.40 hrs, Volume= 1.504 af
Primary = 11.7 cfs @ 12.40 hrs, Volume= 1.504 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 13.92% Impervious, Inflow Depth = 1.82" for 10-YR event
Inflow = 15.0 cfs @ 12.47 hrs, Volume= 2.089 af
Primary = 15.0 cfs @ 12.47 hrs, Volume= 2.089 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 2.63" for 10-YR event
Inflow = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af
Primary = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-4:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.79" for 10-YR event
Inflow = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af
Primary = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25-YR Rainfall=5.80"

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Summary for Subcatchment OS1: OFFSITE 1

Runoff = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (ac)	CN	Description
0.943	98	Paved parking, HSG D
0.405	80	>75% Grass cover, Good, HSG D
3.603	77	Woods, Good, HSG D
4.951	81	Weighted Average
4.008		80.95% Pervious Area
0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		Shallow Concentrated Flow, C-D
					Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		Shallow Concentrated Flow, D-E
					Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (ac)	CN	Description
0.582	98	Paved parking, HSG D
1.923	30	Woods, Good, HSG A
0.969	77	Woods, Good, HSG D
0.231	39	>75% Grass cover, Good, HSG A
0.157	80	>75% Grass cover, Good, HSG D
3.862	55	Weighted Average
3.280		84.93% Pervious Area
0.582		15.07% Impervious Area

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Type III 24-hr 25-YR Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Subcatchment S1:

Runoff = 3.8 cfs @ 12.20 hrs, Volume= 0.354 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (ac)	CN	Description
0.194	98	Paved parking, HSG D
0.010	39	>75% Grass cover, Good, HSG A
0.277	80	>75% Grass cover, Good, HSG D
0.668	77	Woods, Good, HSG D
1.149	81	Weighted Average
0.955		83.12% Pervious Area
0.194		16.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
3.0	117	0.0170	0.65		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
0.5	50	0.0200	1.84	5.76	Trap/Vee/Rect Channel Flow, C-D Bot.W=10.00' D=0.25' Z= 10.0 '/' Top.W=15.00' n= 0.040
0.7	121	0.0240	2.69	8.42	Trap/Vee/Rect Channel Flow, D-E Bot.W=10.00' D=0.25' Z= 10.0 '/' Top.W=15.00' n= 0.030
14.2	363	Total			

Summary for Subcatchment S2:

Runoff = 5.1 cfs @ 12.26 hrs, Volume= 0.529 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

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Type III 24-hr 25-YR Rainfall=5.80"

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Area (ac)	CN	Description
* 0.108	98	Exposed Ledge, HSG A
0.092	98	Paved parking, HSG D
0.297	39	>75% Grass cover, Good, HSG A
0.508	80	>75% Grass cover, Good, HSG D
0.693	30	Woods, Good, HSG A
1.295	77	Woods, Good, HSG D
2.993	64	Weighted Average
2.793		93.32% Pervious Area
0.200		6.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
1.7	111	0.0450	1.06		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.0	128	0.0290	2.15	5.10	Trap/Vee/Rect Channel Flow, C-D Bot.W=7.00' D=0.25' Z= 10.0 ' Top.W=12.00' n= 0.040
0.5	59	0.0160	1.90		Shallow Concentrated Flow, D-E Grassed Waterway Kv= 15.0 fps
3.4	184	0.0050	0.90	2.37	Trap/Vee/Rect Channel Flow, E-F Bot.W=8.00' D=0.25' Z= 10.0 ' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	Trap/Vee/Rect Channel Flow, F-G Bot.W=5.00' D=0.50' Z= 3.0 ' Top.W=8.00' n= 0.030
17.5	680	Total			

Summary for Subcatchment S3:

Runoff = 2.5 cfs @ 12.21 hrs, Volume= 0.236 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
6,926	80	>75% Grass cover, Good, HSG D
29,316	77	Woods, Good, HSG D
36,242	78	Weighted Average
36,242		100.00% Pervious Area

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Type III 24-hr 25-YR Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		Shallow Concentrated Flow, C-D Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Reach 1R:

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 2.86" for 25-YR event
 Inflow = 19.4 cfs @ 12.42 hrs, Volume= 2.570 af
 Outflow = 19.4 cfs @ 12.44 hrs, Volume= 2.570 af, Atten= 0%, Lag= 1.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.29 fps, Min. Travel Time= 0.7 min
 Avg. Velocity = 0.70 fps, Avg. Travel Time= 2.3 min

Peak Storage= 829 cf @ 12.42 hrs
 Average Depth at Peak Storage= 0.36'
 Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
 Side Slope Z-value= 10.0 '/' Top Width= 40.00'
 Length= 98.0' Slope= 0.0102 '/'
 Inlet Invert= 57.00', Outlet Invert= 56.00'

**Summary for Reach 2R:**

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 2.86" for 25-YR event
 Inflow = 19.4 cfs @ 12.44 hrs, Volume= 2.570 af
 Outflow = 19.3 cfs @ 12.46 hrs, Volume= 2.570 af, Atten= 0%, Lag= 1.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 3.92 fps, Min. Travel Time= 0.9 min
 Avg. Velocity = 1.32 fps, Avg. Travel Time= 2.6 min

Peak Storage= 1,006 cf @ 12.45 hrs
 Average Depth at Peak Storage= 0.41'
 Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

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Type III 24-hr 25-YR Rainfall=5.80"

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8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
Side Slope Z-value= 10.0 '/' Top Width= 28.00'
Length= 204.0' Slope= 0.0049 '/'
Inlet Invert= 56.00', Outlet Invert= 55.00'

**Summary for Reach 3R:**

Inflow Area = 10.794 ac, 15.93% Impervious, Inflow Depth = 2.86" for 25-YR event
Inflow = 19.3 cfs @ 12.46 hrs, Volume= 2.570 af
Outflow = 19.2 cfs @ 12.48 hrs, Volume= 2.570 af, Atten= 0%, Lag= 0.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.38 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 1.6 min

Peak Storage= 588 cf @ 12.47 hrs
Average Depth at Peak Storage= 0.78'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 103.0' Slope= 0.0097 '/'
Inlet Invert= 55.00', Outlet Invert= 54.00'

**Summary for Reach 4R:**

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 3.70" for 25-YR event
Inflow = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af
Outflow = 12.5 cfs @ 12.42 hrs, Volume= 1.527 af, Atten= 1%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.05 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 0.67 fps, Avg. Travel Time= 4.0 min

Peak Storage= 978 cf @ 12.39 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

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Type III 24-hr 25-YR Rainfall=5.80"

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8.00' x 0.50' deep channel, n= 0.040
Side Slope Z-value= 10.0 '/' Top Width= 18.00'
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 64.00', Outlet Invert= 62.00'

**Summary for Reach 5R:**

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 3.70" for 25-YR event
Inflow = 12.5 cfs @ 12.42 hrs, Volume= 1.527 af
Outflow = 12.4 cfs @ 12.44 hrs, Volume= 1.527 af, Atten= 1%, Lag= 1.6 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.27 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 3.2 min

Peak Storage= 674 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50' Flow Area= 22.5 sf, Capacity= 117.9 cfs

40.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 10.0 '/' Top Width= 50.00'
Length= 123.0' Slope= 0.0325 '/'
Inlet Invert= 62.00', Outlet Invert= 58.00'

**Summary for Reach 6R:**

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 1.40" for 25-YR event
Inflow = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af
Outflow = 3.3 cfs @ 12.51 hrs, Volume= 0.452 af, Atten= 1%, Lag= 4.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.71 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.61 fps, Avg. Travel Time= 7.7 min

Peak Storage= 544 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 11.0 sf, Capacity= 45.5 cfs

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8.00' x 1.00' deep channel, n= 0.040
Side Slope Z-value= 3.0 '/' Top Width= 14.00'
Length= 283.0' Slope= 0.0177 '/'
Inlet Invert= 63.00', Outlet Invert= 58.00'

**Summary for Reach 7R:**

Inflow Area = 0.832 ac, 0.00% Impervious, Inflow Depth = 3.40" for 25-YR event
Inflow = 2.5 cfs @ 12.21 hrs, Volume= 0.236 af
Outflow = 2.4 cfs @ 12.25 hrs, Volume= 0.236 af, Atten= 2%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.47 fps, Min. Travel Time= 1.2 min
Avg. Velocity= 0.42 fps, Avg. Travel Time= 4.1 min

Peak Storage= 171 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.08'
Bank-Full Depth= 0.25' Flow Area= 6.3 sf, Capacity= 18.7 cfs

20.00' x 0.25' deep channel, n= 0.030 Short grass
Side Slope Z-value= 20.0 '/' Top Width= 30.00'
Length= 102.0' Slope= 0.0294 '/'
Inlet Invert= 60.00', Outlet Invert= 57.00'

**Summary for Link SP-1:**

Inflow Area = 6.932 ac, 16.40% Impervious, Inflow Depth = 3.67" for 25-YR event
Inflow = 16.4 cfs @ 12.39 hrs, Volume= 2.118 af
Primary = 16.4 cfs @ 12.39 hrs, Volume= 2.118 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 13.92% Impervious, Inflow Depth = 2.70" for 25-YR event
Inflow = 22.9 cfs @ 12.44 hrs, Volume= 3.099 af
Primary = 22.9 cfs @ 12.44 hrs, Volume= 3.099 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 3.70" for 25-YR event
Inflow = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af
Primary = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

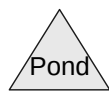
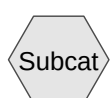
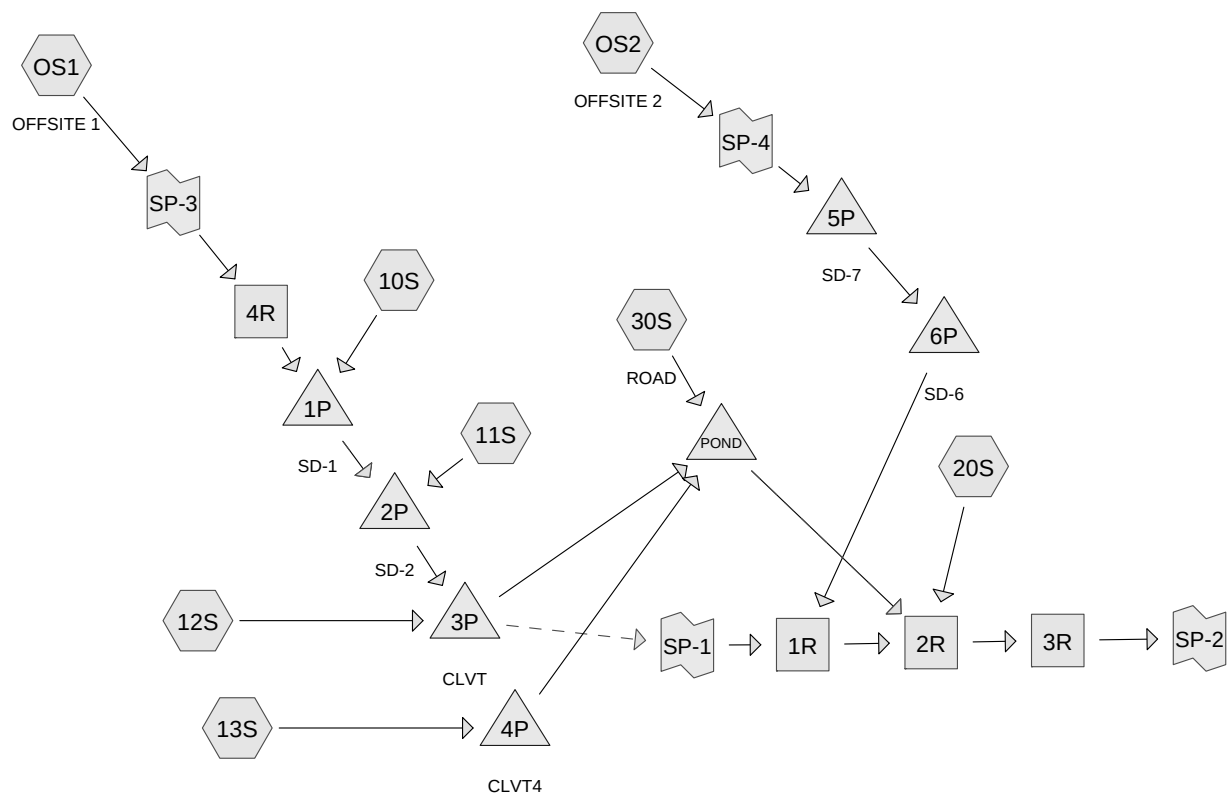
Summary for Link SP-4:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 1.40" for 25-YR event
Inflow = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af
Primary = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

APPENDIX B

POST DEVELOPMENT HYDROCAD OUTPUT



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Type III 24-hr 2-YR Rainfall=3.10"

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Summary for Subcatchment 10S:

Runoff = 1.0 cfs @ 12.10 hrs, Volume= 0.073 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
3,021	98	Paved parking, HSG D
11,151	77	Woods, Good, HSG D
13,358	80	>75% Grass cover, Good, HSG D
27,530	81	Weighted Average
24,509		89.03% Pervious Area
3,021		10.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 11S:

Runoff = 0.3 cfs @ 12.09 hrs, Volume= 0.021 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
1,796	98	Paved parking, HSG D
4,782	80	>75% Grass cover, Good, HSG D
6,578	85	Weighted Average
4,782		72.70% Pervious Area
1,796		27.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 12S:

Runoff = 1.1 cfs @ 12.22 hrs, Volume= 0.106 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

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Type III 24-hr 2-YR Rainfall=3.10"

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Area (sf)	CN	Description
2,601	98	Paved parking, HSG D
19,092	80	>75% Grass cover, Good, HSG D
20,038	77	Woods, Good, HSG D
41,731	80	Weighted Average
39,130		93.77% Pervious Area
2,601		6.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		Shallow Concentrated Flow, C-D Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Subcatchment 13S:

Runoff = 0.4 cfs @ 12.10 hrs, Volume= 0.028 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
484	98	Paved parking, HSG A
2,166	98	Existing Impervious, HSG D
1,873	39	>75% Grass cover, Good, HSG A
7,761	80	>75% Grass cover, Good, HSG D
12,284	78	Weighted Average
9,634		78.43% Pervious Area
2,650		21.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 20S:

Runoff = 1.2 cfs @ 12.27 hrs, Volume= 0.139 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

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Type III 24-hr 2-YR Rainfall=3.10"

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	Area (sf)	CN	Description
*	2,831	98	Existing Impervious, HSG D
*	4,704	98	Exposed Ledge, HSG A
	6,078	98	Paved parking, HSG D
	2,788	39	>75% Grass cover, Good, HSG A
	39,137	80	>75% Grass cover, Good, HSG D
	24,176	30	Woods, Good, HSG A
	20,386	77	Woods, Good, HSG D
	100,100	69	Weighted Average
	86,487		86.40% Pervious Area
	13,613		13.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
0.5	103	0.0480	3.29		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.1	39	0.0250	10.18	17.99	Pipe Channel, C-D 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
1.6	59	0.0160	0.63		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
0.0	33	0.0300	11.15	19.71	Pipe Channel, E-F 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
0.3	69	0.0290	4.57	14.84	Trap/Vee/Rect Channel Flow, F-G Bot.W=5.00' D=0.50' Z= 3.0 '/' Top.W=8.00' n= 0.030 Earth, grassed & winding
3.4	184	0.0050	0.90	2.37	Trap/Vee/Rect Channel Flow, G-H Bot.W=8.00' D=0.25' Z= 10.0 '/' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	Trap/Vee/Rect Channel Flow, H-I Bot.W=5.00' D=0.50' Z= 3.0 '/' Top.W=8.00' n= 0.030
16.8	685	Total			

Summary for Subcatchment 30S: ROAD

Runoff = 1.1 cfs @ 12.09 hrs, Volume= 0.079 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

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Type III 24-hr 2-YR Rainfall=3.10"

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	Area (sf)	CN	Description
	14,694	98	Paved parking, HSG D
*	1,181	98	Existing Impervious
	5,687	39	>75% Grass cover, Good, HSG A
	6,882	80	>75% Grass cover, Good, HSG D
	28,444	82	Weighted Average
	12,569		44.19% Pervious Area
	15,875		55.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment OS1: OFFSITE 1

Runoff = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

	Area (ac)	CN	Description
*	0.943	98	Existing Impervious, HSG D
	0.405	80	>75% Grass cover, Good, HSG D
	3.603	77	Woods, Good, HSG D
	4.951	81	Weighted Average
	4.008		80.95% Pervious Area
	0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		Shallow Concentrated Flow, C-D
					Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		Shallow Concentrated Flow, D-E
					Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YR Rainfall=3.10"

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Type III 24-hr 2-YR Rainfall=3.10"

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Area (ac)	CN	Description
* 0.582	98	Existing Impervious, HSG D
1.923	30	Woods, Good, HSG A
0.969	77	Woods, Good, HSG D
0.231	39	>75% Grass cover, Good, HSG A
0.157	80	>75% Grass cover, Good, HSG D
3.862	55	Weighted Average
3.280		84.93% Pervious Area
0.582		15.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		Shallow Concentrated Flow, C-D Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Reach 1R:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.54" for 2-YR event
 Inflow = 2.6 cfs @ 12.55 hrs, Volume= 0.172 af
 Outflow = 2.6 cfs @ 12.57 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 1.11 fps, Min. Travel Time= 1.5 min
 Avg. Velocity = 0.28 fps, Avg. Travel Time= 5.8 min

Peak Storage= 228 cf @ 12.57 hrs
 Average Depth at Peak Storage= 0.11'
 Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
 Side Slope Z-value= 10.0 ' ' Top Width= 40.00'
 Length= 98.0' Slope= 0.0102 ' '
 Inlet Invert= 57.00', Outlet Invert= 56.00'



Summary for Reach 2R:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 0.91" for 2-YR event
Inflow = 6.3 cfs @ 12.55 hrs, Volume= 1.047 af
Outflow = 6.3 cfs @ 12.56 hrs, Volume= 1.047 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.78 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 0.72 fps, Avg. Travel Time= 4.7 min

Peak Storage= 463 cf @ 12.56 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
Side Slope Z-value= 10.0 '/' Top Width= 28.00'
Length= 204.0' Slope= 0.0049 '/
Inlet Invert= 56.00', Outlet Invert= 55.00'

**Summary for Reach 3R:**

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 0.91" for 2-YR event
Inflow = 6.3 cfs @ 12.56 hrs, Volume= 1.047 af
Outflow = 6.3 cfs @ 12.57 hrs, Volume= 1.047 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.39 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 3.1 min

Peak Storage= 272 cf @ 12.57 hrs
Average Depth at Peak Storage= 0.42'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 103.0' Slope= 0.0097 '/
Inlet Invert= 55.00', Outlet Invert= 54.00'



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Summary for Reach 4R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 1.39" for 2-YR event
 Inflow = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af
 Outflow = 4.7 cfs @ 12.42 hrs, Volume= 0.574 af, Atten= 0%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 1.53 fps, Min. Travel Time= 1.7 min
 Avg. Velocity= 0.51 fps, Avg. Travel Time= 5.2 min

Peak Storage= 488 cf @ 12.42 hrs
 Average Depth at Peak Storage= 0.28'
 Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

8.00' x 0.50' deep channel, n= 0.040
 Side Slope Z-value= 10.0 ' Top Width= 18.00'
 Length= 160.0' Slope= 0.0125 '
 Inlet Invert= 64.00', Outlet Invert= 62.00'

**Summary for Pond 1P: SD-1**

Inflow Area = 5.583 ac, 18.13% Impervious, Inflow Depth = 1.39" for 2-YR event
 Inflow = 5.0 cfs @ 12.40 hrs, Volume= 0.647 af
 Outflow = 5.0 cfs @ 12.42 hrs, Volume= 0.644 af, Atten= 0%, Lag= 1.0 min
 Primary = 5.0 cfs @ 12.42 hrs, Volume= 0.644 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 62.27' @ 12.42 hrs Surf.Area= 626 sf Storage= 339 cf
 Flood Elev= 64.10' Surf.Area= 4,113 sf Storage= 4,114 cf

Plug-Flow detention time= 4.7 min calculated for 0.644 af (99% of inflow)
 Center-of-Mass det. time= 2.0 min (863.8 - 861.8)

Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	4,114 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	34	0	0
61.00	92	63	63
62.00	231	162	225
63.00	1,717	974	1,199
64.00	4,113	2,915	4,114

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Device	Routing	Invert	Outlet Devices
#1	Primary	61.50'	36.0" Round Culvert w/ 12.0" inside fill L= 51.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 60.50' / 60.20' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=5.0 cfs @ 12.42 hrs HW=62.26' TW=61.51' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 5.0 cfs @ 2.21 fps)**Summary for Pond 2P: SD-2**

Inflow Area = 5.734 ac, 18.37% Impervious, Inflow Depth = 1.39" for 2-YR event
Inflow = 5.1 cfs @ 12.42 hrs, Volume= 0.665 af
Outflow = 5.0 cfs @ 12.47 hrs, Volume= 0.654 af, Atten= 2%, Lag= 2.9 min
Primary = 5.0 cfs @ 12.47 hrs, Volume= 0.654 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 61.52' @ 12.47 hrs Surf.Area= 1,651 sf Storage= 1,599 cf
Flood Elev= 62.10' Surf.Area= 1,848 sf Storage= 2,443 cf

Plug-Flow detention time= 18.9 min calculated for 0.653 af (98% of inflow)
Center-of-Mass det. time= 9.3 min (871.9 - 862.6)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	2,443 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	28	0	0
60.00	66	47	47
61.00	1,439	753	800
62.00	1,848	1,644	2,443

Device	Routing	Invert	Outlet Devices
#1	Primary	60.75'	36.0" Round Culvert w/ 12.0" inside fill L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.75' / 59.50' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=5.0 cfs @ 12.47 hrs HW=61.52' TW=58.95' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 5.0 cfs @ 2.21 fps)**Summary for Pond 3P: CLVT**

Inflow Area = 6.692 ac, 16.64% Impervious, Inflow Depth = 1.36" for 2-YR event
Inflow = 5.7 cfs @ 12.44 hrs, Volume= 0.760 af
Outflow = 5.5 cfs @ 12.46 hrs, Volume= 0.760 af, Atten= 3%, Lag= 1.0 min
Primary = 4.3 cfs @ 12.28 hrs, Volume= 0.630 af
Secondary = 2.6 cfs @ 12.55 hrs, Volume= 0.130 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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Peak Elev= 58.99' @ 12.55 hrs Surf.Area= 591 sf Storage= 163 cf

Flood Elev= 60.10' Surf.Area= 1,862 sf Storage= 1,395 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 0.2 min (869.4 - 869.3)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	1,395 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	66	0	0
59.00	597	166	166
60.00	1,862	1,230	1,395

Device	Routing	Invert	Outlet Devices
#1	Primary	57.50'	18.0" Round Culvert SD-4 L= 85.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0059 ' / Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	58.50'	36.0" Round Culvert SD-5 w/ 12.0" inside fill L= 72.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0069 ' / Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=3.6 cfs @ 12.28 hrs HW=58.69' TW=58.19' (Dynamic Tailwater)↑**1=Culvert SD-4** (Outlet Controls 3.6 cfs @ 3.25 fps)**Secondary OutFlow** Max=2.6 cfs @ 12.55 hrs HW=58.99' TW=0.00' (Dynamic Tailwater)↑**2=Culvert SD-5** (Inlet Controls 2.6 cfs @ 1.77 fps)**Summary for Pond 4P: CLVT4**

Inflow Area = 0.282 ac, 21.57% Impervious, Inflow Depth = 1.20" for 2-YR event
 Inflow = 0.4 cfs @ 12.10 hrs, Volume= 0.028 af
 Outflow = 0.3 cfs @ 12.15 hrs, Volume= 0.028 af, Atten= 12%, Lag= 3.0 min
 Primary = 0.3 cfs @ 12.15 hrs, Volume= 0.028 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 58.62' @ 13.19 hrs Surf.Area= 808 sf Storage= 265 cf

Flood Elev= 60.10' Surf.Area= 3,087 sf Storage= 2,835 cf

Plug-Flow detention time= 20.3 min calculated for 0.028 af (100% of inflow)

Center-of-Mass det. time= 20.3 min (871.2 - 850.9)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	2,835 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	41	0	0
59.00	1,271	656	656
60.00	3,087	2,179	2,835

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	15.0" Round Culvert L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 58.00' / 57.50' S= 0.0063 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.3 cfs @ 12.15 hrs HW=58.30' TW=57.49' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.3 cfs @ 1.47 fps)

Summary for Pond 5P: SD-7

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.22" for 2-YR event
Inflow = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af
Outflow = 0.1 cfs @ 13.78 hrs, Volume= 0.056 af, Atten= 49%, Lag= 67.4 min
Primary = 0.1 cfs @ 13.78 hrs, Volume= 0.056 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 62.07' @ 13.78 hrs Surf.Area= 1,347 sf Storage= 739 cf
Flood Elev= 63.50' Surf.Area= 3,561 sf Storage= 3,030 cf

Plug-Flow detention time= 156.5 min calculated for 0.056 af (79% of inflow)
Center-of-Mass det. time= 70.6 min (1,051.9 - 981.3)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	3,030 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
61.00	121	0	0
62.00	1,189	655	655
63.00	3,561	2,375	3,030

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	36.0" Round Culvert w/ 12.0" inside fill L= 39.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 61.00' / 60.50' S= 0.0128 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=0.1 cfs @ 13.78 hrs HW=62.07' TW=59.48' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 0.1 cfs @ 0.67 fps)

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Summary for Pond 6P: SD-6

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.18" for 2-YR event
 Inflow = 0.1 cfs @ 13.78 hrs, Volume= 0.056 af
 Outflow = 0.1 cfs @ 15.42 hrs, Volume= 0.042 af, Atten= 24%, Lag= 98.5 min
 Primary = 0.1 cfs @ 15.42 hrs, Volume= 0.042 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 60.05' @ 15.42 hrs Surf.Area= 1,198 sf Storage= 693 cf
 Flood Elev= 62.00' Surf.Area= 3,808 sf Storage= 5,892 cf

Plug-Flow detention time= 179.1 min calculated for 0.042 af (74% of inflow)
 Center-of-Mass det. time= 84.0 min (1,135.9 - 1,051.9)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	5,892 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	154	0	0
60.00	1,105	630	630
61.00	2,806	1,956	2,585
62.00	3,808	3,307	5,892

Device	Routing	Invert	Outlet Devices
#1	Primary	60.00'	36.0" Round Culvert w/ 12.0" inside fill L= 33.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.00' / 58.00' S= 0.0303 ' S= 0.0303 ' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=0.1 cfs @ 15.42 hrs HW=60.05' TW=57.01' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 0.1 cfs @ 0.62 fps)

Summary for Pond POND:

Inflow Area = 7.627 ac, 20.17% Impervious, Inflow Depth = 1.16" for 2-YR event
 Inflow = 5.0 cfs @ 12.24 hrs, Volume= 0.737 af
 Outflow = 3.0 cfs @ 12.56 hrs, Volume= 0.737 af, Atten= 41%, Lag= 18.8 min
 Primary = 3.0 cfs @ 12.56 hrs, Volume= 0.737 af
 Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 58.83' @ 12.56 hrs Surf.Area= 3,024 sf Storage= 6,959 cf

Plug-Flow detention time= 53.3 min calculated for 0.737 af (100% of inflow)
 Center-of-Mass det. time= 52.5 min (937.4 - 884.9)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	11,483 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,893	0	0
57.00	2,283	2,088	2,088
58.00	2,689	2,486	4,574
59.00	3,090	2,890	7,464
60.15	3,901	4,020	11,483

Device	Routing	Invert	Outlet Devices
#1	Primary	56.00'	15.0" Round Culvert L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 56.00' / 55.50' S= 0.0143 ' S= 0.0143 ' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Secondary	59.20'	8.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Device 1	56.00'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	58.60'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=3.0 cfs @ 12.56 hrs HW=58.83' TW=56.22' (Dynamic Tailwater)↑ **1=Culvert** (Passes 3.0 cfs of 6.9 cfs potential flow)↑ **3=Orifice/Grate** (Orifice Controls 1.5 cfs @ 7.74 fps)↑ **4=Sharp-Crested Rectangular Weir** (Weir Controls 1.5 cfs @ 1.58 fps)**Secondary OutFlow** Max=0.0 cfs @ 0.00 hrs HW=56.00' TW=56.00' (Dynamic Tailwater)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)**Summary for Link SP-1:**

Inflow = 2.6 cfs @ 12.55 hrs, Volume= 0.130 af
 Primary = 2.6 cfs @ 12.55 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 0.91" for 2-YR event
 Inflow = 6.3 cfs @ 12.57 hrs, Volume= 1.047 af
 Primary = 6.3 cfs @ 12.57 hrs, Volume= 1.047 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 1.39" for 2-YR event
 Inflow = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af
 Primary = 4.7 cfs @ 12.40 hrs, Volume= 0.574 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-4:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.22" for 2-YR event
Inflow = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af
Primary = 0.2 cfs @ 12.66 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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Summary for Subcatchment 10S:

Runoff = 1.9 cfs @ 12.09 hrs, Volume= 0.139 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
3,021	98	Paved parking, HSG D
11,151	77	Woods, Good, HSG D
13,358	80	>75% Grass cover, Good, HSG D
27,530	81	Weighted Average
24,509		89.03% Pervious Area
3,021		10.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 11S:

Runoff = 0.5 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 3.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
1,796	98	Paved parking, HSG D
4,782	80	>75% Grass cover, Good, HSG D
6,578	85	Weighted Average
4,782		72.70% Pervious Area
1,796		27.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 12S:

Runoff = 2.1 cfs @ 12.21 hrs, Volume= 0.203 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

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Area (sf)	CN	Description
2,601	98	Paved parking, HSG D
19,092	80	>75% Grass cover, Good, HSG D
20,038	77	Woods, Good, HSG D
41,731	80	Weighted Average
39,130		93.77% Pervious Area
2,601		6.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		Shallow Concentrated Flow, C-D Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Subcatchment 13S:

Runoff = 0.8 cfs @ 12.09 hrs, Volume= 0.056 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
484	98	Paved parking, HSG A
2,166	98	Existing Impervious, HSG D
1,873	39	>75% Grass cover, Good, HSG A
7,761	80	>75% Grass cover, Good, HSG D
12,284	78	Weighted Average
9,634		78.43% Pervious Area
2,650		21.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 20S:

Runoff = 3.1 cfs @ 12.25 hrs, Volume= 0.320 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

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	Area (sf)	CN	Description
*	2,831	98	Existing Impervious, HSG D
*	4,704	98	Exposed Ledge, HSG A
	6,078	98	Paved parking, HSG D
	2,788	39	>75% Grass cover, Good, HSG A
	39,137	80	>75% Grass cover, Good, HSG D
	24,176	30	Woods, Good, HSG A
	20,386	77	Woods, Good, HSG D
	100,100	69	Weighted Average
	86,487		86.40% Pervious Area
	13,613		13.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
0.5	103	0.0480	3.29		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.1	39	0.0250	10.18	17.99	Pipe Channel, C-D 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
1.6	59	0.0160	0.63		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
0.0	33	0.0300	11.15	19.71	Pipe Channel, E-F 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
0.3	69	0.0290	4.57	14.84	Trap/Vee/Rect Channel Flow, F-G Bot.W=5.00' D=0.50' Z= 3.0 ' Top.W=8.00' n= 0.030 Earth, grassed & winding
3.4	184	0.0050	0.90	2.37	Trap/Vee/Rect Channel Flow, G-H Bot.W=8.00' D=0.25' Z= 10.0 ' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	Trap/Vee/Rect Channel Flow, H-I Bot.W=5.00' D=0.50' Z= 3.0 ' Top.W=8.00' n= 0.030
16.8	685	Total			

Summary for Subcatchment 30S: ROAD

Runoff = 2.0 cfs @ 12.09 hrs, Volume= 0.148 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

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Type III 24-hr 10-YR Rainfall=4.60"

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	Area (sf)	CN	Description
	14,694	98	Paved parking, HSG D
*	1,181	98	Existing Impervious
	5,687	39	>75% Grass cover, Good, HSG A
	6,882	80	>75% Grass cover, Good, HSG D
	28,444	82	Weighted Average
	12,569		44.19% Pervious Area
	15,875		55.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment OS1: OFFSITE 1

Runoff = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af, Depth= 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

	Area (ac)	CN	Description
*	0.943	98	Existing Impervious, HSG D
	0.405	80	>75% Grass cover, Good, HSG D
	3.603	77	Woods, Good, HSG D
	4.951	81	Weighted Average
	4.008		80.95% Pervious Area
	0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		Shallow Concentrated Flow, C-D
					Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		Shallow Concentrated Flow, D-E
					Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.60"

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Type III 24-hr 10-YR Rainfall=4.60"

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Area (ac)	CN	Description
* 0.582	98	Existing Impervious, HSG D
1.923	30	Woods, Good, HSG A
0.969	77	Woods, Good, HSG D
0.231	39	>75% Grass cover, Good, HSG A
0.157	80	>75% Grass cover, Good, HSG D
3.862	55	Weighted Average
3.280		84.93% Pervious Area
0.582		15.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		Shallow Concentrated Flow, C-D
					Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Reach 1R:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 2.06" for 10-YR event
 Inflow = 6.5 cfs @ 12.45 hrs, Volume= 0.664 af
 Outflow = 6.5 cfs @ 12.47 hrs, Volume= 0.664 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 1.56 fps, Min. Travel Time= 1.0 min
 Avg. Velocity= 0.40 fps, Avg. Travel Time= 4.1 min

Peak Storage= 408 cf @ 12.47 hrs
 Average Depth at Peak Storage= 0.19'
 Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
 Side Slope Z-value= 10.0 ' ' Top Width= 40.00'
 Length= 98.0' Slope= 0.0102 ' '
 Inlet Invert= 57.00', Outlet Invert= 56.00'



Summary for Reach 2R:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 1.92" for 10-YR event
 Inflow = 13.7 cfs @ 12.41 hrs, Volume= 2.201 af
 Outflow = 13.7 cfs @ 12.42 hrs, Volume= 2.201 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 3.54 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 0.85 fps, Avg. Travel Time= 4.0 min

Peak Storage= 787 cf @ 12.42 hrs
 Average Depth at Peak Storage= 0.34'
 Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
 Side Slope Z-value= 10.0 '/' Top Width= 28.00'
 Length= 204.0' Slope= 0.0049 '/
 Inlet Invert= 56.00', Outlet Invert= 55.00'

**Summary for Reach 3R:**

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 1.92" for 10-YR event
 Inflow = 13.7 cfs @ 12.42 hrs, Volume= 2.201 af
 Outflow = 13.7 cfs @ 12.43 hrs, Volume= 2.201 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 3.05 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 0.66 fps, Avg. Travel Time= 2.6 min

Peak Storage= 462 cf @ 12.43 hrs
 Average Depth at Peak Storage= 0.65'
 Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
 Side Slope Z-value= 3.0 '/' Top Width= 11.00'
 Length= 103.0' Slope= 0.0097 '/
 Inlet Invert= 55.00', Outlet Invert= 54.00'



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Summary for Reach 4R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 2.63" for 10-YR event
 Inflow = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af
 Outflow = 8.9 cfs @ 12.40 hrs, Volume= 1.087 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 1.86 fps, Min. Travel Time= 1.4 min
 Avg. Velocity= 0.61 fps, Avg. Travel Time= 4.4 min

Peak Storage= 770 cf @ 12.40 hrs
 Average Depth at Peak Storage= 0.40'
 Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

8.00' x 0.50' deep channel, n= 0.040
 Side Slope Z-value= 10.0 ' / ' Top Width= 18.00'
 Length= 160.0' Slope= 0.0125 ' / '
 Inlet Invert= 64.00', Outlet Invert= 62.00'

**Summary for Pond 1P: SD-1**

Inflow Area = 5.583 ac, 18.13% Impervious, Inflow Depth = 2.63" for 10-YR event
 Inflow = 9.6 cfs @ 12.39 hrs, Volume= 1.226 af
 Outflow = 9.5 cfs @ 12.42 hrs, Volume= 1.223 af, Atten= 1%, Lag= 1.8 min
 Primary = 9.5 cfs @ 12.42 hrs, Volume= 1.223 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 62.71' @ 12.43 hrs Surf.Area= 1,289 sf Storage= 766 cf
 Flood Elev= 64.10' Surf.Area= 4,113 sf Storage= 4,114 cf

Plug-Flow detention time= 3.5 min calculated for 1.223 af (100% of inflow)
 Center-of-Mass det. time= 1.7 min (844.4 - 842.8)

Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	4,114 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	34	0	0
61.00	92	63	63
62.00	231	162	225
63.00	1,717	974	1,199
64.00	4,113	2,915	4,114

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Device	Routing	Invert	Outlet Devices
#1	Primary	61.50'	36.0" Round Culvert w/ 12.0" inside fill L= 51.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 60.50' / 60.20' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=9.4 cfs @ 12.42 hrs HW=62.71' TW=61.92' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 9.4 cfs @ 2.66 fps)**Summary for Pond 2P: SD-2**

Inflow Area = 5.734 ac, 18.37% Impervious, Inflow Depth = 2.64" for 10-YR event
Inflow = 9.6 cfs @ 12.41 hrs, Volume= 1.261 af
Outflow = 9.5 cfs @ 12.46 hrs, Volume= 1.250 af, Atten= 1%, Lag= 2.6 min
Primary = 9.5 cfs @ 12.46 hrs, Volume= 1.250 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 61.93' @ 12.46 hrs Surf.Area= 1,819 sf Storage= 2,313 cf
Flood Elev= 62.10' Surf.Area= 1,848 sf Storage= 2,443 cf

Plug-Flow detention time= 12.7 min calculated for 1.248 af (99% of inflow)
Center-of-Mass det. time= 7.4 min (850.8 - 843.4)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	2,443 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	28	0	0
60.00	66	47	47
61.00	1,439	753	800
62.00	1,848	1,644	2,443

Device	Routing	Invert	Outlet Devices
#1	Primary	60.75'	36.0" Round Culvert w/ 12.0" inside fill L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.75' / 59.50' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=9.5 cfs @ 12.46 hrs HW=61.93' TW=59.41' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 9.5 cfs @ 2.77 fps)**Summary for Pond 3P: CLVT**

Inflow Area = 6.692 ac, 16.64% Impervious, Inflow Depth = 2.61" for 10-YR event
Inflow = 10.8 cfs @ 12.43 hrs, Volume= 1.453 af
Outflow = 10.8 cfs @ 12.45 hrs, Volume= 1.453 af, Atten= 0%, Lag= 1.2 min
Primary = 4.4 cfs @ 12.10 hrs, Volume= 1.013 af
Secondary = 6.5 cfs @ 12.45 hrs, Volume= 0.440 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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Peak Elev= 59.41' @ 12.45 hrs Surf.Area= 1,118 sf Storage= 519 cf

Flood Elev= 60.10' Surf.Area= 1,862 sf Storage= 1,395 cf

Plug-Flow detention time= 0.4 min calculated for 1.451 af (100% of inflow)

Center-of-Mass det. time= 0.4 min (848.8 - 848.5)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	1,395 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	66	0	0
59.00	597	166	166
60.00	1,862	1,230	1,395

Device	Routing	Invert	Outlet Devices
#1	Primary	57.50'	18.0" Round Culvert SD-4 L= 85.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0059 ' S= 0.0059 ' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	58.50'	36.0" Round Culvert SD-5 w/ 12.0" inside fill L= 72.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0069 ' S= 0.0069 ' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=2.8 cfs @ 12.10 hrs HW=58.87' TW=58.66' (Dynamic Tailwater)↑**1=Culvert SD-4** (Outlet Controls 2.8 cfs @ 2.16 fps)**Secondary OutFlow** Max=6.5 cfs @ 12.45 hrs HW=59.41' TW=0.00' (Dynamic Tailwater)↑**2=Culvert SD-5** (Inlet Controls 6.5 cfs @ 2.42 fps)**Summary for Pond 4P: CLVT4**

Inflow Area = 0.282 ac, 21.57% Impervious, Inflow Depth = 2.38" for 10-YR event
 Inflow = 0.8 cfs @ 12.09 hrs, Volume= 0.056 af
 Outflow = 0.4 cfs @ 12.07 hrs, Volume= 0.056 af, Atten= 45%, Lag= 0.0 min
 Primary = 0.4 cfs @ 12.07 hrs, Volume= 0.056 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Peak Elev= 59.01' @ 12.52 hrs Surf.Area= 1,295 sf Storage= 673 cf

Flood Elev= 60.10' Surf.Area= 3,087 sf Storage= 2,835 cf

Plug-Flow detention time= 29.5 min calculated for 0.056 af (100% of inflow)

Center-of-Mass det. time= 28.8 min (859.7 - 830.9)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	2,835 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	41	0	0
59.00	1,271	656	656
60.00	3,087	2,179	2,835

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	15.0" Round Culvert L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 58.00' / 57.50' S= 0.0063 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.0 cfs @ 12.07 hrs HW=58.42' TW=58.47' (Dynamic Tailwater)

↑**1=Culvert** (Controls 0.0 cfs)

Summary for Pond 5P: SD-7

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.79" for 10-YR event
Inflow = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af
Outflow = 1.5 cfs @ 12.61 hrs, Volume= 0.239 af, Atten= 9%, Lag= 8.1 min
Primary = 1.5 cfs @ 12.61 hrs, Volume= 0.239 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 62.34' @ 12.61 hrs Surf.Area= 2,000 sf Storage= 1,200 cf
Flood Elev= 63.50' Surf.Area= 3,561 sf Storage= 3,030 cf

Plug-Flow detention time= 51.1 min calculated for 0.239 af (94% of inflow)
Center-of-Mass det. time= 20.6 min (940.7 - 920.1)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	3,030 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
61.00	121	0	0
62.00	1,189	655	655
63.00	3,561	2,375	3,030

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	36.0" Round Culvert w/ 12.0" inside fill L= 39.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 61.00' / 60.50' S= 0.0128 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=1.5 cfs @ 12.61 hrs HW=62.34' TW=60.22' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 1.5 cfs @ 1.48 fps)

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Summary for Pond 6P: SD-6

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.74" for 10-YR event
 Inflow = 1.5 cfs @ 12.61 hrs, Volume= 0.239 af
 Outflow = 1.3 cfs @ 12.76 hrs, Volume= 0.224 af, Atten= 11%, Lag= 9.2 min
 Primary = 1.3 cfs @ 12.76 hrs, Volume= 0.224 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 60.32' @ 12.76 hrs Surf.Area= 1,643 sf Storage= 1,064 cf
 Flood Elev= 62.00' Surf.Area= 3,808 sf Storage= 5,892 cf

Plug-Flow detention time= 51.6 min calculated for 0.224 af (94% of inflow)
 Center-of-Mass det. time= 20.6 min (961.3 - 940.7)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	5,892 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	154	0	0
60.00	1,105	630	630
61.00	2,806	1,956	2,585
62.00	3,808	3,307	5,892

Device	Routing	Invert	Outlet Devices
#1	Primary	60.00'	36.0" Round Culvert w/ 12.0" inside fill L= 33.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.00' / 58.00' S= 0.0303 ' S= 0.0303 ' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=1.3 cfs @ 12.76 hrs HW=60.32' TW=57.17' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 1.3 cfs @ 1.42 fps)

Summary for Pond POND:

Inflow Area = 7.627 ac, 20.17% Impervious, Inflow Depth = 1.92" for 10-YR event
 Inflow = 6.9 cfs @ 12.09 hrs, Volume= 1.217 af
 Outflow = 4.9 cfs @ 12.48 hrs, Volume= 1.217 af, Atten= 29%, Lag= 23.2 min
 Primary = 4.9 cfs @ 12.48 hrs, Volume= 1.217 af
 Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 59.01' @ 12.48 hrs Surf.Area= 3,096 sf Storage= 7,490 cf

Plug-Flow detention time= 48.2 min calculated for 1.217 af (100% of inflow)
 Center-of-Mass det. time= 47.6 min (924.3 - 876.7)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	11,483 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,893	0	0
57.00	2,283	2,088	2,088
58.00	2,689	2,486	4,574
59.00	3,090	2,890	7,464
60.15	3,901	4,020	11,483

Device	Routing	Invert	Outlet Devices
#1	Primary	56.00'	15.0" Round Culvert L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 56.00' / 55.50' S= 0.0143 ' S= 0.0143 ' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Secondary	59.20'	8.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Device 1	56.00'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	58.60'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=4.9 cfs @ 12.48 hrs HW=59.01' TW=56.34' (Dynamic Tailwater)↑ **1=Culvert** (Passes 4.9 cfs of 7.2 cfs potential flow)↑ **3=Orifice/Grate** (Orifice Controls 1.5 cfs @ 7.87 fps)↑ **4=Sharp-Crested Rectangular Weir** (Weir Controls 3.3 cfs @ 2.09 fps)**Secondary OutFlow** Max=0.0 cfs @ 0.00 hrs HW=56.00' TW=56.00' (Dynamic Tailwater)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)**Summary for Link SP-1:**

Inflow = 6.5 cfs @ 12.45 hrs, Volume= 0.440 af
 Primary = 6.5 cfs @ 12.45 hrs, Volume= 0.440 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 1.92" for 10-YR event
 Inflow = 13.7 cfs @ 12.43 hrs, Volume= 2.201 af
 Primary = 13.7 cfs @ 12.43 hrs, Volume= 2.201 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 2.63" for 10-YR event
 Inflow = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af
 Primary = 9.0 cfs @ 12.38 hrs, Volume= 1.087 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-4:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 0.79" for 10-YR event
Inflow = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af
Primary = 1.6 cfs @ 12.47 hrs, Volume= 0.254 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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Summary for Subcatchment 10S:

Runoff = 2.7 cfs @ 12.09 hrs, Volume= 0.195 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
3,021	98	Paved parking, HSG D
11,151	77	Woods, Good, HSG D
13,358	80	>75% Grass cover, Good, HSG D
27,530	81	Weighted Average
24,509		89.03% Pervious Area
3,021		10.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 11S:

Runoff = 0.7 cfs @ 12.09 hrs, Volume= 0.052 af, Depth= 4.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
1,796	98	Paved parking, HSG D
4,782	80	>75% Grass cover, Good, HSG D
6,578	85	Weighted Average
4,782		72.70% Pervious Area
1,796		27.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 12S:

Runoff = 3.0 cfs @ 12.21 hrs, Volume= 0.288 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

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Type III 24-hr 25-YR Rainfall=5.80"

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Area (sf)	CN	Description
2,601	98	Paved parking, HSG D
19,092	80	>75% Grass cover, Good, HSG D
20,038	77	Woods, Good, HSG D
41,731	80	Weighted Average
39,130		93.77% Pervious Area
2,601		6.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
2.4	121	0.0280	0.84		Shallow Concentrated Flow, B-C Woodland Kv= 5.0 fps
1.1	77	0.0064	1.20		Shallow Concentrated Flow, C-D Grassed Waterway Kv= 15.0 fps
15.2	273	Total			

Summary for Subcatchment 13S:

Runoff = 1.1 cfs @ 12.09 hrs, Volume= 0.080 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
484	98	Paved parking, HSG A
2,166	98	Existing Impervious, HSG D
1,873	39	>75% Grass cover, Good, HSG A
7,761	80	>75% Grass cover, Good, HSG D
12,284	78	Weighted Average
9,634		78.43% Pervious Area
2,650		21.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment 20S:

Runoff = 4.9 cfs @ 12.24 hrs, Volume= 0.490 af, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

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Type III 24-hr 25-YR Rainfall=5.80"

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	Area (sf)	CN	Description
*	2,831	98	Existing Impervious, HSG D
*	4,704	98	Exposed Ledge, HSG A
	6,078	98	Paved parking, HSG D
	2,788	39	>75% Grass cover, Good, HSG A
	39,137	80	>75% Grass cover, Good, HSG D
	24,176	30	Woods, Good, HSG A
	20,386	77	Woods, Good, HSG D
	100,100	69	Weighted Average
	86,487		86.40% Pervious Area
	13,613		13.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	75	0.0800	0.13		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.10"
0.5	103	0.0480	3.29		Shallow Concentrated Flow, B-C Grassed Waterway Kv= 15.0 fps
0.1	39	0.0250	10.18	17.99	Pipe Channel, C-D 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
1.6	59	0.0160	0.63		Shallow Concentrated Flow, D-E Woodland Kv= 5.0 fps
0.0	33	0.0300	11.15	19.71	Pipe Channel, E-F 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
0.3	69	0.0290	4.57	14.84	Trap/Vee/Rect Channel Flow, F-G Bot.W=5.00' D=0.50' Z= 3.0 ' Top.W=8.00' n= 0.030 Earth, grassed & winding
3.4	184	0.0050	0.90	2.37	Trap/Vee/Rect Channel Flow, G-H Bot.W=8.00' D=0.25' Z= 10.0 ' Top.W=13.00' n= 0.040
0.9	123	0.0080	2.40	7.79	Trap/Vee/Rect Channel Flow, H-I Bot.W=5.00' D=0.50' Z= 3.0 ' Top.W=8.00' n= 0.030
16.8	685	Total			

Summary for Subcatchment 30S: ROAD

Runoff = 2.8 cfs @ 12.09 hrs, Volume= 0.207 af, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

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Type III 24-hr 25-YR Rainfall=5.80"

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	Area (sf)	CN	Description
	14,694	98	Paved parking, HSG D
*	1,181	98	Existing Impervious
	5,687	39	>75% Grass cover, Good, HSG A
	6,882	80	>75% Grass cover, Good, HSG D
	28,444	82	Weighted Average
	12,569		44.19% Pervious Area
	15,875		55.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Summary for Subcatchment OS1: OFFSITE 1

Runoff = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af, Depth= 3.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

	Area (ac)	CN	Description
*	0.943	98	Existing Impervious, HSG D
	0.405	80	>75% Grass cover, Good, HSG D
	3.603	77	Woods, Good, HSG D
	4.951	81	Weighted Average
	4.008		80.95% Pervious Area
	0.943		19.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	75	0.0530	0.11		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
1.2	81	0.0490	1.11		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
1.1	118	0.1180	1.72		Shallow Concentrated Flow, C-D
					Woodland Kv= 5.0 fps
13.6	483	0.0140	0.59		Shallow Concentrated Flow, D-E
					Woodland Kv= 5.0 fps
27.6	757	Total			

Summary for Subcatchment OS2: OFFSITE 2

Runoff = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YR Rainfall=5.80"

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Type III 24-hr 25-YR Rainfall=5.80"

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Area (ac)	CN	Description
* 0.582	98	Existing Impervious, HSG D
1.923	30	Woods, Good, HSG A
0.969	77	Woods, Good, HSG D
0.231	39	>75% Grass cover, Good, HSG A
0.157	80	>75% Grass cover, Good, HSG D
3.862	55	Weighted Average
3.280		84.93% Pervious Area
0.582		15.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	75	0.0730	0.12		Sheet Flow, A-B
					Woods: Light underbrush n= 0.400 P2= 3.10"
0.9	85	0.0940	1.53		Shallow Concentrated Flow, B-C
					Woodland Kv= 5.0 fps
15.3	544	0.0140	0.59		Shallow Concentrated Flow, C-D
					Woodland Kv= 5.0 fps
26.5	704	Total			

Summary for Reach 1R:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 3.64" for 25-YR event
 Inflow = 12.4 cfs @ 12.49 hrs, Volume= 1.172 af
 Outflow = 12.3 cfs @ 12.50 hrs, Volume= 1.172 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 1.96 fps, Min. Travel Time= 0.8 min
 Avg. Velocity = 0.47 fps, Avg. Travel Time= 3.5 min

Peak Storage= 616 cf @ 12.50 hrs
 Average Depth at Peak Storage= 0.28'
 Bank-Full Depth= 1.00' Flow Area= 30.0 sf, Capacity= 123.7 cfs

20.00' x 1.00' deep channel, n= 0.030
 Side Slope Z-value= 10.0 ' ' Top Width= 40.00'
 Length= 98.0' Slope= 0.0102 ' '
 Inlet Invert= 57.00', Outlet Invert= 56.00'



Summary for Reach 2R:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 2.83" for 25-YR event
 Inflow = 21.9 cfs @ 12.46 hrs, Volume= 3.246 af
 Outflow = 21.9 cfs @ 12.47 hrs, Volume= 3.246 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 4.07 fps, Min. Travel Time= 0.8 min
 Avg. Velocity = 0.93 fps, Avg. Travel Time= 3.7 min

Peak Storage= 1,098 cf @ 12.47 hrs
 Average Depth at Peak Storage= 0.44'
 Bank-Full Depth= 1.00' Flow Area= 18.0 sf, Capacity= 116.0 cfs

8.00' x 1.00' deep channel, n= 0.012 Concrete pipe, finished
 Side Slope Z-value= 10.0 '/' Top Width= 28.00'
 Length= 204.0' Slope= 0.0049 '/
 Inlet Invert= 56.00', Outlet Invert= 55.00'

**Summary for Reach 3R:**

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 2.83" for 25-YR event
 Inflow = 21.9 cfs @ 12.47 hrs, Volume= 3.246 af
 Outflow = 21.9 cfs @ 12.47 hrs, Volume= 3.246 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 3.50 fps, Min. Travel Time= 0.5 min
 Avg. Velocity = 0.73 fps, Avg. Travel Time= 2.4 min

Peak Storage= 643 cf @ 12.47 hrs
 Average Depth at Peak Storage= 0.83'
 Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 31.0 cfs

5.00' x 1.00' deep channel, n= 0.030
 Side Slope Z-value= 3.0 '/' Top Width= 11.00'
 Length= 103.0' Slope= 0.0097 '/
 Inlet Invert= 55.00', Outlet Invert= 54.00'



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Summary for Reach 4R:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 3.70" for 25-YR event
 Inflow = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af
 Outflow = 12.5 cfs @ 12.39 hrs, Volume= 1.527 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.05 fps, Min. Travel Time= 1.3 min
 Avg. Velocity= 0.67 fps, Avg. Travel Time= 4.0 min

Peak Storage= 978 cf @ 12.39 hrs
 Average Depth at Peak Storage= 0.48'
 Bank-Full Depth= 0.50' Flow Area= 6.5 sf, Capacity= 13.7 cfs

8.00' x 0.50' deep channel, n= 0.040
 Side Slope Z-value= 10.0 ' / ' Top Width= 18.00'
 Length= 160.0' Slope= 0.0125 ' / '
 Inlet Invert= 64.00', Outlet Invert= 62.00'

**Summary for Pond 1P: SD-1**

Inflow Area = 5.583 ac, 18.13% Impervious, Inflow Depth = 3.70" for 25-YR event
 Inflow = 13.5 cfs @ 12.38 hrs, Volume= 1.722 af
 Outflow = 13.3 cfs @ 12.41 hrs, Volume= 1.719 af, Atten= 1%, Lag= 1.6 min
 Primary = 13.3 cfs @ 12.41 hrs, Volume= 1.719 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 63.09' @ 12.44 hrs Surf.Area= 1,937 sf Storage= 1,366 cf
 Flood Elev= 64.10' Surf.Area= 4,113 sf Storage= 4,114 cf

Plug-Flow detention time= 2.7 min calculated for 1.718 af (100% of inflow)
 Center-of-Mass det. time= 1.6 min (834.4 - 832.8)

Volume	Invert	Avail.Storage	Storage Description
#1	60.00'	4,114 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
60.00	34	0	0
61.00	92	63	63
62.00	231	162	225
63.00	1,717	974	1,199
64.00	4,113	2,915	4,114

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Device	Routing	Invert	Outlet Devices
#1	Primary	61.50'	36.0" Round Culvert w/ 12.0" inside fill L= 51.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 60.50' / 60.20' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=12.7 cfs @ 12.41 hrs HW=63.08' TW=62.28' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 12.7 cfs @ 2.89 fps)

Summary for Pond 2P: SD-2

Inflow Area = 5.734 ac, 18.37% Impervious, Inflow Depth = 3.71" for 25-YR event
Inflow = 13.5 cfs @ 12.41 hrs, Volume= 1.771 af
Outflow = 14.1 cfs @ 12.40 hrs, Volume= 1.760 af, Atten= 0%, Lag= 0.0 min
Primary = 14.1 cfs @ 12.40 hrs, Volume= 1.760 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 62.30' @ 12.40 hrs Surf.Area= 1,848 sf Storage= 2,443 cf
Flood Elev= 62.10' Surf.Area= 1,848 sf Storage= 2,443 cf

Plug-Flow detention time= 10.3 min calculated for 1.758 af (99% of inflow)
Center-of-Mass det. time= 6.5 min (840.0 - 833.5)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	2,443 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	28	0	0
60.00	66	47	47
61.00	1,439	753	800
62.00	1,848	1,644	2,443

Device	Routing	Invert	Outlet Devices
#1	Primary	60.75'	36.0" Round Culvert w/ 12.0" inside fill L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.75' / 59.50' S= 0.0056 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=14.0 cfs @ 12.40 hrs HW=62.29' TW=59.72' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 14.0 cfs @ 3.23 fps)

Summary for Pond 3P: CLVT

Inflow Area = 6.692 ac, 16.64% Impervious, Inflow Depth = 3.67" for 25-YR event
Inflow = 16.1 cfs @ 12.40 hrs, Volume= 2.048 af
Outflow = 15.2 cfs @ 12.42 hrs, Volume= 2.048 af, Atten= 5%, Lag= 1.1 min
Primary = 5.2 cfs @ 12.42 hrs, Volume= 1.298 af
Secondary = 10.1 cfs @ 12.42 hrs, Volume= 0.750 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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Peak Elev= 59.73' @ 12.42 hrs Surf.Area= 1,515 sf Storage= 932 cf
 Flood Elev= 60.10' Surf.Area= 1,862 sf Storage= 1,395 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 0.5 min (838.2 - 837.8)

Volume	Invert	Avail.Storage	Storage Description
#1	58.50'	1,395 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.50	66	0	0
59.00	597	166	166
60.00	1,862	1,230	1,395

Device	Routing	Invert	Outlet Devices
#1	Primary	57.50'	18.0" Round Culvert SD-4 L= 85.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0059 ' / Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Secondary	58.50'	36.0" Round Culvert SD-5 w/ 12.0" inside fill L= 72.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 57.50' / 57.00' S= 0.0069 ' / Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=5.2 cfs @ 12.42 hrs HW=59.72' TW=59.13' (Dynamic Tailwater)
 ↳1=Culvert SD-4 (Inlet Controls 5.2 cfs @ 2.92 fps)

Secondary OutFlow Max=10.0 cfs @ 12.42 hrs HW=59.72' TW=0.00' (Dynamic Tailwater)
 ↳2=Culvert SD-5 (Inlet Controls 10.0 cfs @ 2.83 fps)

Summary for Pond 4P: CLVT4

Inflow Area = 0.282 ac, 21.57% Impervious, Inflow Depth = 3.40" for 25-YR event
 Inflow = 1.1 cfs @ 12.09 hrs, Volume= 0.080 af
 Outflow = 0.5 cfs @ 12.28 hrs, Volume= 0.080 af, Atten= 54%, Lag= 11.5 min
 Primary = 0.5 cfs @ 12.28 hrs, Volume= 0.080 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 59.14' @ 12.42 hrs Surf.Area= 1,527 sf Storage= 853 cf
 Flood Elev= 60.10' Surf.Area= 3,087 sf Storage= 2,835 cf

Plug-Flow detention time= 30.4 min calculated for 0.080 af (100% of inflow)
 Center-of-Mass det. time= 29.7 min (850.3 - 820.6)

Volume	Invert	Avail.Storage	Storage Description
#1	58.00'	2,835 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
58.00	41	0	0
59.00	1,271	656	656
60.00	3,087	2,179	2,835

Device	Routing	Invert	Outlet Devices
#1	Primary	58.00'	15.0" Round Culvert L= 80.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 58.00' / 57.50' S= 0.0063 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.4 cfs @ 12.28 hrs HW=59.13' TW=59.12' (Dynamic Tailwater)

↑**1=Culvert** (Outlet Controls 0.4 cfs @ 0.40 fps)

Summary for Pond 5P: SD-7

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 1.40" for 25-YR event
 Inflow = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af
 Outflow = 3.1 cfs @ 12.52 hrs, Volume= 0.437 af, Atten= 5%, Lag= 5.7 min
 Primary = 3.1 cfs @ 12.52 hrs, Volume= 0.437 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 62.56' @ 12.52 hrs Surf.Area= 2,523 sf Storage= 1,699 cf
 Flood Elev= 63.50' Surf.Area= 3,561 sf Storage= 3,030 cf

Plug-Flow detention time= 31.3 min calculated for 0.436 af (97% of inflow)
 Center-of-Mass det. time= 13.6 min (912.4 - 898.8)

Volume	Invert	Avail.Storage	Storage Description
#1	61.00'	3,030 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
61.00	121	0	0
62.00	1,189	655	655
63.00	3,561	2,375	3,030

Device	Routing	Invert	Outlet Devices
#1	Primary	62.00'	36.0" Round Culvert w/ 12.0" inside fill L= 39.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 61.00' / 60.50' S= 0.0128 '/' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=3.1 cfs @ 12.52 hrs HW=62.56' TW=60.52' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 3.1 cfs @ 1.89 fps)

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Summary for Pond 6P: SD-6

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 1.36" for 25-YR event
 Inflow = 3.1 cfs @ 12.52 hrs, Volume= 0.437 af
 Outflow = 3.0 cfs @ 12.61 hrs, Volume= 0.422 af, Atten= 4%, Lag= 5.5 min
 Primary = 3.0 cfs @ 12.61 hrs, Volume= 0.422 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 60.55' @ 12.61 hrs Surf.Area= 2,035 sf Storage= 1,488 cf
 Flood Elev= 62.00' Surf.Area= 3,808 sf Storage= 5,892 cf

Plug-Flow detention time= 31.3 min calculated for 0.422 af (97% of inflow)
 Center-of-Mass det. time= 12.8 min (925.2 - 912.4)

Volume	Invert	Avail.Storage	Storage Description
#1	59.00'	5,892 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
59.00	154	0	0
60.00	1,105	630	630
61.00	2,806	1,956	2,585
62.00	3,808	3,307	5,892

Device	Routing	Invert	Outlet Devices
#1	Primary	60.00'	36.0" Round Culvert w/ 12.0" inside fill L= 33.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 59.00' / 58.00' S= 0.0303 ' S= 0.0303 ' Cc= 0.900 n= 0.012, Flow Area= 5.01 sf

Primary OutFlow Max=3.0 cfs @ 12.61 hrs HW=60.55' TW=57.26' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 3.0 cfs @ 1.86 fps)

Summary for Pond POND:

Inflow Area = 7.627 ac, 20.17% Impervious, Inflow Depth = 2.49" for 25-YR event
 Inflow = 6.7 cfs @ 12.31 hrs, Volume= 1.585 af
 Outflow = 6.5 cfs @ 12.37 hrs, Volume= 1.584 af, Atten= 2%, Lag= 3.4 min
 Primary = 6.5 cfs @ 12.37 hrs, Volume= 1.584 af
 Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 59.13' @ 12.37 hrs Surf.Area= 3,184 sf Storage= 7,883 cf

Plug-Flow detention time= 45.1 min calculated for 1.582 af (100% of inflow)
 Center-of-Mass det. time= 45.3 min (914.6 - 869.3)

Volume	Invert	Avail.Storage	Storage Description
#1	56.00'	11,483 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

41041 POST

Prepared by Microsoft

HydroCAD® 10.00-20 s/n 02173 © 2017 HydroCAD Software Solutions LLC

Type III 24-hr 25-YR Rainfall=5.80"

Printed 9/4/2018

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Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
56.00	1,893	0	0
57.00	2,283	2,088	2,088
58.00	2,689	2,486	4,574
59.00	3,090	2,890	7,464
60.15	3,901	4,020	11,483

Device	Routing	Invert	Outlet Devices
#1	Primary	56.00'	15.0" Round Culvert L= 35.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 56.00' / 55.50' S= 0.0143 ' S= 0.0143 ' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Secondary	59.20'	8.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#3	Device 1	56.00'	6.0" Vert. Orifice/Grate C= 0.600
#4	Device 1	58.60'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=6.5 cfs @ 12.37 hrs HW=59.13' TW=56.42' (Dynamic Tailwater)↑ **1=Culvert** (Passes 6.5 cfs of 7.4 cfs potential flow)↑ **3=Orifice/Grate** (Orifice Controls 1.6 cfs @ 7.92 fps)↑ **4=Sharp-Crested Rectangular Weir** (Weir Controls 5.0 cfs @ 2.39 fps)**Secondary OutFlow** Max=0.0 cfs @ 0.00 hrs HW=56.00' TW=56.00' (Dynamic Tailwater)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)**Summary for Link SP-1:**

Inflow = 10.1 cfs @ 12.42 hrs, Volume= 0.750 af
 Primary = 10.1 cfs @ 12.42 hrs, Volume= 0.750 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-2:

Inflow Area = 13.787 ac, 17.65% Impervious, Inflow Depth = 2.83" for 25-YR event
 Inflow = 21.9 cfs @ 12.47 hrs, Volume= 3.246 af
 Primary = 21.9 cfs @ 12.47 hrs, Volume= 3.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-3:

Inflow Area = 4.951 ac, 19.05% Impervious, Inflow Depth = 3.70" for 25-YR event
 Inflow = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af
 Primary = 12.6 cfs @ 12.38 hrs, Volume= 1.527 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link SP-4:

Inflow Area = 3.862 ac, 15.07% Impervious, Inflow Depth = 1.40" for 25-YR event
Inflow = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af
Primary = 3.3 cfs @ 12.43 hrs, Volume= 0.452 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

APPENDIX C

STORMWATER QUALITY CALCULATIONS

[illegible]

Total New Developed Area =	21,000
Min Treatment Area (50%) =	10,500

APPENDIX D

Filterra Sizing Calculations

Tony Panciocco
Northeast Civil Solutions, Inc.
381 Payne Road
Scarborough, ME 04074

April 25th, 2018

**RE: Capisic Meadows Subdivision (Contech Reference No. 589,880)
Review of Filterra Design**

Dear Mr. Panciocco:

The purpose of this letter is to document Contech Engineered Solutions' review of the plans and the proposed application of Filterra water quality units for the Capisic Meadows Subdivision project in Scarborough, ME.

Contech Engineered Solutions (Contech) has reviewed the Filterra design for this project. We believe the FTIBC Filterra configuration with internal bypass is an appropriate water quality solution for this site. The Filterra systems are approved for use by MEDEP as an alternate to the General Standards of the Stormwater Rules (Chapter 500) if designed, installed, and maintained in accordance with the provisions noted in the February 2, 2017 approval letter from the MEDEP.

The engineer of record reports treatment drainage areas of 0.186 acres impervious and 0.156 acres landscaped, for each of two Filterra units. The two Filterra were designed in accordance with the sizing design guidelines to treat the runoff from the 0.95" storm over the entire contributing drainage area, including all pervious areas, prior to bypass. In order to adequately treat the generated run-off directed to each system, Contech recommends 6'x8' Filterra. The attached HydroCAD report is provided to support this size recommendation. The modeled peak elevation in the Filterra shows that at the approved 140"/hr hydraulic loading rate, the ponding in the Filterra will remain below the inside of the top slab (elevation 60.33' in the model) and be fully treated before bypass. The 25-year peak storm event was also modelled, and the HydroCAD report demonstrates that each of the Filterra's bypass capacities are suitable to convey the peak flow safely and keep the water surface elevation below the bottom of the system's top slab.

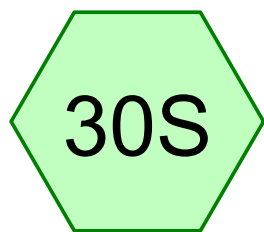
The configuration of the Filterra is acceptable. The system appears to be constructible and is located in order to facilitate maintenance activities. Our systems require periodic maintenance to continue operating properly. Given typical runoff pollutant loading rates, Contech recommends maintenance inspections on an annual basis. Based on the location of the system, we anticipate replacement of the mulch layer every 12 months for the system to continue to remove pollutants. Contech will be responsible for the first year of maintenance as included in the purchase of the Filterra unit; subsequent years of maintenance shall be performed by a third party at the owner's expense.

This system is expected to operate in accordance with Contech's design intent. Please feel free to contact me if you have any questions or concerns.

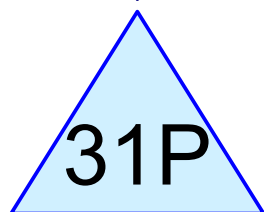
Sincerely,



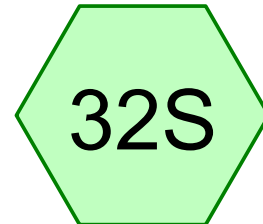
Nicholas T. Busque
Stormwater Design Engineer
Contech Engineered Solutions, LLC.
(410) 609-6140
nbusque@conteches.com



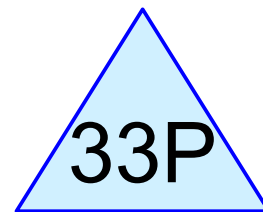
DA1



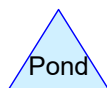
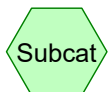
Filtterra 6x8/8x6



DA2



Filtterra 6x8/8x6



Routing Diagram for Filtterra - 140inhr ME - Rainfall Type III Sizing - Final
Prepared by Contech Engineered Solutions LLC, Printed 4/25/2018
HydroCAD® 10.00-20 s/n 02512 © 2017 HydroCAD Software Solutions LLC

Summary for Subcatchment 30S: DA1

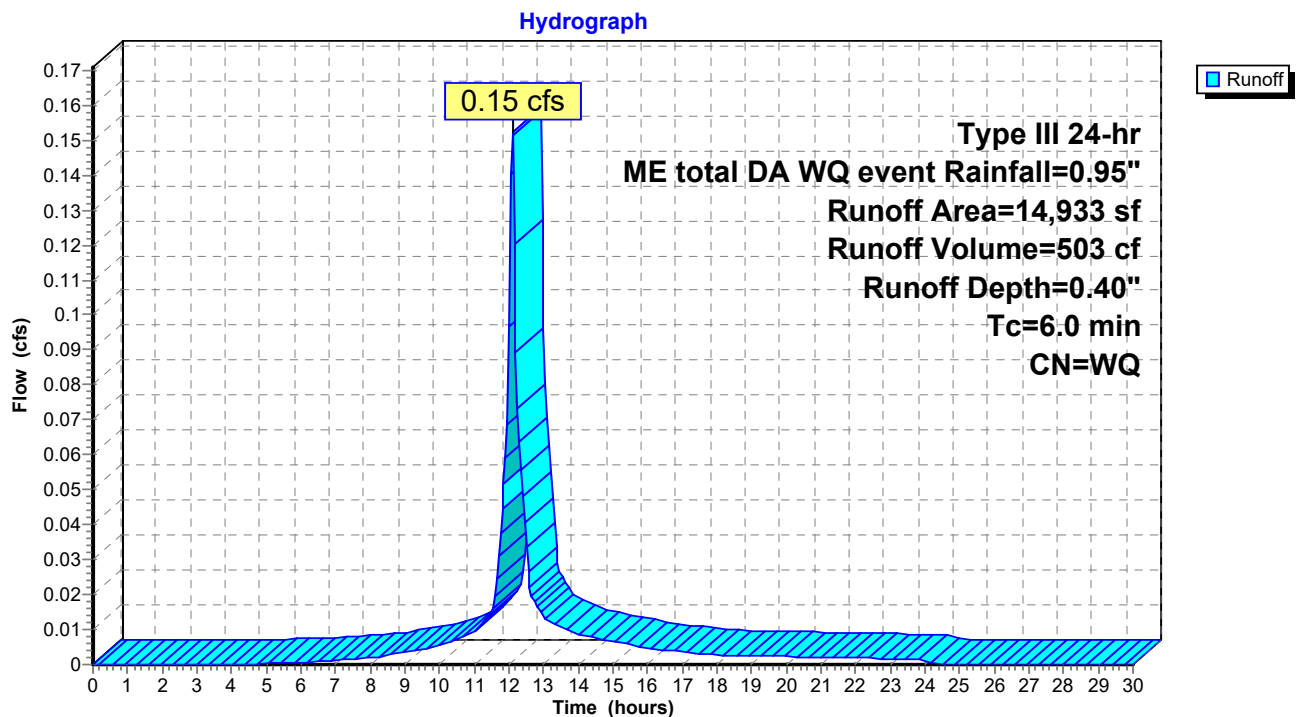
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 503 cf, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr ME total DA WQ event Rainfall=0.95"

	Area (sf)	CN	Description
*	8,116	98	impervious
	6,817	69	50-75% Grass cover, Fair, HSG B
	14,933		Weighted Average
	6,817	69	45.65% Pervious Area
	8,116	98	54.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 30S: DA1



Hydrograph for Subcatchment 30S: DA1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	0.95	0.15	0.00
0.50	0.00	0.00	0.00	27.00	0.95	0.15	0.00
1.00	0.01	0.00	0.00	27.50	0.95	0.15	0.00
1.50	0.01	0.00	0.00	28.00	0.95	0.15	0.00
2.00	0.02	0.00	0.00	28.50	0.95	0.15	0.00
2.50	0.02	0.00	0.00	29.00	0.95	0.15	0.00
3.00	0.03	0.00	0.00	29.50	0.95	0.15	0.00
3.50	0.03	0.00	0.00	30.00	0.95	0.15	0.00
4.00	0.04	0.00	0.00				
4.50	0.05	0.00	0.00				
5.00	0.05	0.00	0.00				
5.50	0.06	0.00	0.00				
6.00	0.07	0.00	0.00				
6.50	0.08	0.00	0.00				
7.00	0.09	0.00	0.00				
7.50	0.10	0.00	0.00				
8.00	0.11	0.00	0.00				
8.50	0.12	0.00	0.00				
9.00	0.14	0.00	0.00				
9.50	0.16	0.00	0.00				
10.00	0.18	0.00	0.01				
10.50	0.21	0.00	0.01				
11.00	0.24	0.00	0.01				
11.50	0.28	0.00	0.02				
12.00	0.47	0.01	0.10				
12.50	0.67	0.05	0.03				
13.00	0.71	0.06	0.01				
13.50	0.74	0.07	0.01				
14.00	0.77	0.08	0.01				
14.50	0.79	0.09	0.01				
15.00	0.81	0.09	0.01				
15.50	0.83	0.10	0.01				
16.00	0.84	0.11	0.00				
16.50	0.85	0.11	0.00				
17.00	0.86	0.11	0.00				
17.50	0.87	0.12	0.00				
18.00	0.88	0.12	0.00				
18.50	0.89	0.12	0.00				
19.00	0.90	0.13	0.00				
19.50	0.90	0.13	0.00				
20.00	0.91	0.13	0.00				
20.50	0.92	0.14	0.00				
21.00	0.92	0.14	0.00				
21.50	0.93	0.14	0.00				
22.00	0.93	0.14	0.00				
22.50	0.94	0.15	0.00				
23.00	0.94	0.15	0.00				
23.50	0.95	0.15	0.00				
24.00	0.95	0.15	0.00				
24.50	0.95	0.15	0.00				
25.00	0.95	0.15	0.00				
25.50	0.95	0.15	0.00				
26.00	0.95	0.15	0.00				

Summary for Pond 31P: Filtterra 6x8/8x6

Inflow Area = 14,933 sf, 54.35% Impervious, Inflow Depth = 0.40" for ME total DA WQ event event
 Inflow = 0.15 cfs @ 12.09 hrs, Volume= 503 cf
 Outflow = 0.15 cfs @ 12.09 hrs, Volume= 503 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.15 cfs @ 12.09 hrs, Volume= 503 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.13' @ 12.09 hrs Surf.Area= 48 sf Storage= 0 cf

Plug-Flow detention time= 0.1 min calculated for 503 cf (100% of inflow)
 Center-of-Mass det. time= 0.0 min (790.0 - 789.9)

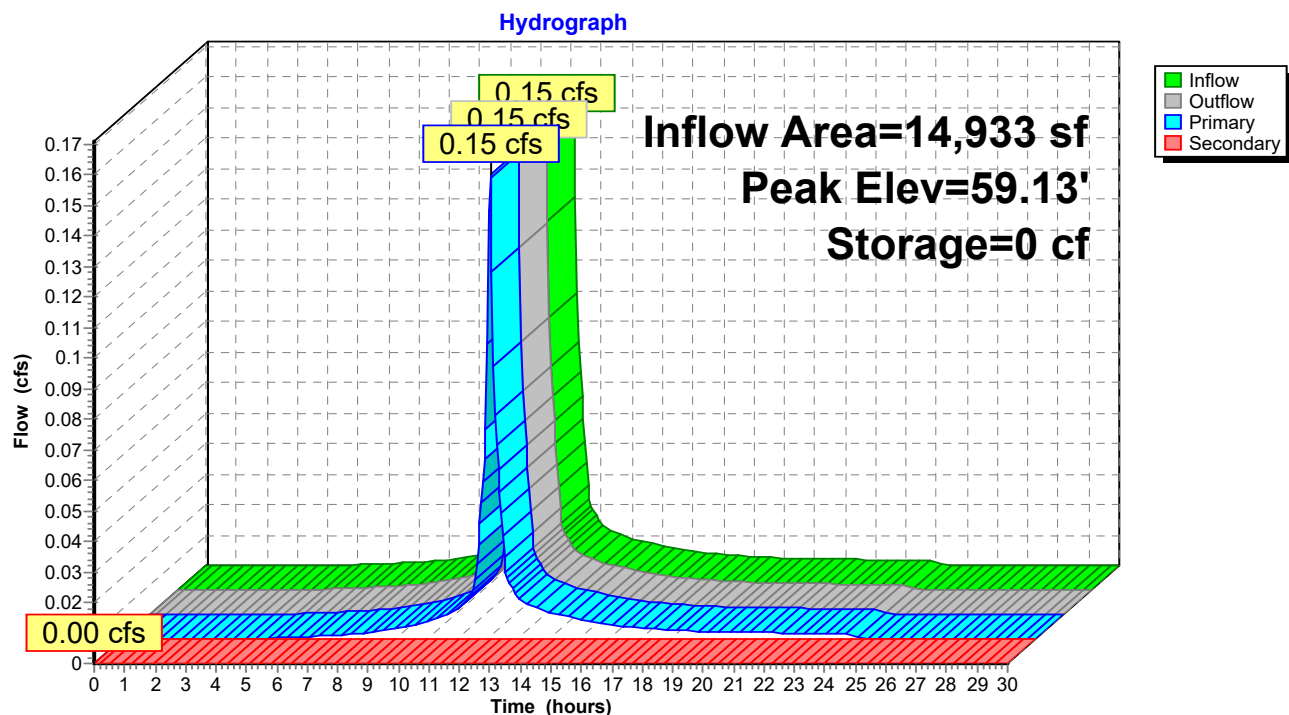
Volume	Invert	Avail.Storage	Storage Description
#1	59.12'	48 cf	8.00'W x 6.00'L x 1.00'H Prisma

Device	Routing	Invert	Outlet Devices
#1	Primary	59.12'	140.000 in/hr Exfiltration over Surface area
#2	Secondary	59.54'	10.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.16 cfs @ 12.09 hrs HW=59.13' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.16 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.12' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

Pond 31P: Filtterra 6x8/8x6



Hydrograph for Pond 31P: Filterra 6x8/8x6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	59.12	0.00	0.00	0.00
1.00	0.00	0	59.12	0.00	0.00	0.00
2.00	0.00	0	59.12	0.00	0.00	0.00
3.00	0.00	0	59.12	0.00	0.00	0.00
4.00	0.00	0	59.12	0.00	0.00	0.00
5.00	0.00	0	59.12	0.00	0.00	0.00
6.00	0.00	0	59.12	0.00	0.00	0.00
7.00	0.00	0	59.12	0.00	0.00	0.00
8.00	0.00	0	59.12	0.00	0.00	0.00
9.00	0.00	0	59.12	0.00	0.00	0.00
10.00	0.01	0	59.12	0.01	0.01	0.00
11.00	0.01	0	59.12	0.01	0.01	0.00
12.00	0.10	0	59.13	0.10	0.10	0.00
13.00	0.01	0	59.12	0.01	0.01	0.00
14.00	0.01	0	59.12	0.01	0.01	0.00
15.00	0.01	0	59.12	0.01	0.01	0.00
16.00	0.00	0	59.12	0.00	0.00	0.00
17.00	0.00	0	59.12	0.00	0.00	0.00
18.00	0.00	0	59.12	0.00	0.00	0.00
19.00	0.00	0	59.12	0.00	0.00	0.00
20.00	0.00	0	59.12	0.00	0.00	0.00
21.00	0.00	0	59.12	0.00	0.00	0.00
22.00	0.00	0	59.12	0.00	0.00	0.00
23.00	0.00	0	59.12	0.00	0.00	0.00
24.00	0.00	0	59.12	0.00	0.00	0.00
25.00	0.00	0	59.12	0.00	0.00	0.00
26.00	0.00	0	59.12	0.00	0.00	0.00
27.00	0.00	0	59.12	0.00	0.00	0.00
28.00	0.00	0	59.12	0.00	0.00	0.00
29.00	0.00	0	59.12	0.00	0.00	0.00
30.00	0.00	0	59.12	0.00	0.00	0.00

Summary for Subcatchment 30S: DA1

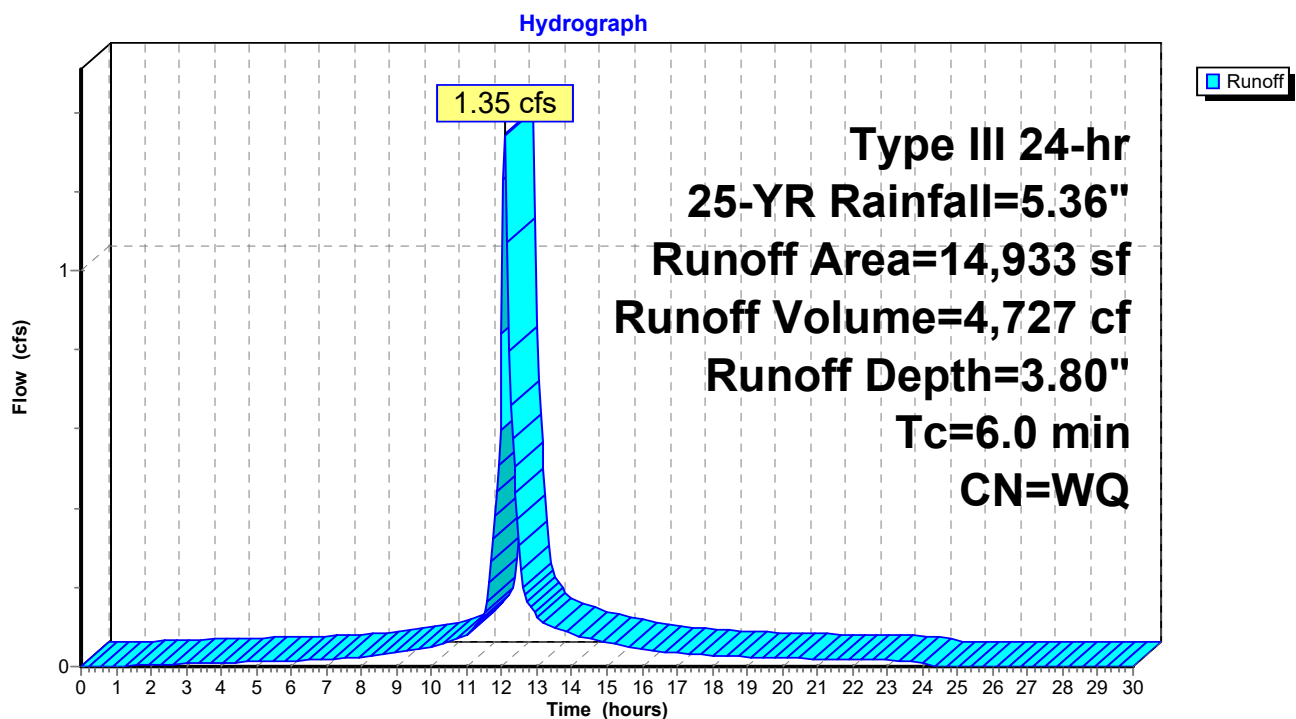
Runoff = 1.35 cfs @ 12.09 hrs, Volume= 4,727 cf, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YR Rainfall=5.36"

	Area (sf)	CN	Description
*	8,116	98	impervious
	6,817	69	50-75% Grass cover, Fair, HSG B
	14,933		Weighted Average
	6,817	69	45.65% Pervious Area
	8,116	98	54.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 30S: DA1



Hydrograph for Subcatchment 30S: DA1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	5.36	3.70	0.00
0.50	0.03	0.00	0.00	27.00	5.36	3.70	0.00
1.00	0.05	0.00	0.00	27.50	5.36	3.70	0.00
1.50	0.08	0.00	0.00	28.00	5.36	3.70	0.00
2.00	0.11	0.00	0.00	28.50	5.36	3.70	0.00
2.50	0.14	0.00	0.01	29.00	5.36	3.70	0.00
3.00	0.16	0.00	0.01	29.50	5.36	3.70	0.00
3.50	0.20	0.00	0.01	30.00	5.36	3.70	0.00
4.00	0.23	0.00	0.01				
4.50	0.27	0.00	0.01				
5.00	0.30	0.00	0.01				
5.50	0.34	0.00	0.01				
6.00	0.39	0.00	0.01				
6.50	0.43	0.00	0.02				
7.00	0.49	0.01	0.02				
7.50	0.54	0.02	0.02				
8.00	0.61	0.03	0.02				
8.50	0.69	0.05	0.03				
9.00	0.78	0.08	0.03				
9.50	0.89	0.13	0.04				
10.00	1.01	0.18	0.05				
10.50	1.16	0.25	0.06				
11.00	1.34	0.35	0.08				
11.50	1.60	0.51	0.13				
12.00	2.68	1.32	0.84				
12.50	3.76	2.25	0.31				
13.00	4.02	2.48	0.13				
13.50	4.20	2.64	0.10				
14.00	4.35	2.77	0.08				
14.50	4.47	2.88	0.07				
15.00	4.58	2.98	0.06				
15.50	4.67	3.07	0.05				
16.00	4.75	3.14	0.04				
16.50	4.82	3.20	0.04				
17.00	4.87	3.25	0.03				
17.50	4.93	3.30	0.03				
18.00	4.97	3.34	0.03				
18.50	5.02	3.38	0.02				
19.00	5.06	3.42	0.02				
19.50	5.09	3.45	0.02				
20.00	5.13	3.49	0.02				
20.50	5.16	3.52	0.02				
21.00	5.20	3.55	0.02				
21.50	5.23	3.58	0.02				
22.00	5.26	3.61	0.02				
22.50	5.28	3.63	0.02				
23.00	5.31	3.66	0.02				
23.50	5.34	3.68	0.02				
24.00	5.36	3.70	0.01				
24.50	5.36	3.70	0.00				
25.00	5.36	3.70	0.00				
25.50	5.36	3.70	0.00				
26.00	5.36	3.70	0.00				

Summary for Pond 31P: Filterra 6x8/8x6

Inflow Area = 14,933 sf, 54.35% Impervious, Inflow Depth = 3.80" for 25-YR event
 Inflow = 1.35 cfs @ 12.09 hrs, Volume= 4,727 cf
 Outflow = 1.34 cfs @ 12.09 hrs, Volume= 4,696 cf, Atten= 1%, Lag= 0.0 min
 Primary = 0.16 cfs @ 11.60 hrs, Volume= 3,243 cf
 Secondary = 1.18 cfs @ 12.09 hrs, Volume= 1,453 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.81' @ 12.09 hrs Surf.Area= 48 sf Storage= 33 cf

Plug-Flow detention time= 4.8 min calculated for 4,688 cf (99% of inflow)
 Center-of-Mass det. time= 0.5 min (774.0 - 773.5)

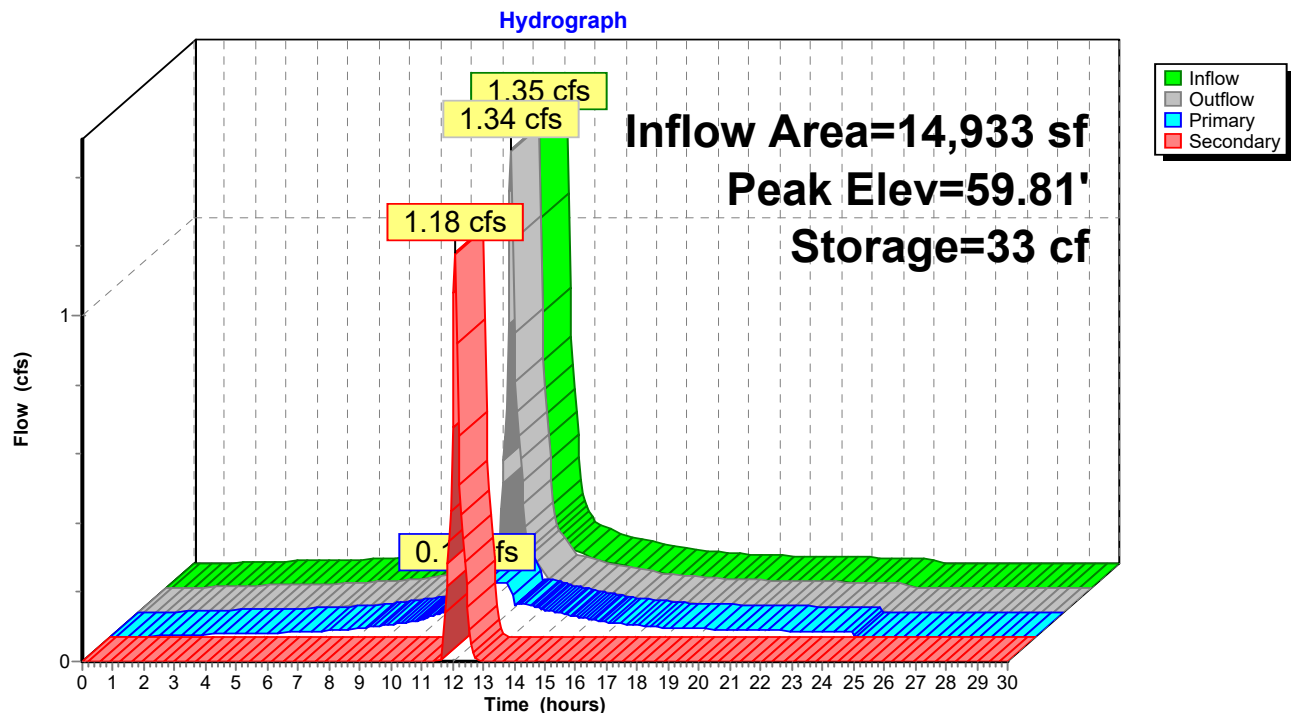
Volume	Invert	Avail.Storage	Storage Description
#1	59.12'	48 cf	8.00'W x 6.00'L x 1.00'H Prisma

Device	Routing	Invert	Outlet Devices
#1	Primary	59.12'	140.000 in/hr Exfiltration over Surface area
#2	Secondary	59.54'	10.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.16 cfs @ 11.60 hrs HW=59.14' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Secondary OutFlow Max=1.15 cfs @ 12.09 hrs HW=59.80' (Free Discharge)
 ↳ **2=Orifice/Grate** (Weir Controls 1.15 cfs @ 1.68 fps)

Pond 31P: Filterra 6x8/8x6



Hydrograph for Pond 31P: Filterra 6x8/8x6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	59.12	0.00	0.00	0.00
1.00	0.00	0	59.12	0.00	0.00	0.00
2.00	0.00	0	59.12	0.00	0.00	0.00
3.00	0.01	0	59.12	0.01	0.01	0.00
4.00	0.01	0	59.12	0.01	0.01	0.00
5.00	0.01	0	59.12	0.01	0.01	0.00
6.00	0.01	0	59.12	0.01	0.01	0.00
7.00	0.02	0	59.12	0.02	0.02	0.00
8.00	0.02	0	59.12	0.02	0.02	0.00
9.00	0.03	0	59.12	0.03	0.03	0.00
10.00	0.05	0	59.12	0.05	0.05	0.00
11.00	0.08	0	59.13	0.08	0.08	0.00
12.00	0.84	29	59.72	0.83	0.16	0.68
13.00	0.13	9	59.31	0.16	0.16	0.00
14.00	0.08	0	59.13	0.08	0.08	0.00
15.00	0.06	0	59.12	0.06	0.06	0.00
16.00	0.04	0	59.12	0.04	0.04	0.00
17.00	0.03	0	59.12	0.03	0.03	0.00
18.00	0.03	0	59.12	0.03	0.03	0.00
19.00	0.02	0	59.12	0.02	0.02	0.00
20.00	0.02	0	59.12	0.02	0.02	0.00
21.00	0.02	0	59.12	0.02	0.02	0.00
22.00	0.02	0	59.12	0.02	0.02	0.00
23.00	0.02	0	59.12	0.02	0.02	0.00
24.00	0.01	0	59.12	0.01	0.01	0.00
25.00	0.00	0	59.12	0.00	0.00	0.00
26.00	0.00	0	59.12	0.00	0.00	0.00
27.00	0.00	0	59.12	0.00	0.00	0.00
28.00	0.00	0	59.12	0.00	0.00	0.00
29.00	0.00	0	59.12	0.00	0.00	0.00
30.00	0.00	0	59.12	0.00	0.00	0.00

Summary for Subcatchment 32S: DA2

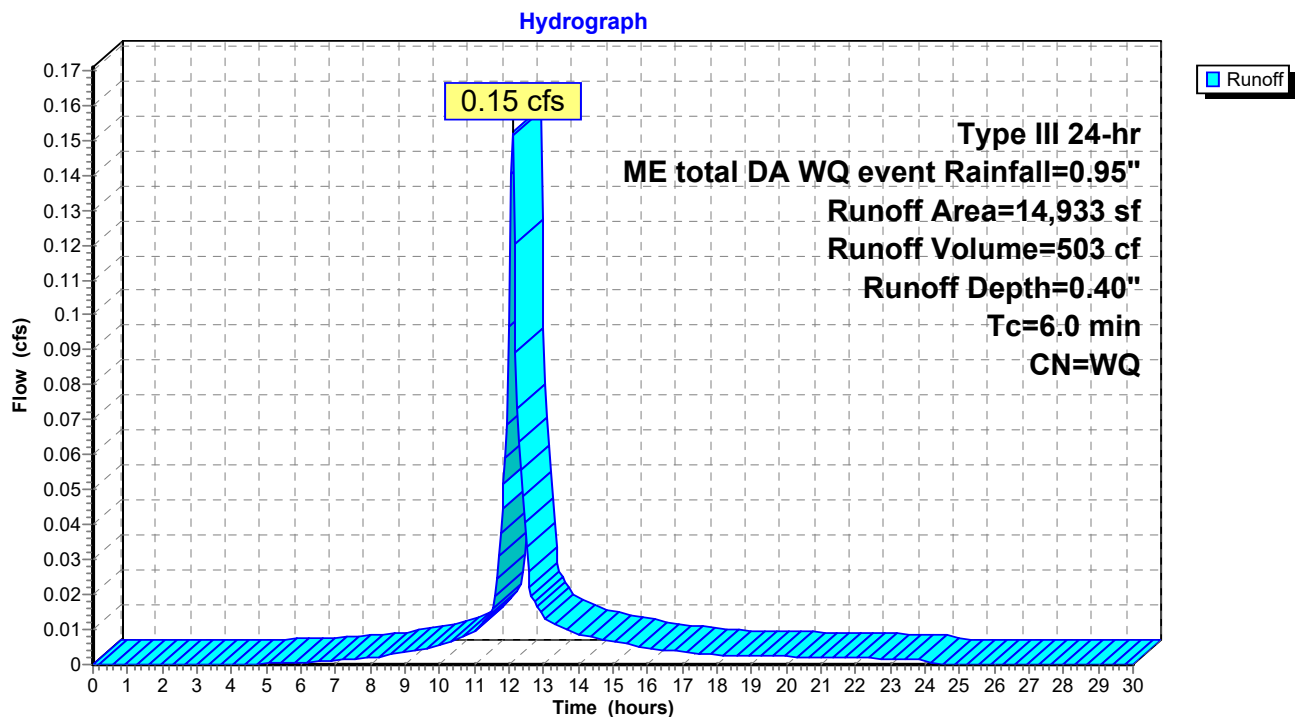
Runoff = 0.15 cfs @ 12.09 hrs, Volume= 503 cf, Depth= 0.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr ME total DA WQ event Rainfall=0.95"

	Area (sf)	CN	Description
*	8,116	98	impervious
	6,817	69	50-75% Grass cover, Fair, HSG B
	14,933		Weighted Average
	6,817	69	45.65% Pervious Area
	8,116	98	54.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 32S: DA2



Hydrograph for Subcatchment 32S: DA2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	0.95	0.15	0.00
0.50	0.00	0.00	0.00	27.00	0.95	0.15	0.00
1.00	0.01	0.00	0.00	27.50	0.95	0.15	0.00
1.50	0.01	0.00	0.00	28.00	0.95	0.15	0.00
2.00	0.02	0.00	0.00	28.50	0.95	0.15	0.00
2.50	0.02	0.00	0.00	29.00	0.95	0.15	0.00
3.00	0.03	0.00	0.00	29.50	0.95	0.15	0.00
3.50	0.03	0.00	0.00	30.00	0.95	0.15	0.00
4.00	0.04	0.00	0.00				
4.50	0.05	0.00	0.00				
5.00	0.05	0.00	0.00				
5.50	0.06	0.00	0.00				
6.00	0.07	0.00	0.00				
6.50	0.08	0.00	0.00				
7.00	0.09	0.00	0.00				
7.50	0.10	0.00	0.00				
8.00	0.11	0.00	0.00				
8.50	0.12	0.00	0.00				
9.00	0.14	0.00	0.00				
9.50	0.16	0.00	0.00				
10.00	0.18	0.00	0.01				
10.50	0.21	0.00	0.01				
11.00	0.24	0.00	0.01				
11.50	0.28	0.00	0.02				
12.00	0.47	0.01	0.10				
12.50	0.67	0.05	0.03				
13.00	0.71	0.06	0.01				
13.50	0.74	0.07	0.01				
14.00	0.77	0.08	0.01				
14.50	0.79	0.09	0.01				
15.00	0.81	0.09	0.01				
15.50	0.83	0.10	0.01				
16.00	0.84	0.11	0.00				
16.50	0.85	0.11	0.00				
17.00	0.86	0.11	0.00				
17.50	0.87	0.12	0.00				
18.00	0.88	0.12	0.00				
18.50	0.89	0.12	0.00				
19.00	0.90	0.13	0.00				
19.50	0.90	0.13	0.00				
20.00	0.91	0.13	0.00				
20.50	0.92	0.14	0.00				
21.00	0.92	0.14	0.00				
21.50	0.93	0.14	0.00				
22.00	0.93	0.14	0.00				
22.50	0.94	0.15	0.00				
23.00	0.94	0.15	0.00				
23.50	0.95	0.15	0.00				
24.00	0.95	0.15	0.00				
24.50	0.95	0.15	0.00				
25.00	0.95	0.15	0.00				
25.50	0.95	0.15	0.00				
26.00	0.95	0.15	0.00				

Summary for Pond 33P: Filterra 6x8/8x6

Inflow Area = 14,933 sf, 54.35% Impervious, Inflow Depth = 0.40" for ME total DA WQ event event
 Inflow = 0.15 cfs @ 12.09 hrs, Volume= 503 cf
 Outflow = 0.15 cfs @ 12.09 hrs, Volume= 503 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.15 cfs @ 12.09 hrs, Volume= 503 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.13' @ 12.09 hrs Surf.Area= 48 sf Storage= 0 cf

Plug-Flow detention time= 0.1 min calculated for 503 cf (100% of inflow)
 Center-of-Mass det. time= 0.0 min (790.0 - 789.9)

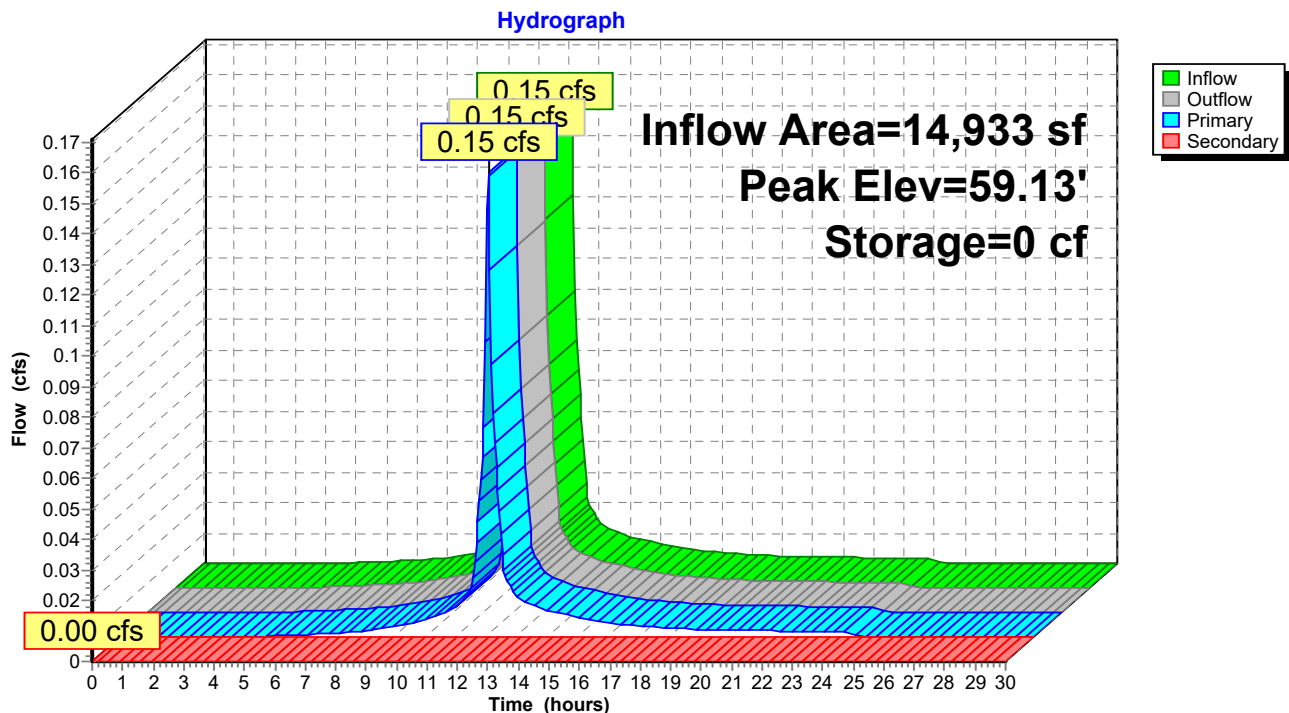
Volume	Invert	Avail.Storage	Storage Description
#1	59.12'	48 cf	8.00'W x 6.00'L x 1.00'H Prisma

Device	Routing	Invert	Outlet Devices
#1	Primary	59.12'	140.000 in/hr Exfiltration over Surface area
#2	Secondary	59.54'	10.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.16 cfs @ 12.09 hrs HW=59.13' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.16 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=59.12' (Free Discharge)
 ↑2=Orifice/Grate (Controls 0.00 cfs)

Pond 33P: Filterra 6x8/8x6



Hydrograph for Pond 33P: Filterra 6x8/8x6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	59.12	0.00	0.00	0.00
1.00	0.00	0	59.12	0.00	0.00	0.00
2.00	0.00	0	59.12	0.00	0.00	0.00
3.00	0.00	0	59.12	0.00	0.00	0.00
4.00	0.00	0	59.12	0.00	0.00	0.00
5.00	0.00	0	59.12	0.00	0.00	0.00
6.00	0.00	0	59.12	0.00	0.00	0.00
7.00	0.00	0	59.12	0.00	0.00	0.00
8.00	0.00	0	59.12	0.00	0.00	0.00
9.00	0.00	0	59.12	0.00	0.00	0.00
10.00	0.01	0	59.12	0.01	0.01	0.00
11.00	0.01	0	59.12	0.01	0.01	0.00
12.00	0.10	0	59.13	0.10	0.10	0.00
13.00	0.01	0	59.12	0.01	0.01	0.00
14.00	0.01	0	59.12	0.01	0.01	0.00
15.00	0.01	0	59.12	0.01	0.01	0.00
16.00	0.00	0	59.12	0.00	0.00	0.00
17.00	0.00	0	59.12	0.00	0.00	0.00
18.00	0.00	0	59.12	0.00	0.00	0.00
19.00	0.00	0	59.12	0.00	0.00	0.00
20.00	0.00	0	59.12	0.00	0.00	0.00
21.00	0.00	0	59.12	0.00	0.00	0.00
22.00	0.00	0	59.12	0.00	0.00	0.00
23.00	0.00	0	59.12	0.00	0.00	0.00
24.00	0.00	0	59.12	0.00	0.00	0.00
25.00	0.00	0	59.12	0.00	0.00	0.00
26.00	0.00	0	59.12	0.00	0.00	0.00
27.00	0.00	0	59.12	0.00	0.00	0.00
28.00	0.00	0	59.12	0.00	0.00	0.00
29.00	0.00	0	59.12	0.00	0.00	0.00
30.00	0.00	0	59.12	0.00	0.00	0.00

Summary for Subcatchment 32S: DA2

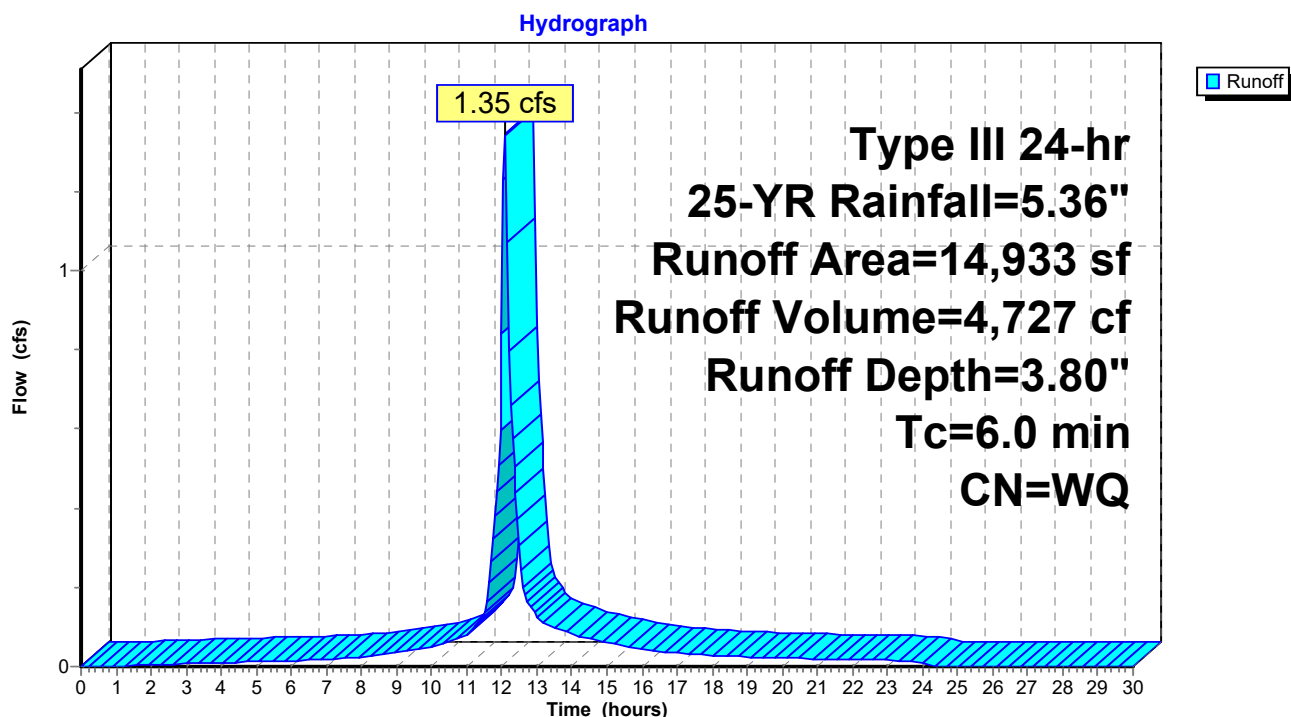
Runoff = 1.35 cfs @ 12.09 hrs, Volume= 4,727 cf, Depth= 3.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YR Rainfall=5.36"

	Area (sf)	CN	Description
*	8,116	98	impervious
	6,817	69	50-75% Grass cover, Fair, HSG B
	14,933		Weighted Average
	6,817	69	45.65% Pervious Area
	8,116	98	54.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry,

Subcatchment 32S: DA2



Hydrograph for Subcatchment 32S: DA2

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00	26.50	5.36	3.70	0.00
0.50	0.03	0.00	0.00	27.00	5.36	3.70	0.00
1.00	0.05	0.00	0.00	27.50	5.36	3.70	0.00
1.50	0.08	0.00	0.00	28.00	5.36	3.70	0.00
2.00	0.11	0.00	0.00	28.50	5.36	3.70	0.00
2.50	0.14	0.00	0.01	29.00	5.36	3.70	0.00
3.00	0.16	0.00	0.01	29.50	5.36	3.70	0.00
3.50	0.20	0.00	0.01	30.00	5.36	3.70	0.00
4.00	0.23	0.00	0.01				
4.50	0.27	0.00	0.01				
5.00	0.30	0.00	0.01				
5.50	0.34	0.00	0.01				
6.00	0.39	0.00	0.01				
6.50	0.43	0.00	0.02				
7.00	0.49	0.01	0.02				
7.50	0.54	0.02	0.02				
8.00	0.61	0.03	0.02				
8.50	0.69	0.05	0.03				
9.00	0.78	0.08	0.03				
9.50	0.89	0.13	0.04				
10.00	1.01	0.18	0.05				
10.50	1.16	0.25	0.06				
11.00	1.34	0.35	0.08				
11.50	1.60	0.51	0.13				
12.00	2.68	1.32	0.84				
12.50	3.76	2.25	0.31				
13.00	4.02	2.48	0.13				
13.50	4.20	2.64	0.10				
14.00	4.35	2.77	0.08				
14.50	4.47	2.88	0.07				
15.00	4.58	2.98	0.06				
15.50	4.67	3.07	0.05				
16.00	4.75	3.14	0.04				
16.50	4.82	3.20	0.04				
17.00	4.87	3.25	0.03				
17.50	4.93	3.30	0.03				
18.00	4.97	3.34	0.03				
18.50	5.02	3.38	0.02				
19.00	5.06	3.42	0.02				
19.50	5.09	3.45	0.02				
20.00	5.13	3.49	0.02				
20.50	5.16	3.52	0.02				
21.00	5.20	3.55	0.02				
21.50	5.23	3.58	0.02				
22.00	5.26	3.61	0.02				
22.50	5.28	3.63	0.02				
23.00	5.31	3.66	0.02				
23.50	5.34	3.68	0.02				
24.00	5.36	3.70	0.01				
24.50	5.36	3.70	0.00				
25.00	5.36	3.70	0.00				
25.50	5.36	3.70	0.00				
26.00	5.36	3.70	0.00				

Summary for Pond 33P: Filtterra 6x8/8x6

Inflow Area = 14,933 sf, 54.35% Impervious, Inflow Depth = 3.80" for 25-YR event
 Inflow = 1.35 cfs @ 12.09 hrs, Volume= 4,727 cf
 Outflow = 1.34 cfs @ 12.09 hrs, Volume= 4,696 cf, Atten= 1%, Lag= 0.0 min
 Primary = 0.16 cfs @ 11.60 hrs, Volume= 3,243 cf
 Secondary = 1.18 cfs @ 12.09 hrs, Volume= 1,453 cf

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 59.81' @ 12.09 hrs Surf.Area= 48 sf Storage= 33 cf

Plug-Flow detention time= 4.8 min calculated for 4,688 cf (99% of inflow)
 Center-of-Mass det. time= 0.5 min (774.0 - 773.5)

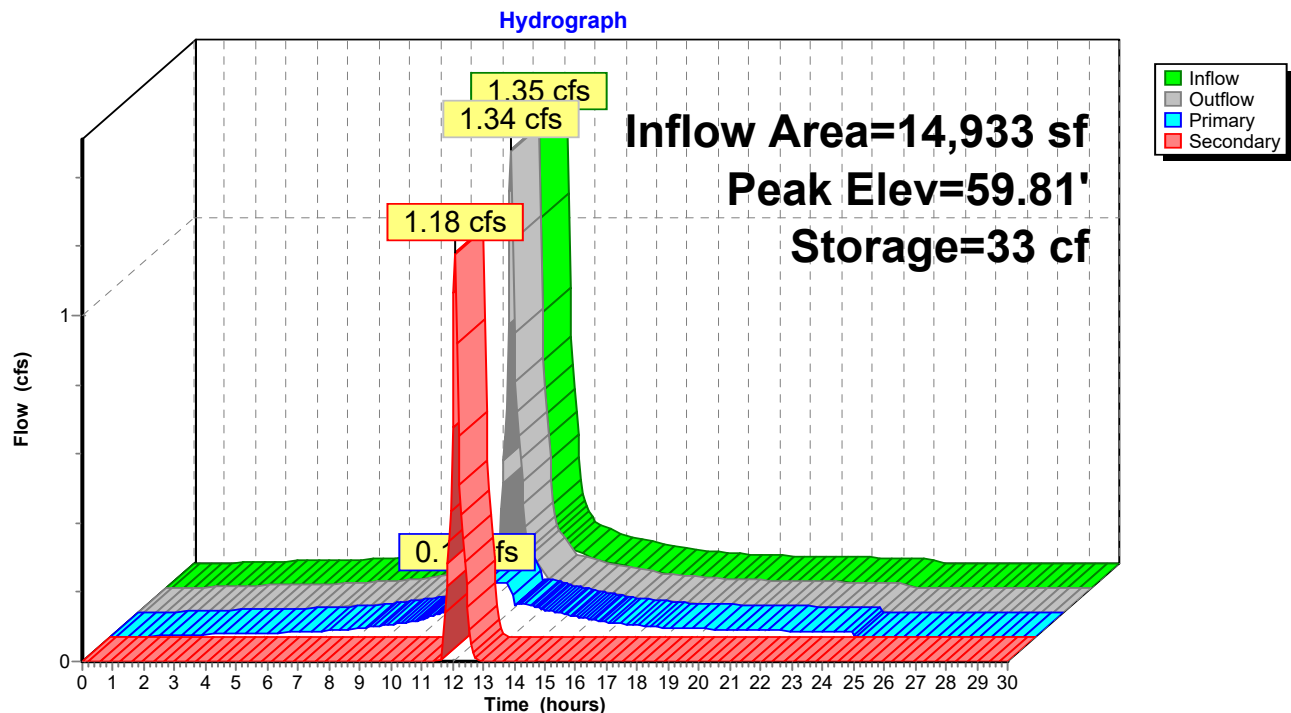
Volume	Invert	Avail.Storage	Storage Description
#1	59.12'	48 cf	8.00'W x 6.00'L x 1.00'H Prismaoid

Device	Routing	Invert	Outlet Devices
#1	Primary	59.12'	140.000 in/hr Exfiltration over Surface area
#2	Secondary	59.54'	10.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.16 cfs @ 11.60 hrs HW=59.14' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Secondary OutFlow Max=1.15 cfs @ 12.09 hrs HW=59.80' (Free Discharge)
 ↳ **2=Orifice/Grate** (Weir Controls 1.15 cfs @ 1.68 fps)

Pond 33P: Filtterra 6x8/8x6

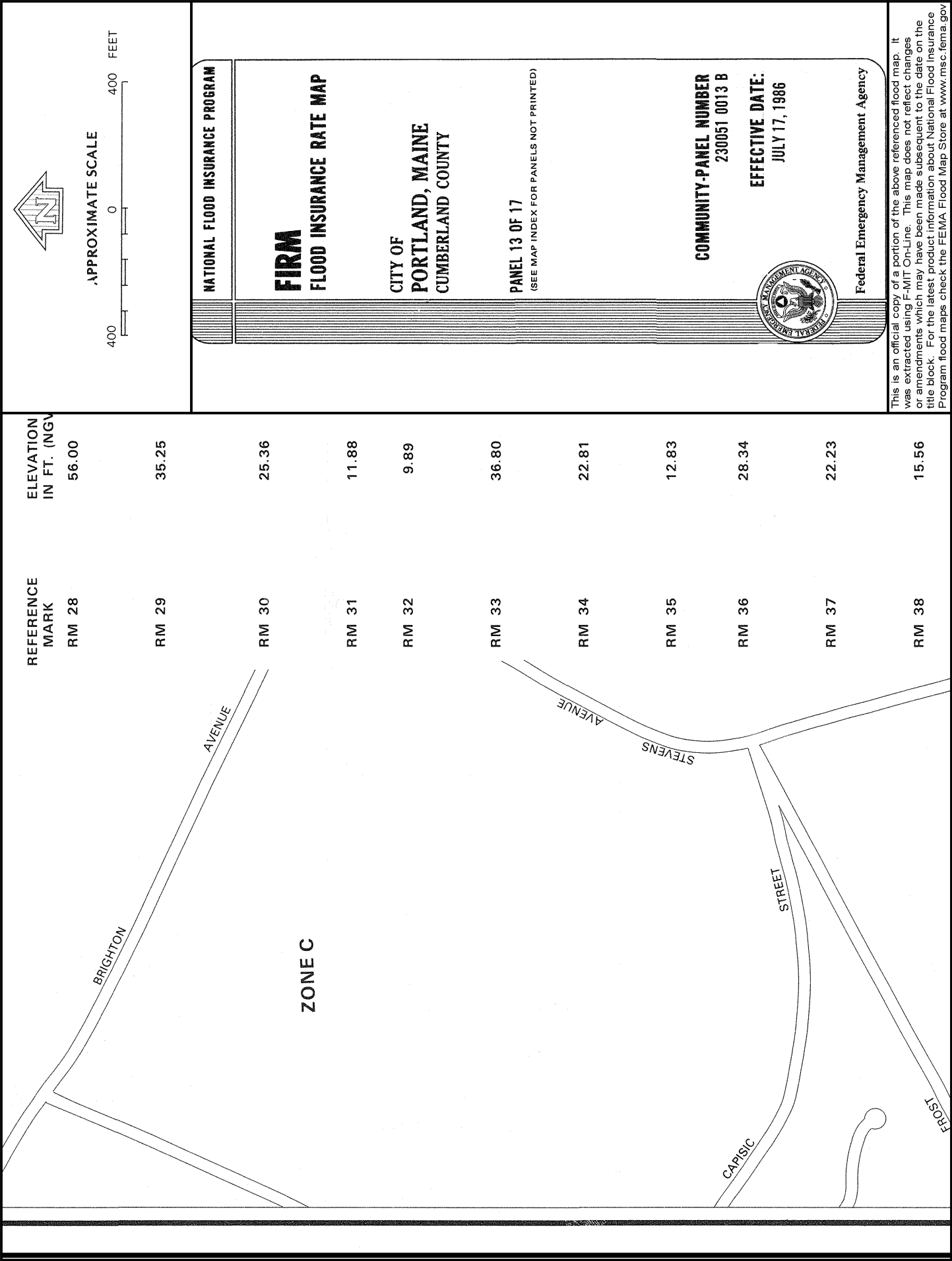


Hydrograph for Pond 33P: Filterra 6x8/8x6

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	59.12	0.00	0.00	0.00
1.00	0.00	0	59.12	0.00	0.00	0.00
2.00	0.00	0	59.12	0.00	0.00	0.00
3.00	0.01	0	59.12	0.01	0.01	0.00
4.00	0.01	0	59.12	0.01	0.01	0.00
5.00	0.01	0	59.12	0.01	0.01	0.00
6.00	0.01	0	59.12	0.01	0.01	0.00
7.00	0.02	0	59.12	0.02	0.02	0.00
8.00	0.02	0	59.12	0.02	0.02	0.00
9.00	0.03	0	59.12	0.03	0.03	0.00
10.00	0.05	0	59.12	0.05	0.05	0.00
11.00	0.08	0	59.13	0.08	0.08	0.00
12.00	0.84	29	59.72	0.83	0.16	0.68
13.00	0.13	9	59.31	0.16	0.16	0.00
14.00	0.08	0	59.13	0.08	0.08	0.00
15.00	0.06	0	59.12	0.06	0.06	0.00
16.00	0.04	0	59.12	0.04	0.04	0.00
17.00	0.03	0	59.12	0.03	0.03	0.00
18.00	0.03	0	59.12	0.03	0.03	0.00
19.00	0.02	0	59.12	0.02	0.02	0.00
20.00	0.02	0	59.12	0.02	0.02	0.00
21.00	0.02	0	59.12	0.02	0.02	0.00
22.00	0.02	0	59.12	0.02	0.02	0.00
23.00	0.02	0	59.12	0.02	0.02	0.00
24.00	0.01	0	59.12	0.01	0.01	0.00
25.00	0.00	0	59.12	0.00	0.00	0.00
26.00	0.00	0	59.12	0.00	0.00	0.00
27.00	0.00	0	59.12	0.00	0.00	0.00
28.00	0.00	0	59.12	0.00	0.00	0.00
29.00	0.00	0	59.12	0.00	0.00	0.00
30.00	0.00	0	59.12	0.00	0.00	0.00

APPENDIX E

Fema Firm Map





APPROXIMATE SCALE



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND,
MAINE
CUMBERLAND COUNTY

PANEL 12 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

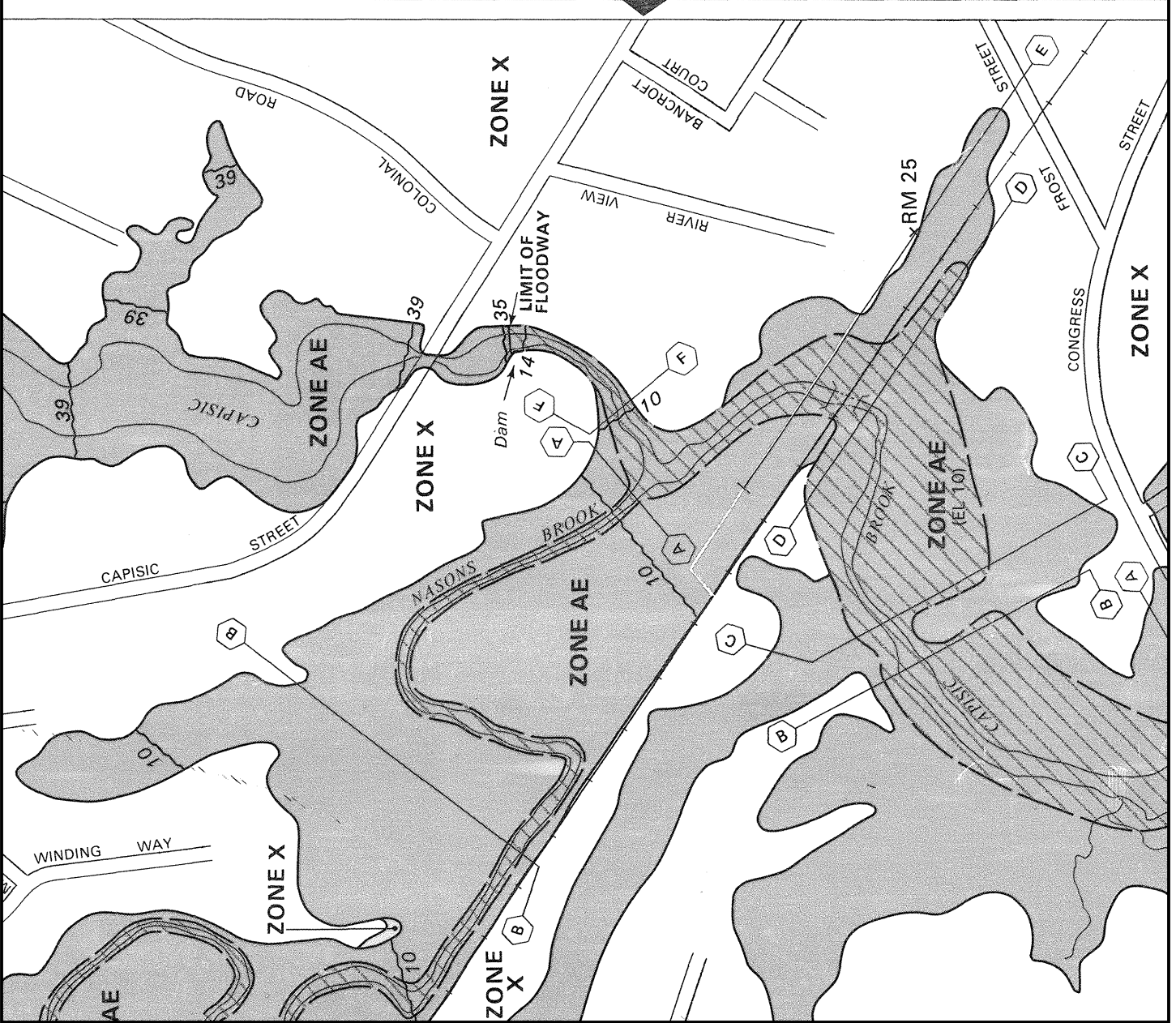
COMMUNITY-PANEL NUMBER
230051 0012 C

MAP REVISED:
DECEMBER 8, 1998



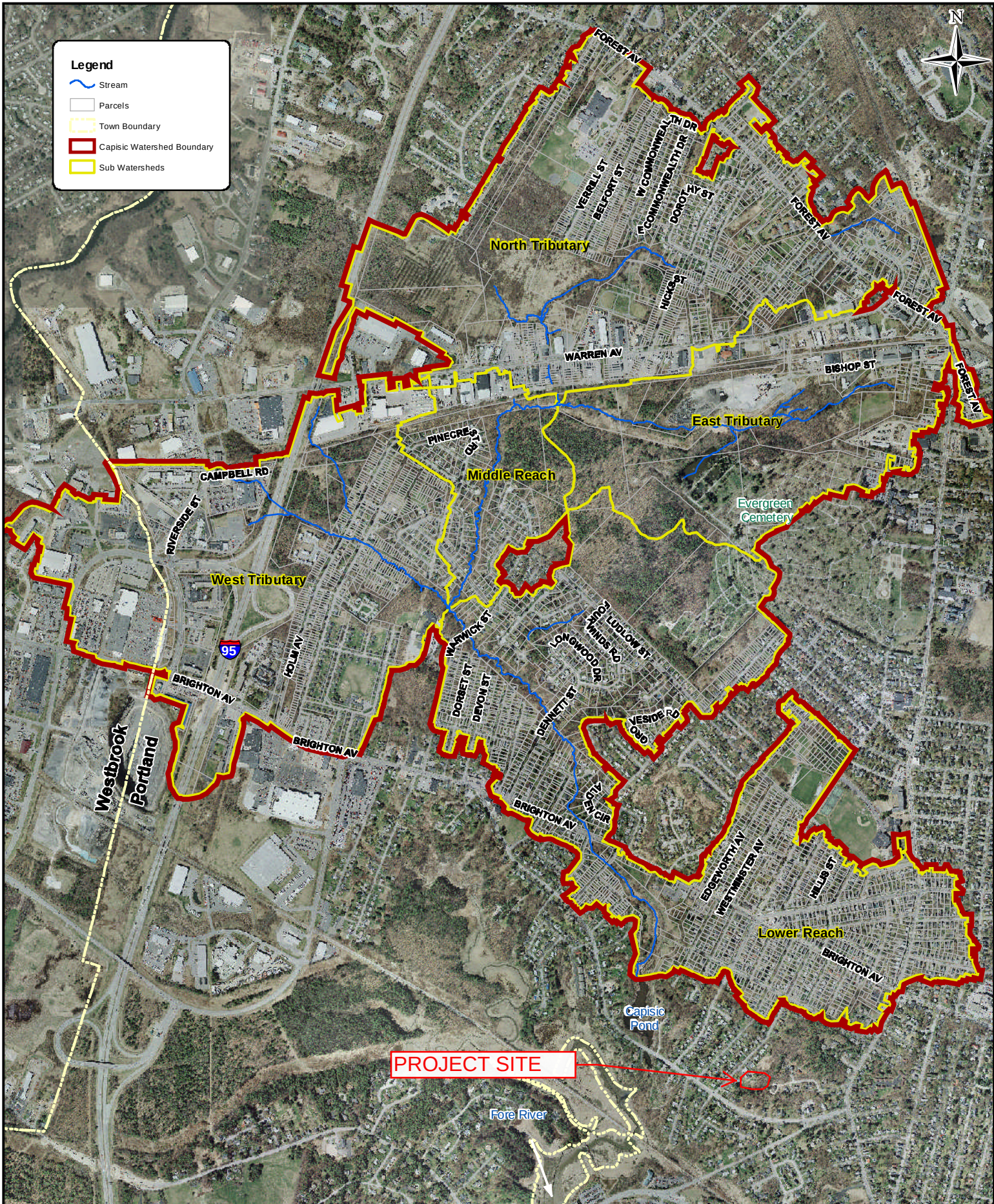
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



APPENDIX F

Capisic Brook Watershed Map



Scale: 1" = 1500' Job #: 203939 Date: Oct 2010 Checked By: ZH Drawn By: ADF/JJS	Aerial Site Location Figure 1	City of Portland - Capisic Brook Watershed Management Plan Sources: City of Portland, Maine Office of GIS, DEP, WC Doc: Site_Location_Aerials.mxd		41 Hutchins Drive Portland ME 04102 T 800.426.4262 207.774.2112 F 207.774.6635 www.woodardcurran.com Commitment and Integrity Drive Results
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INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

Capisic Meadows Subdivision Bancroft Street Portland, Maine

Introduction

The following plan outlines the anticipated inspection and maintenance procedures for the erosion and sedimentation controls as well as stormwater management devices for the project site. Also, this plan outlines several housekeeping requirements that shall be followed during and after construction. These procedures should be followed in order to ensure the intended function of the designed measures and to prevent unreasonable adverse impacts to the surrounding environment.

The procedures outlined in this inspection and maintenance plan are provided as an overview of the anticipated practices to be used on this site. In some instances, additional measures may be required due to unexpected conditions. For additional detail on any of the erosion and sedimentation control measures or stormwater management devices to be utilized on this project, refer to the most recently revised edition of the "Maine Erosion and Sedimentation Control BMP" manual and/or the "Stormwater Management for Maine: Best Management Practices" manual as published by the Maine Department of Environmental Protection (MDEP). This is in compliance with the City of Portland Code of Ordinances, Chapter 32 Section 38 of the Post-construction stormwater management plan.

Inspections: The owner or operator of a BMP shall hire a qualified post-construction stormwater inspector to at least annually, inspect the BMPs, including but not limited to any parking areas, catch basins, drainage swales, detention basins and ponds, pipes and related structures, in accordance with all municipal and state inspection, cleaning and maintenance requirements of the approved post construction stormwater management plan.

Maintenance and repair: If the BMP requires maintenance, repair or replacement to function as intended by the approved post-construction stormwater management plan, the owner or operator of the BMP shall take corrective action(s) to address the deficiency or deficiencies as soon as possible after the deficiency is discovered and shall provide a record of the deficiency and corrective action(s) to the department of public works ("DPW") in the annual report.

Annual report: The owner or operator of a BMP or a qualified post-construction stormwater inspector hired by that person, shall, on or by June 30 of each year, provide a completed and signed certification to DPW in a form provided by DPW, certifying that the person has inspected the BMP(s) and that they are adequately maintained and functioning as intended by the approved post-construction stormwater management plan, or that they require maintenance

or repair, including the record of the deficiency and corrective action(s) taken.

During Construction

1. **Inspection:** During the construction process, it is the Contractor's responsibility to comply with the inspection and maintenance procedures outlined in this section. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once a week as well as before and after a storm event, and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in any applicable permits, shall conduct the inspections.
2. **Maintenance:** All measures shall be maintained in an effective operating condition until areas are permanently stabilized. If Best Management Practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within 7 calendar days and prior to any storm event (rainfall).
3. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained on-site. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of erosion and sedimentation controls, material storage areas, and vehicle access points to the site. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.
4. **Specific Inspection and Maintenance Tasks:** The following is a list of erosion control and stormwater management measures and the specific inspection and maintenance tasks to be performed during construction.
 - A. **Sediment Barriers:**
 - Hay bale barriers, silt fences, and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
 - If the fabric on a silt fence or filter barrier should decompose or become ineffective prior to the end of the expected usable life and the barrier is still necessary, it shall be replaced.
 - Sediment deposits should be removed after each storm event. They must be removed before deposits reach approximately one-half the height of the barrier.
 - Filter berms shall be reshaped as needed.

- Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required should be dressed to conform to the existing grade, prepared, and seeded.

B. Riprap Materials:

- Once a riprap installation has been completed, it should require very little maintenance. It shall, however, be inspected periodically to determine if high flows have caused scour beneath the riprap or dislodged any of the stone.

C. Erosion Control Blankets:

- Inspect these reinforced areas semi-annually and after significant rainfall events for slumping, sliding, seepage, and scour. Pay close attention to unreinforced areas adjacent to the erosion control blankets, which may experience accelerated erosion.
- Review all applicable inspection and maintenance procedures recommended by the specific blanket manufacturer. These tasks shall be included in addition to the requirements of this plan.

D. Stone Check Dams:

- Inspect the center of the dam to make sure it is lower than the edges. Erosion caused by high flows around the edges of the dam must be corrected.
- Sediment accumulation shall be removed prior to reaching half of the original design height.
- Areas beneath stone check dams must be seeded and mulched upon removal.

E. Temporary Storm Drain Inlet Protection:

- The inlet protection structure shall be inspected before each rain event and repaired as necessary.
- Sediment shall be removed and the storm drain sediment barrier restored to its original dimensions when the sediment has accumulated to half of the design depth of the trap.
- Structures shall be removed upon permanent stabilization of the tributary area.
- Upon removal of the structure, all accumulated sediments downstream of the structure shall be cleaned from the storm drain system.

F. Stabilized Construction Entrances/Exits:

- The exit shall be maintained in a condition that will prevent tracking of sediment onto public rights-of-way.
- When the control pad becomes ineffective, the stone shall be removed along with the collected soil material. The entrance should then be reconstructed.

- Areas that have received mud-tracking or sediment deposits shall be swept or washed. Washing shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device (not into storm drains, ditches, or waterways).

G. Temporary Seed and Mulch:

- Mulched areas should be inspected after rain events to check for rill erosion.
- If less than 90% of the soil surface is covered by mulch, additional mulch shall be applied in bare areas.
- In applications where seeding and mulch have been applied in conjunction with erosion control blankets, the blankets must be inspected after rain events for dislocation or undercutting.
- Mulch shall continue to be reapplied until 95% of the soil surface has established temporary vegetative cover.

Stabilized Temporary Drainage Swales:

- Sediment accumulation in the swale shall be removed once the cross section of the swale is reduced by 25%.
- The swales shall be inspected after rainfall events. Any evidence of sloughing of the side slopes or channel erosion shall be repaired and corrective action should be taken to prevent reoccurrence of the problem.
- In addition to the stabilized lining of the channel (i.e. erosion control blankets), stone check dams may be needed to further reduce channel velocity.

5. **Housekeeping:** The following general performance standards apply to the proposed project.

- A. Spill prevention: Controls must be used to prevent pollutants from being discharged from materials on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.
- B. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors, accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.
- C. Fugitive sediment and dust: Actions must be taken to insure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

- D. Debris and other materials: Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.
- E. Trench or foundation dewatering: Trench dewatering is the removal of water from trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.

After Construction

1. **Inspection:** After construction, it is the responsibility of the owner or Homeowner's Association to comply with the inspection and maintenance procedures outlined in this section. All measures must be maintained in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions in all applicable permits, shall conduct the inspections.
2. **Specific Inspection and Maintenance Tasks:** The following is a list of permanent erosion control and stormwater management measures and the inspection and maintenance tasks to be performed after construction.

A. Vegetated Areas:

- Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems.
- Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

B. Ditches, Swales, and Other Open Channels:

- Inspect ditches, swales and other open stormwater channels in the spring, in the late fall, and after heavy rains to remove any obstructions to flow. Remove accumulated sediments and debris, remove woody vegetative growth that could obstruct flow, and repair any erosion of the ditch lining.
- Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity.
- Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable.
- If the ditch has a riprap lining, replace riprap in areas where any

underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged.

C. Culverts:

- Inspect culverts in the spring, in the late fall, and after heavy rains to remove any obstructions to flow.
- Remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit.
- Inspect and repair any erosion damage at the culvert's inlet and outlet.

D. Catch Basins:

- Inspect and, if required, clean-out catch basins at least once a year, preferably in early spring.
- Clean out must include the removal and legal disposal of accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins.
- If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).

E. Winter Sanding:

- Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring.
- Accumulations on pavement may be removed by pavement sweeping.
- Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader or other acceptable method.

F. Detention Pond

- The inlet and outlet of the basin should be checked periodically to ensure that flow structures are not blocked by debris. Inspections should be conducted monthly during wet weather conditions (March to November). Flow structures should be easily accessible for inspection and the removal of debris blockage during storm conditions.
- Embankments should be maintained to preserve their integrity as impoundment structures, including: mowing, control of woody vegetation, rodent, and outlet maintenance and repair. Basins should be mowed no more than twice a year during the growing season to maintain maximum grass heights less than 12 inches. All accumulated trash and debris should be removed.
- Sediment should be removed from the pretreatment structure at least annually and from the basin when necessary.

G. Filterra Units

- See attached documents for inspection and maintenance requirements.
1. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of controls. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. A sample "Stormwater Inspection and Maintenance Form" has been included as Attachment 1 of this Inspection, Maintenance, and Housekeeping Plan.
 2. **Duration of Maintenance:** Perform maintenance as described and required for any associated permits unless and until the system is formally accepted by a municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system.

PAGE _____

BMP STRUCTURE	INSPECTOR (NAME)	WORK PERFORMED	DATE PERFORMED	COMMENTS
Filterra Units				
Catchbasin				
Vegetated Areas				
Sweep Roadway				
Grassed Swales				
Rip Rap				
Culverts				
Detention Pond				
Other				
Additional Comments:				

Operation & Maintenance (OM) Manual v01



filterterra®
Bioretention Systems

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ENGINEERED SOLUTIONS



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- Filterra Schematic
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- Design

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- Exclusion of Services
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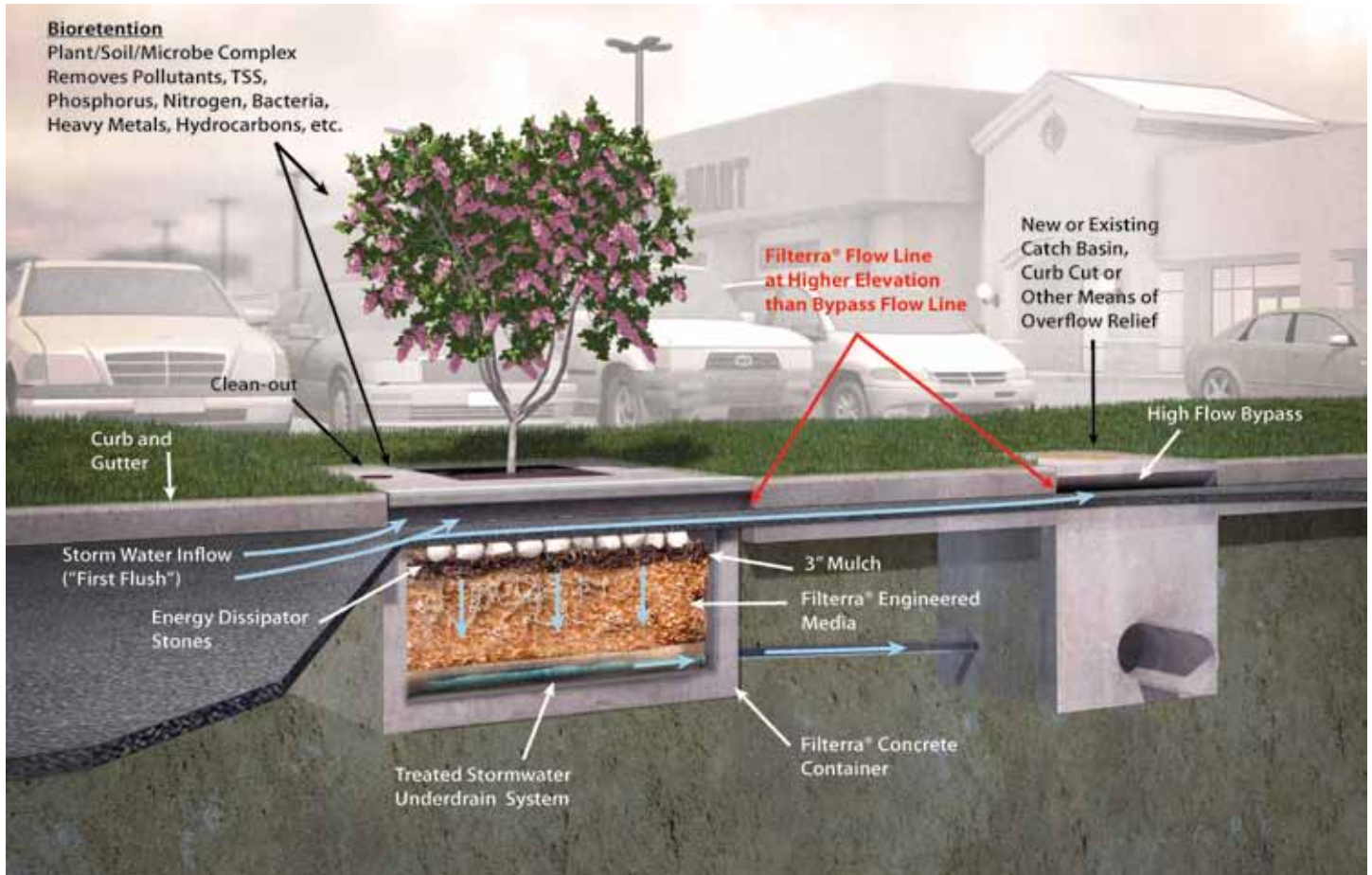
Resources

- *Example Filterra Project Maintenance Report Sheet*
- *Example Filterra Structure Maintenance Report Sheet*
- Filterra Warranty
- *Drawing FTST-2: Filterra Standard Configuration Detail*
- *Drawing FTNL-3: Filterra Narrow Length Configuration Detail*
- *Drawing FTNW-3: Filterra Narrow Width Configuration Detail*



General Description

The following general specifications describe the general operations and maintenance requirements for the Contech Engineered Solutions LLC stormwater bioretention filtration system, the Filterra. The system utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system is a fully equipped, pre-constructed drop-in place unit designed for applications in the urban landscape to treat contaminated runoff.



Stormwater flows through a specially designed filter media mixture contained in a landscaped concrete container. The mixture immobilizes pollutants which are then decomposed, volatilized and incorporated into the biomass of the Filterra system's micro/macro fauna and flora. Stormwater runoff flows through the media and into an underdrain system at the bottom of the container, where the treated water is discharged. Higher flows bypass the Filterra to a downstream inlet or outfall. Maintenance is a simple, inexpensive and safe operation that does not require confined space access, pumping or vacuum equipment or specialized tools. Properly trained landscape personnel can effectively maintain Filterra Stormwater systems by following instructions in this manual.

Basic Operations

Filterra is a bioretention system in a concrete box.

Contaminated stormwater runoff enters the filter box through the curb inlet spreading over the 3-inch layer of mulch on the surface of the filter media. As the water passes through the mulch layer, most of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water passes through the soil media where the finer particles are removed and other chemical reactions take place to immobilize and capture pollutants in the soil media. The cleansed water passes into an underdrain and flows to a pipe system or other appropriate discharge point. Once the pollutants are in the soil, the bacteria begin to break down and metabolize the materials and the plants begin to uptake and metabolize the pollutants. Some pollutants such as heavy metals, which are chemically bound to organic particles in the mulch, are released over time as the organic matter decomposes to release the metals to the feeder roots of the plants and the cells of the bacteria in the soil where they remain and are recycled. Other pollutants such as phosphorus are chemically bound to the soil particles and released slowly back to the plants and bacteria and used in their metabolic processes. Nitrogen goes through a very complex variety of biochemical processes where it can ultimately end up in the plant/bacteria biomass, turned to nitrogen gas or dissolves back into the water column as nitrates depending on soil temperature, pH and the availability of oxygen. The pollutants ultimately are retained in the mulch, soil and biomass with some passing out of the system into the air or back into the water.

Design and Installation

Each project presents different scopes for the use of Filterra systems. To ensure the safe and specified function of the stormwater BMP, Contech reviews each application before supply. Information and help may be provided to the design engineer during the planning process. Correct Filterra box sizing (by rainfall region) is essential to predict pollutant removal rates for a given area. The engineer shall submit calculations for approval by the local jurisdiction. The contractor is responsible for the correct installation of Filterra units as shown in approved plans. A comprehensive installation manual is available at www.conteches.com.

Maintenance

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement.

- Avoid legal challenges from your jurisdiction's maintenance enforcement program.

- Prolong the expected lifespan of your Filterra media.
- Avoid more costly media replacement.
- Help reduce pollutant loads leaving your property.

Simple maintenance of the Filterra is required to continue effective pollutant removal from stormwater runoff before discharge into downstream waters. This procedure will also extend the longevity of the living biofilter system. The unit will recycle and accumulate pollutants within the biomass, but is also subjected to other materials entering the throat. This may include trash, silt and leaves etc. which will be contained within the void below the top grate and above the mulch layer. Too much silt may inhibit the Filterra's® flow rate, which is the reason for site stabilization before activation. Regular replacement of the mulch stops accumulation of such sediment.

When to Maintain?

Contech includes a 1-year maintenance plan with each system purchase. Annual included maintenance consists of a maximum of two (2) scheduled visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as the unit installed, curb and gutter and transitions in place and activation (by Supplier) when mulch and plant are added and temporary throat protection removed.

Activation cannot be carried out until the site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed). Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands while the fall visit helps the system by removing excessive leaf litter.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required; regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency; e.g. some fast food restaurants require more frequent trash removal. Contributing drainage areas which are subject to new development wherein the recommended erosion and sediment control measures have not been implemented may require additional maintenance visits.

Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the Supplier and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the (maintenance) Supplier of any damage to the plant(s), which constitute(s) an integral part of the bioretention technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance to the Supplier (i.e. no pruning or fertilizing).

Exclusion of Services

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant of the Filterra system.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the Supplier maintenance contract. Should a major contamination event occur the Owner must block off the outlet pipe of the Filterra (where the cleaned runoff drains to, such as drop inlet) and block off the throat of the Filterra. The Supplier should be informed immediately.

Maintenance Visit Summary

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of Filterra and surrounding area
2. Removal of tree grate and erosion control stones
3. Removal of debris, trash and mulch
4. Mulch replacement
5. Plant health evaluation and pruning or replacement as necessary
6. Clean area around Filterra
7. Complete paperwork

Maintenance Tools, Safety Equipment and Supplies

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working in close proximity to traffic and also safety hats and shoes. A T-Bar or crowbar should be used for moving the tree grates (up to 170 lbs ea.). Most visits require minor trash removal and a full replacement of mulch. See below for actual number of bagged mulch that is required in each unit size. Mulch should be a double shredded, hardwood variety; do not use colored or dyed mulch. Some visits may require additional Filterra engineered soil media available from the Supplier.

Box Length	Box Width	Filter Surface Area (ft ²)	Volume at 3" (ft ³)	# of 2 ft ³ Mulch Bags
4	4	4	4	2
6	4	6	6	3
8	4	8	8	4
6	6	9	9	5
8	6	12	12	6
10	6	15	15	8
12	6	18	18	9
13	7	23	23	12

Maintenance Visit Procedure

Keep sufficient documentation of maintenance actions to predict location specific maintenance frequencies and needs. An example Maintenance Report is included in this manual.



1. Inspection of Filterra and surrounding area

- Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

Record on Maintenance Report the following:

Standing Water	yes no
Damage to Box Structure	yes no
Damage to Grate	yes no
Is Bypass Clear	yes no

If yes answered to any of these observations, record with close-up photograph (numbered).



2. Removal of tree grate and erosion control stones

- Remove cast iron grates for access into Filterra box.
- Dig out silt (if any) and mulch and remove trash & foreign items.

Record on Maintenance Report the following:

Silt/Clay	yes no
Cups/ Bags	yes no
Leaves	yes no
# of Buckets Removed	_____



3. Removal of debris, trash and mulch

- After removal of mulch and debris, measure distance from the top of the Filterra engineered media soil to the bottom of the top slab. If this distance is greater than 12", add Filterra media (not top soil or other) to recharge to a 9" distance

Record on Maintenance Report the following:

Distance of Bottom of Top Slab (inches)	_____
# of Buckets of Media Added	_____



4. Mulch replacement

- Please see mulch specifications.
- Add double shredded mulch evenly across the entire unit to a depth of 3".
- Ensure correct repositioning of erosion control stones by the Filterra inlet to allow for entry of trash during a storm event.
- Replace Filterra grates correctly using appropriate lifting or moving tools, taking care not to damage the plant.



5. Plant health evaluation and pruning or replacement as necessary

- Examine the plant's health and replace if dead.
- Prune as necessary to encourage growth in the correct directions

Record on Maintenance Report the following:

Height above Grate	(Feet)
Width at Widest Point	(feet)
Health	alive dead
Damage to Plant	yes no
Plant Replaced	yes no



6. Clean area around Filterra

- Clean area around unit and remove all refuse to be disposed of appropriately.



7. Complete paperwork

- Deliver Maintenance Report and photographs to appropriate location (normally Contech during maintenance contract period).
- Some jurisdictions may require submission of maintenance reports in accordance with approvals. It is the responsibility of the Owner to comply with local regulations.

Maintenance Checklist

Drainage System Failure	Problem	Conditions to Check	Condition that Should Exist	Actions
Inlet	Excessive sediment or trash accumulation.	Accumulated sediments or trash impair free flow of water into Filterra.	Inlet should be free of obstructions allowing free distributed flow of water into Filterra.	Sediments and/or trash should be removed.
Mulch Cover	Trash and floatable debris accumulation.	Excessive trash and/or debris accumulation.	Minimal trash or other debris on mulch cover.	Trash and debris should be removed and mulch cover raked level. Ensure bark nugget mulch is not used.
Mulch Cover	"Ponding" of water on mulch cover.	"Ponding" in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils.	Stormwater should drain freely and evenly through mulch cover.	Recommend contact manufacturer and replace mulch as a minimum.
Vegetation	Plants not growing or in poor condition.	Soil/mulch too wet, evidence of spill. Incorrect plant selection. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact manufacturer for advice.
Vegetation	Plant growth excessive.	Plants should be appropriate to the species and location of Filterra.		Trim/prune plants in accordance with typical landscaping and safety needs.
Structure	Structure has visible cracks.	Cracks wider than 1/2 inch or evidence of soil particles entering the structure through the cracks.		Vault should be repaired.
Maintenance is ideally to be performed twice annually.				





3/13/2018

Joshua Wagner
130 Bancroft St
Portland, Maine 04102

Sent via email

RE: Request for Letter of Ability to Serve for 130-144 Bancroft Street, Portland

Dear Mr. Wagner:

Thank you for contacting Central Maine Power Company (CMP) to inquire about the property located on Bancroft Street in Portland. The purpose of this communication is to acknowledge receipt of your March 8, 2018 email requesting ability to serve for the site referenced above.

Currently, CMP has the ability to serve this site with single phase. If you require polyphase service, a line extension will have to be completed. Also, as much lead time as you can reasonably provide to CMP before the project breaks ground is always very much appreciated.

New Service Milestones

- Call 1-800-565-3181 to establish a new account and an SAP work order. Please provide both of these to me.
- Submit Load information. Please complete this CMP spreadsheet using load information
- Submit the easement information worksheet. Please complete this CMP form and either email or fax back to us.
- Submit any electronic drawings (PDF (preferred) or DWG files) of the site layout and proposed electrical connections if you have them.
- Preliminary meetings with CMP Advisor and Engineer to determine details of job (I will need to schedule with your electrician/contractor-please let me know who this is)
- Field planner design appointment to cost out job and develop CMP Invoice.
- Submit invoice for payment.
- Easements signed and payment received.
- Job scheduled for completion after the electrical inspection has been received.

740 Main Street, Lewiston, ME 04240
Tel (207) 629-4552 office

www.cmpco.com



An equal opportunity employer



This process can take several months, depending upon several factors including transformer delivery, potential substation upgrades, return of completed paperwork, and other customer jobs in the system that may be ahead of yours. In addition, contact with the other utilities, including telephone and cable, should be commenced as soon as practical. They may have additional work or charges in addition to the CMP work required to bring your project on line.

For your convenience, here is a link to the CMP Website which contains the Handbook with details regarding most service requirements:

www.cmpco.com/handbook

In the meantime, please contact me if you have any more questions. I can be reached at (207) 629-4552.

Thank you

Regards,

A handwritten signature in black ink, appearing to read "Jeff Lagueux".

Jeff Lagueux
Central Maine Power Company

740 Main Street, Lewiston, ME 04240
Tel (207) 629-4552 office

www.cmpco.com



An equal opportunity employer



March 2, 2018

Jim Fisher
Northeast Civil Solutions Inc.
381 Payne Road
Scarborough Maine 04074

Re: 130 Bancroft Street, Portland Maine

Dear Mr. Wagner:

Thank you for your interest in using natural gas for the above referenced project.

This is to confirm that natural gas can be made available from our distribution system to serve your proposed project.

Any improvements to the existing distribution system necessary to provide this service, as well as the design of the gas system in the project itself will be established as the overall design and scope of your project progresses.

All work necessary to provide service will be performed in accordance with the Maine Public Utilities Commission requirements.

If you have any further questions or require additional information, please contact me directly at (207) 541-2536 or harmon@unitil.com.

Sincerely,

Bridget Harmon
Business Development Representative
Unitil Corporation
(o) 207-541-2536 (f) 207-541-2586

ME GAS CUSTOMER ENERGY SOLUTIONS
376 Riverside Industrial Parkway
Portland, ME 04103

T 207-541-2508 www.unitil.com



March 15, 2018

Mike Skolnick
Northeast Civil Solutions
381 Payne Road
Scarborough, ME 04074

Re: Bancroft Street, PO
Ability to Serve with PWD Water

Dear Mr. Skolnick:

The Portland Water District has received your request for an Ability to Serve Determination for the noted site submitted on March 22, 2018. Based on the information provided per PWD marked up plans dated February 28, 2018, 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. Any changes affecting the approved water system will require further review and approval by PWD.**

Conditions of Service

The following conditions of service apply:

- The properties requesting water service do not have deeded frontage on a public way containing a public water main, which is a requirement for water service. In order to provide water service to this site, a main extension will be required within the private way to a point equal to the center of the last lot to be served. The District can confirm that the existing water system has the capacity to serve the additional seven single family house lots. As final design plans become available for the next construction phase please send a copy to the MEANS group for review. We will work with you or your representative to ensure that the design meets our current standards.
- **Water District approval of final water infrastructure plans will be required for the project prior to construction.**

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 a 12-inch diameter cast iron water main in Bancroft Street and a public fire hydrant located approximately 260 feet from the site. The most recent static pressure reading was 88 psi on May 19, 2017.

Public Fire Protection

The installation of new public hydrants to be accepted into the District water system will most likely 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.

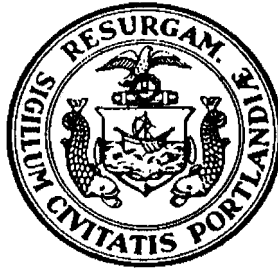
Sincerely,
Portland Water District

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

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: 9-5-2018

1. Please, Submit Utility, Site, and Locus Plans.

Site Address: 130 Bancroft Street

Chart Block Lot Number: 193 Block E, parcels 19,26,39 & 40

Proposed Use: 7 new house lots

Previous Use: undeveloped

Existing Sanitary Flows: 0.0 GPD

Existing Process Flows: N/A GPD

Description and location of City sewer that is to receive the proposed building sewer lateral.

Proposing to connect to sewer main in
Bancroft Street (see attached plans)

Site Category
Commercial (see part 4 below)
Industrial (complete part 5 below)
Governmental
Residential
Other (specify)

X

Clearly, indicate the proposed connections, on the submitted plans.

2. Please, Submit Contact Information.

City Planner's Name: Jean Fraser Phone: 874-8728

Owner/Developer Name: WB Group, Inc. c/o Josh wagner

Owner/Developer Address: 130 Bancroft Street, Portland ME

Phone: _____ Fax: _____ E-mail: joshwagner4545@yahoo.com

Engineering Consultant Name: Northeast Civil Solutions c/o Tony Panciocco

Engineering Consultant Address: 381 Payne Road, Scarborough ME 04074

Phone: 883-1000 Fax: _____ E-mail: tony.panciocco@northeastcivilsolutions.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: 1,890 GPD

Peaking Factor/ Peak Times: _____

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) Maine Waste Water 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.

3 bedroom homes 90/gpd/bedroom=270 gpd/home
7 new homes 7x270 = 1,890 gpd

Total Drainage Fixture Unit (DFU) Values:	N/A
Size of External Grease Interceptor:	
Retention Time:	
Peaking Factor/ Peak Times:	



Christopher C. Branch, P.E.
Director of Public Works

Date: October 5, 2018

Re: Wastewater Capacity Authorization

Address: 130 Bancroft Street

Applicant: WB Group, Inc. c/o Josh Wagner

Planner: Jean Fraser

Anticipated Wastewater Flow:

Estimate of Anticipated Design Flows				
Development	Unit Size	Number of Units	Gallons per Day per Unit	Total Gallons per Day
Existing flow to be removed				
Vacant				0
Proposed flow				
Residential Units	3-Bedroom	7	270	1890
Net Change				+ 1,890
*Values based on STATE OF MAINE: SUBSURFACE WASTEWATER DISPOSAL RULES, most recent edition				

Comments:

The Department of Public Works, which includes the Water Resource Division, have reviewed and determined that the downstream sewers from the project address have the capacity to convey the estimated dry weather wastewater flows which will be generated from this development.

If the City can be of further assistance, please contact me at all 874-8840 or brad@portlandmaine.gov

Sincerely,
CITY OF PORTLAND

Bradley A. Roland, P.E.
Senior Project Engineer

CC:

Jeffrey Levine, Director, Department of Planning and Urban Development, City of Portland

Stuart O'Brien, Planning Director, Department of Planning and Urban Development, City of Portland

Barbara Barhydt, Development Review Services Mgr., Dep't. of Planning and Urban Development, City of Portland

Keith Gray, City Engineer/Engineering Manager, Portland Department of Public Works

Nancy Gallinaro, Water Resources Manager, Portland Department of Public Works

Ben Pearson, Compliance Coordinator, Portland Department of Public Works

John Emerson, Wastewater Coordinator, Portland Department of Public Works

Lauren Swett, Woodard & Curran, DPW Development Review

Scott Firmin, Director of Wastewater, Portland Water District

Charlene Poulin, Wastewater Chief Operator – Systems



SURVEYING ENGINEERING LAND PLANNING

Northeast Civil Solutions

INCORPORATED

www.northeastcivilsolutions.com

41041

May 31, 2018

Dear Neighbor:

Please join us for a neighborhood meeting to discuss our plans for a proposed 8 Lot Subdivision located at 130 Bancroft Street.

Meeting Location: 130 Bancroft Street

Meeting Date: June 19th, 2018

Meeting Time: 4:00pm

(The City code requires that property owners within 500 feet (1000 feet for proposed industrial subdivisions and industrial zone changes) 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 Northeast Civil Solutions, Inc. @ 207-883-1000 or Joshua Wagner @ 207-831-4345.

Sincerely,
NORTHEAST CIVIL SOLUTIONS, INC.

Michael Skolnick
Land Use Regulatory Specialist

File: Joshua Wagner, Land Owner / Developer

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

130 Bancroft Street – Proposed 8 Lot Subdivision

June 19, 2018 @ 4:00pm

WELCOME AND PLEASE SIGN IN

NAME	ADDRESS	TELEPHONE	EMAIL
Carmen Bailey	143 Bancroft	761.3911	cb Bailey@preti.com
Oliver Griswold	38 Reddon Park	917-617-2103	owgriswo@gmail.com
Denise Noonan	67 Rockland Ave	2326210	denisn326x@gmail.com
THOMAS R. LUSSIER	126 BANCROFT ST.	761.3971	TLUSSIER1@Maine.rr.com
MELODY LUSSIER	126 BANCROFT	761.3971	
DAWN LELAND	119 Bancroft St.	207 459-8589	LelandDM@gmail.com
Connie Hughes	147 Bancroft	207 761.1787	
Steven McClelland	137 Bancroft St	781-738-8429	stevenmcclelland@gmail.com
MARY DELois	125 BANCROFT	774-9599	
Christopher Holt	135 Bancroft	956-3771	Christopher Tholt@gmail.com
Jeff Flom	115 CABBAGE ST,	207-332-8277	JEFF.FLOM@YAHOO.COM
Roger Gendron	118 Bancroft St	207-274-6830	
Jean E. Gelpatrick	110 Bancroft St	207-775-1094	
Douglas Babkirk	55 Reddon Park	712-5140	doug.babkirk@maine.edu
Scott H. BERRY	36 June St.	774-1904	
Sam Herr	95 Bancroft St	5203073482	
Jenn+Don Taylor	80 Bancroft St	879-2248	dandjaylor@maine.rr.com
Joshua & Tamara Krueger	58 Reddon Park Rd	807-3180	KruegerTamara@yahoo.com
Jackie Harkins	154 Bancroft St.	207-780-8872	



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www.northeastcivilsolutions.com

41041

June 19, 2018

City of Portland, Planning and Development
389 Congress Street
Portland, Maine 04101

**RE: Level III Subdivision Review – 130 - 144 Bancroft Street – Neighborhood Meeting Minutes
WB Group, Inc. – Capisic Meadows – 8 Lot Subdivision**

On Tuesday 19, 2018, members of the NCS team along with Josh Wagner met for a neighborhood meeting at 130 Bancroft Road to discuss the proposed 8 lot subdivision to be constructed off of Bancroft Street.

The following attendees were present:

NCS - Jim Fisher, Michael Skolnick, Brandon Binette
Owner - Josh Wagner (WB Group, Inc.)
Neighborhood Attendees - Please see attached sign in sheet

Please see the following questions which were presented by members of the neighborhood who attended the meeting in regards to the 8 lot subdivision proposed off Bancroft Street. NCS responses to the neighborhood concerns are written in **bold** below the aforementioned concerns.

Discussion Topics:

Concern: Neighbors are concerned about the runoff of water, for example: Redlon Park Road. Neighbors feel many problems were caused by Redlon not being designed properly. Will the work be done correctly?

Answer: The engineering work is reviewed multiple times by different groups (DEP, City Engineers). The design will only be accepted if the engineering is sufficient to control peak runoff in a major storm event and will not cause future issues, meanwhile eliminate increased runoff onto abutting properties from the proposed development.

Concern: Where is the sewer going to go?

Answer: The sewer will tie into existing facilities in the Bancroft Street Right-of-Way. The project has been reviewed by Portland Public Works and an ability to serve letter has been provided stating that the existing infrastructure has sufficient capacity to allow for the proposed sewer connection.

Concern: Will there be blasting? Will the blasting cause damage to surrounding houses? What can you do about the ground moving?

Answer: Blasting will be used if no other means work to remove the material. Any damage done to surrounding properties by blasting will be paid for by the company which is doing the blasting. The blasting will be completed by a licensed blasting contractor and anticipate pre-blast surveys will be required prior to blasting. Before all blasting shall occur surrounding properties will be inspected to ensure no damage will be caused due to such actions.

Concern: Will our basements flood due to the proposed construction?

Answer: John Wagner states, "I currently have water problems with my basement flooding." This engineering will mitigate some flooding issues and will help water move more fluently due to the proposed drainage design. The clearing of existing easement/drainage areas that have not been maintained will allow for the existing stormwater systems to work as designed, meanwhile reduce backup which in turn is causing flooding.

Concern: Who has to clean the existing drainage easement burdening the existing parcels on Bancroft Street?

Answer: The City shall be responsible for cleaning of existing stormwater drainage areas within the existing Bancroft Street subdivision; however as part of the proposed development, the drainage area will be cleared to ensure that all drainage is working properly and efficiently.

Concern: How can the surrounding property owners be sure that the design is done properly?

Answer: Inspections are completed throughout the constructions process, meanwhile an As-Built will be completed post-construction to ensure the stormwater facilities function as designed. Along with inspections and an As-Built, the project will be reviewed by third-party reviewers, the City's engineering department and the Maine DEP to ensure all design elements as following best management practices, meanwhile function as intended.

Concern: If water appears in my basement who will pay for the damages?

Answer: A review of each aspect of the development (engineering, construction, etc.) will be completed to determine who should be held liable for the negative effects of the project on the

abutting project. The party who is determined at fault will be liable for adverse effects on the aforementioned parcel.

Concern: Why are there going to be 7 new lots?

Answer: The proposed development could yield additional lots (more than 7) as per net residential density calculation, however John Wagner opted to move forward with an additional 7 lots for to both fit in with the character of the development, meanwhile minimize adverse effects to the surrounding area.

Concern: Will trees have to be cut down to allow this project to happen?

Answer: Yes, trees will have to be cut to allow for the proposed development. Only trees that are necessary to be cut per grading and stormwater design will be removed.

Concern: How do we know where the water will go after blasting?

Answer: Controlled blasting is done, to disturb as little of the earth as possible. The site will then be graded to control stormwater as designed.

Concern: Problems with a culvert in back of my yard. (Unknown man) Will this be fixed?

Answer: Any work completed in association with the proposed development will function as designed. If there are problems with culverts on an abutter's property not directly correlated with the proposed development, it is home owner's obligation to inform the City of something not working correctly.

Concern: Will road work be done at the corner of Bancroft Street and Capisic Street in coordination with the proposed project?

Answer: No work will be completed at that corner of Bancroft Street and Capisic Street.

Concern: John, would you still put this development in if you planned to still live at your current house on Bancroft for another 10...20 years?

Answer: "I would have done some sort of residential development behind my property, perhaps not to the extent of the proposed subdivision, however I purchased the land for economic gain and would have moved forward with some sort of development."

**Construction Management Plan
General Template
WB Group, Inc.
Capisic Meadows - 8 Lot Subdivision**

A detailed construction management site plan will be prepared and submitted to City Staff for review once a contractor has been selected for the project. It is requested that this item be a Condition of Approval and submitted for City review prior to the issuance of a building permit or in advance of site work approval. The CMP will address the following Standards and Requirements:

The Capisic Meadows Construction Management Plan 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 WB Group, Inc and its 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

WB Group, Inc and its 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. The plan minimizing impacts to areas surrounding the building/construction site will be primary considerations in the process. 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, WB Group, Inc and its 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

WB Group, Inc and its 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 WB Group, Inc and its 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 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 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 WB Group, Inc's selected 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 WB Group, Inc's selected 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 areas 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 well 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.



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April 30, 2018

RE: Level III Subdivision Review – Capisic Meadow – Sidewalk Waiver Request

The application for Level III Subdivision Review for the proposed 7 lot development located at 130-144 Bancroft Street would like to request a waiver for the need for sidewalks on both sides of the proposed residential street servicing the subdivision.

In the pre-development state there are no existing sidewalks within the Bancroft Street public Right-of-Way. While sidewalks increase pedestrian circulation throughout a development, the proposed development would not benefit from additional sidewalks on both sides of the street, meanwhile a singular sidewalk will allow for access throughout the subdivision. The proposed sidewalk will not increase interconnectivity because there is no sidewalk along the adjacent subdivision to connect too.

The addition of sidewalks on both sides of the proposed right-of way would increase unnecessary impervious area throughout the subdivision. In order to meet the requirement to incorporate sidewalks on both sides of a proposed road, the project would require further wetland fill and disturbed area. This area will not support the use of dual sidewalks within the Right-of-Way without unnecessary costs and environmental effects within the proposed subdivision.

The site has been designed to conform to the surrounding community in its existing state, meanwhile abide to the requirements of the existing land use standards. Granting of the requested waiver will allow for the proposed subdivision to conform to the surrounding neighborhood, meanwhile reduce any possible adverse effects to the natural environment.



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July 11, 2018

Jean Fraser, Planner
City of Portland
389 Congress Street
Portland, ME 04101

RE: Staff Review Comments – 8 Lot Subdivision, 130 Bancroft Street Portland

Dear Jean:

We are writing to address review comments received from you via email on June 25, 2018, and subsequent emails. Your comments are indicated followed by our responses in bold.

Civil Engineering – Third Party Reviewer

1. The Applicant has submitted a copy of the NRPA Application to the DEP for proposed wetland fill. Copies of all final permit approvals should be forwarded to the City upon receipt.
The MDEP has approved our application for a Tier I wetland fill permit. A copy of the approved permit has been forwarded to the City via eplan and email. The Army Corps of Engineers is reviewing our permit application. Once we receive a decision from the Army Corps we will forward this along to the City.
2. The stormwater inspection and maintenance plan should include provisions for the requirements of Chapter 32 of the City of Portland Code of Ordinances, as well as inspection and maintenance requirements for the proposed Filterra Units and Detention Pond. Update the stormwater inspection and maintenance plan.
Stormwater inspection and maintenance plan have been updated in compliance with Chapter 32 of the City of Portland Code of Ordinances. Maintenance requirements for proposed Filterra Units and detentions ponds have been forwarded to the City via eplan and email.
3. The Applicant has stated that the lot impervious areas were included in the HydroCAD model, however the narrative report indicates that there will be 0.62-acres of new impervious area and the model indicates that there will be only 0.48-acres of new impervious area. Clarify the amount of impervious surface that has been modeled, and confirm that it includes all impervious surface anticipated to drain to the pond.

We have confirmed that the new impervious area for the project equals 0.65 acres. The HydroCAD model and the Stormwater Report have been updated to reflect this number. All impervious areas tributary to the pond have been included in the model.

4. Note that the standard detail for Sidewalk Ramp Detectable Warning Panels was revised in October 2017. The acceptable material is now uncoated cast iron. Please revise the detail.
The sidewalk ramp detectable warning panel detail has been updated on the plans to reflect the October 2017 detail revision.
5. The Grading and Drainage Plan indicates that SD-7 will be a 15-inch pipe, but the HydroCAD model indicates that it is 18-inches. The dimensions of the emergency spillway are also inconsistent between the plans and the model. The Applicant should clarify and ensure that the drawings and the model are consistent.
The Army Corps of Engineers (in reviewing the Tier I Wetland Impact Permit Application) has requested that all wetland crossing culverts be 36" wide and imbedded at least 6 inches. We have updated all the culverts in the wetland crossing areas to reflect a 36" pipe imbedded 1 foot. The pipe sizes have been updated on the pipe schedule on the plan set and in the HydroCAD model. A detail has been added to the plans to reflect this condition.
6. Proposed details include a "Type B Underdrain Installation Detail – Alternative A" that shows underdrain along the roadside edge under curbing; however, the proposed grading and drainage plan does not show locations or discharge points for proposed underdrain. Clarify the use of underdrain on the site
Underdrain locations have been identified on the plan set. Underdrains are proposed to discharge into proposed cross culverts.
7. A construction management plan has not been provided. Provide a construction management plan using the City's template which is available online.
A Construction Management Plan using the City's Template has been submitted to the City via eplan.
8. All piping installation within the proposed roadway is required to be in conformance with the City's Technical Manual, Section 2 Sanitary Sewer and Stormdrain. This includes material types and installation. Note that the City of Portland requires HDPE stormdrain pipe to be ADS HP triple-wall pipe. Refer to figure II-12 for the typical pipe trench installation. Update the plans and details to be in conformance with the City's standards.
We have updated the pipe schedule to reflect the requirement for ADS HP triple-wall pipe. Additionally, we have added the City's II-12 Typical Pipe Trench Installation and Notes detail to our plan set.
9. We have reviewed the Grading and Drainage Plan, and there are a few areas where the grading is not detailed enough to show that water will not be directed towards the building foundations. Specifically on Lots 5, 6, and 7. Additional spot grades are also recommended in the area between Lots 2 and 3, the area in front of Lot 4 and the area adjacent to the

retaining wall at the edge of the detention pond to clearly define grading such that ponding will not occur. Provide updated Grading and Drainage Plan.

Spot grades have been added to the plans to clarify some of the grading areas. The retaining wall and pool have been removed from the plans as the pool will be removed as part of this project.

10. Filterra units are proposed for installation within the future City Right Of Way. The Applicant should discuss the maintenance of these systems with the City of Portland Department of Public works to determine if they will be maintained by the City or if maintenance will be required by the owners. In addition, a system of culverts extends through the site, both over private property and the City Right Of Way, to a stormwater pond that is located on private property. Responsibility of maintenance of all stormwater systems should be clearly established, and Stormwater Maintenance Agreements are required in conformance with the City's Chapter 32. Provide Stormwater Maintenance Agreements.

The maintenance of the proposed stormwater systems throughout the proposed development will be assessed via a Homeowners Association within the proposed subdivision. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are up maintained to work as designed. This will include culverts, detention pond and other stormwater infrastructure not accepted by the City. Draft Homeowners Association documentation will be forwarded to the City once it has been completed.

Additionally, in discussions with the City Engineer (Keith Gray) it was indicated that the City may look at a different treatment device other than the Filterra units. We will continue to work with the City on determining which device best suits the site and the City requirements.

Fire Department

11. All homes will be required to be sprinkled.
We have added a note to the Subdivision Plan indicating that all homes will be required to be sprinklered.
12. Fire Department access to all homes is acceptable.
No response required.
13. A 30 x 30 turnaround is required at the dead end of the road.
The turnaround has been drawn as 30 x 30 per detail I-5.
14. The fire hydrant at the end of the road must be removed. No fire hydrant is required for this project.
The hydrant has been removed from the plans.

Additional Comments

15. It is very unusual to have the piping going through private property. This along with the neighbors issues and the scale of wetland fill raises questions and we would like to be sure we are all on the same page (or at least have options clarified with known pros and cons) before it goes to a PB Workshop.

The maintenance of the proposed stormwater systems throughout the proposed development will be assessed via a Homeowners Association within the proposed subdivision. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are up maintained to work as designed. Draft Homeowners Association documentation will be forwarded to the City once it has been completed.

16. Also we would like a site plan or lot layout/development and landscape plan (see example attached) that includes the driveways, buildable areas on the lots, key dimensions, and a sidewalk along the north side of the proposed new road- also think about tree saves as this would seem appropriate here.

An additional Site Layout Plan has been created to satisfy the requirements as indicated above. Building envelopes are indicated on the Subdivision Plan and additionally one story and two story setbacks are identified to show buildable areas. We have identified the clearing limits for the proposed development via pre and post construction tree lines on the submitted plans. We have identified a sidewalk on the southern side of the proposed road and have submitted a waiver request for a sidewalk along the northerly side of the proposed road as there is no sidewalk in Bancroft Street.

17. The issue here is partly re the physical layout, and partly the question of who is going to be responsible for the stormwater system and all parts of it - while the City would accept the street, it would not take responsibility for the stormwater system that is not in the street. And if part of that system is under private properties, will each property be responsible for their section or what? So one of the discussion topics (with DPW present) was this question.

The maintenance of the proposed stormwater systems throughout the proposed development will be assessed via a Homeowners Association within the proposed subdivision. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are up maintained to work as designed.

18. Who will be responsible for the proposed stormwater system located within private lots; who will be responsible for the maintenance of the detention pond and the existing easement that will be used for drainage (I would note that the City would not normally take on any of this maintenance and there would need for formal agreements to clarify/confirm)

The maintenance of the proposed stormwater systems throughout the proposed development will be assessed via a Homeowners Association within the proposed subdivision. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are up maintained to work as designed.

19. How will your system avoid flooding of neighbors properties (in view of the addition of impervious surfaces)

Please see the previously submitted stormwater report and calculations explaining the proposed design indicating that the proposed stormwater infrastructure will control the peak flow via a detention pond.

20. Regarding the sidewalk, the other engineers who provide comments on projects wanted the sidewalk on the other side as it impacts less wetland, is less impervious area, and it is on the side of the applicants house

NCS had met with Keith Gray and the City's 3rd party reviewer and spoken about the request that the sidewalk be located on the northerly side of the road and reached a conclusion that it would not be necessary to change the sidewalk location. The proposed design actually reduces impervious surface due to the fact that the sidewalk is shorter, not extending past the shared driveway between lots #6 and #7. Wetland impacts would remain the same whether the sidewalk were located on the northerly or southerly side of the proposed road due to grading. Necessary grading on both sides of the road, no matter which side the sidewalk were located, would not allow for wetland fill to be reduced.

Abutter Concerns

21. Respond to the comments from neighbors that I have sent (not in detail, but to broad questions)

A proposed Stormwater Report, Traffic Study and DEP Wetland Fill Permit have been submitted in coordination with this project which addresses the broad spectrum of abutter concerns. We will be happy to discuss any outlying topics in further detail with the Planning Board.

a. Stormwater

There is a major concern brought forth by abutters in the surrounding are of stormwater mitigation and the concern that their previously existing "wet" lots will be further affected by the proposed development. The concerns are addressed by the Stormwater Report and calculations provided within the original submission package. The design has taken into account both on-site and off-site watersheds which come in contact with the proposed development. As required by the City, the development is not allowed to increase the peak runoff from the proposed parcel onto any abutting parcel. To control stormwater a partially open and closed drainage system has been implemented throughout the development through a series of drainage ditches and culverts. The proposed impervious surface created by the road will be treated via a Filterra System (or something approved equivalent by the City of Portland) and, along with all created stormwater, directed to a detention pond. The pond has been designed to meet the demands of a 25-year storm event, meanwhile drain within 24 hours after such storm event, eliminating the concern of standing water. Additionally, the stormwater report and calculations are being reviewed by the City's third party reviewer, Woodard and Curran.

b. Wetland Impacts

Wetland impacts have been minimized to the extent practical given the site layout. The MDEP has approved the Tier I wetland fill application for the project. The Army Corps of Engineers is reviewing our application.

c. Open Space

Even though a majority of the land used by the proposed residential development is existing undeveloped (lawn and woods) the land is private property. This land is not part of "Redlon Woods", nor is it part of the Portland Land Bank. The land has not been set aside and dedicated as "open space". As such, development is not restricted by an "open space" designation. The proposed design meets all necessary requirements for lot size and the development does not have an open space requirement that must be met for a traditional subdivision.

d. Underground Piping

A Boundary, Existing Conditions and Topographic Survey have been conducted for the project area identifying all possible on site features that may affect the proposed project or the surrounding area. Additionally, we have looked at City infrastructure plans for Bancroft Street and Capisic Street. As such, we do not anticipate any unknown drainage pipes crossing the property. Should any unknown pipes be encountered will look at all possible solutions to mitigate any effects this may have on the proposed design and ultimately devise a solutions to resolve/re-route any drainage piping. All revised designs will need to be reviewed and approved by the City.

e. Traffic

A Traffic Study conducted by Bill Bray, P.E. of Traffic Solutions was submitted providing information proving that the proposed development will have minimal effect on the existing traffic flows on Bancroft Street. The 6-7 daily trips, 7 per peak hour, will not overburden the existing right-of-way and will not require anything more than a stop bar and sign along the proposed intersection.

f. Site Layout

The proposed design meets the City's requirement for minimum lots size, frontage and building setbacks within the R-3 zone. We have also indicated setbacks for 1 & 1-1/2 story and 2 story houses on the plans.

g. Construction Time

At this point we do not know the timeframe for construction of all the houses. It will depend on the housing market. There will be additional noise and disruption during the construction phase.

h. Redlon Park drainage.

The Redlon Parks development's runoff drains onto the property of the proposed development. We have made provisions in the layout, to allow this runoff to continue to flow across our property to the existing outlet point.

i. Existing drainage easement

The parcels of land owned by Jacqueline Harkins, Dusko Rakovic & Zeljka Rakovic, and William F. Johnson & William R. Johnson, are subject to a 30 ' drainage easement as described in their respective property deeds and as shown on the original subdivision plan, recorded in Planbook 125, Page 8, that created their original parcel configurations. The proposed subdivision will create a Homeowners Association and it will be the responsibility of the Homeowners Association to maintain the 30' Drainage Easement. The City has requested that as part of the project the drainage easement area be cleared of existing vegetation and the ditch line re-graded to ensure positive flow to the pipe inlet. This work will be completed within the 30' drainage easement identified on the plans.

Please contact me if you have any questions or concerns. Thank you.

Sincerely,
Northeast Civil Solutions, Inc.

Michael Skolnick
Land Use Regulatory Specialist

September 28, 2018

Jean Fraser, Planner
Planning & Urban Development Department
City of Portland
389 Congress Street
Portland, Maine 04101

***Re: Capisic Meadows 8 Lot Subdivision, 130 Bancroft Street / Application
by WB Group, Inc. for Level III Subdivision Approval /
Project # PL0000092-2018***

Dear Ms. Fraser:

This office represents WB Group, Inc. (hereafter the "WB Group") with respect to its application for Level III Subdivision Approval of an 8-lot residential subdivision to be known as "Capisic Meadows" (hereafter the "Project") at 130 and 144 Bancroft Street (hereafter the "Project Site").

It is my understanding that your office has asked WB Group to supply the City with a legal opinion confirming that WB Group holds sufficient right, title, and interest in certain properties abutting the Project Site (hereafter the "Abutting Lots") to allow it to (a) discharge stormwater from the stormwater detention basin proposed for the Project Site through a 30'-wide drainage easement (hereafter the "Drainage Easement") located on the Abutting Lots, and (b) to maintain and repair that Drainage Easement either itself or through a Homeowners' Association (hereafter the "HOA"). It is further my understanding that the City has directed WB Group and/or the HOA to improve the functioning of the Drainage Easement by clearing it of current vegetation and regrading the ditch line to ensure positive drainage into the existing outlet culvert within the Drainage Easement. That culvert discharges into a catchbasin at the corner of Bancroft and Capisic Streets.

The Abutting Lots include the following properties:

- 154 Bancroft Street, Tax Lot# 193 EO28001, owned by Jacqueline Harkins (hereafter the "Harkins Property");

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- 160 Bancroft Street, Tax Lot# Lot 193 EO20001, owned by Dusko and Rakovic Zeljka (hereafter the “Zeljka Property”); and
- 119 Capisic Street, Tax Lot# Lot 193 EO29001, owned by William R. Johnson (hereafter the “Johnson Property”).

It is our opinion that that WB Group has sufficient right, title, or interest to (a) discharge stormwater across the Abutting Lots within the bounds of the Drainage Easement and (b), maintain and improve the Drainage Easement, either by itself or through an HOA, to the extent necessary to allow the Drainage Easement to discharge stormwater from the detention basin into the City’s stormwater drainage system.

A. Background on Cheney Realty and Its Original Property.

As of 1965, both the Project Site and the Abutting Lots were commonly owned by Cheney Realty Co. (hereafter “Cheney Realty”), a Maine corporation with an office in Portland. The President and sole shareholder of Cheney Realty was J. Fred Cheney; the Vice President was the President’s son, Robert J. Cheney. When J. Fred Cheney died on January 13, 1979, Robert J. Cheney briefly became President until the Corporation was dissolved in 1981. As will later become significant, one of Cheney Realty’s principal “customers,” Charlotte L. F. Cheney (a/k/a Charlotte F. O’Boyle), was Robert J. Cheney’s daughter.

Cheney Realty acquired the Project Site and the Abutting Lots, as a single parcel, by a Deed from George E. Emerson et al to Cheney Realty dated June 21, 1965 and recorded at the Cumberland County Registry of Deeds in Book 2910, Page 255 (hereafter the “Emerson Parcel”). Between 1965 and 1980, Cheney Realty gradually sold lots from the Emerson Parcel to several individuals, and subdivided a small portion of it along Bancroft Street as “Emerson Woods.”¹

B. How Cheney Realty Created the Abutting Lots.

Most importantly, Cheney Realty purportedly conveyed the land that now comprises the Abutting Lots to Charlotte L. F. Cheney by two deeds: one dated August 8, 1967, recorded at the Cumberland County Registry of Deeds in Book 3008, Page 688 (which conveyed the most westerly portion of the Abutting Lots) and another dated January 9,

¹ See “Plan of Emerson Woods, Portland, Maine” by Robert P. Titcomb Associates recorded at the Cumberland County Registry of Deeds on January 10, 1973 in Plan Book 93, Page 42 and a revision to that plan recorded at the Cumberland County Registry of Deeds on April 12, 1973 in Plan Book 94, Page 19.

1970, recorded at the Cumberland County Registry of Deeds in Book 3116, Page 96 (which conveyed the easterly remainder of the Abutting Lots). Cheney Realty retained ownership of the Project Site, which adjoins the “Abutting Lots” to the east.²

In its 1967 Deed of the westerly portion of the Abutting Lots to Charlotte L. F. Cheney, Cheney Realty reserved the following easement:

Excepting and reserving, however, for sewer, water, gas, electricity and other utility [a] utility easement/right of way extending easterly across the above-described premises from the easterly side line of Capisic Street to other land of this Grantor, its successors and assigns.

In the 1970 deed of the easterly remainder of the Abutting Lots, Cheney Realty Co. excepted and reserved from the grant “a utility easement right of way extending westerly across the within premises to said above referred to proposed street.”³ The deeds conveying those utility easements did not prescribe a definite location or width for those easements.

² It is possible that the purported conveyance of the Abutting Lots from Cheney Realty to Charlotte L. F. Emery was in name only, and that Charlotte L. F. Cheney was acting merely as Cheney Realty’s nominee. On the Plans of Emerson Woods referenced in Footnote 1 above – which were recorded two years *after* Cheney Realty ostensibly completed the sale of the “Abutting Lots” to Charlotte L. F. Cheney -- the area that now comprises the “Abutting Lots” is described as still being owned by “Cheney Realty” rather than “Charlotte L.F. Cheney.” Given that Charlotte L. F. Cheney was a close lineal descendant of the principals of Cheney Realty, it is reasonable to conclude that she took title to the Abutting Lots for the principal purpose of advancing Cheney Realty’s overall development plan rather than as an independent investment. That conclusion is supported by the fact that Cheney Realty had previously conveyed other parcels, including property on Capisic Street just southerly of the Abutting Lots, to Charlotte A. Cheney – Robert J. Cheney’s *wife*. See deed from Cheney Realty Co. to Charlotte A. Cheney dated December 27, 1965 and recorded at the Cumberland County Registry of Deeds in Book 2943, Page 357. The female Cheneyes appear to have been “silent partners” of the male principals of Cheney Realty. [Information concerning the familial relationship between J. Fred Cheney, Robert J. Cheney, Charlotte A. Cheney, and Charlotte L. F. Cheney was derived from data available at www.ancestry.com.]

³ It is unclear exactly what “proposed street” was intended to be referenced in that deed. The most likely explanation is that that “proposed street” was “Hazel Street” or “Kenilworth Street” as shown on the original and revised Plans of Emerson Woods, respectively, referenced in Footnote 1 above.

C. How the Drainage Easement was Created.

On October 5, 1979, Charlotte L. F. Cheney filed in Plan Book 125, Page 8 at the Cumberland County Registry of Deeds the "Plan of Property in Portland, Maine made for Charlotte L.F. Cheney," by H.I. & E.C. Jordan (hereafter the "1979 Cheney Survey"):

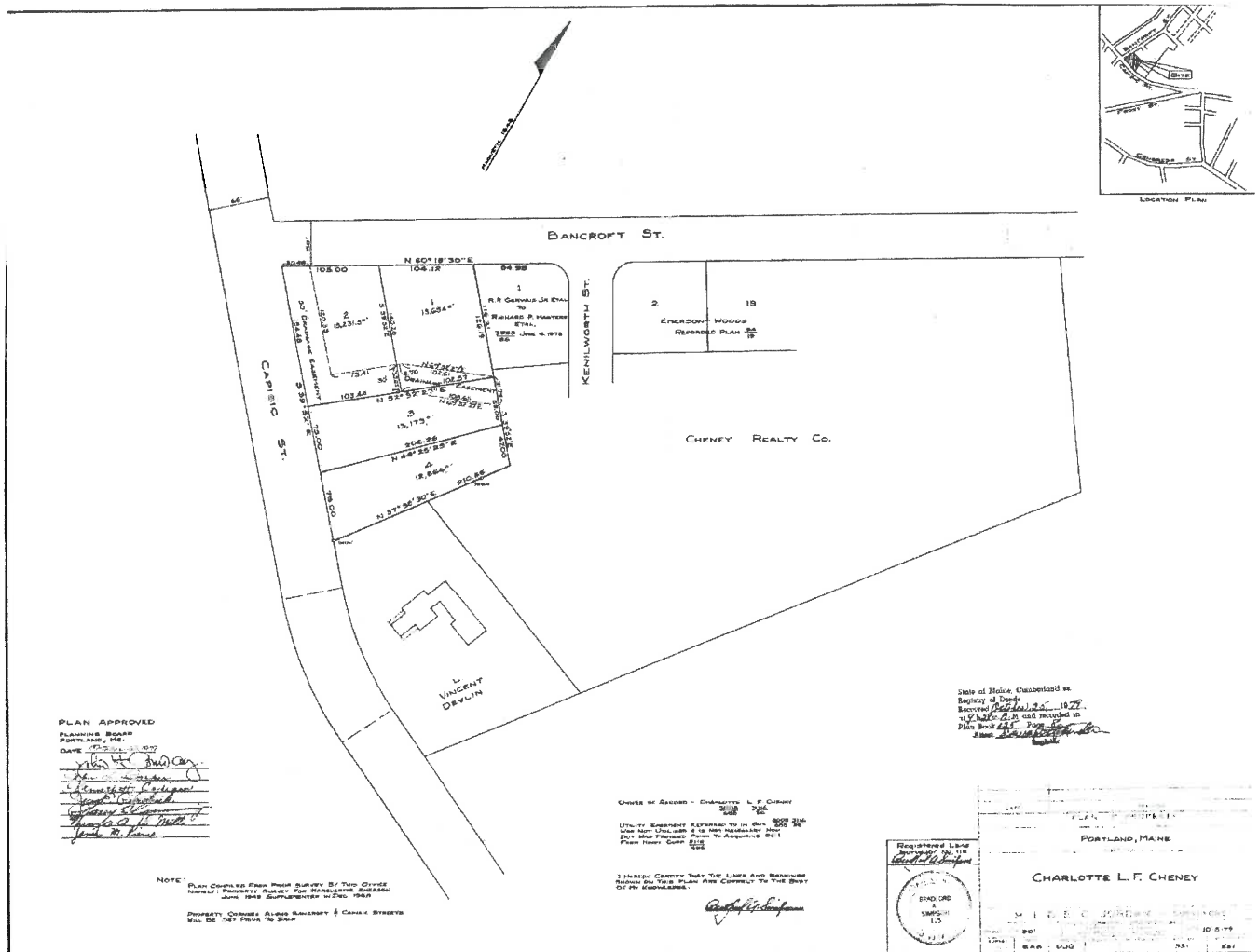


Figure 1
The 1979 Cheney Survey⁴

On the following page of this letter is an enlargement of the 1979 Cheney Survey providing a clearer view of the Abutting Lots and the "Drainage Easement" running through them:

⁴ A larger copy of Figure 1 is attached to this letter as Exhibit A.

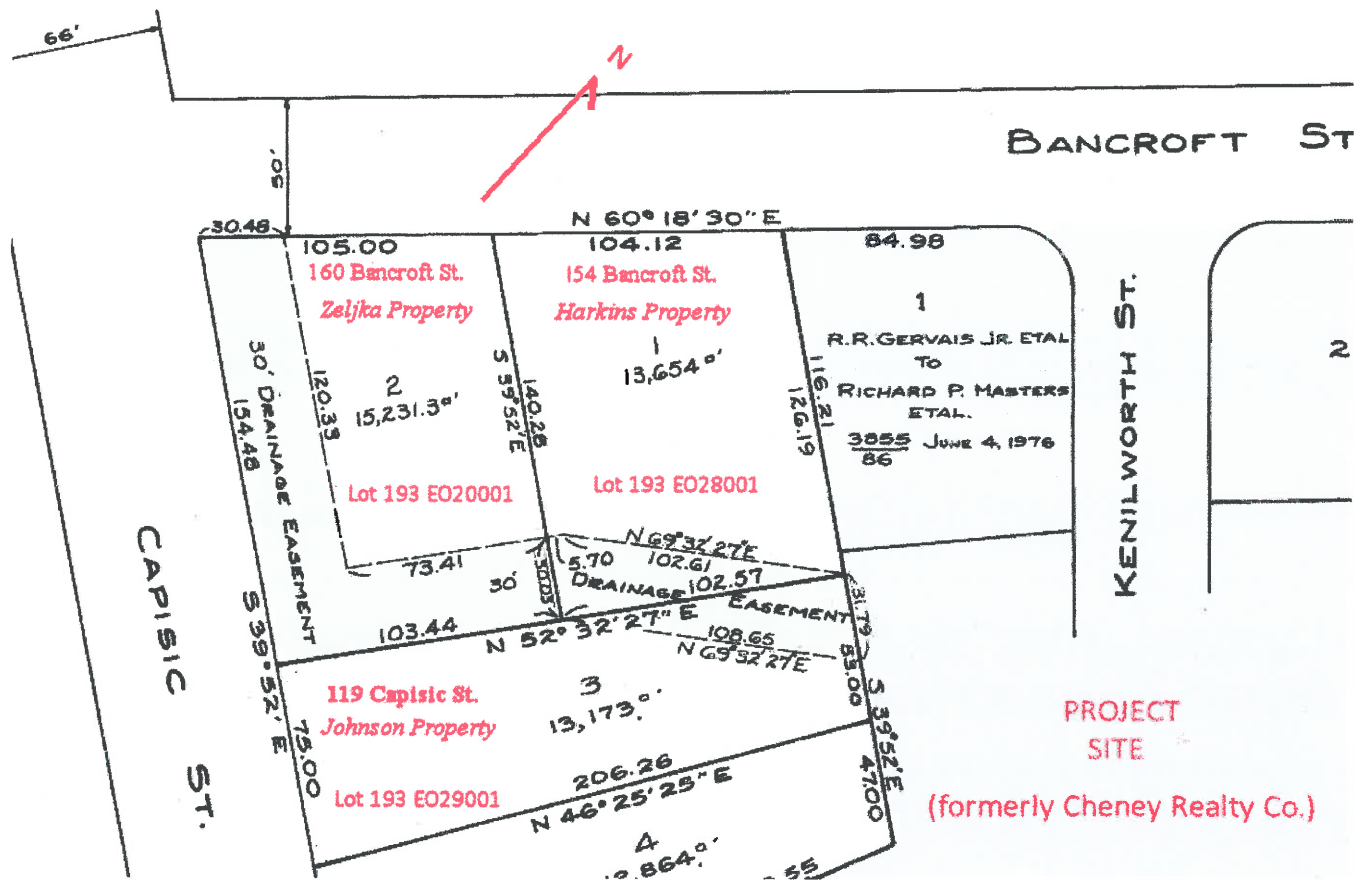


Figure 2

Enlargement of 1979 Cheney Survey Showing “Abutting Lots” and “Drainage Easement”⁵

In Figure 2 above, Lot 1 corresponds to the present Harkins Property, Lot 2 is the current Zeljka Property, and Lot E is now the Johnson Property. The Drainage Easement is shaded in green, while the present Project Site is shaded in blue.

D. The Drainage Easement Created Rights only in Cheney Realty – Not in the Abutters.

The only logical explanation for Charlotte L. F. Cheney’s creation of the Drainage Easement on the 1979 Cheney Subdivision was to specify a particular location for the broadly-worded utility easement that Cheney Realty had reserved over the Abutting Lots in

⁵ A larger copy of Figure 2 is attached to this letter as Exhibit B.

its deeds to Charlotte L. F. Cheney dated 1967 and 1970.⁶ Because stormwater crossing the Cheney Realty property has always flowed in a southwesterly direction toward Capisic Street, the Drainage Easement designated a particular route for the passage of stormwater from the Cheney Realty Property, across the Abutting Lots, to the intersection of Capisic and Bancroft Streets.⁷ The Drainage Easement could not have been intended for the benefit of the Abutting Lots, because stormwater from those lots likewise drains southwesterly towards Capisic Street rather than southeasterly toward the Cheney Realty Property. Moreover even if any stormwater on the Abutting Lots *had* flowed to the southeast, the Drainage Easement would have intercepted very little of the stormwater flowing across Lot 3, and *none* of the stormwater from Lot 4.

Charlotte L. F. Cheney married Thomas E. O'Boyle on August 3, 1979 and thereafter adopted the last name "O'Boyle." Charlotte O'Boyle first conveyed out Lots 1, 2, and 3 as shown on Figure 2 above in the following deeds:

Lot 1: Deed from Charlotte Cheney O'Boyle to Michael P. McLaughlin and Deborah J. McLaughlin, dated August 26, 1980 and recorded at the Cumberland County Registry of Deeds in Book 4652, Page 201;

Lot 2: Deed from Charlotte Cheney O'Boyle to Gerard D. Picard dated July 2, 1981 and recorded at the Cumberland County Registry of Deeds in Book 4813, Page 284; and

Lot 3: Deed from Charlotte Cheney O'Boyle to James T. King and Helen J. King dated May 29, 1985 and recorded at the Cumberland County Registry of Deeds in Book 6771, Page 17.⁸

⁶ As discussed above, Charlotte Cheney would have had a natural incentive to protect the interests of her father and grandfather, who were the Vice President and President of Cheney Realty Co., respectively.

⁷ *Capisic Meadows Subdivision, Bancroft Street, Portland Maine, Stormwater Management Report, May, 2018 Prepared for WB Group, Inc., by Northeast Civil Solutions, pp. 2-5; peer review comments in e-mail from Lauren Swett to Jean Fraser July 13, 2018. A culvert in the section of the Drainage Easement located on the southwesterly side of Lot 2 as shown in Figure 2 above discharges into a catch basin at the intersection of Capisic and Bancroft Streets.*

⁸ The Kings owned both Lot 3 and Lot 4 as shown on Figure 2 above. Charlotte Cheney O'Boyle had previously conveyed Lot 4 to the Kings by deed dated April 30, 1984 and recorded at the Cumberland County Registry of Deeds in Book 6437, Page 38. *See also* corrective deed of Lot 4 from O'Boyle to the Kings dated July 16, 1984 and recorded at the Cumberland County Registry of Deeds

All three of the above deeds contain language expressly rendering those conveyances subject to both the Drainage Easement shown on the 1979 Cheney Survey and all utility easements of record.⁹ Conversely, none of the above deeds conveys to the grantees any easement rights of any kind over the adjacent Cheney Realty Property, including any right to discharge water through the Drainage Easement onto the Cheney Realty Property. In short, under the deeds by which they were first conveyed, the Abutting Lots were burdened, but not benefited, by the Drainage Easement.

E. The Drainage Easement Benefits all Lots in the Project.

When the 1979 Cheney Survey was recorded, none of the land shown on that Survey as being owned by Cheney Realty Co., other than the “Emerson Woods” development, had been subdivided. However, under Maine law, an easement benefitting a previously undivided parcel also benefits any lots subsequently subdivided from that parcel. *Edwards v. Blackman*, 2015 ME 165, ¶ 37, 129 A.3d 971, 982; *Cleaves v. Braman*, 103 Me. 154, 161, 68 A. 857, 860 (1907). Therefore, the Drainage Easement is appurtenant to each of the eight lots proposed for the Project.

F. WB Group and/or an HOA Created by it May Maintain the Drainage Easement.

Finally, it is well settled that WB Group’s rights in the Drainage Easement include not only the right to discharge water through the Drainage Easement, but also to perform any maintenance or repairs within the Drainage Easement that are reasonably necessary to facilitate the flow of stormwater from the Project into the catch basin at the corner of Capisic and Bancroft Streets:

in Book 6508, Page 68. The deeds to Lot 4 make no reference to the Drainage Easement, nor do they grant the Kings any easement rights in the abutting Cheney Realty Property.

⁹ Lot 1: “This conveyance is made subject to a drainage easement shown on said [1979 Cheney Survey] plan and subject to utility easements of record.”

Lot 2: “This conveyance is made subject to drainage easement shown on said [1979 Cheney Survey] plan and subject to utility easements of record.”

Lot 3: “The above premises are conveyed subject to a drainage easement located at the Northeast corner thereof and as shown on the above mentioned [1979 Cheney Survey] Plan as recorded in the Cumberland County Registry of Deeds and subject to any and all rights and easement for utilities as may be of record.”

September 28, 2018

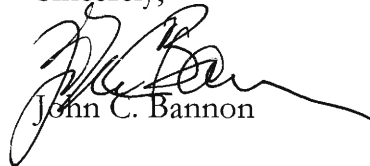
Page 8

As a general rule of interpretation and addition to those rights enumerated in the easement grant, the [grantee of an easement]...may take any action reasonably necessary to realize the full enjoyment of the right....Specifically, all rights necessary for the reasonable enjoyment of the enjoyment, such as *maintenance*, impliedly pass with the easement.

Hermansen & Richards, *Maine Roads and Easements* § 3.5.2 at 15-16 (2d ed. 2003) (emphasis added). “The unrestricted grant of an easement gives the grantee all such rights as are incidental or necessary to the reasonable and proper enjoyment of the easement.” *Beckwith v. Rossi*, 157 Me. 532, 536 (Me. 1961). See, e.g., *Gendron v. Central Maine Power Company*, 379 A.2d 1002, 1005 (Me. 1977) (utility pole easement held to include the right to spray vegetation located outside the bounds of the easement to prevent its invading the easement); *Ring v. Walker*, 87 Me. 550 (1895) (grant of a mill right includes authority to build and repair sluice by which lumber is supplied to the mill); *Hammond v. Woodman*, 41 Me. 177 (1856) (owner of a mill privilege has implied right to maintain and repair and maintain flume that supplies water to power the mill). With respect to the Drainage Easement, such maintenance rights would include the right to clear vegetation from the swales and to grade the Drainage Easement to the extent necessary to ensure positive drainage into the culvert leading to the catch basin at the corner of Capisic and Bancroft Streets. WB Group may either exercise those maintenance rights itself or else delegate that authority to an HOA by declaring the Drainage Easement a “common area” of the development and requiring the HOA to maintain it.

Thank you for your attention to this letter. I hope it has answered your questions, but if you have any others, please do not hesitate to contact me.

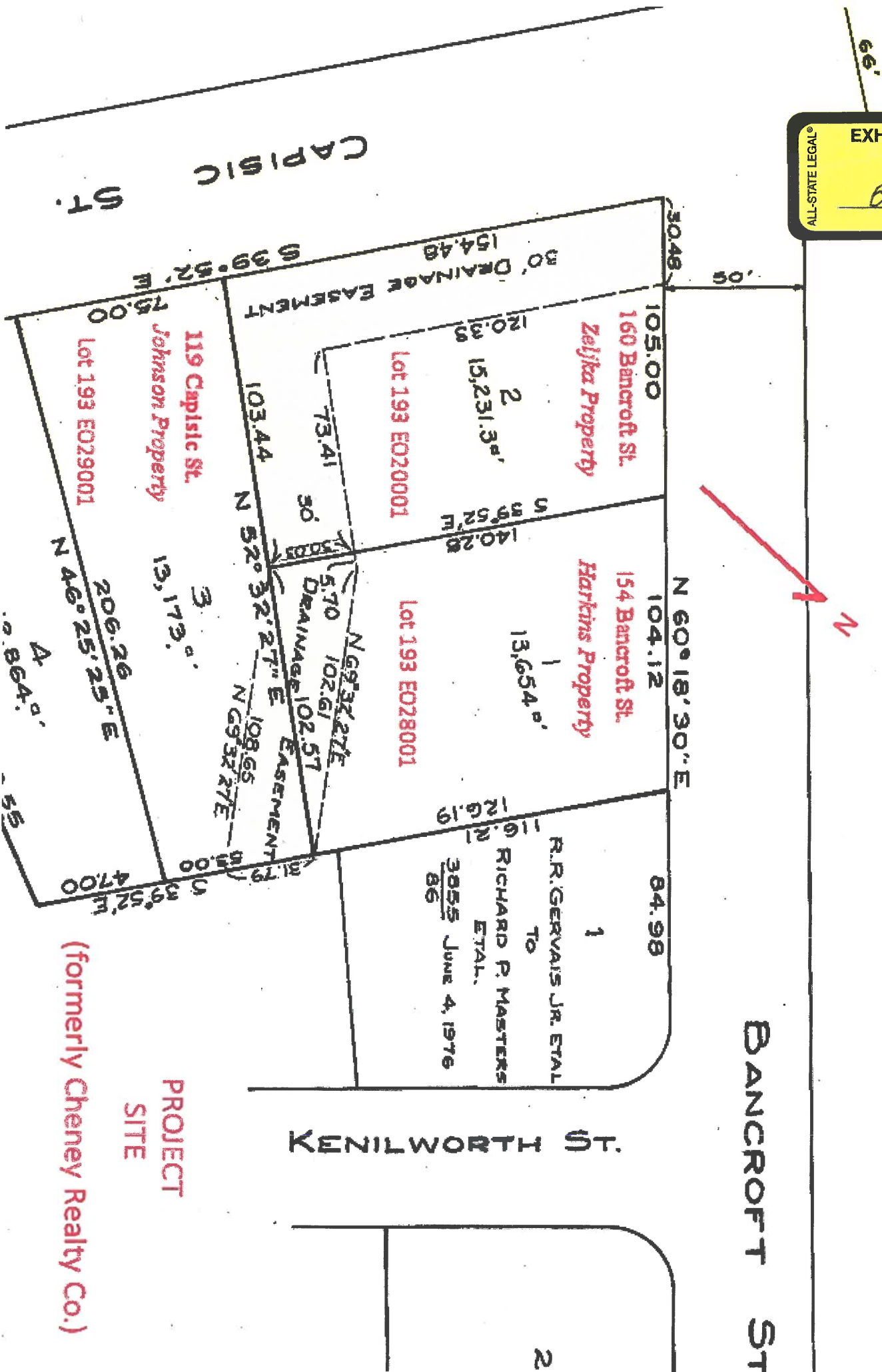
Sincerely,



John C. Bannon

JCB/kwm

cc: Josh Wagner
Jim Fisher, Northeast Civil Solutions





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September 7, 2018

Jean Fraser, Planner
City of Portland
389 Congress Street
Portland, ME 04101

RE: Staff Review Comments – 8 Lot Subdivision, 130 Bancroft Street Portland

Dear Jean:

We are writing to address review comments received from you via email on June 25, 2018, and subsequent emails and correspondence. Additionally, we are addressing comments received at the Planning Board workshop which was held on July 17, 2018. Your comments are indicated followed by our responses in bold.

Civil Engineering – Third Party Reviewer

1. The Applicant has submitted a copy of the NRPA Application to the DEP for proposed wetland fill. Copies of all final permit approvals should be forwarded to the City upon receipt.
The MDEP and the Army Corps of Engineers have approved the Tier I Wetland Fill permit application for the project. Copies of these permits are included with this submission.
2. The stormwater inspection and maintenance plan should include provisions for the requirements of Chapter 32 of the City of Portland Code of Ordinances, as well as inspection and maintenance requirements for the proposed Filterra Units and Detention Pond. Update the stormwater inspection and maintenance plan.
The Stormwater Inspection, Maintenance & Housekeeping plan has been updated in compliance with Chapter 32 of the City of Portland Code of Ordinances. Maintenance requirements for proposed Filterra Units and the detention pond have been included in the document. A revised copy of the plan is included with this submission.
3. The Applicant has stated that the lot impervious areas were included in the HydroCAD model, however the narrative report indicates that there will be 0.62-acres of new impervious area and the model indicates that there will be only 0.48-acres of new impervious area. Clarify the amount of impervious surface that has been modeled, and confirm that it includes all impervious surface anticipated to drain to the pond.

We have confirmed that the new impervious area for the project equals 0.65 acres. The HydroCAD model and the Stormwater Report have been updated to reflect this number. Impervious areas tributary to the pond have been included in the model. Updated HydroCAD output is included within the revised Stormwater report.

4. Note that the standard detail for Sidewalk Ramp Detectable Warning Panels was revised in October 2017. The acceptable material is now uncoated cast iron. Please revise the detail. **The sidewalk ramp detectable warning panel detail has been updated on the plans to reflect the October 2017 detail revision.**
5. The Grading and Drainage Plan indicates that SD-7 will be a 15-inch pipe, but the HydroCAD model indicates that it is 18-inches. The dimensions of the emergency spillway are also inconsistent between the plans and the model. The Applicant should clarify and ensure that the drawings and the model are consistent.
The Army Corps of Engineers (in reviewing the Tier I Wetland Impact Permit Application) had requested that all wetland crossing culverts be 36" wide and imbedded at least 6 inches. We have updated all the culverts in the wetland crossing areas to reflect a 36" pipe imbedded 1 foot. The pipe sizes have been updated on the pipe schedule on the plan set and in the HydroCAD model. A detail has been added to the plans to reflect this condition. The emergency spillway has been updated to reflect the HydroCAD model.
6. Proposed details include a "Type B Underdrain Installation Detail – Alternative A" that shows underdrain along the roadside edge under curbing; however, the proposed grading and drainage plan does not show locations or discharge points for proposed underdrain. Clarify the use of underdrain on the site
Underdrain locations have been identified on the plan set. Underdrains are proposed to either discharge into a proposed cross culvert or discharge directly to the site drainage way.
7. A construction management plan has not been provided. Provide a construction management plan using the City's template which is available online.
A general Construction Management Plan using the City's Template is included with this submission. We would request that this item be a Condition of Approval and submitted to the City for review once a site contractor has been selected.
8. All piping installation within the proposed roadway is required to be in conformance with the City's Technical Manual, Section 2 Sanitary Sewer and Stormdrain. This includes material types and installation. Note that the City of Portland requires HDPE stormdrain pipe to be ADS HP triple-wall pipe. Refer to figure II-12 for the typical pipe trench installation. Update the plans and details to be in conformance with the City's standards.
We have updated the pipe schedule to reflect the requirement for ADS HP triple-wall pipe. Additionally, we have added the City's II-12 Typical Pipe Trench Installation and Notes detail to our plan set.
9. We have reviewed the Grading and Drainage Plan, and there are a few areas where the grading is not detailed enough to show that water will not be directed towards the building

foundations. Specifically on Lots 5, 6, and 7. Additional spot grades are also recommended in the area between Lots 2 and 3, the area in front of Lot 4 and the area adjacent to the retaining wall at the edge of the detention pond to clearly define grading such that ponding will not occur. Provide updated Grading and Drainage Plan.

Spot grades have been added to the plans to clarify grading areas around the proposed structures. The retaining wall and pool have been removed from the plans as the pool will be removed as part of this project.

10. Filterra units are proposed for installation within the future City Right Of Way. The Applicant should discuss the maintenance of these systems with the City of Portland Department of Public works to determine if they will be maintained by the City or if maintenance will be required by the owners. In addition, a system of culverts extends through the site, both over private property and the City Right Of Way, to a stormwater pond that is located on private property. Responsibility of maintenance of all stormwater systems should be clearly established, and Stormwater Maintenance Agreements are required in conformance with the City's Chapter 32. Provide Stormwater Maintenance Agreements.

The maintenance of the proposed stormwater systems throughout the proposed development will be maintained by the proposed Capisic Meadows Homeowners Association. It will be the responsibility of all members of the Homeowners Association to ensure that all stormwater facilities are being maintained to work as designed. This includes culverts, detention pond, detention pond outlet structure and other stormwater infrastructure not accepted by the City. Draft Homeowners Association documentation and a draft Stormwater Drainage System Maintenance Agreement are included with this submission for the City to review.

Fire Department

11. All homes will be required to be sprinkled.
We have added a note to the Subdivision Plan indicating that all homes will be required to be sprinklered.
12. Fire Department access to all homes is acceptable.
No response required.
13. A 30 x 30 turnaround is required at the dead end of the road.
The turnaround has been drawn as 30 x 30.
14. The fire hydrant at the end of the road must be removed. No fire hydrant is required for this project.
The hydrant has been removed from the plans.

Additional Comments

(Received via email, June 29, 2018 & July 2, 2018)

15. It is very unusual to have the piping going through private property. This along with the neighbors issues and the scale of wetland fill raises questions and we would like to be sure we are all on the same page (or at least have options clarified with known pros and cons) before it goes to a PB Workshop.

The maintenance of the proposed stormwater systems, throughout the proposed development will be the responsibility of the proposed Capisic Meadows Homeowners Association. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are maintained and work as designed. Draft Homeowners Association documentation is included with this submission for City review.

16. Also we would like a site plan or lot layout/development and landscape plan (see example attached) that includes the driveways, buildable areas on the lots, key dimensions, and a sidewalk along the north side of the proposed new road- also think about tree saves as this would seem appropriate here.

An additional plan entitled, Site Layout, Landscape & Tree Save has been added to address the requirements indicated above. Building envelopes are indicated on the Subdivision Plan and additionally one story and two story setbacks are identified to show buildable areas. We have identified a sidewalk on the southern side of the proposed road and have submitted a waiver request for a sidewalk along the northerly side of the proposed road as there is no sidewalk in Bancroft Street. We have identified the clearing limits for the proposed development via pre and post construction tree lines on the project plans as well as call outs for tree saves on the plans. All trees larger than 10 inches in diameter have been survey located and have been added to the Boundary and Topographic survey plan.

17. The issue here is partly re the physical layout, and partly the question of who is going to be responsible for the stormwater system and all parts of it - while the City would accept the street, it would not take responsibility for the stormwater system that is not in the street. And if part of that system is under private properties, will each property be responsible for their section or what? So one of the discussion topics (with DPW present) was this question.

The maintenance of the proposed stormwater systems throughout the proposed development will be the responsibility of the proposed Capisic Meadows Homeowners Association. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are maintained to work as designed. A copy of the draft Homeowner's Association documentation is attached for review

18. Who will be responsible for the proposed stormwater system located within private lots; who will be responsible for the maintenance of the detention pond and the existing easement that will be used for drainage (I would note that the City would not normally take on any of this maintenance and there would need for formal agreements to clarify/confirm)

The maintenance of the proposed stormwater systems throughout the proposed development (including on private lots) will be the responsibility of the proposed Capisic Meadows Homeowners Association. It will be the responsibility of all members of the Homeowners Association to ensure all stormwater facilities are maintained to work as designed.

19. How will your system avoid flooding of neighbors properties (in view of the addition of impervious surfaces)

Please see the revised Stormwater Report and calculations (attached) explaining the proposed design, indicating that the proposed stormwater infrastructure will control the peak rate of runoff from the property with the use of a detention pond.

20. Regarding the sidewalk, the other engineers who provide comments on projects wanted the sidewalk on the other side as it impacts less wetland, is less impervious area, and it is on the side of the applicants house

NCS had met with Keith Gray and the City's 3rd party reviewer and spoken about the request that the sidewalk be located on the northerly side of the road and reached a conclusion that it would not be necessary to change the sidewalk location. The proposed design actually reduces impervious surface due to the fact that the sidewalk is shorter, not extending past the shared driveway between lots #6 and #7. Wetland impacts would remain the same whether the sidewalk was located on the northerly or southerly side of the proposed road due to grading associated with the roadway slopes and esplanade. Necessary grading on both sides of the road, no matter which side the sidewalk were located, would not allow for wetland fill to be reduced.

Abutter Concerns

21. Respond to the comments from neighbors that I have sent (not in detail, but to broad questions)

A proposed Stormwater Report, Traffic Study and DEP/Army Corps Wetland Fill Permit have been submitted in coordination with this project which addresses the broad spectrum of abutter concerns. We will be happy to discuss any outlying topics in further detail with the Planning Board. We have addressed the major concerns below.

- a. Stormwater

There is a major concern brought forth by abutters in the surrounding area of stormwater mitigation and the concern that their previously existing "wet" lots will be further affected by the proposed development. The concerns are addressed by the Stormwater Report and calculations provided within the original submission package. The design has taken into account both on-site and off-site watersheds which come in contact with the proposed development. As required by the City, the development is not allowed to increase the peak rate of runoff from the proposed project onto any abutting parcel. To control stormwater, a partially open and closed drainage system has been implemented throughout the development through a series of drainage ditches, culverts, and a detention pond. The proposed

impervious surface area created by the road will be treated via a Filterra System (or something approved equivalent by the City of Portland) and, along with all created stormwater, directed to a detention pond. The pond has been designed to meet the demands of a 25-year storm event, meanwhile drain within 24 hours after such storm event, eliminating the concern of standing water. Trash racks and chain link fencing have been incorporated into the pond design as additional safety features. Additionally, the stormwater report and calculations are being reviewed by the City's third party reviewer, Woodard and Curran.

b. Wetland Impacts

Wetland impacts have been minimized to the extent practical given the site layout. The MDEP and the Army Corps of Engineers have approved the Tier I Wetland Fill Permit Application for the project. Copies of those permits are attached for review.

c. Open Space

Even though a majority of the land used by the proposed residential development is existing undeveloped (lawn and woods) the land is private property. This land is not part of "Redlon Woods", nor is it part of the Portland Land Bank. The land has not been set aside and dedicated as "open space". As such, development is not restricted by an "open space" designation. The proposed design meets all necessary requirements for lot size and the development does not have an open space requirement that must be met for a traditional subdivision.

d. Underground Piping

A Boundary Survey, Existing Conditions Survey and a Topographic Survey have been conducted for the project area identifying all possible on site features that may affect the proposed project or the surrounding area. Additionally, we have looked at City infrastructure plans for Bancroft Street and Capisic Street. As such, we do not anticipate any unknown drainage piping crossing the property. Should any unknown pipes be encountered we will evaluate possible solutions to mitigate any effects these pipes may have on the proposed design. We will work with the City to resolve/re-route any drainage piping issues. All revised designs will need to be reviewed and approved by the City.

Additionally, we have spoken with the City Engineer regarding the presence of any unknown piping in the area. It is not anticipated that any unknown pipes will be encountered. Should any unknown pipes be encountered we will contact the City Engineer and work out a solution for re-routing those pipes.

e. Traffic

A Traffic Study conducted by Bill Bray, P.E. of Traffic Solutions was submitted providing information proving that the proposed development will have minimal effect on the existing traffic flows on Bancroft Street. The 6-7 daily trips, 7 per peak hour, will not overburden the existing right-of-way and will not require anything more than a stop bar and sign along the proposed intersection.

f. Site Layout

The proposed design meets the City's requirement for minimum lots size, frontage and building setbacks within the R-3 zone. We have also indicated setbacks for 1 & 1-1/2 story and 2 story houses on the plans to provide building envelopes for different types of structures.

g. Construction Time

At this point we do not know the time frame for construction of all the houses. It will depend on the housing market. There will be additional noise and disruption during the construction phase.

h. Redlon Park drainage

The Redlon Park development's runoff drains onto the property of the proposed development. We have made provisions in the layout, to allow this runoff to continue to flow across our property (via culverts and ditching) to the existing outlet point. Redlon Park is approximately 8-10 feet higher in elevation than the central portion of our site. As such we do not anticipate this development will affect the Redlon Park development.

i. Existing drainage easement

The parcels of land owned by Jacqueline Harkins, Dusko Rakovic & Zeljka Rakovic, and William F. Johnson & William R. Johnson, are subject to a 30' drainage easement as described in their respective property deeds and as shown on the original subdivision plan, recorded in Planbook 125, Page 8, that created their original parcel configurations. The proposed subdivision will create a Homeowners Association and it will be the responsibility of the Homeowners Association to maintain the 30' Drainage Easement. The City has requested that as part of the project the drainage easement area be cleared of existing vegetation and the ditch line re-graded to ensure positive flow to the pipe inlet. This work will be completed within the 30' drainage easement identified on the plans. A draft legal opinion, explaining the project's right to access and use this drainage easement area is attached for review.

j. Sewer System impacts

This project is proposing to connect into the public sewer system located in Bancroft Street. We are proposing a single new manhole on the existing sewer line for the connection to the City system. We do not anticipate a rat problem with this connection. We have submitted a Wastewater Capacity Application to the City of Portland Department of Public Works to accept these flows in the public system. Once we receive notification from the Department we will forward that information along to the Planning Department for review.

Next steps (Prior to Final Plan Submission) to Include:

Below are additional comments received during the Planning Board Workshop which was held on July 17, 2018.

22. Submit final Subdivision Plat that clarifies stormwater management system location and responsibilities and includes all dimensions (eg lot Frontage)
Included with this submission is an updated subdivision plan which shows dimensional requirements for the proposed lots, as well as the proposed stormwater pond area. A note has been added to the subdivision plan indicating that all stormwater infrastructure located outside of the right-of-way area shall be the responsibility of the Capisic Meadows Homeowners Association.
23. Submit documentation as to the rights and responsibilities in relation to the existing drainage easement being upgraded and utilized to drain the detention pond.
Attached with this submission is a draft legal opinion prepared by Murray Plumb and Murray indicating the applicant's rights to the existing drainage easement.
24. Clarify the mechanism (Homeowners Association) that will ensure future maintenance of the stormwater system.
Attached with this submission is draft Capisic Meadows Homeowners Association documentation which includes a Stormwater Drainage System Maintenance Agreement.
25. Submit further comparisons information to help determine the preferred location for the sidewalk
As previously mentioned the sidewalk as shown on the southern side of the proposed roadway will create slightly less impervious surface area than if it was located on the northerly side of the road. Wetland fill numbers will not be reduced if the sidewalk was moved to the northerly side of the road due to the roadway section and associated grading.
26. Submit a landscape plan to include tree saves based on a tree survey.
We have survey located all the trees larger than 10 inches in diameter. These trees have been added to our Boundary and Topographic survey plan within the plan set. We have added a Site Layout, landscape, and tree save to our plan set. This plan identifies the proposed new tree line as well as surveyed trees to be saved as part of the project.
27. Submit a copy of the MDEP determination that there is not a stream on the site.
Attached with this submission is the MDEP field determination form that indicates that there are no streams on the property.
28. Clarify regarding street lighting.
We have added street lighting to the site plan in accordance with the City of Portland Technical Manual section 10 – Municipal Street Lighting Standards.

29. Provide final figures for existing and proposed areas of wetlands and impervious surfaces, and complete zoning assessment.

Wetland numbers, impervious surface numbers and the zoning assessment have been added to the subdivision plan.

30. Address the staff review memo and Planning Board comments.

Please see comment responses attached.

Planning Board Comments:

Tree saves and tree survey.

31. **We have survey located all the trees larger than 10 inches in diameter. These trees have been added to our Boundary and Topographic survey plan within the plan set. We have added a Site Layout, landscape, and tree save to our plan set. This plan identifies the proposed new tree line as well as surveyed trees to be saved as part of the project.**

32. Annual stormwater maintenance costs.

Stormwater maintenance for the detention pond and culverts should be fairly simple once vegetation is established. This would include mowing the pond area twice a year and removing grass clippings, leaves sticks etc. from the pond so the outlet structure does not clog. Removing any debris from culvert ends that would potentially clog culverts. Removing any woody vegetation that begins to regrow in the drainage easement area, pond etc.

If you have any questions or require any additional information please let us know

Sincerely,

Northeast Civil Solutions, Inc.



Anthony P. Panciocco
Senior Project Engineer

**STORMWATER DRAINAGE SYSTEM
MAINTENANCE AGREEMENT**

For SUBDIVISIONS

IN CONSIDERATION OF the site plan and subdivision approval granted by the Planning Board of the City of Portland to the proposed CAPISIC MEADOWS SUBDIVISION (project number _____) shown on the Subdivision Plat (Exhibit A) recorded in Cumberland Registry of Deeds in Plan Book ____, Page ____ submitted by Northeast Civil Solutions, and associated **Grading, Drainage & Erosion Control Plan (insert correct name of plan)** (Exhibit B) prepared by Northeast Civil Solutions (engineer/agent) of 381 Payne Road, Scarborough, Maine 04074 dated _____ and pursuant to a condition thereof, **CAPISIC MEADOWS HOMEOWNER’S ASSOCIATION**, a Maine non-profit corporation with a place of business in the City of Portland, County of Cumberland and State of Maine, and having a mailing address of c/o Wagner, 130 Bancroft Street, Portland, Maine 04102 (the “HOA”), does hereby agree, for itself, its successors and assigns, as follows:

Maintenance Agreement

That it, its successors and assigns, will, at its own cost and expense and at all times in perpetuity, maintain in good repair and in proper working order the drainage swale and detention pond, (hereinafter collectively referred to as the “Stormwater System”), as shown on the Plan attached as Exhibit B and in strict compliance with the approved **Stormwater Maintenance and Inspection Agreement** prepared for the HOA by Northeast Civil Solutions (copy attached as Exhibit C) and Chapter 32 of the Portland City Code. The HOA is owner of the Stormwater System and related property by virtue of a deed dated _____, 2018 and recorded in the Cumberland County Registry of Deeds at Book ____, Page ____ (the “Property”).

The HOA further agrees, at its own cost, to keep a Stormwater Maintenance Log. Such log shall be made available for inspection by the City of Portland upon reasonable notice and request.

Said agreement is for the benefit of the said City of Portland and all persons in lawful possession of said premises and abutters thereto; further, that the said City of Portland may enforce this Agreement by an action at law or in equity in any court of competent jurisdiction; further, that after giving the HOA written notice and a stated time to perform, the said City of Portland, by its authorized agents or representatives, may, but is not obligated to, enter upon said premises to maintain, repair, or

replace the Stormwater System in the event of any failure or neglect thereof, the cost and expense thereof to be reimbursed in full to the said City of Portland by the HOA upon written demand. Any funds owed to the City under this paragraph shall be secured by a lien on the Property.

This Agreement shall also not be construed to allow any change or deviation from the requirements of the subdivision and/or site plan most recently and formally approved by the Planning Board of the City of Portland.

This agreement shall bind the undersigned only so long as it retains any interest in the Property, and shall run with the land and be binding upon the HOA's successors and assigns as their interests may from time to time appear.

The HOA agrees to record a copy of this Agreement in the Cumberland County Registry of Deeds within thirty (30) days of final execution of this Agreement. The HOA further agrees to provide a copy of this Agreement to any successor or assign and to forward to the City an Addendum signed by any successor or assign in which the successor or assign states that the successor or assign has read the Agreement, agrees to all its terms and conditions and the successor or assign will obtain and forward to the City's Department of Public Services and Department of Planning and Urban Development a similar Addendum from any other successor or assign.

For the purpose of this agreement and release "HOA" is any person or entity who is a successor or assign and has a legal interest in part, or all, of the Property. The real estate shown by chart, block and lot number in the records on file in the City Assessor's office shall constitute "the property" that may be entered by the City and lienied if the City is not paid all of its costs and charges following the mailing of a written demand for payment to the HOA pursuant to the process and with the same force and effect as that established by 36 M.R.S.A. §§ 942 and 943 for real estate tax liens.

Any written notices or demands required by this Agreement shall be complete on the date the notice is mailed by certified mail, return receipt requested and ordinary mail to the HOA to its

registered agent of record at the time such notice is given. The failure to receive any written notice required by this Agreement shall not prevent the City from entering the Property and performing maintenance or repairs on the Stormwater System, or any component thereof, or lien-ing it or create a cause of action against the City.

Dated at Portland, Maine this _____ day of _____, 2018.

WITNESS:

CAPISIC MEADOWS HOMEOWNER'S
ASSOCIATION

By _____
Joshua Wagner
Its President

STATE OF MAINE
CUMBERLAND, ss.

_____, 2018

Personally appeared the above-named Joshua Wagner, in his said capacity, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said homeowner's association.

Before me,

Notary Public/Attorney at Law

Print name: _____

Exhibit A: Subdivision Plat as recorded

Exhibit B: Approved Grading and Drainage Plan (*name of the plan showing the Stormwater System in detail*)

Exhibit C: Approved Stormwater Maintenance and Inspection Agreement

WGNR003/1216288

BYLAWS
OF
CAPISIC MEADOWS
HOMEOWNER'S ASSOCIATION

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BYLAWS
OF
CAPISIC MEADOWS
HOMEOWNER'S ASSOCIATION

ARTICLE I

Section 1. Purpose of Association. The purpose of the Capasic Homeowner's Association is to perpetually maintain in good repair and proper working order the drainage swale and detention pond (hereinafter collectively referred to as the "Stormwater System") that serves the Capasic Meadows Subdivision , and to fulfill the ongoing obligations of the Association under that certain Stormwater Drainage System Maintenance Agreement between the Association and the City of Portland, Maine, dated August ____, 2018 (the "Stormwater Agreement").

Section 2. Applicability of Bylaws. The provisions of these Bylaws are applicable to all members of the Capasic Meadows Homeowner's Association (hereinafter called the "Association"), which include Lots 1 through 8 of the Capasic Meadows Subdivision plan, as recorded in Cumberland Registry of Deeds in Plan Book ____, Page _____. The Association is owner of the Stormwater System and related property by virtue of a deed dated _____, 2018 and recorded in the Cumberland County Registry of Deeds at Book ____, Page ____ (the "Property").

Section 3. "Member" Defined. The membership of the Association shall consist of all owners of record of the lots within the Capasic Meadows Subdivision, as they may

be from time to time. Membership shall cease automatically upon recorded transfer or sale by any member of his/her lot.

Section 4. Application. All present and future members, lessees and occupants of the structures and the employees and any other persons who may use the facilities of the area designated as the Property in any manner are subject to these Bylaws, and to any rules and regulations established by the Board of Directors of the Association (the "Board of Directors" or "Board") as hereinafter set forth. The acceptance of a deed of conveyance or the entering into of a lease or the act of occupancy of a member's property by any of the foregoing persons shall constitute an agreement that these Bylaws and the rules and regulations as they may be amended from time to time, are accepted, ratified and will be complied with.

Section 5. Office. The Principal office of the Association and the Board of Directors shall be located at c/o Wagner, 30 Bancroft Street, Portland, Maine, or at such place as the Board of Directors may designate from time to time.

ARTICLE II

Board of Directors

Section 1. Board of Directors. Until the first meeting, the affairs of the Association shall be governed by a Board of Directors consisting of three (3) persons elected by the developer of the Capisic Meadows subdivision, WB Group Inc., who need not be lot owners. Thereafter, the affairs of the Association shall be governed by a Board of Directors elected by the members, initially comprised of three persons, and as

increased or decreased at any annual meeting by a majority vote, within the limits of the Articles of Incorporation of the Association. Each such Director shall be the owner or the spouse of an owner of a lot, or if an owner shall be an entity, then the Director shall be an officer, partner, member, trustee or beneficiary thereof. The Directors shall be entitled to one vote each.

Section 2. Powers and Duties. The Board of Directors shall have the powers and duties necessary for the administration of the affairs of the Association and shall do all such acts and things except those which by law or by these Bylaws may not be delegated to the Board of Directors by the members. Such powers and duties of the Board of Directors shall include, but shall not be limited to, the following:

- (a) Operation, care, upkeep and maintenance of the Property.
- (b) To fulfill the obligations under the Stormwater Agreement.
- (c) Determination of the common expenses required for the affairs of the Association including, without limitation, the operation and maintenance of the Property and the fulfillment of the Associations obligations under the Stormwater Agreement.
- (d) Collection of the common charges from the members.
- (e) Employment and dismissal of the personnel necessary for the maintenance, operation, repair and replacement of the common areas and facilities.
- (f) Adoption and amendment of rules and regulations covering the details of the operation and use of the Property.

- (g) Opening of bank accounts on behalf of the association and designating the signatories required therefor.
- (h) Making of repairs, additions and improvements to or alterations of the Property and repairs to and restoration of the Property in accordance with the other provisions of these Bylaws, after damage or destruction by fire or other casualty, or as a result of condemnation or eminent domain proceedings.

Section 3. Managing Agent and Manager. The Board of Directors may employ for the Association a managing agent or a manager at a compensation established by the Board of Directors to perform such duties and services as the Board of Directors shall authorize, including but not limited to the duties listed in subdivisions (a), (b), (d), (e) and (h) of Section 2.02.

Section 4. Regular Meetings. Regular meetings of the Board of Directors may be held at such time and place as shall be determined from time to time by a majority of the members of the Board of Directors, but at least one (1) such meeting shall be held during each fiscal year to elect the officers of the Association and to transact such other business as may be necessary. Notice of regular meetings of the Board of Directors shall be given to each member of the Board of Directors, by mail, telephone or telegraph, at least five (5) business days prior to the day named for such meeting.

Section 5. Special Meetings. Special meetings of the Board of Directors may be called by the President on three (3) business days' notice to each member of the Board of

Directors, given by telephone or telegraph, or on five (5) business days' notice given by ordinary first-class mail, which notice shall state the time, place and purpose of the meeting. Special meetings of the Board of Directors shall be called by the President or Secretary in like manner and on like notice on the written request of at least three (3) members of the Board of Directors.

Section 6. Waiver of Notice. Any member of the Board of Directors may at any time waive notice of any meeting of the Board of Directors in writing, and such waiver shall be deemed equivalent to the giving of such notice. Attendance by a member of the Board of Directors at any meeting of the Board shall constitute a waiver of notice by him or the time and place thereof. If all the members of the Board of Directors are present at any meeting of the Board, no notice shall be required and any business may be transacted at such meeting.

Section 7. Quorum of Board of Directors. At all meetings of the Board of Directors, seventy percent (70%) of the voting interests thereof shall constitute a quorum for the transaction of business, and the votes of a seventy percent (70%) of the voting interest of the Board of Directors present at a meeting at which a quorum is present shall constitute the decision of the Board of Directors. If at any meeting of the Board of Directors there shall be less than a quorum present, a majority of those present may adjourn the meeting from time to time. At any such adjourned meeting at which a quorum is present any business which might have been transacted at the meeting originally called may be transacted without further notice.

Section 8. Informal Action by Board of Directors. Any action required to be taken at a meeting of the Board of Directors or any other action which may be taken at a meeting of the Board of Directors, may be taken without a meeting if a consent in writing setting forth the action so taken shall be signed by all of the members of the Board of Directors entitled to vote with respect to the subject matter thereof.

Section 9. Compensation. No member of the Board of Directors shall receive any compensation from the Association for acting as a director, except that members of the Board of Directors may be reimbursed for expenses they incur in connection with their services of Directors, as the Board may from time to time determine.

Section 10. Liability of the Board of Directors. The members of the Board of Directors shall not be liable to the members for any mistake of judgment, negligence, or otherwise, except for their own individual willful misconduct or bad faith. The unit owners shall indemnify and hold harmless each of the members of the Board of Directors against all contractual liability to others arising out of contracts made by the Board of Directors on behalf of the Association unless any such contract shall have been made in bad faith or contrary to the provisions of these Bylaws. It is intended that the members of the Board of Directors shall have no personal liability with respect to any contract made by them on behalf of the Association. It is also intended that the liability of any member arising out of any contract made by the Board of Directors or out of the aforesaid indemnity in favor of the members of the Board of Directors shall be limited to such proportion of the total liability thereunder as his interest in the common areas and

facilities bears to the interests of all the unit owners in the common areas and facilities. Every agreement made by the Board of Directors or by the managing agent or by the manager on behalf of the Association shall provide that the members of the Board of Directors, or the managing agent, or the manager, as the case may be, are acting only as agents for the members and shall have no personal liability thereunder (except as unit owners), and that each unit owner's liability thereunder shall be limited to such proportion of the total liability thereunder as his interest in the common areas bears to the interests of all members in the common areas, provided, however, the failure to so provide will not invalidate such agreement.

Section 11. Fiscal Year. The fiscal year of the Association shall be the calendar year.

ARTICLE III

Members

Section 1. Annual Meetings. The first meeting of the members shall be held, at the call of the developer, WB Group, Inc., within 30 days after the closing of sales of 90% of the lots in the Capisic Meadows subdivision. Thereafter, the annual meeting of the members to appoint the Directors for the following year shall be held each year on the second Tuesday of April, or, in the event that day is a legal holiday, then on the first day thereafter which is not a holiday.

Section 2. Parliamentary Procedure. At all meetings of the members or of the Board of Directors, Roberts' Rules of Order, as then amended, shall be followed, except in the event of conflict, in which case these Bylaws shall prevail.

Section 3. Proxies. Votes may be cast in person or by proxy. Proxies must be filed with the Secretary at or before the time of each meeting. A member or Director may designate any person, who need not be an owner, to act as proxy. The designation of any such proxy shall be made in writing, signed by the member or Director and shall be revocable at any time by written notice to the Secretary by the person designating the proxy.

ARTICLE IV

Officers

Section 1. Designation. The principal officers of the Association shall be the President, Vice President, the Secretary, Clerk, and the Treasurer, all of whom shall be elected by the Board of Directors. The Board of Directors may appoint an Assistant Treasurer, an Assistant Secretary and such other officers as in its judgment may be necessary.

Section 2. Election of Officers. The officers of the Association shall be elected annually by the Board of Directors at the annual meeting of the Board of Directors and shall hold office at the pleasure of the Board of Directors.

Section 3. Removal of Officers. Upon the affirmative vote of a majority of the members of the Board of Directors, any officer may be removed, either with or without

cause, and his successor may be elected at any regular meeting of the Board of Directors or at any special meeting of the Board of Directors called for that purpose.

Section 4. President. The President shall be the chief executive officer of the Association. He shall preside at all meetings of the members and of the Board of Directors. He shall have all of the general powers and duties which are incident to the office of president of a non-profit corporation organized under the laws of the State of Maine, including but not limited to the power to appoint committees from among the members from time to time as he may in his discretion decide is appropriate to assist in the conduct of the affairs of the Association.

Section 5. Vice President. The Vice President shall take the place of the President and perform his duties whenever the President shall be absent or unable to act. If neither the President nor the Vice President is able to act, the Board of Directors shall appoint some other member of the Board of Directors to act in the place of the President, on an interim basis. The Vice President shall also perform such other duties as shall from time to time be imposed upon him by the Board of Directors or by the President.

Section 6. Secretary. The Secretary shall keep the minutes of all meetings of the members and of the Board of Directors; he shall have charge of such books and papers as the Board of Directors may direct; and he shall, in general, perform all the duties incident to the office of secretary of a non-profit corporation organized under the laws of the State of Maine.

Section 7. Treasurer. The Treasurer shall have the responsibility for Association funds and securities and shall be responsible for keeping full and accurate financial records and books of accounts showing all receipts and disbursements and for the preparation of all required financial data. He shall be responsible for the deposit of all monies and other valuable effects in the name of the Association, or the managing agent, in such depositories as may from time to time be designated by the Board of Directors, and he shall, in general, perform all the duties incident to the office of Treasurer of a non-profit corporation organized under the laws of the State of Maine.

Section 8. Agreements, Contracts, Checks, etc. All agreements, contracts, checks and other instruments of the Association shall be executed by two officers of the Association or by such other person or persons as may be designated by the Board of Directors.

Section 9. Compensation of Officers. No officer shall receive any compensation from the Association for acting as such, except that officers may be reimbursed for expenses incurred by them for their services as officers of the Association, as the Board of Directors may from time to time determine.

ARTICLE V

Operation of the Association

Section 1. Determination of Common Expenses and Fixing of Common Charges. The Board of Directors shall from time to time, and at least annually, prepare a budget for the Association, determine the amount of the common charges payable by the

members to meet the common expenses of the Association, and allocate such common charges among the members according to their proportionate share. A proportionate share shall be one (1) share for each lot, so that all lot owners share equally, whether or not a lot has a residence thereon. The common expenses shall include, among other things, (a) the costs of the repairs and maintenance of the Property (b) the cost of fulfilling the Association's obligations under the Sotrmwater Agreement and (c) such amounts as the Board of Directors may deem proper for the operation and maintenance of the Property, including, without limitation, an amount for working capital for the Association, for a general operating reserve, for a reserve fund for replacements, and to make up any deficit in the common expenses for any prior year. Seven days prior to adoption of any proposed budget for the Association, the Board of Directors shall provide a written summary of the budget to all members.

Section 2. Payment of Common Charges. All members shall be obligated to pay the common charges assessed by the Board of Directors pursuant to the provisions of Section 1. No member shall be liable for the payment of any part of the common charges assessed against his property subsequent to a sale, transfer or other conveyance by him of such property, together with the appurtenant interests. No institutional mortgage shall be liable for the payment of common charges.

Section 3. Collection of Assessments; Liens. The Board of Directors shall take prompt action to collect any common charge due from any members which remain unpaid for more than thirty (30) days from the due date for payment thereof. A late

charge equal to five (5%) percent of the common charge due shall be assessed against each lot owner for any common charges not paid within thirty (30) days from the due date for every month such common charge remains unpaid. The total common charge and late payment fees assessed with respect thereto shall, until fully paid, constitute a lien against the lot in favor of the Association. Such lien shall be prior to all liens and encumbrances on a lot except for a first mortgage recorded before or after the date which the assessment sought to be enforced becomes delinquent and liens for real estate taxes and other governmental assessments or charges against the lot. The lien for the common charges may be enforced and foreclosed by the Association in like manner as a mortgage on real estate or by any other means presently or hereafter provided by law or in equity. A suit to recover a money judgment for unpaid common charges including late payment fees may be maintained against the lot owner personally without foreclosing or waiving the lien securing such common charge and a foreclosure may be maintained notwithstanding the pendency of any suit to recover a money judgment.

Section 4. Statement of Common Charges. The Board of Directors shall promptly provide any member requesting in writing a recordable statement setting forth the amount of unpaid assessments currently levied against such member property.

Section 5. Abatement and Enjoinment of Violations by Unit Owners. The violation of any rule or regulation adopted by the Board of Directors, or the breach of any Bylaw contained herein, shall give the Board of Directors the right, in addition to any other rights set forth in these Bylaws:

(a) To enjoin, abate or remedy by appropriate legal proceedings, either at law or in equity, the continuance of any such breach at the cost, including attorney's fees, of such member;

(b) If the Board of Directors has adopted and published rules and regulations governing the use the Stormwater System and the personal conduct of any person thereon violates those rules and regulations, to suspend such use by any such person for violation of such rules and regulations for a period not to exceed thirty (30) days for any single violation.

Section 6. Maintenance and Repairs. All maintenance, repairs and replacements to the Property shall be made by the Board of Directors and be charged to all the members as a common expense.

ARTICLE VI

Records

Section 1. Records and Audits. The Board of Directors or the managing agent shall keep detailed records of the actions of the Board of Directors and the managing agent, minutes of the meetings of the Board of Directors, and financial records and books of account for the Association.

Section 2. Statement. A written report summarizing all receipts and expenditures of the Association shall be rendered by the Board of Directors to all members at least annually.

ARTICLE VII

Miscellaneous

Section 1. Notices. All notices hereunder shall be sent registered or certified mail to the Board of Directors, in care of the managing agent, or if there be no managing agent, to the office of the Board of Directors or to such other address as the Board of Directors may hereafter designate from time to time by notice in writing to all members and to all mortgagees of units. All notices to any unit owner shall be sent by ordinary prepaid mail to the unit address or to such other address as may have been designated by them from time to time, in writing, to the Board of Directors. All notices to mortgagees of units shall be sent by ordinary prepaid mail to their respective addresses, as designated by such unit owner from time to time, in writing, to the Board of Directors. All notices shall be deemed to have been given when mailed, except notices of change of address which shall be deemed to have been given when received.

Section 2. Invalidity. The invalidity of any part of these Bylaws shall not impair or affect in any manner the validity, enforceability or effect of the balance of these Bylaws.

ARTICLE VIII

Amendments to Bylaws

These Bylaws may be altered, amended or added to at any duly called meeting of members, provided: (1) that the notice of the meeting shall contain a full statement of the proposed amendment; and (2) that the amendment shall be approved by at least 75% of

the total votes in the Association. However, so long as any portion of the Property is served by the Stormwater System, no amendment or termination of these Bylaws relating to the repair, replacement, operation or funding of the Stormwater System shall be effective unless approved by the Town of Portland Planning Board.

ARTICLE IX

Dissolution

Upon dissolution or final liquidation of the Association, all assets of the Association shall become the sole and exclusive property of the then existing members of the Association in proportion to their respective membership interests.

END

41041

October 3, 2018

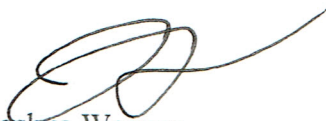
Jean Frasier, Planner
City of Portland
389 Congress Street
Portland, ME 04101

Re: Capisic Woods Development (off of Bancroft Road)

Dear Jean:

I, Joshua Wagner, as developer of the residential subdivision project known as Capisic Meadows, upon your approval by the Planning Board of the proposed development, intend to give the city the fee interest in the entirety of the new street as part of the petition for it to be accepted as a public street.

Sincerely,



Joshua Wagner



Jean Fraser <jf@portlandmaine.gov>

RE: Survey lacks info and not clear you have RTi- Bancroft

1 message

Jim Fisher <jim.fisher@northeastcivilsolutions.com>

Tue, Oct 2, 2018 at 3:59 PM

To: Jean Fraser <jf@portlandmaine.gov>

Cc: Brandon Binette <brandon.binette@northeastcivilsolutions.com>, Tony Panciocco <tony.panciocco@northeastcivilsolutions.com>

Jean—

Regarding your questions/statements below: the city has no record of ever accepting Kennilworth Street (which was always a paper street only), but even if it did the 1997 Order vacated it by default of not including it in the list of paper streets being excepted from vacation. We do not show the stub of Kennilworth Street on the plan because it does not apply. Both Wagner and Doiron (current property owners on either side of the Kennilworth ROW) are the two parties involved in this development, and the P&S from Doiron to Wagner giving Wagner full ownership of all lands of Doiron (except his actual house lot) is attached. Any people with lots in the “old subdivision” referred to below (PB 94/ Pg 19) are those with properties along Bancroft Street. Any rights they may have to the paper street portion of Kennilworth ends at the back of the lots of N/F Wagner and Doiron (the paper street never, on any previous plan that we have seen, is shown to extend further back than this). And given that this same area of Kennilworth is to be a public street in this new development, I don’t see any issues. The only people with any rights in the Kennilworth paper “stub” are Wagner and Doiron, and Doiron’s P&S to Wagner shows that he is selling to Wagner all of his interest in the land he owns (including Kennilworth, but excluding his house lot) to Wagner. I think this addresses your questions/concerns; please contact us if you have anything further. JIM

From: Tony Panciocco**Sent:** Tuesday, October 02, 2018 8:13 AM**To:** Jean Fraser; Brandon Binette**Cc:** Jim Fisher**Subject:** RE: Survey lacks info and not clear you have RTi- Bancroft

Jean,

I will pass this along to our surveyors for review.

Thanks

Tony

From: Jean Fraser [mailto:jf@portlandmaine.gov]**Sent:** Monday, October 01, 2018 4:48 PM**To:** Brandon Binette**Cc:** Tony Panciocco; Jim Fisher**Subject:** Survey lacks info and not clear you have RTi- Bancroft

Hello Brandon

My DPW Surveyor and Associate Corporation Counsel have just noticed that the submitted boundary survey and plat do not clarify what happened when Kenilworth was vacated, and that may have implications for making the street a public street in the future. They have commented:

- The first section of this street is labeled as Kenilworth Street on Plan Book 125 Page 8. That street has apparently been vacated by omission from the 1997 Order Excepting Streets From Deemed Vacation in Deed Book 13326 Page 19. I'm not sure how this affects this project but there's a chance that the land owners for Lot A and the Doiron property may have rights to the portion of the vacated street that abuts their property. Therefore, those land owners may need to be involved in the offer of this new street to the City as a public way. I've attached a copy of Bill Clark's research summary into the status of this street for your review and use.
- The submitted boundary plan doesn't even show the former location of Kenilworth at all. I think they should have because I believe Doiron has rights extending to the center line of the former street, and the other lots in the old subdivision (PB 94 PG 19) could still have easement rights across the vacated street's location. It does look like Doiron is also listed as one of the owners of the property in the title block of the NCS boundary plan. But the plan seems to show Doiron owning part of the back lot, not half of the former street location.
- If the subdivision plan proposes to dedicate the street, the applicant will need to show sufficient right title and interest to do that - either because the developer owns the whole width of the road in fee or has offered a deed dedicating the whole of the road and signed by all with property rights in the road.

Perhaps you have some way to address this that I can forward to my colleagues?

Thank you

Jean

PS I have some more detailed surveyor comments on the plat but the above is more important now (ie for hearing) as its a RTI issue.

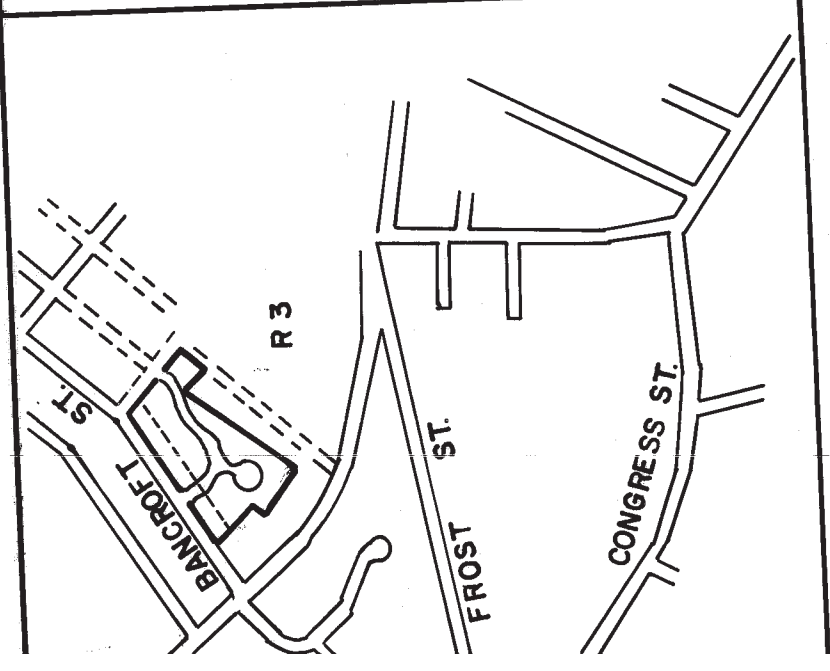
Jean Fraser, Planner

Planning & Urban Development Department

City of Portland
389 Congress Street
Portland, ME 04101
phone: (207) 874-8728

email: jf@portlandmaine.gov

93	42
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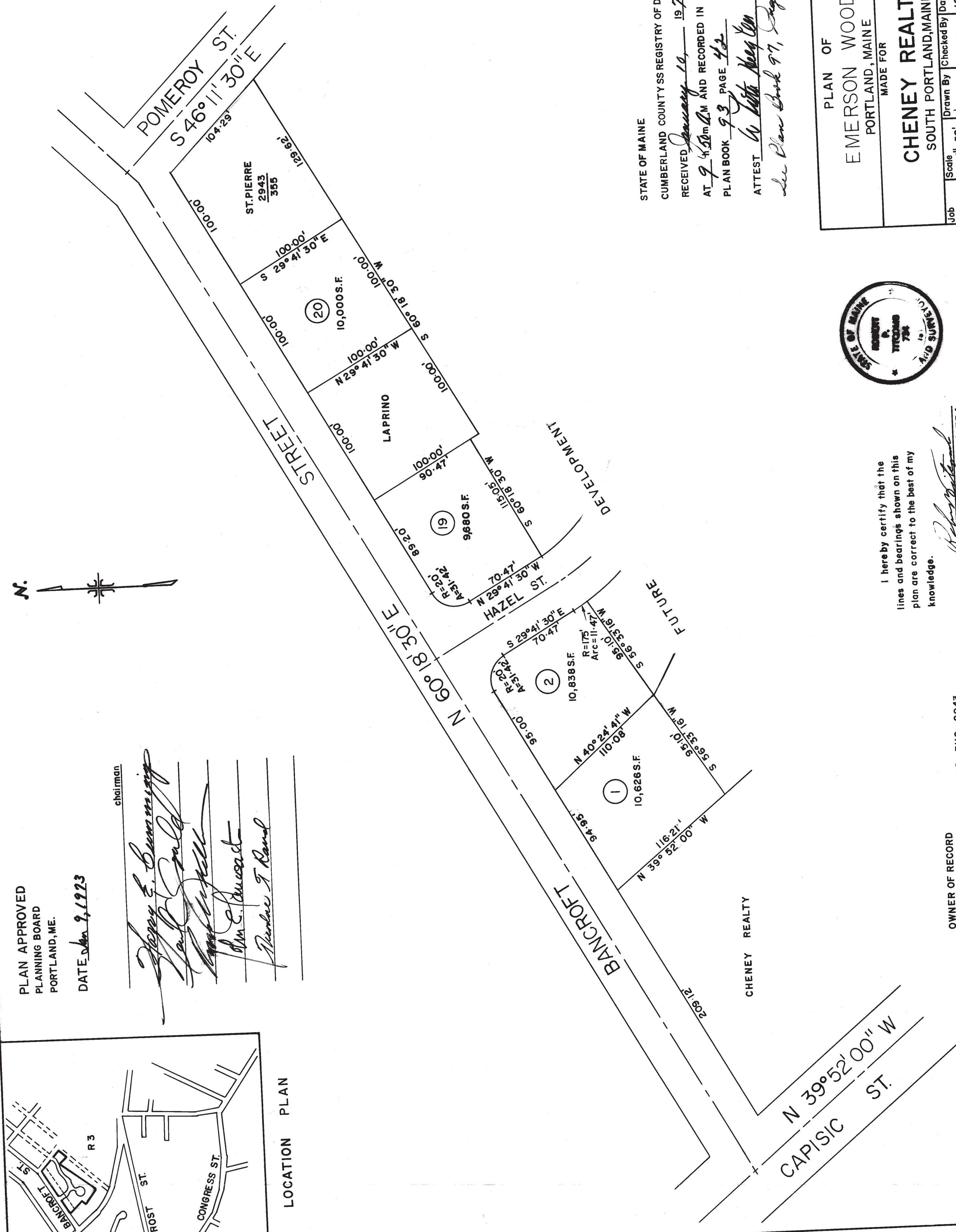


PLAN APPROVED
PLANNING BOARD
PORTLAND, ME.

DATE Jan 9, 1973

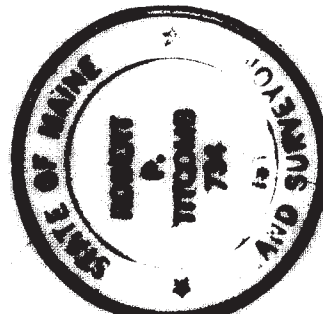
chairman

[Signature]
[Signature]
[Signature]
[Signature]
[Signature]



STATE OF MAINE
CUMBERLAND COUNTY SS REGISTRY OF DEEDS
RECEIVED January 16, 1973
AT 9:45 AM AND RECORDED IN
PLAN BOOK 93 PAGE 42
ATTEST [Signature] REGISTER
See Plan Book 97, Page 28.

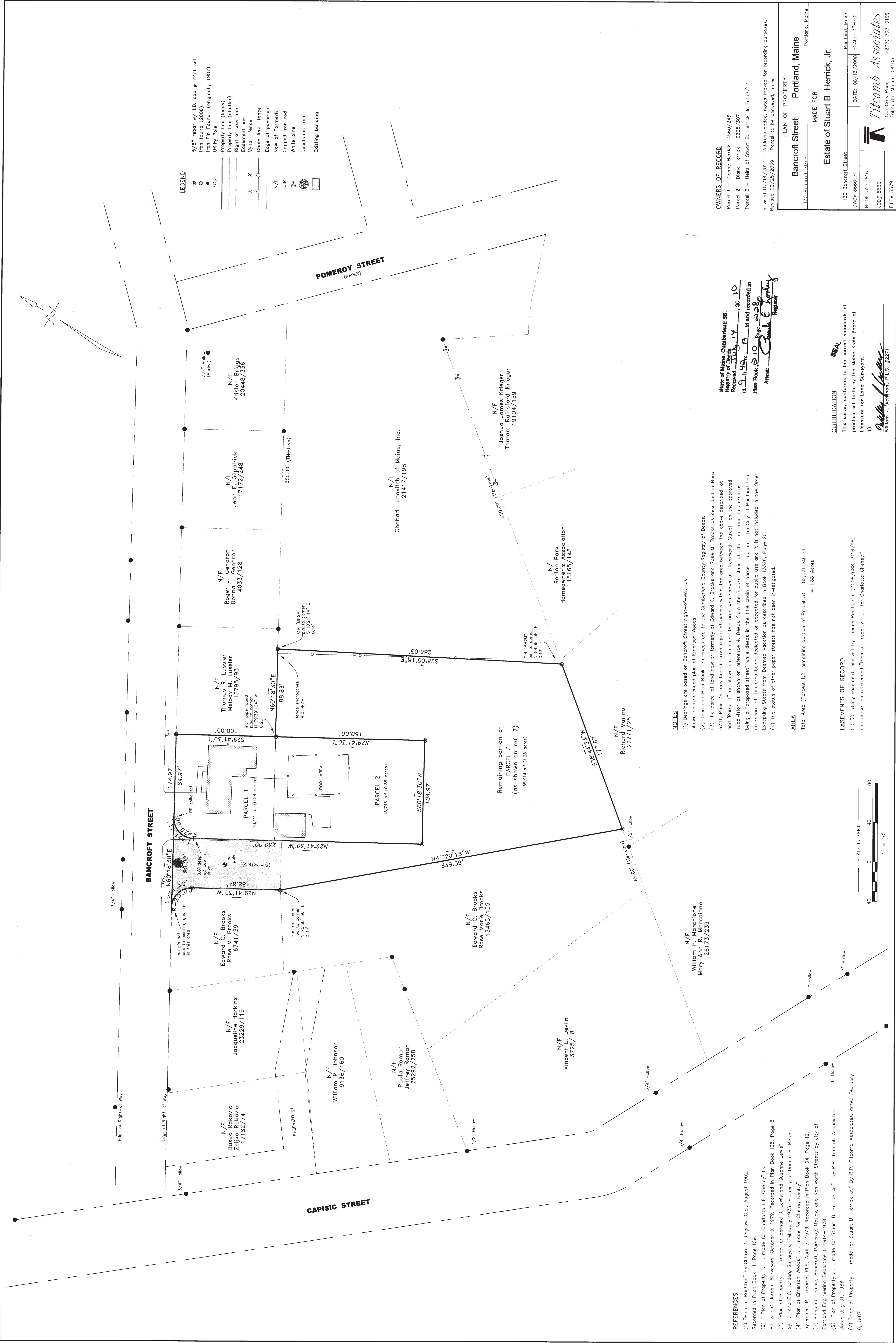
PLAN OF EMERSON WOODS PORTLAND, MAINE MADE FOR CHENEY REALTY SOUTH PORTLAND, MAINE	
Job 82256	Scale 1"=50'
Book 37	Drawn By M. D.
File 415	Checked By Date 12/20/72
Sheet 1 Of 1	
ROBERT P. TITCOMB REGISTERED LAND SURVEYOR	



I hereby certify that the
lines and bearings shown on this
plan are correct to the best of my
knowledge.

[Signature]
ROBERT P. TITCOMB L.S. 734

OWNER OF RECORD
CHENEY REALTY CO. 2910 3112 2943
255' 486' 355



REFERENCES

- (1) "Plan of Brighton" by Clifford C. Legrow, C.E., August 1902. Recorded in Plan Book 11, Page 109.
- (2) "Plan of Property . . . made for Charlotte L.F. Cheney" by H.L. & E.C. Jordan, Surveyors, October 5, 1979. Recorded in Plan Book 125, Page 8.
- (3) "Plan of Property . . . made for Bernard J. Lewis and Suzanne Lewis" by H.L. and E.C. Jordan, Surveyors, February 1973. Property of Donald R. Peters.
- (4) "Plan of Emerson Woods" . . . made for Cheney Realty by Robert P. Titcomb, RLS, April 5, 1973. Recorded in Plan Book 94, Page 19.
- (5) Plans of Capisic, Bancroft, Pomeroy, Malley, and Kenilworth Streets by City of Portland Engineering Department, 1914-1978.
- (6) "Plan of Property . . . made for Stuart B. Herrick, Jr." by R.P. Titcomb Associates, dated July 31, 1986.
- (7) "Plan of Property . . . made for Stuart B. Herrick, Jr." By R.P. Titcomb Associates, dated February 6, 1987.

OWNERS OF RECORD

- Parcel 1 - Diane Herrick 4560/246
- Parcel 2 - Diane Herrick 6305/307
- Parcel 3 - Heirs of Stuart B. Herrick Jr. 6238/53

Revised 07/14/2010 - Address added, notes moved for recording purposes.
Revised 02/25/2009 - Parcel to be conveyed, notes.

PLAN OF PROPERTY		
Bancroft Street	Portland, Maine	
130 Bancroft Street	MADE FOR	
Estate of Stuart B. Herrick, Jr.		
130 Bancroft Street	DATE: 08/13/2008	SCALE: 1"=40'
DWG# 8660-r1		
BOOK 315, 816		
JOB# 8660		
FILE# 3379		
Titcomb Associates		
133 Gray Road (207) 797-9199		
Falmouth, Maine 04105		

CERTIFICATION

This survey conforms to the current standards of practice set forth by the Maine State Board of Licensure for Land Surveyors.

1) *William J. Ackerson*
William J. Ackerson, P.L.S. #2271

EASEMENTS OF RECORD

- (1) 30' utility easement reserved by Cheney Realty Co. (3008/688, 3116/96) and shown on referenced "Plan of Property . . . for Charlotte Cheney."

AREA

Total Area (Parcels 1,2, remaining portion of Parcel 3) = 82,071 SQ. FT.
= 1.88 Acres

NOTES

- (1) Bearings are based on Bancroft Street right-of-way, as shown on referenced plan of Emerson Woods.
- (2) Deed and Plan Book references are to the Cumberland County Registry of Deeds.
- (3) The parcel of land now or formerly of Edward C. Brooks and Rose M. Brooks as described in Book 6741, Page 39 may benefit from rights of access within the area between the above described lot and "Parcel 1" as shown on this plan. This area was shown as "Kenilworth Street" on the approved subdivision as shown on reference 4. Deeds from the Brooks chain of title reference this area as being a "proposed street" while deeds in the title chain of parcel 1 do not. The City of Portland has no record of this area being dedicated or accepted for public use and it is not included in the Order Excepting Streets from Deeded Vacation as described in Book 13326, Page 20.
- (4) The status of other paper streets has not been investigated.

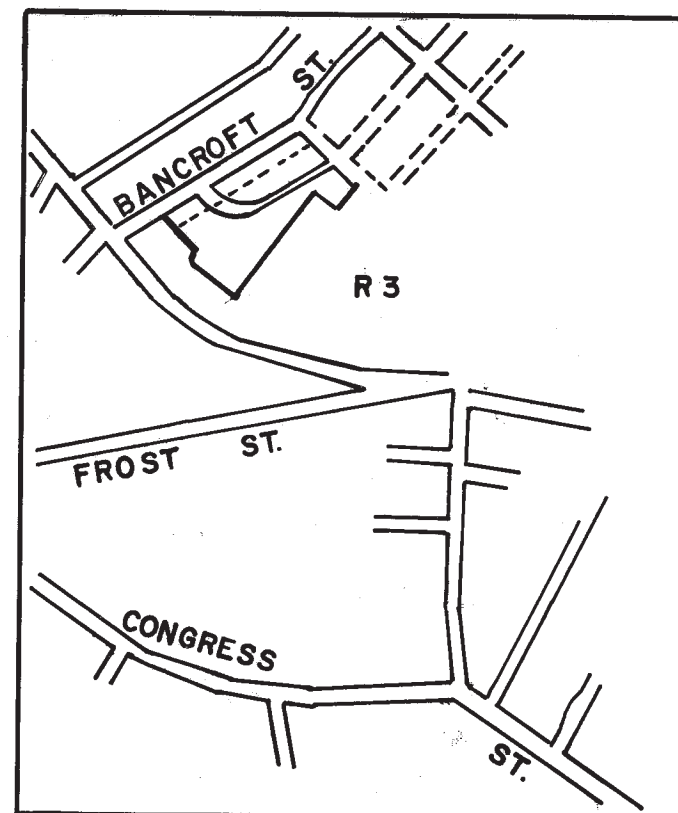
State of Maine, Cumberland SS.

Received JUL 14, 2010
at 9:42 AM, 2010
Plan Book 310, Page 828
Attest: *Charles E. Loring*
Register

SEAL

This survey conforms to the current standards of practice set forth by the Maine State Board of Licensure for Land Surveyors.

1) *William J. Ackerson*
William J. Ackerson, P.L.S. #2271



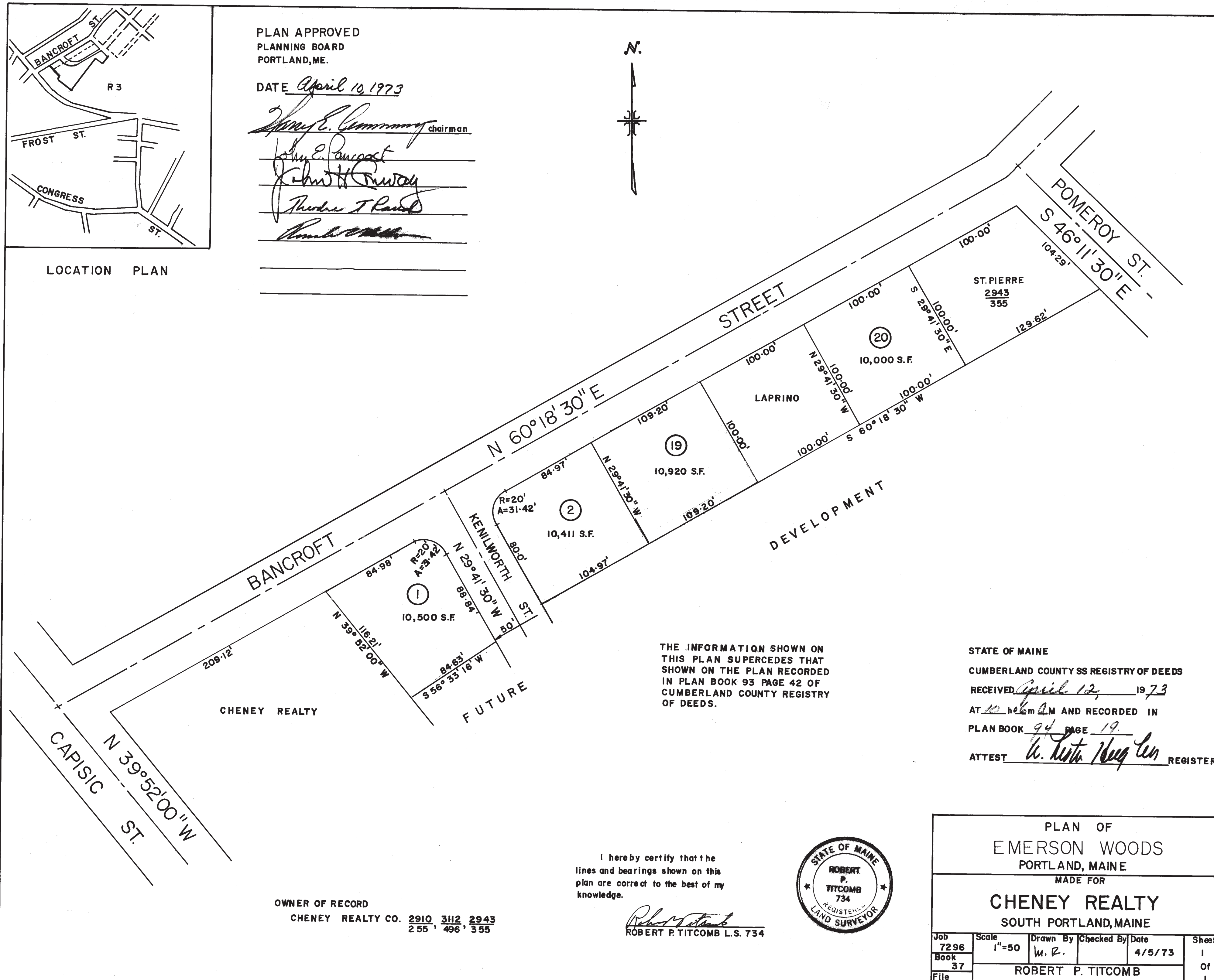
LOCATION PLAN

PLAN APPROVED
PLANNING BOARD
PORTLAND, ME.

DATE April 10, 1973

James E. Cummings chairman
John E. Poirer
John H. Conway
Thomas J. Rand
Donald W. Smith

N.



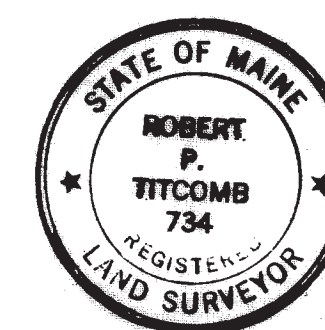
THE INFORMATION SHOWN ON
THIS PLAN SUPERCEDES THAT
SHOWN ON THE PLAN RECORDED
IN PLAN BOOK 93 PAGE 42 OF
CUMBERLAND COUNTY REGISTRY
OF DEEDS.

STATE OF MAINE
CUMBERLAND COUNTY SS REGISTRY OF DEEDS
RECEIVED April 12, 19 73
AT 10:12 AM AND RECORDED IN
PLAN BOOK 94 PAGE 19
ATTEST W. L. Titcomb REGISTER

OWNER OF RECORD
CHENEY REALTY CO. 2910 312 2943
255' 496' 355'

I hereby certify that the
lines and bearings shown on this
plan are correct to the best of my
knowledge.

Robert P. Titcomb
ROBERT P. TITCOMB L.S. 734



PLAN OF EMERSON WOODS PORTLAND, MAINE MADE FOR CHENEY REALTY SOUTH PORTLAND, MAINE				
Job 7296	Scale 1"=50'	Drawn By M. R.	Checked By 4/5/73	Sheet 1 of 1
Book 37	ROBERT P. TITCOMB REGISTERED LAND SURVEYOR			
File 415				



Jean Fraser <jf@portlandmaine.gov>

Fwd: e-mail re resubmit

1 message

Jean Fraser <jf@portlandmaine.gov>
To: "Fraser, Jean" <jf@portlandmaine.gov>

Thu, Oct 4, 2018 at 3:46 PM

FROM APPLICANT- INFORMATION REGARDING THE DETENTION POND

----- Forwarded message -----

From: **Brandon Binette** <brandon.binette@northeastcivilsolutions.com>
Date: Thu, Oct 4, 2018 at 3:12 PM
Subject: RE: e-mail re resubmit
To: Jean Fraser <jf@portlandmaine.gov>

Jean

We have added trash racks to the outlet pipes to prevent people from entering the pipes. These are indicated on the detail sheets. We have also added a fence around the pond to prevent people from entering the pond.

As previously mentioned, this pond is not a wet pond. It will not have a constant stand of water in it. It will fill up and drain down in order to control the peak rate of runoff from the project site, per the City's stormwater requirements.

In order to meet the City of Portland's Technical Manual Stormwater requirements (Flooding Standard- controlling the peak rate of runoff) a pond is required.

Please let me know if you have any other questions.

Thanks,

Brandon

Brandon Binette*Project Engineer*

(work) 207.883.1000

(fax) 207.883.1001

Comments Regarding PL-000092-2018 130 Bancroft St

Peter Carpenter <petemcarpenter@gmail.com>

Jun 4, 2018 9:37 AM

Posted in group: **Planning Board**

To whom it may concern,

I'm the property owner of 244 Bancroft St and I'm sending my comments regarding Plan Number PL-000092-2018.

While, I understand the need for new housing in the Portland area, I do not agree that this location is a suitable one to "shoehorn" in seven single family homes and a new city street.

One, there will be the inevitable increase in traffic that will result from seven new houses. At the very least, that means seven additional vehicles traveling in and out of the area. In all likely hood, there will be much more traffic than that.

Two, the land between Bancroft St and Stevens Ave contains some of the last non-public forest and freshwater wetlands left in the city. The subdivision would destroy much of it and that is forested land that will never return.

Three, we will have to undergo an extended period of traffic and noise disruption during the construction phase. I'm not sure how long it would take to build seven houses and a city street. I do know it took a long time to complete the nearby 11 Pomeroy St project and that involved only one house.

In conclusion, I am opposed to this plan and I can't imagine many of the property owners in the immediate area are very happy about it. I particularly think that seven houses is too many to squeeze into such a small area. As a compromise, I would be willing to hear about a plan consisting of one or two houses.

Thank you,
Peter Carpenter
244 Bancroft St.

Comment on Proposed Housing Subdivision at 130 Bancroft Street (PL-000092-2018)

Douglas Babkirk <doug.babkirk@maine.edu>

Jun 5, 2018 9:22 PM

Posted in group: **Planning Board**

Date: June 5, 2018

To: City of Portland Planning Board Members

From: Douglas G. Babkirk

Re: PL-000092-2018 (Proposed subdivision at 130 Bancroft Street)

As a resident of the Rosemont neighborhood for the past ten years, I have appreciated the city's investment in acquiring, preserving and maintaining green space for wildlife habitats, public enjoyment and quality of life enhancement for Portland residents and visitors. Nearby Capisic Pond and Redlon Woods are two examples of the city's commitment to such open space.

Planning Board approval of the seven (7) lot subdivision, proposed by Joshua Wagner, representing the WB Group Inc., between Bancroft Street and Redlon Park would be inconsistent with the city's commitment to preserving green space and wetlands. I am well aware of the affordable housing shortage that exists in Portland and am unsure at this time what market the proposed subdivision would attract.

Regardless of the proposed housing audience, I am concerned about the negative impacts on the wetland that runs through the property under consideration because it is an extension of the wetland that courses through Redlon Park.

In the past two years we have noticed significant water backup after a rainfall in the Redlon Woods abutting our properties ever since the Chabad House, now operating as a year-round hotel for up to 15 Orthodox Jewish guests, was built on Pomeroy Street contiguous to Redlon Park. I fear any additional dense housing development adjoining Redlon Park and the Chabad House would only exacerbate the water drainage issue.

I plan to attend future meetings related to this proposed 2.9 acre development in a dense residential zone of Portland where green space is a premium for wildlife and residents alike.

55 Redlon Park
Portland, ME
712-5140

Proposed Housing Subdivision at 130 Bancroft Street (PL-000092-2018)

Jeff D. Emerson <jdemerson@northendgroup.com>

Jun 7, 2018 8:45 AM

Posted in group: **Planning Board**

City of Portland Planning Board

389 Congress St
4th Floor
Portland, ME 04101

June 7, 2018

Planning Board Members:

The Planning board is contemplating approval of a development project which abuts one or more homes in the Redlon Park Association. I own one of the homes in the Association.

As a resident of this neighborhood since 2012, I have appreciated the City's care in preserving and maintaining undeveloped space for wildlife habitats, public enjoyment and quality of life enhancement for Portland residents and visitors.

Planning Board approval of the seven (7) lot subdivision, proposed by Joshua Wagner, representing the WB Group Inc., between Bancroft Street and Redlon Park would be contrary to the City's history of preserving green space and wetlands.

I also am concerned about the negative impacts on the wetland that runs through the property under consideration because it is an extension of the wetland that courses through Redlon Park.

In the past two years my neighbors have noticed significant water backup after a rainfall in the Redlon Woods abutting their properties ever since the Chabad House, now operating as a year-round commercial and religious property, was built on Pomeroy Street contiguous to Redlon Park. I fear that any additional dense housing development adjoining Redlon Park and the Chabad House would only exacerbate the water drainage issue.

While I am sympathetic to the City's need for additional housing I strongly urge the Planning Board not to approve a development which will burden the existing homes in the Rosemont neighborhood and further reduce the green space. The City made, and continues to make, a serious mistake in permitting the operation of the Chabad House in a residential neighborhood. I suggest that you do not further compound that mistake with the approval of additional development.



Jeff D. Emerson

President

NorthEnd Group LLC

18 Redlon Park Road
Portland, ME 04102

Tel: (240) 752-7143

Efax: (207) 221-1159

Confidentiality Notice: This e-mail transmission may contain confidential or legally privileged information that is intended only for the individual or entity named in the e-mail address. If you are not the intended recipient, you are hereby notified that any disclosure, copying, distribution, or reliance on the contents of this e-mail is strictly prohibited. If you have received this e-mail transmission in error, please notify the sender so that we can arrange for its proper delivery. Then please delete this e-mail from your computer. Thank you.

Jeff D. Emerson
18 Redlon Park Road
Portland, ME 04102

City of Portland Planning Board
389 Congress St
4th Floor
Portland, ME 04101

June 7, 2018

Planning Board Members:

The Planning board is contemplating approval of a development project which abuts one or more homes in the Redlon Park Association. I own one of the homes in the Association.

As a resident of this neighborhood since 2012, I have appreciated the City's care in preserving and maintaining undeveloped space for wildlife habitats, public enjoyment and quality of life enhancement for Portland residents and visitors.

Planning Board approval of the seven (7) lot subdivision, proposed by Joshua Wagner, representing the WB Group Inc., between Bancroft Street and Redlon Park would be contrary to the City's history of preserving green space and wetlands.

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Redlon Woods/////Fwd: Bancroft subdivision

maureen gavin <mgavin@jhu.edu>

Jun 7, 2018 5:26 PM

Posted in group: **Planning Board**

How is development like this even possible in wetlands of Redlon Park Woods??

I thought all this parkland and wetlands were to be preserved via Portland Land Bank??

Maureen C. Gavin
24 June St.
Portland, Maine 04102

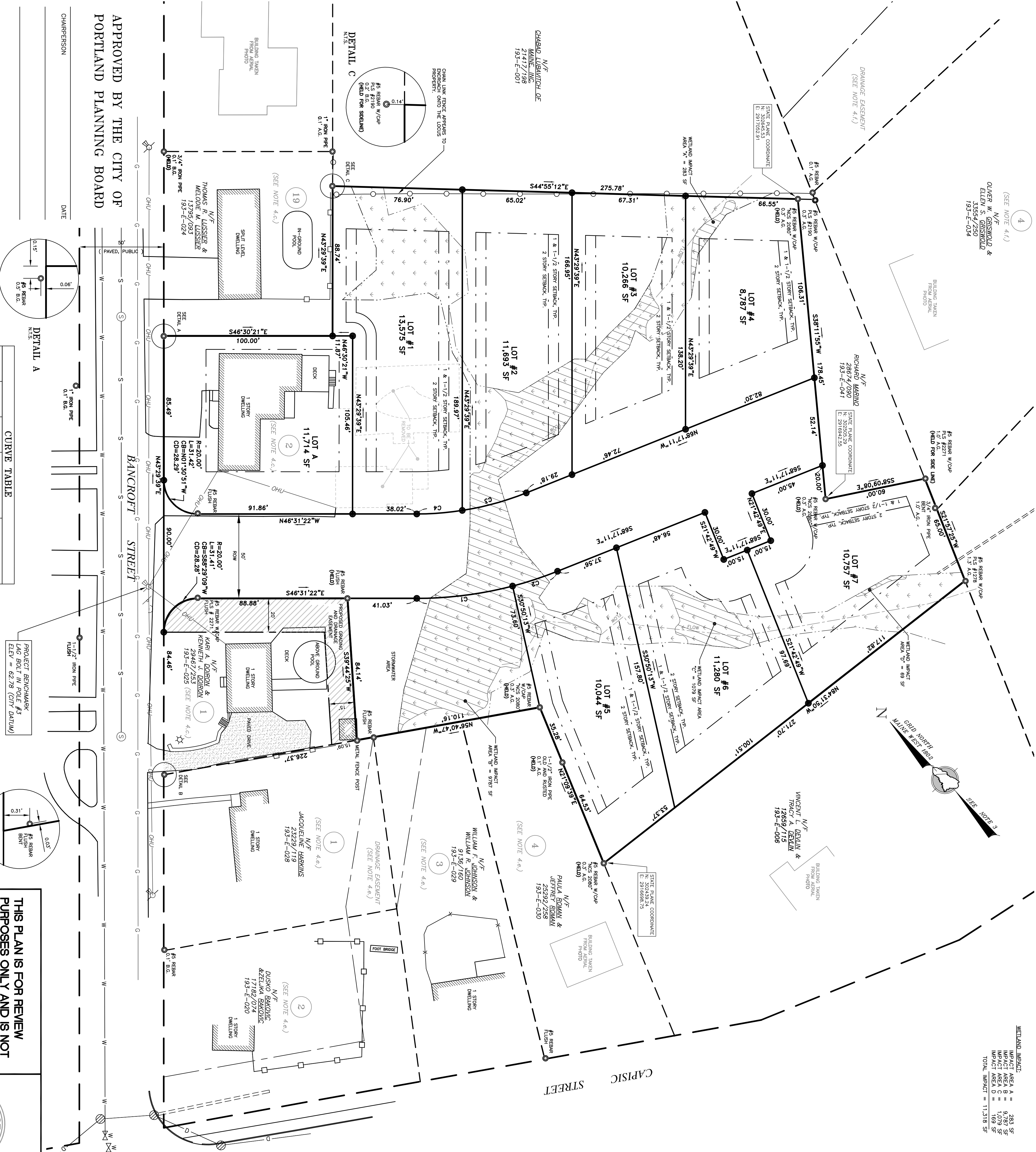
Begin forwarded message:

From: Doug Babkirk <doug.babkirk@maine.edu>
Subject: Fwd: Bancroft subdivision
Date: June 7, 2018 at 4:48:33 PM EDT
To: mgavin@jhu.edu



SUBDIVISION NOTES

- S-1. DEVELOPER:
S-2. SURVEYING / ENGINEERING:
381 PANE ROAD SOLUTIONS, INC.
SCARBOROUGH, MAINE 04074
S-3. WETLAND Delineation:
6 SECOND STREET
BRYTON, MAINE 04903
S-4. THE SUBJECT PARCEL IS LOCATED IN R-3 ZONE. PORTIONS OF BUILD & SPACE REQUIREMENTS ARE AS FOLLOWS:
MINIMUM LOT FRONTAGE = 50'
MINIMUM LOT DEPTH = 45.00'
FRONT SETBACK = 25'
SIDE SETBACK = 25'
1 & 1-1/2 STORY = 8'
3 STORY = 16'
S-5. ELEVATIONS AND CONTOURS ARE BASED ON CITY OF PORTLAND DATUM.
SEE PLAN FOR IBM DESCRIPTION.

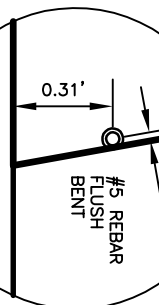


CURVE TABLE

CURVE	LENGTH	RADIUS	CHORD LENGTH	CHORD BEARING
C1	28.06'	223.00'	28.06'	S84°42'27"E
C2	39.39'	175.00'	39.39'	N61°52'20"W
C3	27.09'	175.00'	27.09'	N05°57'25"W

APPROVED BY THE CITY OF
PORTLAND PLANNING BOARD

CHAIRPERSON _____ DATE _____



THIS PLAN IS FOR REVIEW
PURPOSES ONLY AND IS NOT
INTENDED FOR CONSTRUCTION
OR RECORDING



LEGEND

- #3 REBAR WITH PLASTIC CAP (PROPOSED)
- SET GRANITE MONUMENT WITH PLASTIC CAP (PROPOSED)
- (PROPOSED MONUMENTATION SHOWN ON THIS SURVEY PLAT MAY OR MAY NOT BE USED BY THE SURVEYOR, INC. AND IF SO WILL BE DONE UPON CLIENT APPROVAL)
- FOUND IRON (SIZE & TYPE AS NOTED)
- UTILITY POLE (NUMBER AS NOTED)
- GUY WIRE ANCHOR
- TREE LINE (APPROXIMATE)
- BOUNDARY LINE
- EASEMENT LINE
- EDGE OF PAVEMENT
- RIGHT-OF-WAY LINE
- ABUTTER LINE
- BUILDING SETBACK
- OVERHEAD UTILITY
- NOW OR FORMERLY OWNED BY DEED BOOK AND PAGE (CDR)
- TAX MAP—LOT
- PARENTHESIS DENOTE RECORD DATA

BOUNDARY NOTES

- RECORD OWNERS OF THE PARCELS SURVEYED ARE DESCRIBED IN THE FOLLOWING DEEDS:
a. FROM EDWARD C. BROOKS & ROSE MARIE BROOKS TO KARI A. DOIRON & KENNETH 285 (PARCEL 193-E-039).
b. FROM DAINE E. HERBICK TO PAUL WAGNER DATED MARCH 23, 2010 AND RECORDED IN DEED BOOK 27668, PAGE 230 (PARCEL 193-E-026 & 040).
c. FROM THE ESTATE OF STUART HERBICK, JR. TO OSKUA WAGNER DATED AUGUST 23, 2010 AND RECORDED IN DEED BOOK 28022, PAGE 268 (PARCELS 193-E-019).
- THE PARCELS SURVEYED ARE IDENTIFIED ON THE CITY/TOWN OF PORTLAND TAX ASSESSOR'S MAP 193, BLOCK E, PARCELS 19, 26, 39 & 40.
- THE BEARINGS SHOWN ON THIS PLAN ARE BASED ON MAINE STATE COORDINATE SYSTEM, WEST ZONE, 1801, GRID NORTH.
- REFERENCE IS MADE TO THE FOLLOWING PLANS:
a. "PLAN OF PROPERTY, 130 BANCROFT STREET, PORTLAND, MAINE", BY TTCOMB ASSOCIATES, DATED 8/30/2008, RECORDED IN PLAN BOOK 210, PAGE 228.
b. "PLAN OF PROPERTY, 130 BANCROFT STREET, PORTLAND, MAINE", BY TTCOMB ASSOCIATES, DATED 8/13/2008, RECORDED IN PLAN BOOK 208, PAGE 370.
c. "PLAN OF EMERSON WOODS, PORTLAND, MAINE", BY ROBERT P. TTCOMB, DATED 4/30/1973, RECORDED IN PLAN BOOK 94, PAGE 19.
d. "PLAN OF EMERSON WOODS, PORTLAND, MAINE", BY ROBERT P. TTCOMB, DATED 12/20/1972, RECORDED IN PLAN BOOK 93, PAGE 42.
e. "PLAN OF PROPERTY IN PORTLAND, MAINE MADE FOR CHARLOTTE L.F. CHENEY", BY H.L. & E.C. JOBDAN, DATED 10/05/1979, RECORDED IN PLAN BOOK 125, PAGE 8.
f. "FIRST AMENDED SUBDIVISION PLAN OF REDLON PARK SUBDIVISION", BY SEBRAD TECHINCS, DATED 4/11/2016, RECORDED IN PLAN BOOK 216, PAGE 139.
g. "PLANNED RESIDENTIAL UNIT DEVELOPMENT PLAN AND SUBDIVISION PLAN, REDLON PARK, REDLON ROAD, PORTLAND, MAINE 57 PARKWAY & GREEN, DATED 4/27/1997, RECORDED IN PLAN BOOK 197, PAGE 193.
h. "RIGHT-OF-WAY MAP, STATE HIGHWAY NO. 17, FEDERAL AID PROJECT NO. W-0814(2), BY STATE OF MAINE DEPARTMENT OF TRANSPORTATION, DATED 4/1988, D.O.I. FILE NO. S-384.
i. MULTIPLE STREET LINE RECORDS PROVIDED BY THE CITY OF PORTLAND PUBLIC WORKS.
j. PLAN OF BRIGHTON, PORTLAND, MAINE MADE FOR GEORGE T. EDWARDS, BY CLOFFORD C. LEGGOW, DATED AUGUST, 1902, RECORDED IN PLAN BOOK 11, PAGE 103.
- THE WIDTH OF BANCROFT STREET IS 50' BASED ON CITY OF PORTLAND STREET LINE RECORDS. THE LAYOUT OF THE RIGHT-OF-WAY LIMITS IS BASED ON SAID STREET LINE RECORDS AND MONUMENTATION TOWNS.
- ELEVATIONS AND CONTOURS ARE BASED ON CITY OF PORTLAND DATUM CALCULATED BY KIM (WNO 1988 DATUM) AND ADJUD 0.8 (DIFFERENCE BETWEEN 1988 AND 1929 IN PORTLAND) TO GET TO CITY DATUM. SEE PLAN FOR IBM DESCRIPTION. THE UTILITIES SHOWN ON THIS PLAN WERE FROM FIELD OBSERVATION ONLY. THERE MAY (B88)DIO-SAFE PRIOR TO ANY EXCAVATION WORK.
- WETLANDS SHOWN WERE Delineated BY LONGVIEW PARTNERS, LLC, JANUARY, 2017 AND A FIELD DETERMINATION THAT NO STREAMS EXIST ON THE SITE.

Number _____ Date _____ Change _____

PROJECT: 41041
DRAWING NAME: 41041 Subdivision.dwg
ISSUED: MAY 1, 2018 SCALE: 1"=50' FB # 420 DRAWN BY: JWP
FIELD BY: JWP / MAC FIELD DATE: 1/10/2017 CHECKED BY: TMW

Drawn: Name and Address:
SUBDIVISION PLAN
130 & 144 BANCROFT STREET, PORTLAND, MAINE
JOSHUA WAGNER (193-E-019)
PAUL WAGNER (193-E-026 & 040)
KARI DOIRON & KENNETH J. DOIRON (193-E-039)
144 BANCROFT STREET, PORTLAND, MAINE 04102

Drawn for:
JOSH WAGNER

SURVEYING • ENGINEERING • LAND PLANNING
INCORPORATED
Northeast Civil Solutions
381 PANE ROAD, SCARBOROUGH, MAINE 04074
Tel: 207.883.1000 Fax: 207.883.1001
e-mail: info@northeastcivilsolutions.com
www.northeastcivilsolutions.com
0 30' 60' 120'

130 Bancroft Street Subdivision

Jun 8, 2018 2:26 PM

Posted in group: **Planning Board**

Dear Ms. Fraser,

I am writing to express my concerns about the proposed subdivision at 130 Bancroft Street.

First, I live next door to this proposed development and the first that I heard of it, was via the post card from your office a week ago. I regularly would see Ms. Wagner, and not once did he mention his plans to me. The lack of transparency is troubling.

My concerns are: 1. As you know, this is wetland area. Most, if not all of the properties on the Mr Wagner's side of the street already have very wet back yards. When the Redlon development was built, people had flooded pools and basements. The same occurred as a result of "The Ledges" condo development on Steven's Avenue. 2. I understand that some kind of retention pond is proposed for behind my neighbor's property, soon to become Mr. Wagner's property. First, this acknowledges that Mr. Wagner and the engineers know this is very wet property. This retention pool could over flow, spilling directly into my already very wet backyard. This "pool" would also serve as a magnet for mosquitos and other insects, which could very possible create health issues for me, and the nearby property owners. 3. The traffic (conservatively 14 more cars) increase would change the already busy traffic pattern on the street. There are families with young children and grandparents whose grandchild visit, and this could very possibly create a safety issue. 4. Ledge is prevalent in the proposed space, and I am concerned about the structural effects from blasting and the additional upset that this would cause to the balance of the water table. 5. The green space on this street was one of the reasons I bought in this location twelve and a half years ago; Portland's green space is being eroded at too fast a pace; once land is developed, that green space is forever lost. 6. I am concerned about the impact to my property value. 7. Lastly, why wasn't the Landbank Trust on the notification list from the city? This organization found out this proposed project from an e-mail forwarded to them. They should have been among the first to receive notification of this proposed project.

In closing, I do not believe that this project is a good fit for this piece of land. I ask the planning board members to very carefully consider the points that I have outlined above, and I'm sure that they mirror other concerned residents' comments.

Respectfully submitted,

Jacqueline Harkins
Bancroft Street Resident

--

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PL-000092-2018 (Proposed subdivision at 130 Bancroft Street)

Oliver Griswold <owgriswo@gmail.com>

Jun 8, 2018 3:46 PM

Posted in group: **Planning Board**

Date: June 7, 2018
To: City of Portland Planning Board Members
From: Oliver and Ellen Griswold
Re: PL-000092-2018 (Proposed subdivision at 130 Bancroft Street)

Planning Board Members:

We live directly in back of the proposed Bancroft development, adjoining the forestland that would be razed to make room for the seven lots. Forests like this one are becoming more and more rare in Portland, succumbing to development pressures in a growing city. But the character of the Rosemont neighborhood is in some ways defined by these pockets of open space. Balancing the density of our residential streets, they shape a community that is unlike any other in Portland, and provide an ideal spot for both adults and children to explore nature, observe wildlife, and play in a natural environment. We urge you to maintain this balance, and reject this development proposal.

We are also extremely concerned about the wetlands - both the negative impacts on the wetlands upon which these new houses would sit, and the consequences for surrounding neighborhoods that would be adversely impacted by displacement of the wetlands, including Rosemont and Redlon Park. Often the effects of displacing wetlands are not felt until it's too late, as has been the case in the recent past in this area.

Bancroft Street is already the site of a contentious development issue that has increased congestion, noise, and tensions in our neighborhood. Approving development that would not only compound these problems, but also fill in a valuable stretch of open space, would frankly feel like piling on. We have heard that the landowner is not remaining in the neighborhood, so these issues would be left for the rest of us to live with.

Thank you so much for your consideration of this letter. We plan to attend any meetings about this seven-lot development proposal, where we hope you will agree that there are simply too many potential problems to consider it a viable plan.

Oliver and Ellen Griswold
38 Redlon Park Rd

Re: Comments on proposed development at 130 Bancroft St. in Portland

Barbara Barhydt <bab@portlandmaine.gov>

Jun 14, 2018 7:23 AM

Posted in group: **Planning Board**

Good morning:

Thank you for your public comment and we will include it in the materials for the Planning Board, when this item is scheduled for a workshop. At this time, I do not have a firm date for a planning board workshop. I am cc'ing Jean Fraser, who is the planner assigned to this project and she will share your comments with the other staff members and third party engineers who are reviewing the application under the City's standards for subdivisions.

I am also adding our Office Manager, Jennifer Munson, to this e-mail. She can advise you how to sign up for notifications through the City's web site, so you receive notification of Planning Board meetings and agendas.

Thank you.

Barbara

Barbara Barhydt
Development Review Services Manager
Planning Division
389 Congress Street 4th Floor
Portland, ME 04101
(207) 874-8699
Fax: (207) 756-8256
bab@portlandmaine.gov

On Wed, Jun 13, 2018 at 10:43 PM, Judy Gailen <judy@judygailendesigns.com> wrote:

To the Planning Board,

We live at 68 Bancroft St. It has come to my attention that Josh Wagner is proposing an 8 lot subdivision on our street. Because we live more than 500 ft. away from him, we did not get any of the information that he sent to neighbors and was not invited to the meeting. I think he wants to tell as few people as possible, so he doesn't have to deal with the fallout. The fact that he is holding the meeting in his garage at 4:00 in the afternoon on a Tuesday, when people who work cannot attend, is sneaky. But this is a fairly friendly and connected neighborhood, so it could not go unnoticed. And it appears that he wants to sell all those lots, while he himself will move away. I think that is unconscionable!

A development like this would impact our entire neighborhood, not just his closest neighbors. The temple on Pomeroy impacts the whole street. This would impact it even more. When Redlon Park was built, the water problem on Bancroft by our house worsened, from what we heard. (We have been here for 20 years...moving in after they built it...and have been trying to solve the water problem ever since). There is so much water and /or ledge back there in those woods, that it would create even more of a problem. Especially since the city has refused to put another storm drain on the street. I imagine blasting would be necessary...I can't even imagine what will happen.

But the biggest problem would be the traffic and congestion on Bancroft. There would be only one way in and out of the development, correct? It would be one thing if the road let out on Stevens or Capisic, but Bancroft is a quiet street with many children. We already have people using the street as a cut-through from Brighton to Capisic, speeding and running the stop sign at Rockland. Putting a 3-way stop at a new intersection in the middle of the block will not stop them.

I realize that this is his land, and he can sell it if he wants, but this is wrong in so many ways. Apparently he bought more land from a neighbor that butts up against another neighbor's fence, without even asking her if she might be interested in buying it first. It's greed, pure and simple, with little thought to the impact on his surrounding neighbors and environment. We don't need more congestion on this street. We do need what green space we have here.

If I had the money to buy him out and keep the woods from being developed, I would! But I don't, so I am asking that you consider very seriously the impact that this development would have. The concerns about the temple project went unheeded. (No one building a "house" sends out a glossy fundraising brochure to raise money to build classrooms, hospitality rooms, two kitchens, and other parts of a temple campus!). I imagine house lots would bring in a lot more in property taxes to the city, but please consider very seriously what this would do to this neighborhood.

Even though I live more than 500 ft from the property, can I be included on an 'interested parties' list and be informed of any public hearing that takes place?

Thank you,
Judy Gailen

FW: Bancroft St Project

Doiron, Ken <kdoiron@ptc.com>

Jun 13, 2018 11:06 AM

Posted in group: **Planning Board**

To whom it may concern:

My wife and I wanted to write in support of the proposed development project off Bancroft St. We live at 144 Bancroft and we will be the most directly affected by the project. We feel the new houses going in will certainly improve property values in the Rosemont neighborhood and do not see any issues that would negatively impact to us or surrounding neighbors.

One of the biggest positives for us personally will be correcting the major water drainage issues we have on our property. The back two-thirds of our land is unusable because the water drainage from the Redlon Park Rd development and an old culvert from a property on Capisic Street. They both end up collecting on our property. There is a drainage easement from Capisic Street to our property line that has not been taken care of in years resulting in the overgrowth of trees and weeds and the sediment build up now actually holds water on our land. We are looking forward to that problem getting resolved through this planned development as it is a muddy mess and is a mosquito breeding ground. We would be happy to have someone from the Planning Board come visit us to show off these issues.

We believe there will be concern over more cars on Bancroft Street but we also see this as an opportunity to fix the number of cars currently speeding down the road as they cut from Brighton to Capisic. We would like to see a 3 way stop on at the new road being proposed.

Thank you for taking the time to read our email and we look forward to this new development in our neighborhood.

Regards,

Ken & Kari Doiron

130 Bancroft - Benjamin Way (Rosemont 7 family development)

Sarah Delisle <sarahmdelisle@gmail.com>

Jun 14, 2018 12:12 PM

Posted in group: **Planning Board**

Hello Planning Board Members,

I live at 111 Bancroft Street and have lived on Bancroft St. with my family for 9 years, and I plan to stay at least that many more. As I Realtor I see the extreme need for more housing every day. There was another article this morning about the housing shortage we are facing as a city. From the plans I have seen these homes will fit with the scope and scale of the neighborhood, unlike a giant one family home taking up the space of 7 homes. This project will be not only be good for the home values in Rosemonet but it will allow 7 new residents to our desirable neighborhood. I realize the opposition has concern for the wetlands and I also appreciate our local wildlife and green spaces --If this plan was for Capisic Pond Park or any area of the Portland Trails I would be opposed to it. It is completely natural for change to bring forth apprehension in neighbors, that this project will directly effect, but when weighing the pros and cons I see this growth supporting a healthy growth for our neighborhood. I understand that there will be a period of construction and although I most definitely am irritated when driving downtown through construction I realize the value when it's done.

I know Josh as a neighbor and he and his family have been nothing short of pleasant and respectful neighbors. I know Josh is a business owner and has a great reputation in the real estate community. Although I do not know him beyond a passing neighborly conversation their reputation for being good neighbors and business owners makes me feel confident that Josh will have the utmost care for this project and our neighborhood. Please consider this project as smart and productive growth for our city and neighborhood.

I appreciate your consideration.

Sarah Delisle
Associate Broker/Realtor
Vitalius Real Estate Group
207.523.9183

Fwd: 130 Bancroft St

Jean Fraser <jf@portlandmaine.gov>
To: Jennifer Munson <jmy@portlandmaine.gov>

Fri, Jul 6, 2018 at 9:32 AM

Could you place "on the record" - thanks

----- Forwarded message -----
From: **Ejlheureux** <ejlheureux@aol.com>
Date: Thu, Jul 5, 2018 at 10:27 AM
Subject: 130 Bancroft St
To: jf@portlandmaine.gov

I have been recently informed that there is a proposal to build 7 homes at this location. My initial reaction was WHAT?. The mere fact that Mr. Wagner needs a variance speaks to fact that homes should not be built on the property. My concerns are with the fact that some of property is wetlands(and I don't see that building a detention pond is equitable tradeoff), the increase traffic in the area and the negative impact that it will have on the neighbors.

I want to be placed on the notice list for any actions on this property.

Thank you

Estelle
ejlheureux@aol.com

--
Jean Fraser, Planner
City of Portland
874 8728

In reference to 130 Bancroft Development Plan

Caleb O'Connell <caleb@caleboconnell.com>

Jul 9, 2018 6:11 PM

Posted in group: **Planning Board**

I'm writing in objection to the plan for 130 Bancroft st that is porpoised by Josh Wagner and Northeast Civil Engineering. Both Josh and the engineers who made themselves available for the neighborhood meeting were very helpful in talking with neighbors and their concerns about the development.

The water issues in question are not just runoff or storm water as they mention in their narrative. This water is a stream based flow that runs from the higher elevation down through the neighborhood to Capsic brook as it probably has forever. For 6-8 months of the year there is a very defined edge stream that flows through the neighborhood into the cities catch basin to direct water into Capsic brook. Due to the fact the area has been developed poorly over time, the natural streams usually come straight across my lawn and spew up from under ground culverts probably installed in the 1920s. This water comes from high elevations to the east and flows down as a stream, which I imagine has always been the case. Any change in the flow of this water could effect my property of the properties directly downstream of this development. Also, the house lots proposed would have to deal with the large amounts of water in their future lining them up for problems.

The engineering firms focus on the Redlon Park development and what was done poorly there causing the water be worse for everyone else is exactly the reason this project should reconsidered from it proposed size. While I agree that Redlon probably was not done correctly, I see no reason that this new proposal would be any different. And everyone else at the neighborhood meeting expressed the same concerns.

Neighbors who have been dealing with this water issue for years were rightfully concerned how this was going to negatively effect them and after repeated questions with no real answer it was obvious we would all be on our own to monitor our own situation and chase down whomever might be the next responsible person in line. It is typical Tough Luck situation.

Possible solution

Smaller development that doesn't put buildings directly on top of the stream running through. Possibly having those properties be included in the Redlon woods park that has been in development for years.

130 Bancroft sub division

Diane Herrick <ben7@maine.rr.com>

Jul 10, 2018 6:21 PM

Posted in group: **Planning Board**

Planning Board Members,

I currently live at 159 Bancroft St. My late husband, Stewart Herrick and I used to live at 130 Bancroft St. We owned the land Josh Wagner plans on developing.

I am writing you in support of the proposed subdivision. Having lived there for many years it was frustrating having such a large mostly unusable back yard. Ever since Redlon Park went in the amount of water passing over the land made it a soggy mess. It was July most years by the time it dried out enough that I could mow it.

Josh has shared with me his plans and I feel that it will positively impact our neighborhood and make good use out of a relatively uninviting piece of land.

Respectfully, Diane Herrick

From: <jackiehark@maine.rr.com>
Date: Tue, Jul 3, 2018 at 1:48 PM
Subject: 130 Bancroft Street Proposed Subdivision
To: planningboard@portlandmaine.gov
Cc: jf@portlandmaine.gov

Dear Planners,

I am writing to follow-up with additional concerns/questions regarding the proposed subdivision at [130 Bancroft Street](#), subsequent to the meeting that was held by the developer.

First, the detention pond is of major concern, because of the location (right next to my property). I am concerned about possible overflow from the pond onto my property, and I am concerned about it being a breeding ground for mosquitos and other disease carrying insects. Also, vigilant maintenance is paramount to detention ponds working effectively. What checks and balance are in place on the City's part to make sure that the pond is regularly maintained? Does the City require a responsible party to be named in a contract, and to report that regular maintenance has been done? How soon does the City respond if the maintenance is not being done?

The area where the developer wants to build these houses is very wet, and becomes extremely so, after even a moderate a rainstorm. The developer commented at the meeting when neighbors next door mentioned how wet their back property is, that many times he is unable to use his ATV his backyard because of the wet ground; yet, he is proposing seven homes to be built on that land. An abutting neighbor to this project brought up at the meeting, concerns to do with possible underground drainage pipes that could be discovered upon excavating and how that drainage could further exacerbate the existing major water problems in the back of properties to the left and right of [130 Bancroft Street](#). It was obvious that the engineers at the meeting had not anticipated this very good question, and they did not have a conclusive answer for the question. The Ledges (condo development) first caused added drainage issues to properties on a significant stretch of backyards on the even side of Bancroft Street, then Redlon Park added to the already troublesome drainage issues, and now this project could potentially cause serious flooding issues for those same properties.

Lastly, the engineers were unclear about who would be responsible for cleaning out the drainage easement that runs behind my property and my neighbor's property. Is it the City's responsibility or is it the developer's responsibility? Who would be responsible for removing debris (bushes, felled trees, etc.) when the clean out is completed?

I ask you to consider the ramifications of this proposed development on people who have lived in this neighborhood for some time, and already endured negative impacts to their property and the use of their property (due to water infiltration).

Respectfully submitted,

Jacqueline Harkins



Jean Fraser <jf@portlandmaine.gov>

Questions/Concerns re Proposed Subdivision at 130 Bancroft Street

1 message

Mary Foley <melizfol@maine.rr.com>
To: jf@portlandmaine.gov

Mon, Jul 16, 2018 at 7:39 AM

Good Morning Jean,

I am the homeowner who resides at 105 Bancroft Street and have some questions/concerns about the proposed subdivision for 7 new homes at 130 Bancroft Street. I was not able to attend the afternoon meeting held in June at the developer's home and I am not sure if I will be able to attend the workshop on Tuesday due to work.

Impact to current Sewer system on Bancroft Street

I certainly do not want an adverse impact to my home or other existing homes' sewer systems as a result of this subdivision and am very concerned that it may happen.

-

1. Will the sewer systems of these 7 new homes connect to Bancroft Street or Capisic Street?
2. If these 7 new homes connect to Bancroft Street, how will this impact the current sewer system's handling capacity due to the age of the system?
3. If there is an adverse impact as the result of this development, such as sewer backup to homes, who will be responsible for payment of affected homeowner bills incurred, i.e., the city or the developer? The affected homeowners should not bear these costs.
4. The most recent rat infestation on Bancroft Street on the other side of Capisic Street is very alarming. I have heard that this was the result of the excavation work done on Capisic pond, and/or recent work on the sewer system in that part of Bancroft Street. What precautions will be put in place to ensure that the sewer work that will be needed for this subdivision doesn't create another rodent problem for current homeowners?

Impact to increased vehicle traffic

The entrance to the new street of the subdivision, Benjamin Way, on Bancroft Street is only 3 houses up from the intersection with Capisic Street. I am concerned with the potential for vehicle congestion and accidents resulting from the additional vehicles (most likely 2 vehicles per home as well as visitors and delivery vehicles) entering to/from the subdivision onto Bancroft Street, as well as the close proximity of the street entrance to the busy Capisic Street intersection. Many cars currently travel on Bancroft, by both current homeowners, as well as those who use Bancroft Street to access both Brighton Avenue and Capisic Street. In addition, many cars turn onto Bancroft Street from Capisic Street at a fast rate of speed and if approved, Benjamin Way will be only a short distance from this intersection with vehicles entering and exiting onto Bancroft Street. Has a traffic impact study been conducted to address these concerns?

Impact to water table on Bancroft Street

The land on the side of the street where these houses would be built is very wet. It is my understanding that problems arose with changes to the water table from the construction of Redlon Park homes and the new home on Pomeroy Street that resulted in some damage and increased wetness to land for some of the homes on that side of the street. In addition, water runs out to the street in heavy rains and freezes in the winter on that side of the street. I am very

concerned that the construction from these 7 new homes will result in same for those homes in close proximity. What measures will be put into place to prevent adverse impact to the water table from the construction of the subdivision?

Impact from the proposed detention pond

I am very concerned that having a detention pond will create a breeding ground for insects, mainly mosquitos, that can result in an adverse health impact on residents in the area. Who will monitor this pond?

Impact from construction

Having experienced the noise from the blasting that took place with the construction of homes at Redlon park, and the sometimes shaking of my home from the vehicles repeatedly digging up Pomeroy street due to chronic water main leaks, as my home is 1 house away from Pomeroy Street, I am concerned that the new subdivision will result in same, especially for those homes in very close proximity.

I am very concerned about the potential negative impact the construction of this subdivision will have for the existing homeowners. Has an impact study to the neighborhood been completed?

I thank you for your consideration of my questions/concerns and look forward to hearing from you.

Mary E. Foley

105 Bancroft Street



Jean Fraser <jf@portlandmaine.gov>

Fwd: detention pond information

1 message

Jacqueline Harkins <harkij@portlandschools.org>

Wed, Jul 18, 2018 at 10:43 AM

To: planningboard@portlandmaine.gov

Cc: jf@portlandmaine.gov

----- Forwarded message -----

From: RVRMAILRMCP@portlandschools.org <RVRMAILRMCP@portlandschools.org>

Date: Wed, Jul 18, 2018 at 10:27 AM

Subject: detention pond information

To: harkij@portlandschools.orgReply to: RVRMAILRMCP@portlandschools.org <RVRMAILRMCP@portlandschools.org>

Device Name: RVRMAILRMCP

Device Model: MX-M565N

Location: Not Set

File Format: PDF MMR(G4)

Resolution: 200dpi x 200dpi

Attached file is scanned image in PDF format.

Use Acrobat(R)Reader(R) or Adobe(R)Reader(R) of Adobe Systems Incorporated to view the document.

Adobe(R)Reader(R) can be downloaded from the following URL:

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<http://www.adobe.com/>

Dear Planning Board Members,

Attached are three articles that outline detention pond "do's and don'ts". It's a quick read, but it contains very helpful, and problem-preventing information.

Respectfully submitted,

Jacqueline Harkins

154 Bancroft Street

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**Scanned Image _20180718_102751.pdf**

1105K

SAFETY OF DETENTION AND RETENTION PONDS

By Jonathan E. Jones, James Guo, Ben Urbonas, Rachel Pittinger

Jonathan Jones, P.E., is CEO of Wright Water Engineers Inc. in Denver, CO.

James Guo, Ph.D., P.E., is a professor in the University of Colorado's Civil Engineering Department.

Ben Urbonas, P.E., is manager of the Master Planning Program for the Urban Drainage & Flood Control District in Denver, CO.

Rachel Pittinger is a project engineer with Wright Water Engineers in Denver.

Introduction

Urban stormwater retention and detention ponds are widely used in the United States. Retention ponds, also commonly called wet ponds, refer to facilities that maintain a permanent pool, while detention ponds, often called dry ponds, contain water only in the aftermath of runoff events.

Although retention and detention ponds can be effective for stormwater management and flood control, they can also pose risks to public health, safety, and welfare. Urban storm drainage system planners, designers, facility owners, maintenance staff, and municipalities, including their elected officials and governing bodies, must be aware of such risks and insist on the use of recommended techniques to minimize them. Licensed professional engineers should be especially concerned about the risks that their designs may pose and be knowledgeable of design approaches that reduce such risks, given that their paramount responsibility as licensed professionals is to protect public health, safety, and welfare.

The purposes of this article are to

- review safety hazards that can be associated with retention/detention ponds;
- discuss techniques that can be used to reduce the risk of such hazards; and
- review representative pond safety recommendations and guidance from municipalities, state and federal governments, professional societies, and the general stormwater literature.

Although the focus of the article is on wet and dry ponds, many of the issues and recommendations presented here apply to other stormwater facilities, such as best management practices (BMPs), long underground pipes, and culverts (see the discussion of this topic later in the article). Conceptual designs of a typical wet pond and dry pond are provided in Figures 1 and 2, respectively. Photographs 1 and 2 show examples of typical facilities.

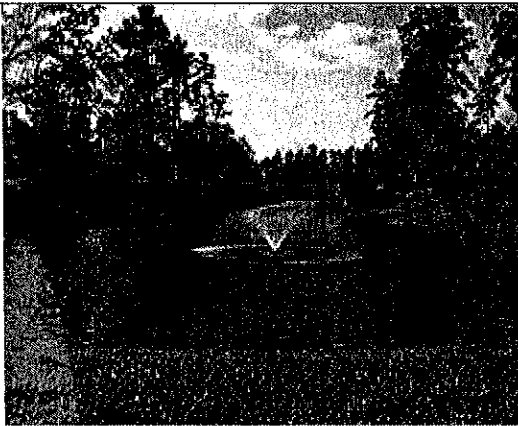


Photo 1: Typical retention pond



Photo 2: Typical detention pond

Overview

Unsafe conditions can occur under both dry and wet weather conditions. These range from readily apparent problems such as outlet pipes that are open (unprotected with trash/safety racks) to less obvious concerns such as outflow pipes that are subject to overwhelming hydrostatic forces due to high headwater depths. A complicating factor is that children are often attracted to stormwater facilities, and this poses special design challenges and risks. For instance, the authors are aware of a case where a dry pond in an office park had a rapid rise, and a child playing in the pond was apparently knocked down by jet flows from an inlet pipe, tumbled by vortex flows, and ultimately dragged into an unprotected outlet pipe by suction forces. These forces were not visible (apparent) when the water depth in the pond covered the pipe entrances and outlet. Although it is not feasible to anticipate every public safety risk, many scenarios are foreseeable and can be accounted for during design. Pond safety issues that do not involve drowning must also be considered. For example, embankment slopes that are too steep can be hazardous to the public and maintenance staff (such as those operating lawnmowers). Another example is high wingwalls or other vertical structures. In the past few years, a serious public health concern that has emerged is related to ponds that create mosquito-breeding habitat due to shallow and stagnant standing water, thus increasing the risk of West Nile virus to the adjacent community. * * * *James Town Canyon Virus*

Specific Safety Deficiencies

The authors have observed the following safety deficiencies in storage facilities:

- * • Outlets are open and unprotected, they lack trash/safety racks, the racks have openings large enough to pose a danger to the public, and/or the racks are too close to the outlet to provide sufficiently slow flow velocities that will not impinge a person against them.
- Adjacent land uses are incompatible with storage facilities and few, if any, steps have been taken to minimize obvious risks. For example, a nursery school playground without a fence was observed immediately next to a retention pond that had a high concrete wall along one side without a suitable railing.
- The public is effectively invited to spend time near storage facilities because they are located in parks, along bike trails, next to playgrounds, etc., yet the designers fail to recognize that frequent use will occur, and public safety has clearly not been a specific design objective.
- Education of community residents, office and industrial park employees, users of multipurpose recreational facilities, etc., regarding pond hazards is not provided. Signs warning the public of rapidly rising floodwaters and associated danger are not posted.
- Sideslopes of the facility are excessively steep or vertical without suitable safety rails. As a result, it would be very difficult for someone to get out of the pond when water levels are rising.
- Sideslopes within the pond's permanent pool are too steep, and/or ponds lack "safety benches" around their perimeter.
- Pond inflow and outflow pipes are directly across from and in close proximity to one another. In this case, a person can be knocked over by the impulse forces (momentum) of inflows and then sucked into and/or pinned against the outlet structure.
- * • Pond depths increase very rapidly, and inflow/outflow pipes are quickly inundated and not visible.
- Hydraulic structures are designed and constructed in a manner that makes them hazardous. For example, steel bars on grates are not beveled, rounded, or covered, but have sharp ends. Bolts have jagged, exposed ends. Gaps between steel bars and concrete walls are too wide. Railings either are not used where they should be or are improperly designed.
- Ponds have a "hard edge" appearance, such as a block or cobblestone vertical wall, immediately adjacent to the water surface drop into a pond that has steep sideslopes, so a person who falls in cannot get out without having to swim.
- * * • A variety of problems with spillways have been observed. For example, spillways are undersized. Dams and embankments are not designed to withstand overtopping forces during floods larger than they were designed to detain, despite the presence of homes and businesses in the "dam break" floodplain downstream. This is often the result of designers assessing embankment behavior for the design event, such as the 50-year storm or the 100-year storm, but failing to recognize that larger events can and do occur, and that the consequences of such events have to be considered.

- ✱ ✱ • Inadequate maintenance and monitoring occur, thus leaving the facilities unable to function as designed or intended. For example, when pond outlet structures are fully or partially blocked with debris, the risk of embankment overtopping and failure increases. Orifices in riser pipes that are used to gradually "bleed down" a water-quality design storm typically have small diameters, which leaves them vulnerable to plugging by trash, debris, sediment, algae, etc., unless frequently inspected and maintained. This can lead to prolonged pooling of shallow, stagnant water, which sets the stage for mosquitoes and, potentially, West Nile virus.
- Other drainage facilities adjacent to the pond (designed at the same time as the pond) are unsafe, such as channels, drop structures, energy dissipaters, and culverts.

The key to reducing the observations described above is careful consideration of risks in the design phase, coupled with regular inspection and maintenance of the pond to ensure that the facility is functioning as intended and that unforeseen hazards have not been created.

Design and Operational Techniques to Reduce Risks

The following risk-reduction techniques are recommended (see Photographs 3-10 for examples):

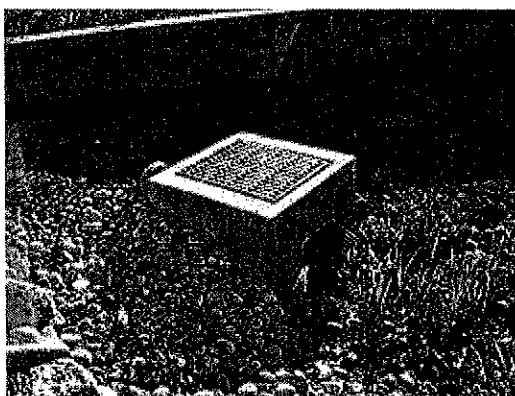


Photo 3: Detention pond outlet with trash/safety racks

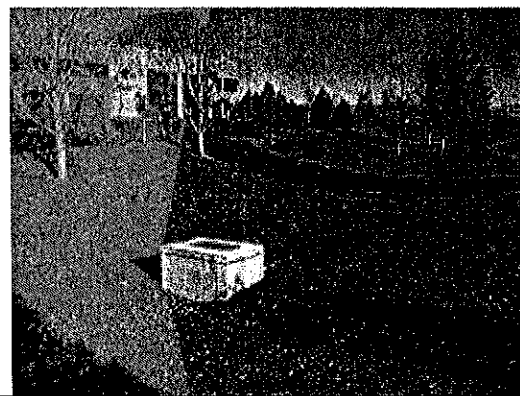


Photo 4: Detention pond with safe outlet, placed mid-pond, with mild sideslopes and good visibility from office building

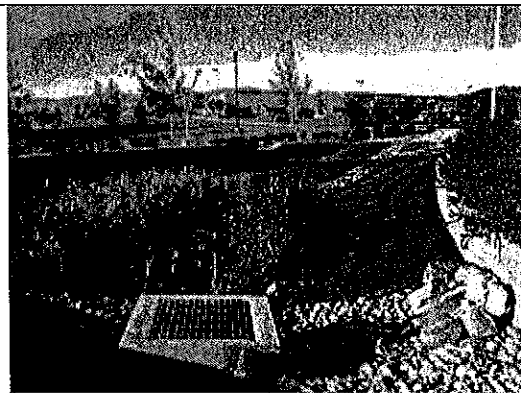


Photo 5: Wetland vegetation in pond bottom promotes water-quality enhancement and tends to discourage public access

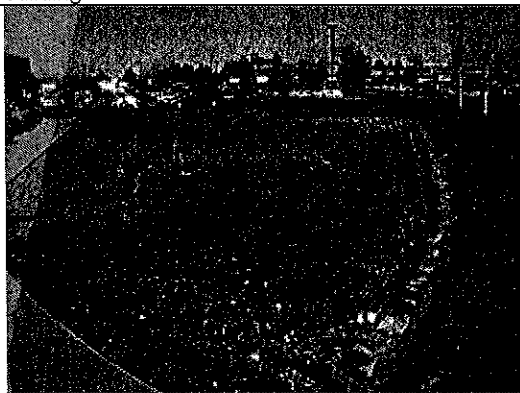


Photo 6: Limit the use of vertical walls, have mild sideslopes above and below walls, and use railings where appropriate.



Photo 7: Retention pond with various safety provisions, including mild sideslopes and shallow water around full pond perimeter



Photo 8: Fences have pros and cons as a safety measure; in general, do not rely exclusively on fencing for safety.



Photo 9: There is widespread recognition of public hazards associated with urban-area impoundments and attempts to limit liability.



Photo 10: Trash/safety rack on drop inlet pipe at wet pond

1. Inform members of the pond design team that promoting public safety is an essential design objective. Raise the subject regularly while the design is progressing. Educate designers to understand that safety can be addressed without significantly increasing costs or disrupting hydraulic function.
- * * 2. After a conceptual or preliminary design for the facility has been prepared, review it with the facility owner, municipality, state staff concerned with dam safety (if relevant), and parties charged with its long-term operation/maintenance for potential safety issues. Modify, as necessary, to reduce risks to the public. Pay particular attention to risks to unattended children. Engineers are advised to design storage facilities in concert with a landscape architect, who will often have excellent suggestions for promoting safety (along with techniques to enhance appearance and maintenance).
3. Outlets pose particular risks and merit special attention. Do not use open, unprotected pipes as outlets. Instead, integrate the outlet pipe into an outlet structure that has smaller openings, and/or utilize a sloping trash/safety rack at the pipe entrance. The rack should have a surface area that is many times larger than the surface area of the outlet pipe to reduce entrance velocities (which is necessary to minimize the risk of a person being pinned against the rack) and to ensure that if debris is a factor, at least some of the surface area of the rack will be open during flooding to enable the pond to drain. * *

The Urban Drainage and Flood Control District in Denver, CO, has prepared detailed minimum design guidance for pond outlet racks. The rack should be sloped at 3H:1V or milder. A clear opening at the bottom of 9 to 12 inches will permit small debris at lower flows to go through. The bars on the face of the rack should be spaced to provide 4- to 5-inch clear openings between them. Transverse support bars should be minimized, but they are essential for structural support under heavy hydraulic loads and will enable a person to climb up the rack.

HOA of this project need to be educated about proper maintenance & function of pond.

4. When feasible, place the outlet away from areas of heavy public use such as playgrounds, parks, and schoolyards. Screen the outlet so that the public will not be "drawn" to it. Thick shrubs, grading techniques, and aesthetic fencing or railing can be useful in this regard. Ensure that embankment sideslopes adjacent to the outlet structure are not too steep to enable people to scramble away from the structure as pond waters are rising.
5. Grade the overall site with safety in mind. For example, provide mild sideslopes leading to and within the pond and minimize the use of vertical walls. Use safety railings when vertical walls or overly steep slopes are used.
6. Integrate a safety ledge (also referred to as a safety bench) around the perimeter of the permanent pool of a pond. Fortunately, this recommendation is consistent with another technique related to stormwater-quality enhancement: integrating a littoral zone of emergent vegetation around the pond perimeter. Integrating a safety bench with emergent vegetation will discourage people from wading into the pond. This approach can also create wildlife habitat and provide an attractive natural shoreline.
7. Owners are advised to periodically observe the facility to ascertain how the public interacts with it. Owners should also consider the comments received from adjoining property owners. For example, if children are skateboarding on concrete pans in the bottom of a dry basin, they should be told not to do this and warned of the hazard. Signs that say "No Skateboarding" may be helpful, although it may also be necessary to create a rough surface to make skating difficult. For facilities that are on private property, it is often feasible to have them included on security watches. Security staff should be instructed to pay particular attention to them during runoff events.
8. Community education can be a valuable tool. Use signs that warn of rapidly rising floodwater and educational, interpretative signs that explain how the stormwater storage facilities work. Urge local radio and television stations to include short public service announcements that emphasize the hazards posed by storm drainage facilities. Educate schoolchildren to these risks. Distribute flyers. Inform homeowner associations and property owner associations (for commercial areas) of these risks. Ponds are often located near public facilities such as recreation centers, libraries, and fire stations. Staff can be asked to observe the storage facility during dry and wet weather conditions and to identify potential hazards. Similarly, facilities in office parks and industrial complexes are often visible to workers, and they can be asked to identify potential hazards.
9. Attempt to separate certain land uses, such as preschools, from ponds or incorporate obstacles that will assuredly prevent access.
- * 10. Separate inflow and outflow pipes by long distances and ensure that the pipes are not directly across from each other. This will avoid the creation of a continuous flow stream (current), which poses special dangers for the public. If this is not feasible, use an energy dissipater at the outlet where it discharges into the detention facility.
- * 11. Regularly inspect and maintain the detention facility. Anticipate potential problems. Look at the impoundment from the perspective of someone who knows nothing about the risks that such facilities pose. Look for potential hazards and address them.
12. Recognize that detention facility dams can be hazardous and use care in their design. Ensure that all aspects of dam safety, ranging from upstream and downstream sideslopes to spillway adequacy to behavior of the pond during overtopping, are addressed. In particular, acknowledge that floods larger than the 100-year event can and will occur, and determine how the dam will behave under such conditions. If the dam is anticipated to fail during extreme floods, analyze the downstream impact of such failure.
- * 13. Take steps to eliminate shallow, shallow-stagnant water in the bottom of "dry" basins that can be conducive to mosquito breeding. For example, determine maximum groundwater table elevations prior to design. Do not use outlet structure designs that are subject to plugging. Consider the use of gravity underdrains. Because mosquitoes generally require a stable, shallow, and stagnant water surface for at least three days to reproduce, design ponds to drain the water-quality design storm in less than 72 hours and use fountains or aerators in wet ponds to induce waves. Over the past few years, there have been many articles in stormwater literature about mosquito control, and readers are urged to become familiar with this subject and to address it during design and operations/maintenance.

14. The question of whether to construct fences around detention facilities is complicated, with arguments both for and against the practice. Ultimately, the decision should be site-specific and there should be a good rationale for whatever decision is made.

Fences certainly discourage some people from accessing ponds. Fences lend themselves to the installation of warning signs. Provided that fencing materials are carefully selected and well maintained, fences can be aesthetic.

On the other hand, many children or youths will view crossing a fence as a worthy and exciting challenge. The authors have observed many unattractive, poorly maintained fences that are eyesores. It often seems to be the case that ponds surrounded by fences are not as well maintained as those that are in the open and more visible. Ironically, if a situation does occur involving public safety, reaching the person who requires assistance will be impeded by a fence. If the safety issues are addressed using many of the other techniques described in this article, it should not be necessary to fence the facility.

- * ✱ Isolated lengths of fence can be desirable, provided that they are attractive and properly integrated into the overall site plan (again, this emphasizes the value in engineers working closely with landscape architects during design). For example, it can be valuable to include a fence at the top of a steep slope to discourage access.
- 15. Concrete pans in pond bottoms should be designed to make them less attractive for skateboarding, such as finishing the concrete with a rough texture and/or narrow V-shaped surface.
- 16. Reduce the number of small, onsite ponds that are used in new residential and commercial developments by appropriate drainage master planning, minimizing directly connected impervious area, using low-impact development measures, and emphasizing larger, regional storage facilities. It should not be necessary for every new convenience store, gas station, and fast food outlet to have its own dry detention pond, as this needlessly compounds public risks and creates other problems.

Safety Racks at Stormwater-Quality BMPs, Long Underground Pipes, and Culverts

Safety (trash) racks should often be integrated into the outlet structures for BMPs such as wetlands and swales. Although the primary focus of such facilities is water-quality enhancement, designers must concurrently protect public safety.

The use of trash/safety racks at inlets to culverts and long underground pipes should be considered on a case-by-case basis. While there is a sound argument for the use of racks for safety reasons, field experience has shown that when the culvert is needed the most—that is, during heavy runoff—trash racks often become clogged and the culvert is rendered ineffective. A general rule of thumb is that a trash/safety rack will not be needed if one can clearly "see daylight" from one side of the culvert to the other, if the culvert is of sufficient size to pass a 48-inch-diameter object, and if the outlet is not likely to trap or injure a person. By contrast, at entrances to longer culverts and long underground pipes and for culverts not meeting the above-stated tests, a trash/safety rack is necessary (Urban Drainage and Flood Control District 2001).

Conclusion

Public safety must be carefully accounted for when planning, designing, and maintaining urban stormwater detention and retention facilities, BMPs, culverts, and other facilities. Failure to properly address these risks could leave all parties involved with their ownership, design, and maintenance subject to legal liability in the event of injury or death. The potential risks are numerous and significant, but they can be managed. Indeed, the great paradox of designing safe stormwater detention and retention facilities is that if they are attractive, interesting, well maintained, and "inviting," they will be regularly used by people of all ages, and this will promote public safety.



Maintaining Detention Ponds

Contents...

Page 1: Why is maintenance important; Definitions; Who's responsible; Why ponds fail
Page 2: Maintenance considerations; The O&M Program; Routine maintenance; Non-routine maintenance; Costs and funding
Page 3: "Quick Hit" Detention Pond SOP
Page 4: Inspection checklist

Definitions...

Wet detention pond: a pond designed to have a remaining permanent pool of water after a storm event.

Dry detention pond: a pond designed to NOT have a significant pool of water remaining after a storm event.

Regional Pond: a pond designed to capture stormwater runoff from a larger, regional area.

Water Quality Pond: a detention pond with an orifice sized to allow time for settling and filtering of pollutants before the runoff is discharged from the pond.

Tributary drainage area: the total land area that drains to the pond.

Impervious area: a solid surface that does not allow rain to enter.

Stormwater runoff: runoff that occurs as a result of a rain or storm event hitting an impervious surface and running off.

UDFCD: Urban Drainage and Flood Control District; assists local governments in the metro Denver area in urban stormwater issues.

Inlet: The point where stormwater enters the pond.

Trickle channel: A channel that efficiently conveys stormwater from the inlet to the outlet structure (selected ponds).

Outlet: A structure that controls the rate of release from the pond and the water depth and storage volume in the pond.

Orifice: A controlled opening on the outlet structure through which stormwater is discharged from the pond (selected ponds).

Trash Rack: A structural feature of the outlet that filters stormwater by trapping debris before runoff is discharged (selected ponds).

Rip rap: Rock material typically used to stabilize conveyance channels.

Emergency spillway: Conveyance feature of a detention pond to discharge excess stormwater flows to maintain the integrity of the pond structure during substantial runoff events.

Easement: A set-aside area with various restrictions to provide open access for inspection or repair of drainage feature.

So you have a detention pond on your property...

Detention ponds are used to **improve the quality** of urban runoff from roads, parking lots, residential neighborhoods, commercial areas, and industrial sites, and to **reduce peak stormwater runoff rates** by providing temporary storage during larger storm events. If the detention pond on your property was constructed early in the development process, it was probably used to trap sediment from construction activities in the tributary drainage area, a very effective way to collect and remove pollutants. In addition, the detention pond on your property may provide other benefits such as passive recreation and open space opportunities in addition to reducing peak runoff rates and improving water quality. A functioning detention pond is a requirement for stormwater management.

You, as the owner of this stormwater feature, the manager of a commercial site, or as a member of a Homeowner Association (HOA), need to understand the importance of the detention pond facility and your obligation to assure its continued proper function. This detention pond maintenance fact sheet will provide the information and the contacts you need to operate a fully functional detention pond on your property.

Who's responsible for your pond...

Designation of a responsible party is important to assure proper operation of your detention pond feature. In some instances this may be a shared responsibility. In the majority of cases, the commercial property owner or the HOA is responsible for the correct operation and proper maintenance of the pond. Some ponds may be eligible for maintenance by the Southeast Metro Stormwater Authority (SEMSWA). In rare cases, UDFCD has accepted maintenance eligibility on Regional Ponds for the *structural components* of the pond, including the trickle channel and outlet works. You can find out about SEMSWA assistance and UDFCD eligibility by calling SEMSWA @ 303-858-8844. SEMSWA does have the authority to inspect and review maintenance activities to ensure the viability of your pond, and easements provide for this.

Why Maintain your pond...

Stormwater runoff is a significant source of water pollution in urbanizing areas. In addition, the increased volumes of flow resulting from added impervious areas during urbanization results in increased runoff volumes. Detention ponds mitigate both scenarios in providing a treatment basin for pollutant removal as well as a collection basin to retain the larger flows and thus reduce the peak runoff rates downstream. Studies have shown that *properly maintained detention ponds* can be very effective at removing certain pollutants and providing necessary storage volumes during larger storm events. Improperly maintained ponds can increase the discharge of pollutants downstream, increase the risk of flooding downstream, increase the instability of downstream channels, and lead to aesthetic and nuisance problems.

Why some ponds fail...

Studies show that poor operation and maintenance is the leading cause of pond failure. Poor maintenance can also create unpleasant odors, nuisance insects, algae blooms and a generally unsightly, unkempt area. Detention ponds may fail due to

- poor vegetation maintenance in terms of mowing and weed control,
- clogged inlets resulting from trash and debris, sediment accumulation,
- failed side slopes, and
- inadequate access for routine maintenance activities.

Knowing why this pond was built at your commercial site or in your subdivision community and the importance of all the components working together should reduce the chance of pond failure.



Maintaining Detention Ponds

Maintenance considerations...

Routine HOA maintenance, like mowing and debris removal, is vital to the proper operation of the detention pond, and needs to be done on a frequent basis. Non-routine HOA maintenance, like slope stabilization and sediment removal, will probably be more on an annual basis. Every pond is different in the size, type and characteristics of the tributary area that contributes runoff to the pond, as well as the location of the pond within the development.

- A pond serving a large commercial district will likely require more maintenance than one serving an established neighborhood, and a pond in a prominent location in the development will require more frequent collection of trash to make a favorable impression.
- Maintenance considerations for a wet pond will need to focus on floating litter, scum and algal blooms, shoreline erosion, possible unpleasant odors and mosquitoes, as well as more difficult sediment removal.
- Maintenance considerations for a dry pond will concentrate more on mowing to control the vegetation and frequent removal of the trash and debris that may clog the outlet/trash rack.

Maintenance will always be needed; if maintenance is not done, or not done frequently enough, or properly, a false sense of security exists for the pond's temporary storage abilities during a large storm event, and its pollutant removal abilities during a typical runoff event.

Costs and Funding...

The property owner or the HOA will need to establish an O&M fund and assess annual fees for maintenance. Typically, fees are established by the developer prior to turning the responsibility of the pond over to the owner. After several years of operation with these set fees, it may be necessary to re-evaluate maintenance costs for the actual operation of the pond after the development is established. An excellent source of information about pond maintenance costs is UDFCD. You can contact SEMSWA @ 303-858-8844 and ask about estimates for costs for your pond based on UDFCD data.

The Operation & Maintenance (O&M) Program...

An effective Operations and Maintenance Program requires several things:

- A good plan that specifies what maintenance actions are needed, when they will be performed and how often they will be performed, inspection checklists and follow-up repair timetables
- An understanding of the routine and non-routine activities to be employed
- An understanding of the equipment and materials needed for maintenance
- An identification of responsible parties for routine maintenance, non-routine maintenance, inspections and repairs
- Adequate funding for the maintenance activities

An O&M Manual may have been prepared for your pond; please contact SEMSWA to inquire if there is one or request a sample O&M Manual that may be applicable.

Minimum checklist components...

(A good time to fill out checklist is every time routine maintenance is done; while mowing, someone can check the other features, too)

- Any obstructions of the inlet or outlet or orifice?
- Has trash accumulated in the pond or on the rack?
- Any erosion or instability on the slopes?
- Any sedimentation in the basin?
- Any settling or cracking of the bermed areas?
- Are there any upstream or downstream conditions that could affect pond operation?
- Is trickle channel conveyance in good working order?
- Is outlet channel conveyance in good working order?

Routine HOA Maintenance...

Routine maintenance includes:

Inspections: Periodic scheduled inspections with a specified checklist, and inspections after major rainfall events, to check for obstructions/damage & to remove debris/ trash.

Vegetation Management: Mowing on a regular basis to prevent erosion or aesthetic problems. Limited use of fertilizers and pesticides in and around the ponds to minimize entry into pond and subsequent downstream waters.

Trash, debris and litter removal: Removal of any trash, etc causing any obstructions at the inlet, outlet, orifice or trash rack during periodic inspections and especially after every runoff producing rainfall event. General pickup of trash, etc in and around the pond during all inspections.

Mechanical Equipment check: Inspection of any valves, pumps, fence gates, locks or mechanical components during periodic inspections and appropriate replacement/repair.

Structural Component check: Inspection of the outlet works, inlet, orifice, trash rack, trickle channel on a regular basis for additions to the annual Non-routine Maintenance list

Non-routine HOA maintenance...

Non-routine maintenance includes:

Bank erosion/stabilization: It is critical to keep effective ground cover on all vegetated areas in order to see the benefits of proper infiltration of runoff, and effective filtering of pollutants. All areas not vegetated should be re-vegetated and stabilized immediately

Sediment removal: Every six months or so, the accumulated sediment should be removed from the bottom of the outlet structure and the pond depths checked at several points. If the depth of the accumulated sediment is greater than 25% of the original design depth, sediment should be removed. Check w/ SEMSWA on typical sediment removal schedules for residential ponds and commercial ponds.

Structural Repair/Replacement: Eventually the outlet structure or other structural components like the trickle channel or trash rack will need repair or be replaced.



Maintaining Detention Ponds

DETENTION POND "Quick Study" Standard Operating Procedure (SOP) Fact Sheet



Standard Operating Procedures (SOPs) are prepared for activities that have the potential to impact waters of the state. One of the primary goals of these SOPs is to **provide time-tested, generally accepted routine procedures that minimize the potential for release of pollutants.** This Fact Sheet provides an overview of routine maintenance standard operating procedures at a detention pond facility.

Detention Pond Maintenance is an operational best management practice (BMP) developed to control pollutant discharges by keeping these stormwater facilities operating properly with routine maintenance procedures, including mowing and debris control.

These procedures are critical steps that must be included during pond maintenance on an annual basis, after an inspection, or on an as-needed basis after a storm event.

DO

- Inspect inlet and outlet works initially on a monthly basis until the appropriate timing of maintenance is established; prepare a maintenance schedule that assures proper function.
- Conduct maintenance per schedule, or on an as-needed basis as identified during an annual inspection, or on an as-needed basis after a storm event.
- Keep screen and/or trash rack free from debris using established maintenance schedule or on an as-needed basis after a storm event; notify supervisor if screen or rack is in need of maintenance at a higher level than scheduled.
- Report damage/compromise to side slopes, pond banks, inlet pipe, trickle channels, outlet structure; prepare a repair schedule and complete repairs.
- Remove vegetation adjacent to outlet works that may interfere with operation; note if noxious weeds present and notify supervisor to schedule treatment/removal.
- Remove debris/trash from the detention pond and surrounding area and dispose properly.
- When mowing, collect grass clippings and all other clippings/trimmings and take offsite for disposal or dispose in trash on site; do not leave in the pond.
- Notify supervisor any hazardous conditions or materials found during inspection.

DON'T

- DO NOT** mow detention pond too close to the surface; height should be 4 to 6 inches to maintain healthy grasses.
- DO NOT** clean equipment or conduct maintenance on equipment in the detention pond, or near a storm drain or other stormwater conveyance feature.
- DO NOT** leave grass clippings or trimming residue in pond; collect and dispose of in trash.
- DO NOT** apply landscaping chemicals in pond area, or in areas where the residue could make it into the pond during a storm event.
- DO NOT** attempt to clean up any unidentified or possibly hazardous materials found in or around pond during inspections; notify supervisor immediately upon discovery of hazardous materials.

Contact Numbers...

Southeast Metro Stormwater Authority: 303-858-8844
Urban Drainage and Flood Control District: 303-455-6277

Websites of interest: www.semswa.org
www.SPLASHCO.org
www.epa.gov/nps

Reference Document: "Maintaining Your BMPs", available as a pdf at www.novaregion.org/pdf/Maintaining_BMPs.pdf



Maintaining Detention Ponds

Example Maintenance Inspection Checklist

Pond: _____ Date: _____ Inspected by: _____ Type of Inspection: ☐ Routine ☐ Storm Event _____
(# days since event)

General Observations:

Is water flowing? ☐ Yes ☐ No Standing water? ☐ Yes ☐ No Depth: _____ Comments: _____

Any evidence of obstructions or erosion in vicinity of the pond that could affect performance? ☐ Yes ☐ No _____

Pond Conditions:

Does the pond sides/slopes/bottom show signs of settling, cracking, sloughing or other problems? ☐ Yes ☐ No _____

Do the embankments, emergency spillway (if applicable), or side slopes show any erosion or instability? ☐ Yes ☐ No _____

Is there any evidence of animal burrowing or other activity that could contribute to instability or increased erosion? ☐ Yes ☐ No _____

Is there evidence of encroachment into the pond or improper use of the pond? ☐ Yes ☐ No _____

Do vegetated areas need mowing? ☐ Yes ☐ No Are there areas that need to be re-vegetated? ☐ Yes ☐ No
☐ Mowed today ☐ Will schedule mowing ☐ Will schedule re-vegetation activities

Do vegetated areas need thinning, i.e. cattails, willows, trees? ☐ Yes ☐ No ☐ Thinned today ☐ Will schedule thinning

Is there accumulation of trash, debris and/or litter to be removed? ☐ Yes ☐ No ☐ Removed today ☐ Will schedule removal

Any signs of vandalism or other activity that could affect performance of the pond? ☐ Yes ☐ No _____

If permanent pool, any visible pollution? ☐ Yes ☐ No _____ Erosion at high water mark? ☐ Yes ☐ No _____

Abnormally high water level? ☐ Yes ☐ No _____ Unusual Algae blooms? ☐ Yes ☐ No _____
(May indicate obstruction at orifice, or trash rack; verify outlet structure operating properly) (May signal too many nutrients in runoff; identify dog activity and clippings management; will need monitoring)

Structural Components:

Are the pipes/inlets going into or out of the pond clogged or obstructed? ☐ Yes ☐ No _____

Is the outfall channel from the pond functioning appropriately? ☐ Yes ☐ No _____

Is the inflow trickle channel working properly? ☐ Yes ☐ No _____

Is the orifice and/or trash rack obstructed? ☐ Yes ☐ No _____

Is the outfall channel, trickle channel or other conveyance in need of repair? ☐ Yes ☐ No _____

Are the manholes, frames, and covers associated with the outfall channel in appropriate condition? ☐ Yes ☐ No _____

Do any safety features, such as fences, gates or locks need repair or replacement? ☐ Yes ☐ No _____

Plan of Action:

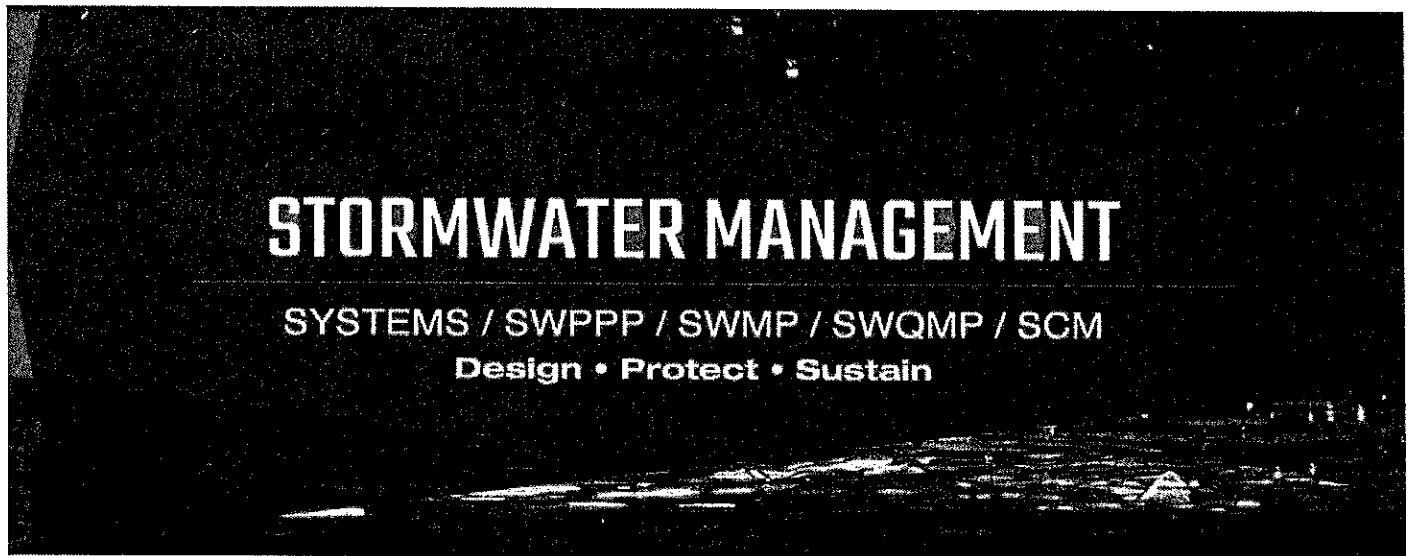
If answered YES to any of the above, the following is an anticipated *Maintenance Needs Action List*:

Total number of concerns: _____ Need more monitoring (Anticipated schedule to re-visit; identify what will trigger action)
(Yes answers) _____ Need routine repair (Approximate schedule for repairs; date of follow-up to re-inspect)
_____ Need immediate repair (Take action if correct equipment on site; or contact supervisor)

Signature _____



Stormwater Blog



Detention Ponds: Life After Construction

Posted by [Drew Fehrle](#) on Mon, May 15, 2017

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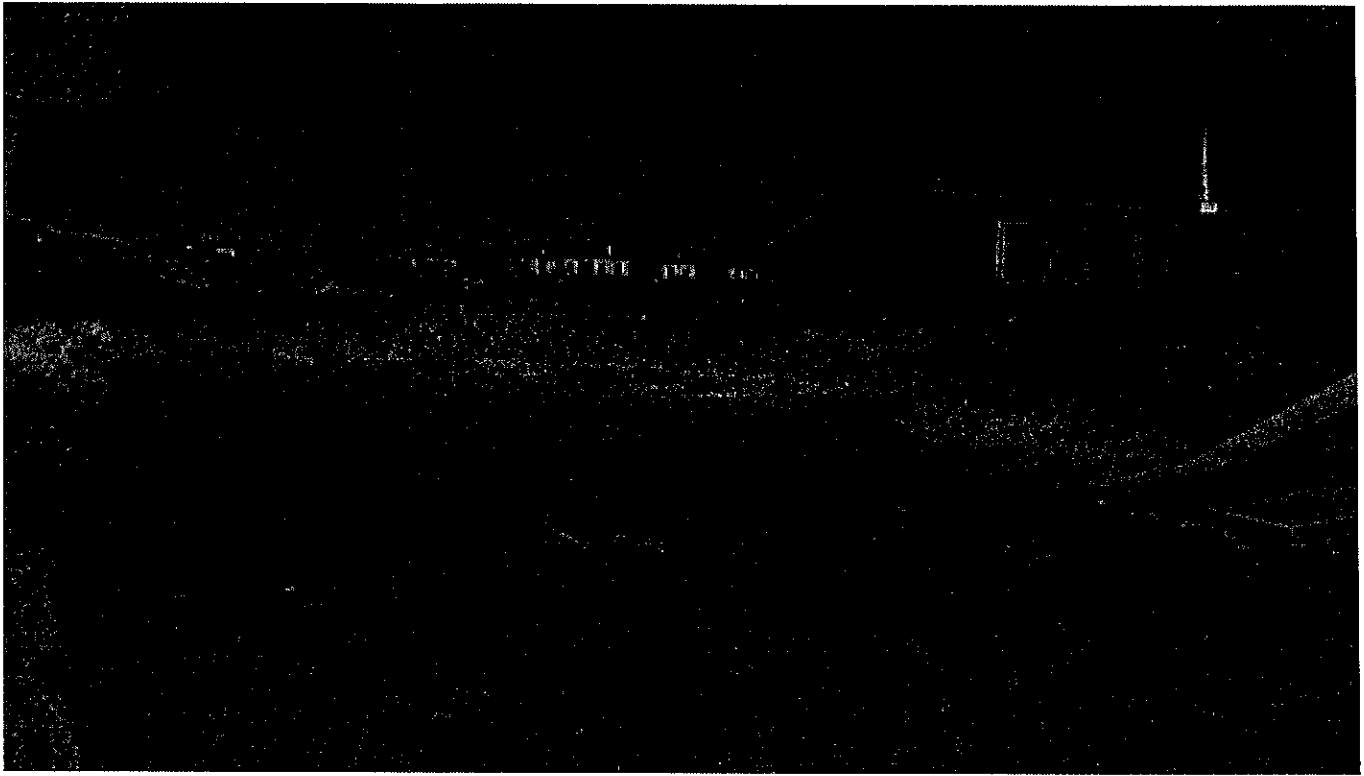
By now we should all know that vegetative stabilization during construction is a key step in a site's infancy. But what do you do after the site is built, when the construction crews are gone, and now you (or your tenant) are using the property to conduct business? You guessed it...long term stabilization!

- * Pond upkeep is often one of the most overlooked aspects of a property's maintenance routine, and yet, it is one of the most important. When neglected, a detention pond can cost thousands to repair or rehabilitate, and yet, when a regular routine is established, a maintenance program can be easily budgeted for.

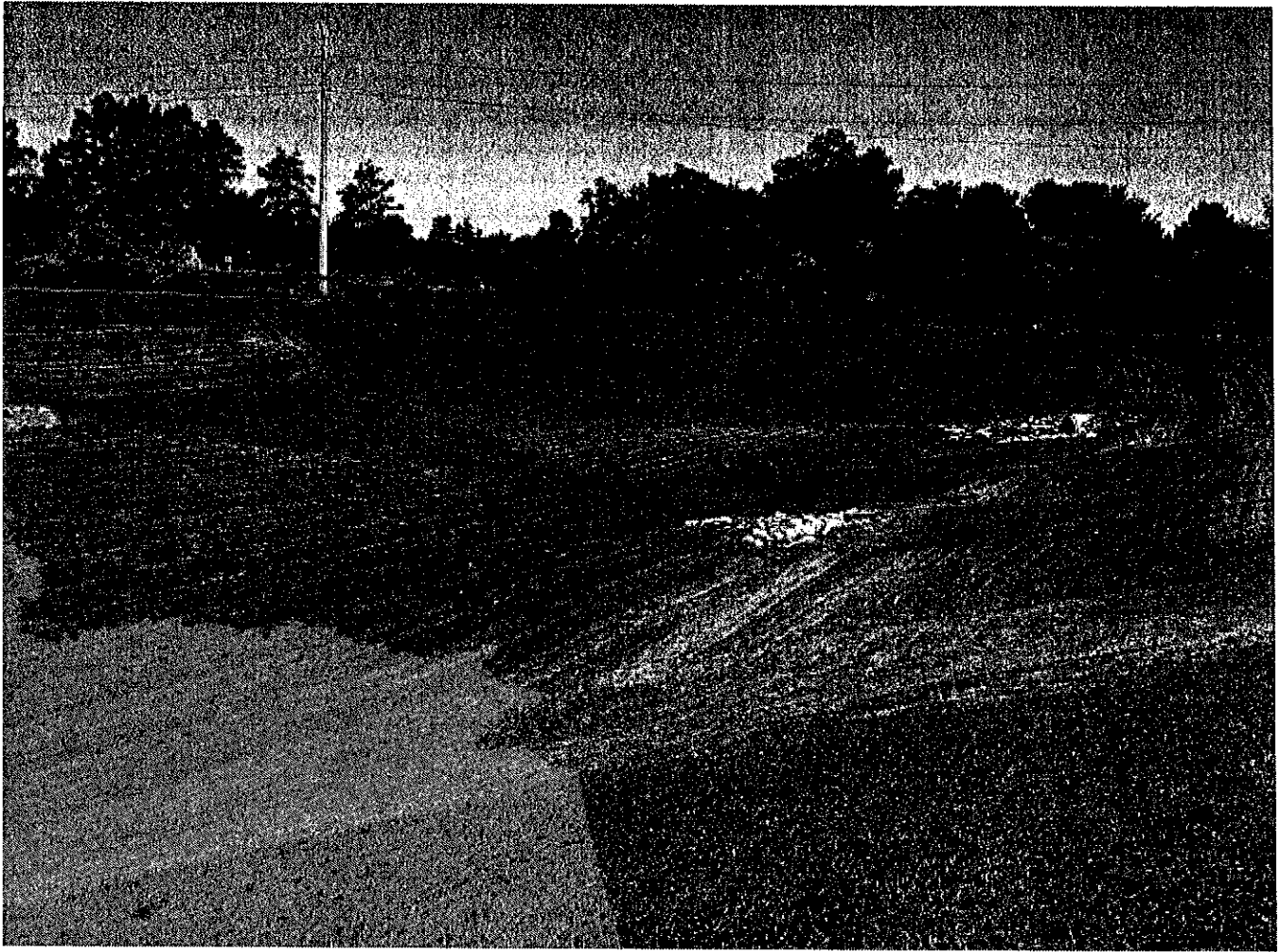
Maintenance routines are fairly universal, regardless of the size or shape of the pond: monthly inspections and mowing, and semi-annual seeding and fertilizing. Some detention ponds have pilot channels, which require some additional steps (more on this in future blogs), and some detention ponds have storm water quality structures at the outfall, which have specific, unique maintenance requirements.

What all detention ponds have in common, and what is typically neglected is vegetation, and it is the key to sustaining the integrity of the pond. Without healthy vegetation, soil will erode, causing sometimes massive rills and sink holes. However, simply by fertilizing and seeding the slopes of the pond twice a year, those costly problems are easily avoided.

Must be included in the Home Owners' Association "monthly" budget.



Another aspect of pond maintenance is mowing, and it too is vital to preventing major issues that require expensive and time-intensive repairs. In addition to mowing the slopes of the pond, it is important to mow the bottom of the basin as well, and prevent weeds and small trees from growing in the pond, degrading the integrity of the pond and ultimately requiring tedious removal of the overgrowth.



The key to staying on top of all of these things is monthly inspections, which are required by the local jurisdiction and specified in the property's Stormwater Quality Management Plan. If your detention pond is in need of maintenance, contact us. We will do an on-site assessment and work with you to develop a maintenance program to fit your needs.

**Request a
Quote**

Tags: Stormwater Quality Management Plans (SWQMP), detention and drainage, detention basin maintenance, detention ponds

First Name*

Jeff D. Emerson
18 Redlon Park Road
Portland, ME 04102

City of Portland Planning Board
389 Congress St
4th Floor
Portland, ME 04101
2018

September 28, 2018

Dear Planning Board Members:

The Planning board is contemplating approval of a development project which abuts one or more homes in the Redlon Park Association. I own one of the homes in the Association.

As a resident of this neighborhood since 2012, I have appreciated the City's care in preserving and maintaining undeveloped space for wildlife habitats, public enjoyment and quality of life enhancement for Portland residents and visitors.

Planning Board approval of the seven (7) lot subdivision, proposed by Joshua Wagner, representing the WB Group Inc., between Bancroft Street and Redlon Park would be contrary to the City's history of preserving green space and wetlands.

Also, I am concerned about the negative impacts on the wetland that runs through the property under consideration because it is an extension of the wetland that courses through Redlon Park. In the past two years my neighbors have noticed significant water backup after a rainfall in the Redlon Woods abutting their properties ever since the Chabad House, now operating as a year-round commercial and religious property, was built on Pomeroy Street contiguous to Redlon Park. I fear that any additional dense housing development adjoining Redlon Park and the Chabad House would only exacerbate the water drainage issue.

The developer testified before the Planning Board that the proposed homes would sell for approximately \$400,000 **which is not moderate or low cost housing**. There is no rationale for creation of more expensive homes in this sub-division.

While I am sympathetic to the City's need for additional housing I strongly urge the Planning Board not to approve a development which will burden the existing homes in the Rosemont neighborhood and further reduce the green space without increasing the availability of affordable homes. The City made, and continues to make, a serious mistake in permitting the operation of the Chabad House in a residential neighborhood. I suggest that you do not further compound that mistake with the approval of additional development in the Rosemont neighborhood.



130 Bancroft Street Proposed Subdivision

jackiehark@maine.rr.com <jackiehark@maine.rr.com>

Oct 4, 2018 8:52 PM

Posted in group: **Planning Board**

Dear Planning Board Members,

Unfortunately I will be unable to attend the meeting on 10-9-18, so I am writing to you to communicate my thoughts regarding this proposed subdivision. First, I strongly believe that this wetland, and ledge area of land is not an appropriate location for a housing development. I can't imagine that these lots would be easily sold, once prospective buyers see, and hear how wet the area is. If, however, the city, however, decides to approve this project, I want to make absolutely sure that the following concerns are addressed. First, the city needs to review all specifications for the detention pond and make sure the bar is raised not for a detention pond that would meet a very low threshold of handling a twenty-five year storm event (as the architect stated in the July meeting), but a seventy-five year storm event. The latter type of event is becoming more and more common as weather patterns change. Also, the city needs to require the developer to include in the association by-laws, that the pond is to be regularly maintained, and if needed maintenance is not performed, the city will perform the maintenance and the association will be billed. A fence (of my choosing) needs to be installed between my property and the abutting property where the detention pond is proposed. There is an old fence in that location that is rotten and will soon be coming down.

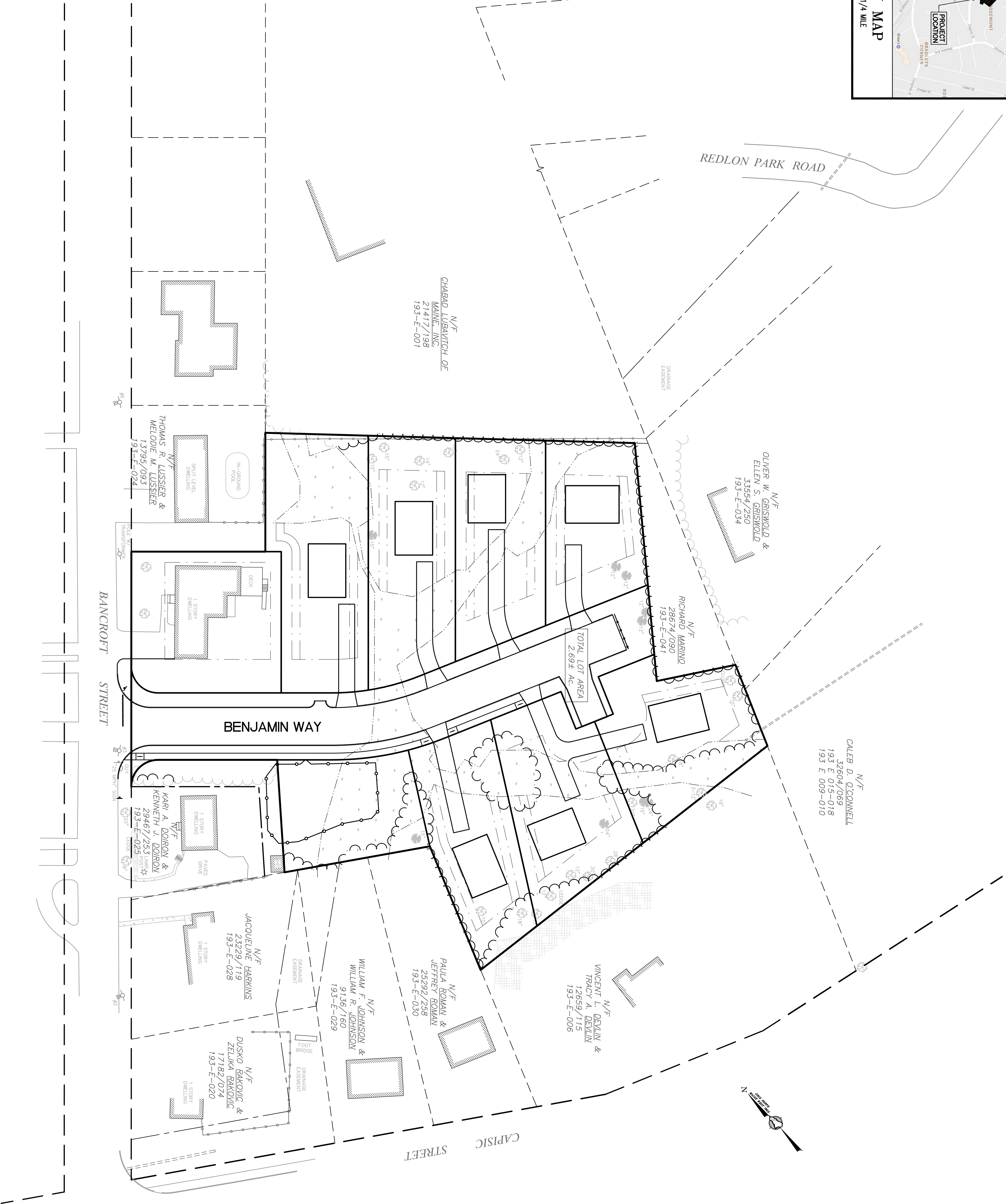
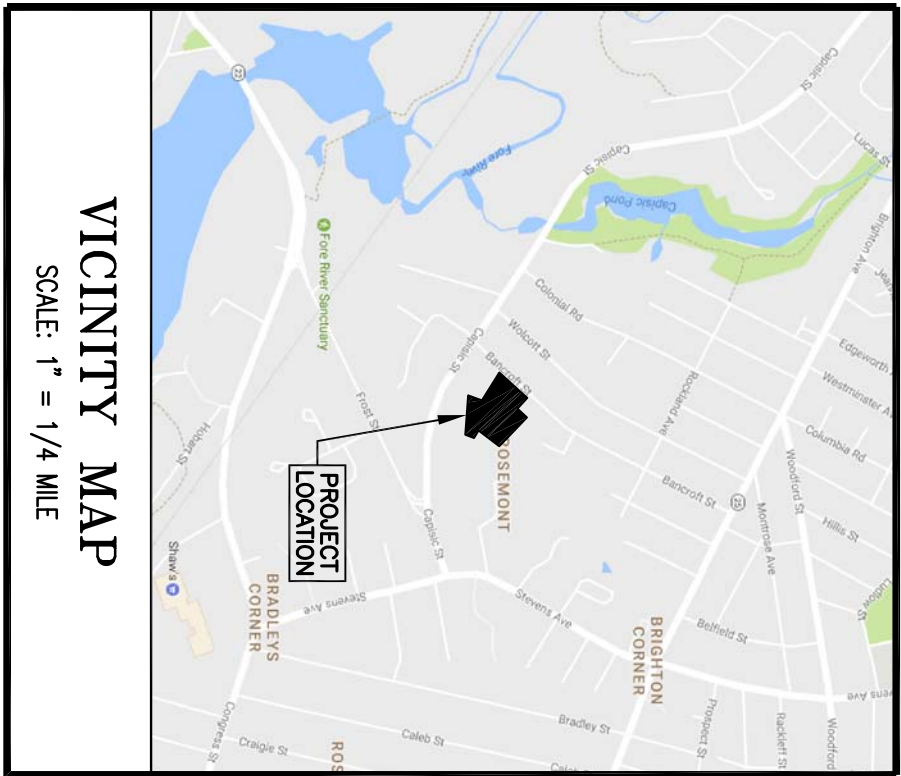
Before any excavation work is to be done, the storm drain clean-out needs to be done. This drain has never been cleaned out (over three decades worth of growth), and the water does not flow because of all of the overgrowth. Any digging would cause even more water to flow, and presently it has no where to go, except on my property and on my neighbors', the Rakovics' property. I need to be given a minimum of a forty-eight hour notice for the clean-out, as I want to be present. There is something at the end of my property that I don't want crushed. Also, all trees, bushes, etc; that are felled in the process of the clean-out, need to be removed. Under no circumstances would it be acceptable to have debris left behind. There needs to be a signed written agreement with the above stipulations stated and agreed to.

Lastly, if I experience any flooding, and/or any damage to my property or dwelling, I will pursue compensation to the fullest extent of the law from all responsible parties. I have consulted with an attorney and he will review any contracts/agreements.

Sincerely,

Jacqueline Harkins
154 Bancroft Street

PROPOSED CAPISIC MEADOWS SUBDIVISION
130 BANCROFT STREET, PORTLAND, MAINE



SHEET INDEX

- COVER/INDEX/VICINITY MAP
- BOUNDARY & TOPOGRAPHIC SURVEY
- SUBDIVISION PLAN
- PLAN & PROFILE
- GRADING & DRAINAGE PLAN
- UTILITY PLAN
- EROSION & SEDIMENTATION CONTROL PLAN
- CONSTRUCTION DETAILS - SHEET 1
- CONSTRUCTION DETAILS - SHEET 2
- CONSTRUCTION DETAILS - SHEET 3
- CONSTRUCTION DETAILS - SHEET 4
- CONSTRUCTION DETAILS - SHEET 5
- CONSTRUCTION DETAILS - SHEET 6
- SITE LAYOUT, LANDSCAPE & TREE SAVE PLAN
- PRE-DEVELOPMENT DRAINAGE AREA PLAN
- POST-DEVELOPMENT DRAINAGE AREA PLAN

ABUTTERS

ASSESSOR'S MAP NUMBER	OWNER'S NAME
193-E	CHABAD LIBAVITCH OF MAINE, INC. 101 CAIGE STREET, PORTLAND, ME 04102 BOOK 21417, PAGE 198
193-E	OLIVER W. GRISWOLD & ELLEN S. GRISWOLD 38 REDLON PARK ROAD, PORTLAND, ME 04102 BOOK 33554, PAGE 250
193-E	38 REDLON PARK ROAD, PORTLAND, ME 04102 BOOK 28674, PAGE 90
193-E	CALEB D. O'DONNELL 9 & 10 BOOK 32604, PAGE 69
193-E	VINCENT L. DEVLIN & TRACY A. DEVLIN 12659/115 BOOK 12659/115
193-E	PAULA ROMAN & JEFFREY ROMAN 60 WOODVALE STREET, PORTLAND, ME 04102 BOOK 23292, PAGE 238
193-E	WILLIAM F. JOHNSON & JACQUELINE HARKINS 114 BANCROFT STREET, PORTLAND, ME 04102 BOOK 9136, PAGE 160
193-E	JACQUELINE HARKINS 154 BANCROFT STREET, PORTLAND, ME 04102 BOOK 23292, PAGE 119
193-E	DUSKO BAKOLIC & ZELMA BAKOLIC 17182/074 BOOK 17182, PAGE 74
193-E	THOMAS R. LUSIER & MELODY M. LUSIER 126 BANCROFT STREET, PORTLAND, ME 04102 BOOK 13793, PAGE 93

THIS PLAN IS FOR REVIEW
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OR RECORDING

Revised	By	Date	Change
3	SMA	9/7/18	SUBMITTED FOR FINAL SITE PLAN/SUBDIVISION REVIEW
2	SMA	5/11/18	SUBMITTED FOR PRELIMINARY SITE PLAN/SUBDIVISION REVIEW
1	SMA	5/4/18	SUBMITTED FOR WMP TIER 1 REVIEW
PROJECT NUMBER: 41041			
DRAWING STATUS			
☒ SITE PLAN REVIEW			
☐ DEP REVIEW			
☐ PLANNING BOARD			
☐ SKETCH PLAN			
☐ FOR CONSTRUCTION			
9-7-18			
COVER/INDEX/VICINITY PLAN			
PROJECT NAME			
PROPOSED CAPISIC MEADOWS SUBDIVISION			
130 BANCROFT STREET, PORTLAND, MAINE 04102			
OWNER/APPPLICANT			
WB GROUP, INC.			
130 BANCROFT STREET, PORTLAND, MAINE 04102			

SURVEYING • ENGINEERING • LAND PLANNING

381 PINE ROAD, SCARBOROUGH, MAINE 04074

TEL: 207.853.1000 FAX: 207.853.1001

WWW.NORTHEASTCIVILSOLUTIONS.COM



SUBDIVISION NOTES

- S-1. DEVELOPER:
S-2. SURVEING / ENGINEERING:
381 PANE ROAD
SCARBOROUGH, MAINE 04074
S-3. WETLAND DELINEATION:
6 SECOND STREET
BLIXTON, MAINE 04093
S-4. ELEVATIONS AND CONTOURS ARE BASED ON CITY OF PORTLAND DATUM.
SEE PLAN FOR TBM DESCRIPTION.

ZONING ASSESSMENT
THE SUBJECT PARCELS ARE LOCATED IN R-2 ZONE PORTIONS OF BANGCROFT C. LEGISLATION, MAINE AS FOLLOWS:
MINIMUM LOT AREA = 6,500 SF
FRONT SETBACK = 25'
SIDE SETBACK = 25'
REAR SETBACK = 25'
1 & 1-1/2 STORY = 8'
2 STORY = 14'
3 STORY = 16'

LOT	MIN. LOT AREA	PROPOSED LOT AREA	MIN. LOT FRONTAGE	PROPOSED FRONTAGE
A	6,500 SF	11,417 SF	50'	85.49'
1	6,500 SF	13,575 SF	50'	65.11'
2	6,500 SF	11,693 SF	50'	68.57'
3	6,500 SF	10,266 SF	50'	72.46'
4	6,500 SF	8,787 SF	50'	82.20'
5	6,500 SF	10,044 SF	50'	65.62'
6	6,500 SF	11,280 SF	50'	101.48'
7	6,500 SF	10,757 SF	50'	90.00'

WETLAND IMPACT:		
IMPACT AREA A =	242 SF	
IMPACT AREA B =	9,048 SF	
IMPACT AREA C =	1,723 SF	
IMPACT AREA D =	1,723 SF	
TOTAL IMPACT =	10,741 SF	
EXISTING		
WETLAND	21,796 SF	11,055 SF
IMPERVIOUS	12,458 SF	41,120 SF
PERCENT OF EXISTING WETLAND FILLED =	49.3%	

NOTES

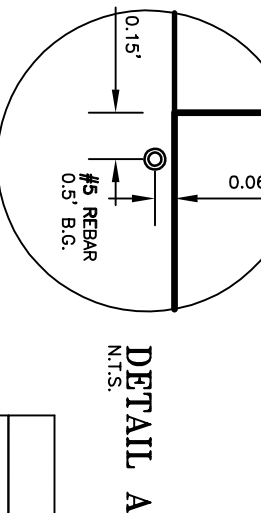
- ALL NEW HOMES IN THE CAPRIC MEADOWS SUBDIVISION WILL REQUIRE SPRINKLER SYSTEMS.
- BE CONSTRUCTED WITH SLAB ON GRADE FOUNDATIONS OR HAVE PROVISIONS FOR SUMP PUMPS.
- ALL STORMWATER INFRASTRUCTURE, LOCATED OUTSIDE OF THE ROADWAY, RIGHT-OF-WAY SHALL BE THE RESPONSIBILITY OF THE CAPRIC MEADOWS HOMEOWNERS ASSOCIATION.

APPROVED BY THE CITY OF
PORTLAND PLANNING BOARD

CHAIRPERSON

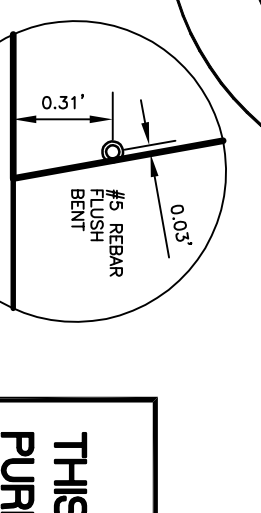
DATE

DETAIL A



CURVE TABLE

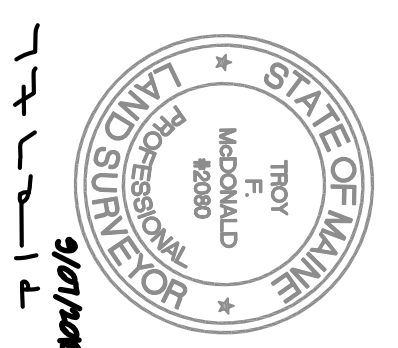
CURVE	LENGTH	RADIUS	CHORD LENGTH	CHORD BEARING
C1	28.00'	220.00'	28.00'	S84°42'27"W
C2	39.39'	175.00'	39.39'	N61°52'20"W
C3	27.00'	175.00'	27.00'	N69°57'25"W



DETAIL B

PROJECT BEGINNARY
LAG BOLT IN POLE #3
ELEV = 62.78 (CITY DATUM)

THIS PLAN IS FOR REVIEW
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LEGEND

- #5 REBAR WITH PLASTIC CAP (PROPOSED)
- SET GRANITE MONUMENT WITH PLASTIC CAP (PROPOSED)
- (PROPOSED MONUMENTATION SHOWN ON THIS SURVEY PLAT MAY OR MAY NOT BE USED BY THE STATE OF MAINE AND IF SO WILL BE DONE UNDER CLIENT AUTHORIZATION)
- FOUND IRON (SIZE & TYPE AS NOTED)
- UTILITY POLE (NUMBER AS NOTED)
- GUY WIRE ANCHOR
- TREE LINE (APPROXIMATE)
- BOUNDARY LINE
- EASEMENT LINE
- EDGE OF PAVEMENT
- RIGHT-OF-WAY LINE
- ABUTTER LINE
- BUILDING SETBACK
- OVERHEAD UTILITY
- NOW OR FORMERLY OWNED BY
- TAX MAP-BOOK AND PAGE (CDD)
- TAX MAP-LOT
- PARENTHESIS DENOTE RECORD DATA

BOUNDARY NOTES

- RECORD OWNERS OF THE PARCELS SURVEYED ARE DESCRIBED IN THE FOLLOWING DEEDS:
a. FROM EDWARD C. BROOKS & ROSE MARIE BROOKS TO KARI A. DOIRON & KENNETH J. DOIRON, DATED MARCH 30, 2012 AND RECORDED IN DEED BOOK 294617, PAGE 285 (PARCEL 193-E-039).
- FROM DAINE E. HERRICK TO PAUL WAGNER DATED MARCH 23, 2010 AND RECORDED IN DEED BOOK 27668, PAGE 230 (PARCEL 193-E-026 & 040).
- FROM THE ESTATE OF STUART HERRICK, JR. TO GOSWAM WAGNER DATED AUGUST 23, 2010 AND RECORDED IN DEED BOOK 28027, PAGE 288 (PARCELS 193-E-019).
- THE PARCELS SURVEYED ARE IDENTIFIED ON THE CITY/TOWN OF PORTLAND TAX ASSESSOR'S MAP 193, BLOCK E, PARCELS 19, 26, 39 & 40.
- THE BEARINGS SHOWN ON THIS PLAN ARE BASED ON MAINE STATE COORDINATE SYSTEM, WEST ZONE, 1801, GRID NORTH.
- REFERENCE IS MADE TO THE FOLLOWING PLANS:
a. PLAN OF PROPERTY, 130 BANGCROFT STREET, PORTLAND, MAINE, BY TITCOMB ASSOCIATES, DATED 8/30/2008, RECORDED IN PLAN BOOK 210, PAGE 228.
b. PLAN OF PROPERTY, 130 BANGCROFT STREET, PORTLAND, MAINE, BY TITCOMB ASSOCIATES, DATED 8/13/2008, RECORDED IN PLAN BOOK 208, PAGE 370.
c. PLAN OF EMERSON WOODS, PORTLAND, MAINE, BY ROBERT P. TITCOMB, DATED 4/30/1973, RECORDED IN PLAN BOOK 94, PAGE 19.
d. PLAN OF EMERSON WOODS, PORTLAND, MAINE, BY ROBERT P. TITCOMB, DATED 12/20/1972, RECORDED IN PLAN BOOK 93, PAGE 42.
e. PLAN OF PROPERTY IN PORTLAND, MAINE MADE FOR CHARLOTTE L.F. CHENET, BY H.L. & E.C. JOBDAN, DATED 10/05/1979, RECORDED IN PLAN BOOK 125, PAGE 8.
f. "1ST AMENDED SUBDIVISION PLAN OF REDLON PARK SUBDIVISION" BY SEBASTIAN TECHINIS, DATED 4/11/2016, RECORDED IN PLAN BOOK 216, PAGE 138.
g. "PLANNED RESIDENTIAL UNIT DEVELOPMENT PLAN AND SUBDIVISION PLAN, REDLON PARK, REDLON ROAD, PORTLAND, MAINE" BY PARKMAN & GREEN, DATED 2/27/1997, RECORDED IN PLAN BOOK 191, PAGE 435.
h. RIGHT-OF-WAY MAP, STATE HIGHWAY NO. 17, FEDERAL AID PROJECT NO. W-0814(2), BY STATE OF MAINE, DEPARTMENT OF TRANSPORTATION, DATED 4/1988, D.O.I., FILE NO. S-384.
i. MULTIPLE STREET LINE RECORDS PROVIDED BY THE CITY OF PORTLAND PUBLIC WORKS.
j. PLAN OF BRIGHTON, PORTLAND, MAINE MADE FOR GEORGE T. EDWARDS, BY CLOFFORD C. LEGGOW, DATED AUGUST, 1902, RECORDED IN PLAN BOOK 11, PAGE 103.
- THE WIDTH OF BANGCROFT STREET IS 50' BASED ON CITY OF PORTLAND STREET LINE RECORDS. THE LAYOUT OF THE RIGHT-OF-WAY LIMITS IS BASED ON SAID STREET LINE RECORDS AND MONUMENTATION TOWNSHIP.
- ELEVATIONS AND CONTOURS ARE BASED ON CITY OF PORTLAND DATUM CALCULATED BY KIM (NEED 1988 DATUM) AND ADDED 0.8' DIFFERENCE BETWEEN 1988 AND 1929 (NEED 1929 IN PORTLAND) TO GET TO CITY DATUM. SEE PLAN FOR TBM DESCRIPTION.
- THE UTILITIES SHOWN ON THIS PLAN WERE FROM FIELD OBSERVATION ONLY. THERE MAY (B88)DI-C-SAFE PRIOR TO ANY EXCAVATION WORK.
- WETLANDS SHOWN WERE DELINEATED BY LONGVIEW PARTNERS, LLC, JANUARY, 2017 AND A FIELD DETERMINATION THAT NO STREAMS EXIST ON THE SITE.

Number	By	Date	Change
3	SWA	3/7/18	SUBMITTED FOR FINAL SITE PLAN/SUBDIVISION REVIEW
PROJECT: 41041			
DRAWING NAME: 41041 Subdivision.dwg			
ISSUED:	MAY 1, 2018	SCALE: 1"=50'	FIG # 420
DESIGNED BY:	JWP / MAC	FIELD DATE:	1/10/2017
CHECKED BY:	JTM		

SUBDIVISION PLAN

- 130 & 144 BANGCROFT STREET, PORTLAND, MAINE
JOSHUA WAGNER (193-E-019)
PAUL WAGNER (193-E-026 & 040)
KARI DOIRON & KENNETH J. DOIRON (193-E-039)
144 BANGCROFT STREET, PORTLAND, MAINE 04102

Prepared for:
JOSH WAGNER



LEGEND

- BOUNDARY LINE
- EDGE OF PAVEMENT
- RIGHT-OF-WAY LINE
- ABUTTER
- EXISTING EASEMENT
- BUILDING SETBACK
- EXISTING UTILITY POLE
- EXISTING OVERHEAD UTILITY
- EXISTING HYDRANT
- EXISTING HYDRANT
- EXISTING WATER LINE
- EXISTING SEWER MANHOLE
- EXISTING WATER LINE
- EXISTING TREE (TO BE SAVED)
- EXISTING TREE LINE
- WETLAND
- PROPOSED TREE
- PROPOSED TREE LINE

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OR RECORDING

Revised	By	Date	Change
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3	SMA	9/7/18	SUBMITTED FOR FINAL SITE PLAN/SUBDIVISION REVIEW	SCALE: 1" = 30'	DATE: MAY 1, 2018
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SITE LAYOUT, LANDSCAPE & TREE SAVE PLAN

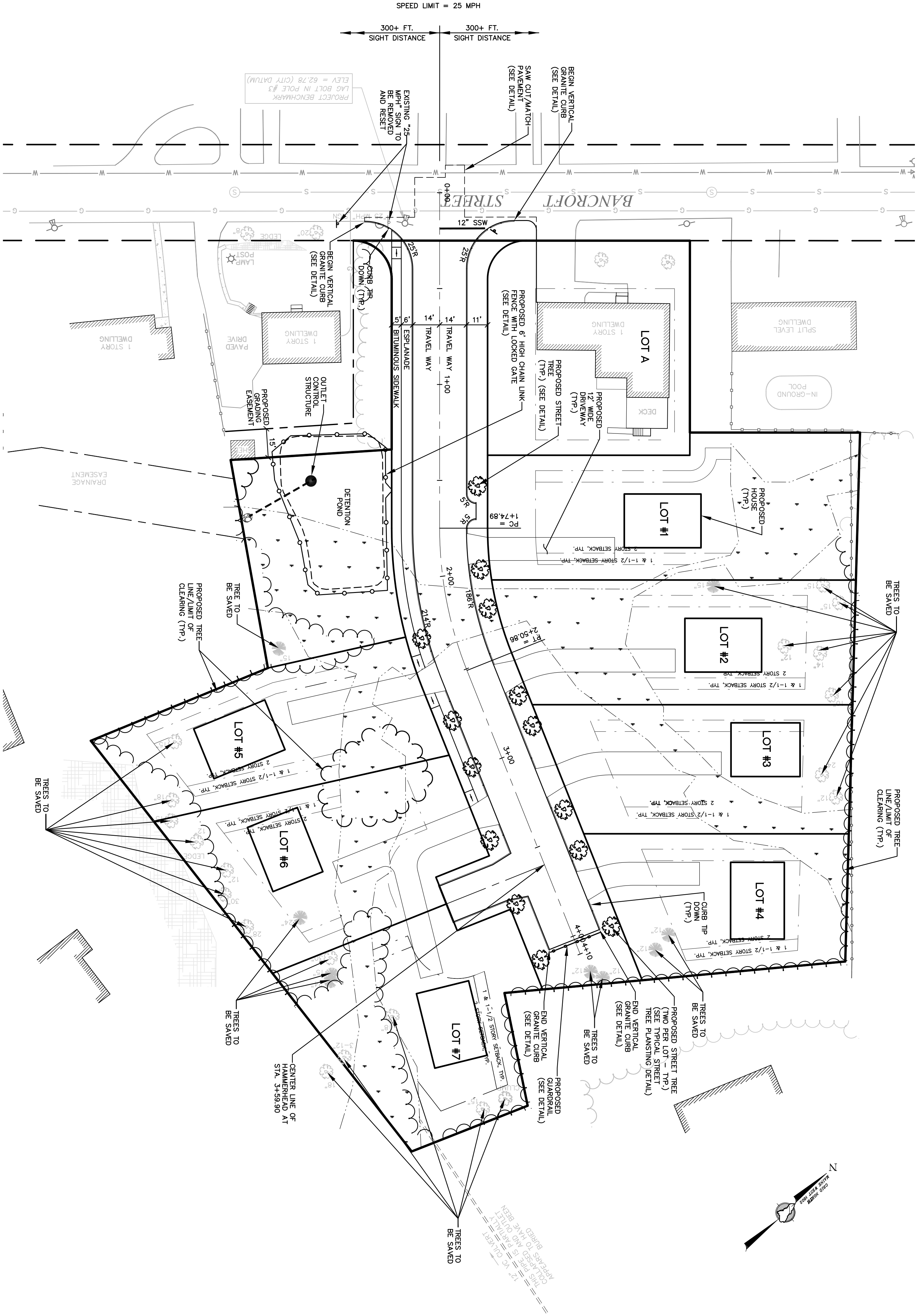
PROPOSED CAPSIC MEADOWS SUBDIVISION
130 BANCROFT STREET, PORTLAND, MAINE 04102

WB GROUP, INC
130 BANCROFT STREET, PORTLAND, MAINE 04102



NCS
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www.northeastcivilsolutions.com

SHEET 15 OF 15



LEGEND

- BOUNDARY LINE
- EDGE OF PAVEMENT
- RIGHT-OF-WAY LINE
- WETLAND
- EXISTING TREE LINE
- PROPOSED TREE
- PROPOSED TREE LINE
- INDIVIDUAL TREE SAVE
- TREE SAVE AREAS
- PROPOSED TREES

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Revised	By	Date	Change

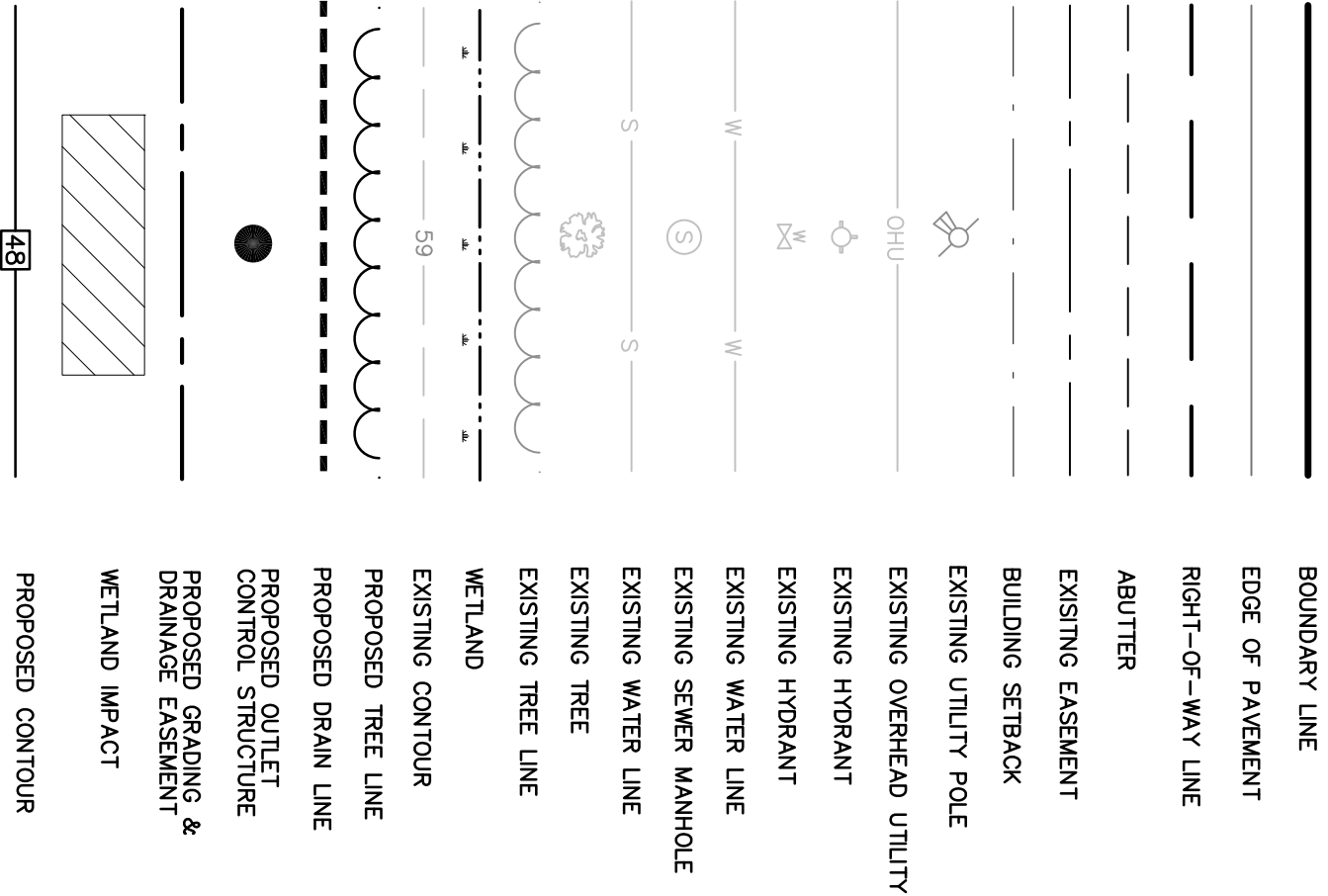
PROJECT NUMBER: 41041	ROAD FILE: 41041-LANDSCAPE.DWG	SCALE: 1" = 30'	DATE: OCTOBER 1, 2018
LANDSCAPE PLAN			
Drawing Name			
Project Name			
PROPOSED CAPSIC MEADOWS SUBDIVISION			
130 BANCROFT STREET, PORTLAND, MAINE 04102			
Owner/Applicant			
WB GROUP, INC			
130 BANCROFT STREET, PORTLAND, MAINE 04102			



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E-MAIL info@northeastcivilsolutions.com
WWW www.northeastcivilsolutions.com



LEGEND



NOTES

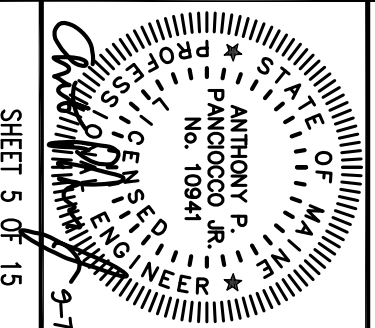
1. WETLAND IMPACT: AREA A = 242 SF
IMPACT AREA B = 9,408 SF
IMPACT AREA C = 1,018 SF
IMPACT AREA D = 73 SF
TOTAL IMPACT = 10,741 SF
2. ALL PROPOSED HOUSES THAT HAVE BASEMENTS SHOULD INCLUDE PROVISIONS FOR A SLUMP PUMP, AND SLUMP PUMP DISCHARGE WITH BACK-FLOW PREVENTION.

PIPE SCHEDULE			
PIPE	DIAMETER	PIPE LENGTH	PIPE SLOPE (F/T/17)
SD-1	36"	51'	0.0059
SD-2	36"	45'	0.0056
SD-3	15"	80'	0.0063
SD-4	18"	85'	0.006
SD-5	36"	72'	0.007
SD-6	36"	32'	0.031
SD-7	36"	38'	0.013
SD-8	15"	35'	0.014

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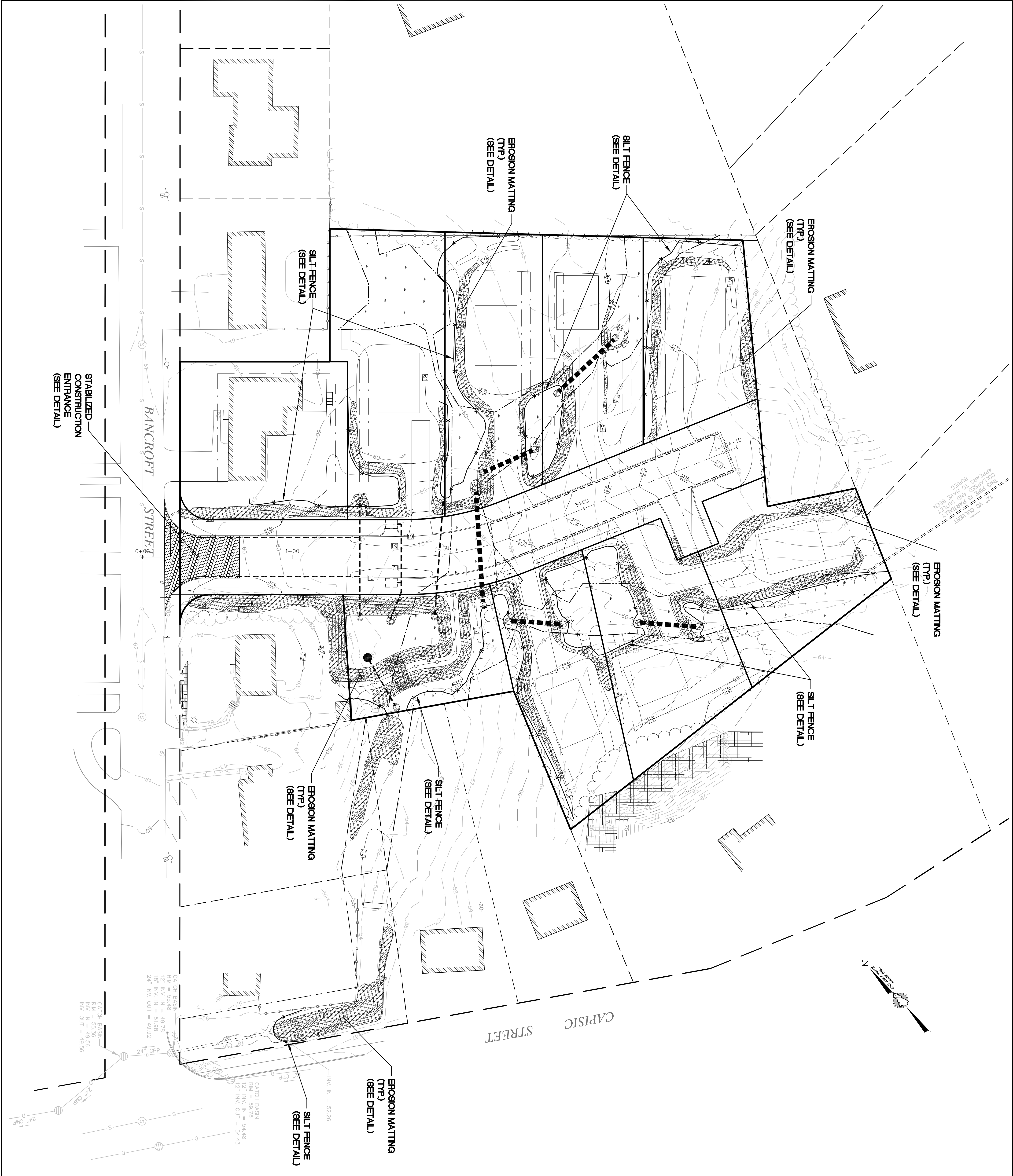
Revised	By	Date	Change
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2	SMA	5/11/18	SUBMITTED FOR PRELIMINARY SITE PLAN/SUBDIVISION REVIEW
1	SMA	5/4/18	SUBMITTED FOR WDEP TIER 1 REVIEW

Project Name: PROPOSED CAPSIC MEADOWS SUBDIVISION
130 BANCROFT STREET, PORTLAND, MAINE 04102
Owner/Client: WB GROUP, INC
130 BANCROFT STREET, PORTLAND, MAINE 04102



LEGEND

- MULCH BERM/EROSION CONTROL
- MIX OR SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- EROSION CONTROL MATTING



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2	SMA	5/11/18	SUBMITTED FOR PRELIMINARY SITE PLAN/SUBDIVISION REVIEW
1	SMA	5/4/18	SUBMITTED FOR WRP TIER 1 REVIEW
PROJECT NUMBER: 41041			ADDD FILE: 41041-EROSION.DWG

Drawing Name: **EROSION & SEDIMENTATION CONTROL PLAN**

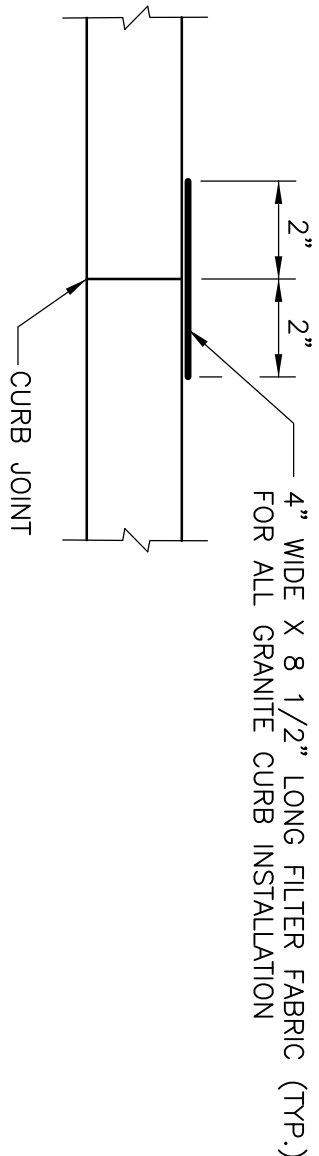
Project Name: **PROPOSED CAPISIC MEADOWS SUBDIVISION**

Owner/Client: **WB GROUP, INC**

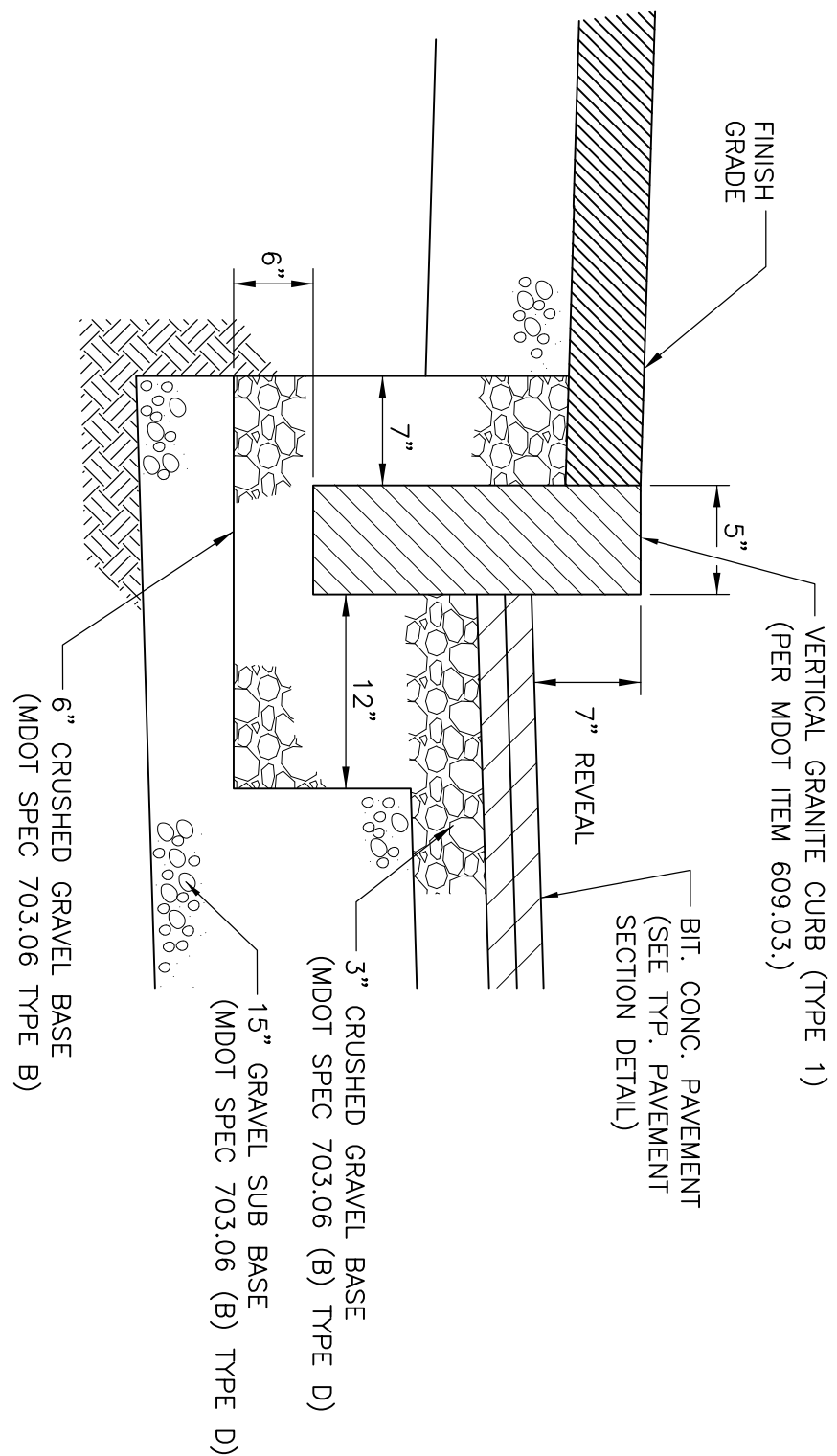
130 BANCROFT STREET, PORTLAND, MAINE 04102

ANTHONY P. LANCR OCCO
No. 10941
9-7-18

Northeast Civil Solutions
SURVEYING • ENGINEERING • LAND PLANNING
INCORPORATED
381 PINE ROAD, SCARBOROUGH, MAINE 04074
TEL: 207.883.1000 FAX: 207.883.1001
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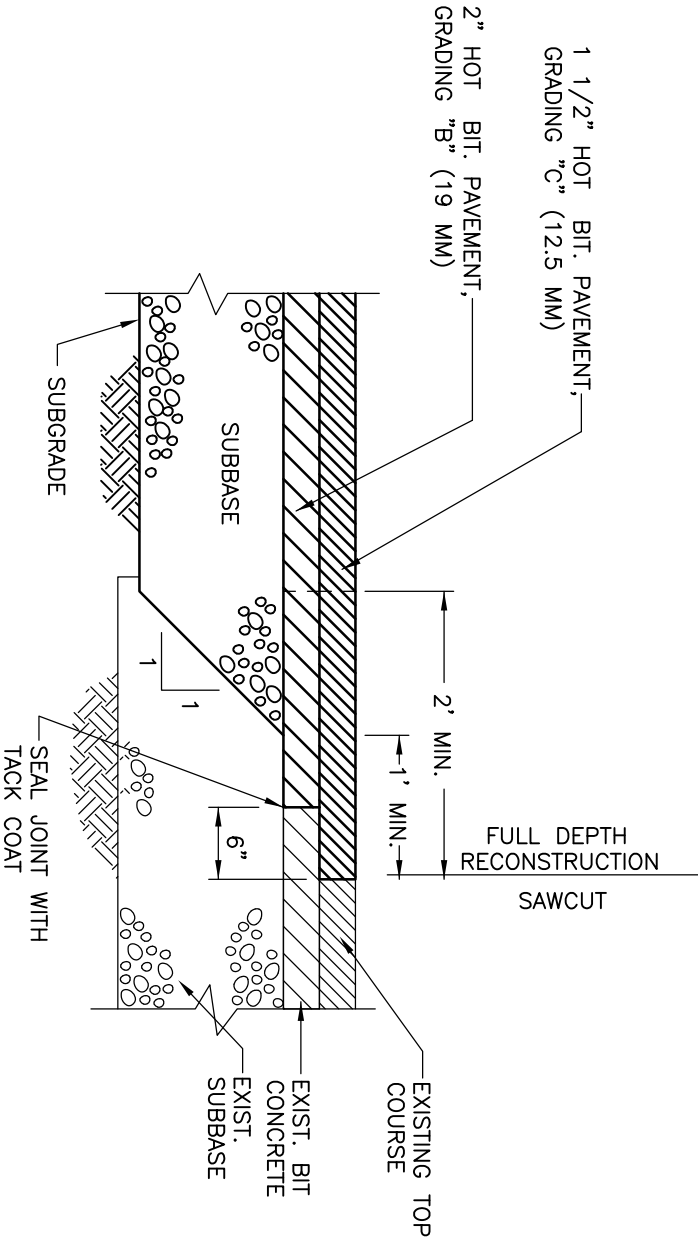


PLAN VIEW



VERTICAL GRANITE CURB DETAIL

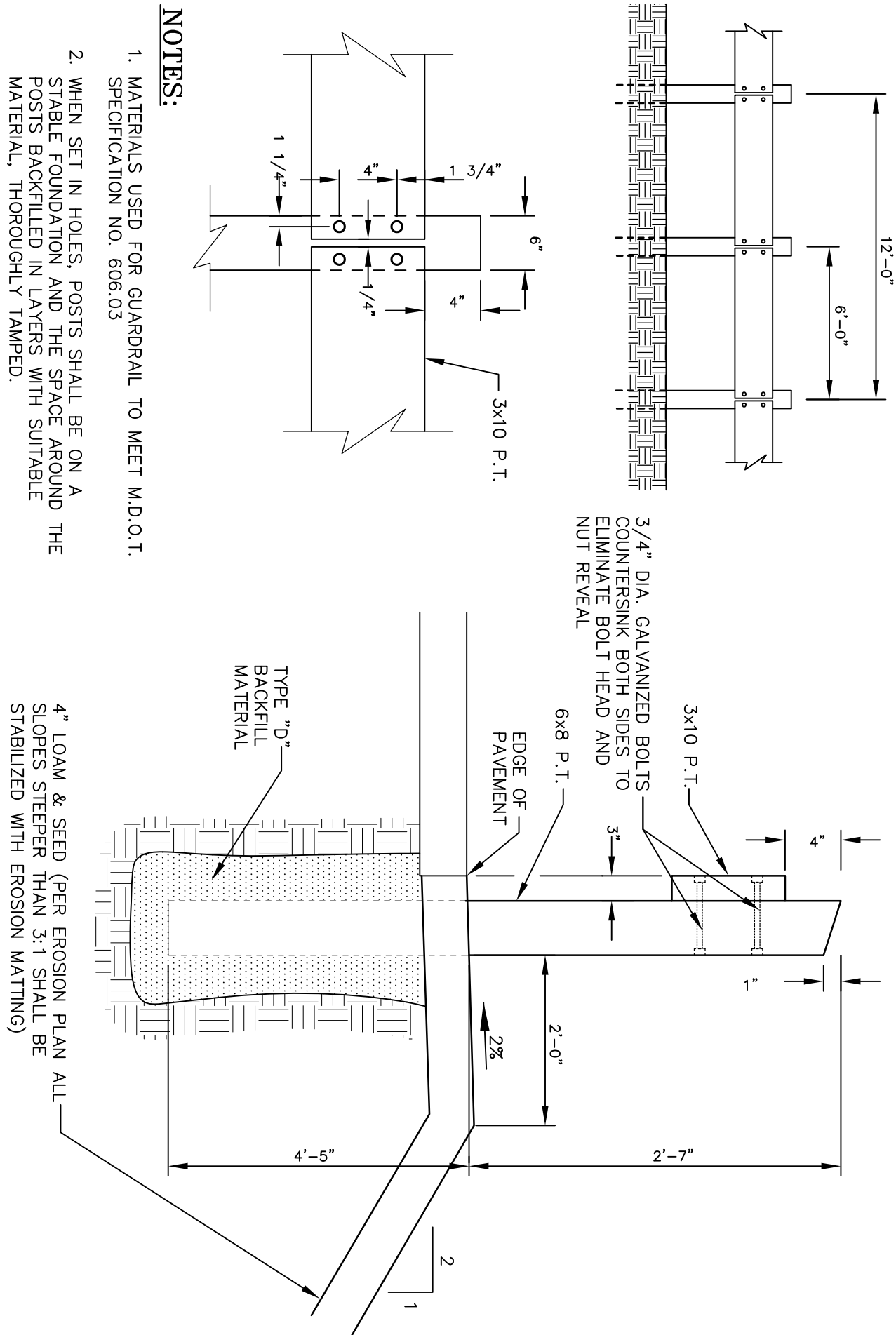
NOTE: PER MDOT ITEM 703.06 (B) TYPE D
N.T.S.



SAWCUT & PAVEMENT

MATCH DETAIL

N.T.S.

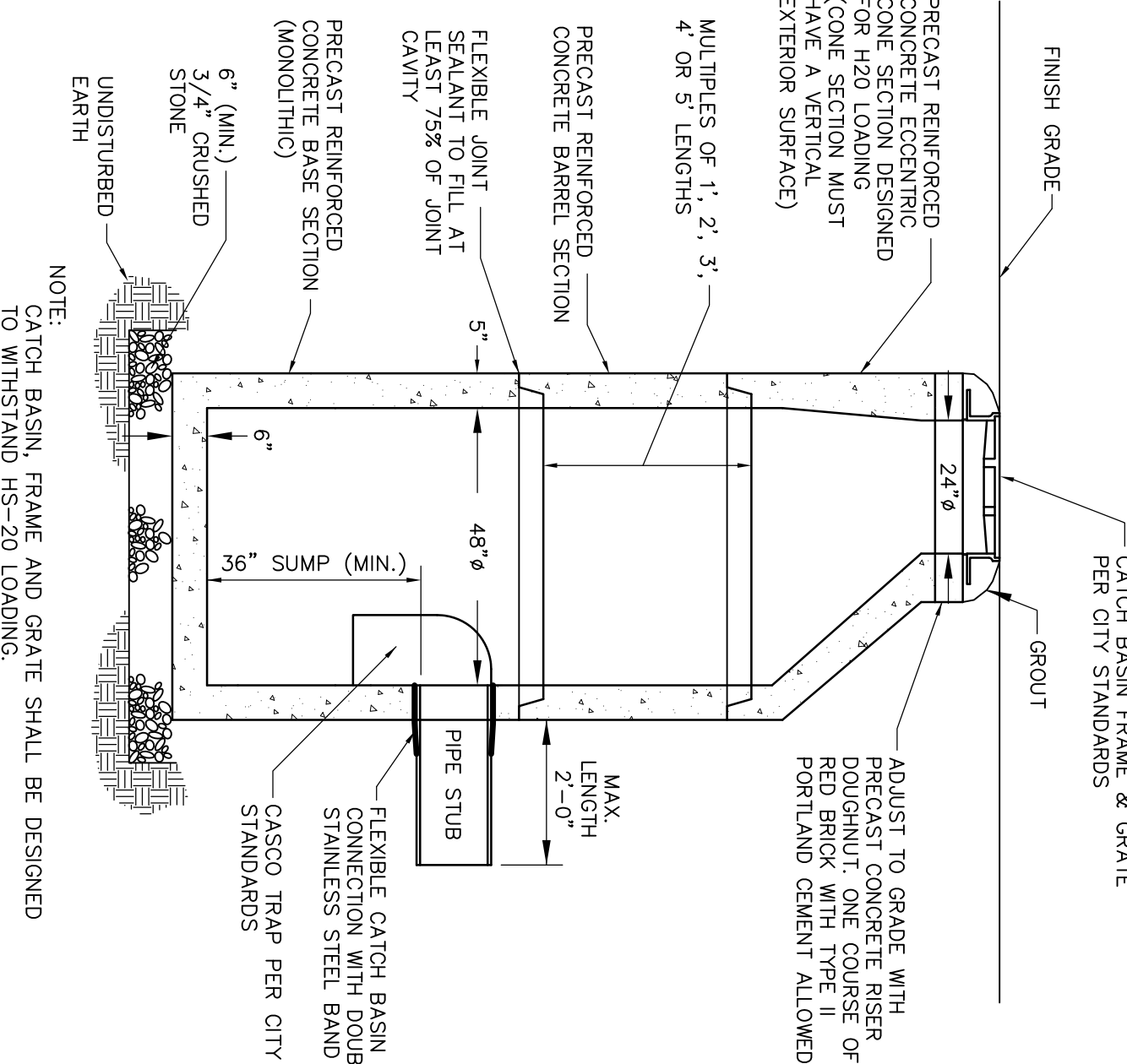


NOTES:

1. MATERIALS USED FOR GUARDRAIL TO MEET M.D.O.T. SPECIFICATION NO. 606.03
2. WHEN SET IN HOLES, POSTS SHALL BE ON A STABLE FOUNDATION AND THE SPACE AROUND THE POSTS BACKFILLED WITH A SUITABLE MATERIAL, THOROUGHLY TAMPED.

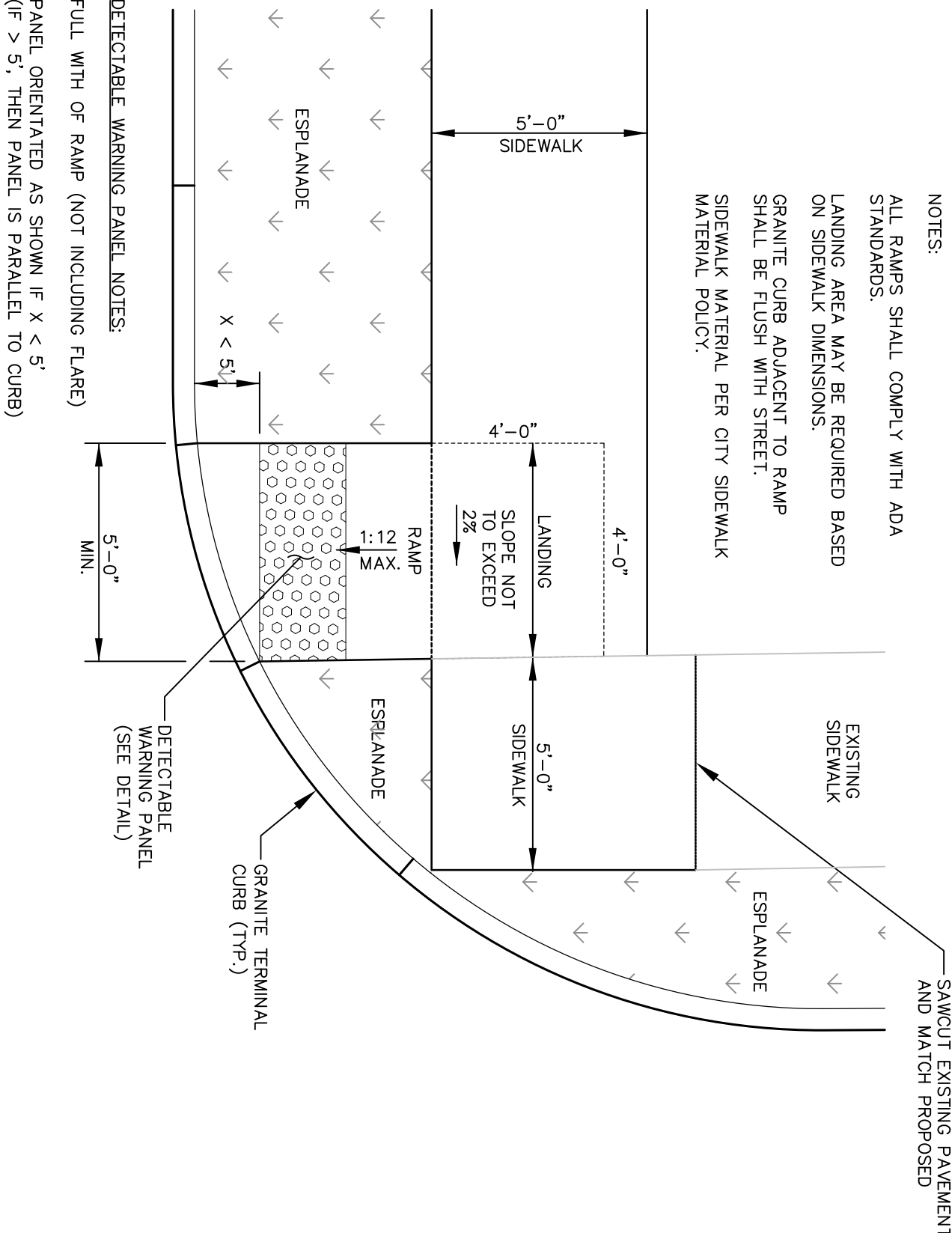
PRESSURE TREATED WOOD GUARDRAIL

N.T.S.



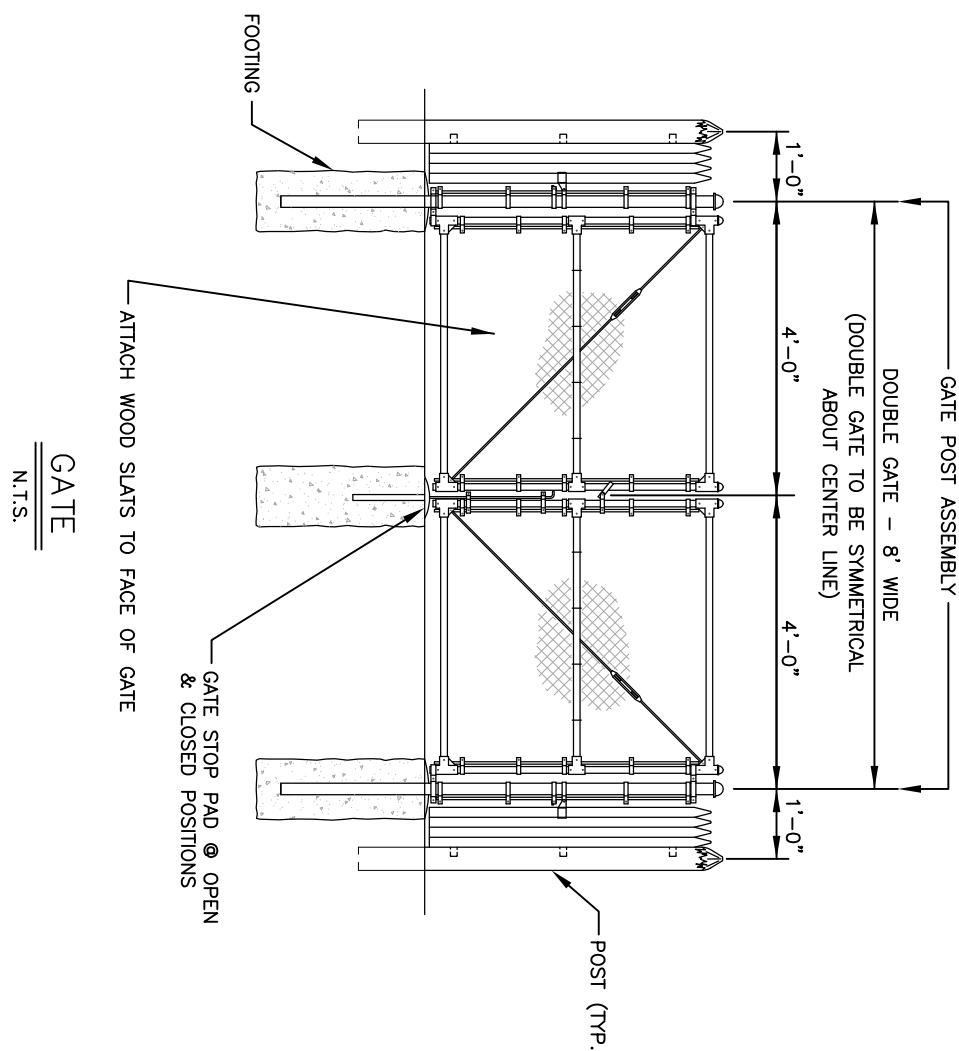
PRECAST CONCRETE CATCH BASIN DETAIL

PER MDOT ITEM 604.
N.T.S.



SIDEWALK LAYOUT DETAIL

N.T.S.



CHAIN LINK FENCE DETAIL

N.T.S.

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INTENDED FOR CONSTRUCTION
OR RECORDING

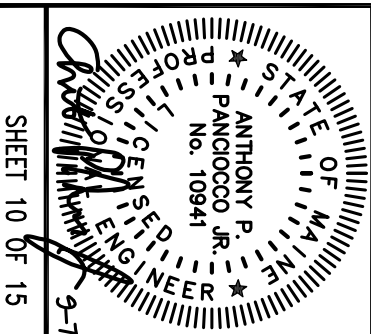
Revised	By	Date	Change
3	SMA	9/7/18	SUBMITTED FOR FINAL SITE PLAN/SUBDIVISION REVIEW
2	SMA	5/11/18	SUBMITTED FOR PRELIMINARY SITE PLAN/SUBDIVISION REVIEW
1	SMA	5/4/18	SUBMITTED FOR WEP TIER 1 REVIEW

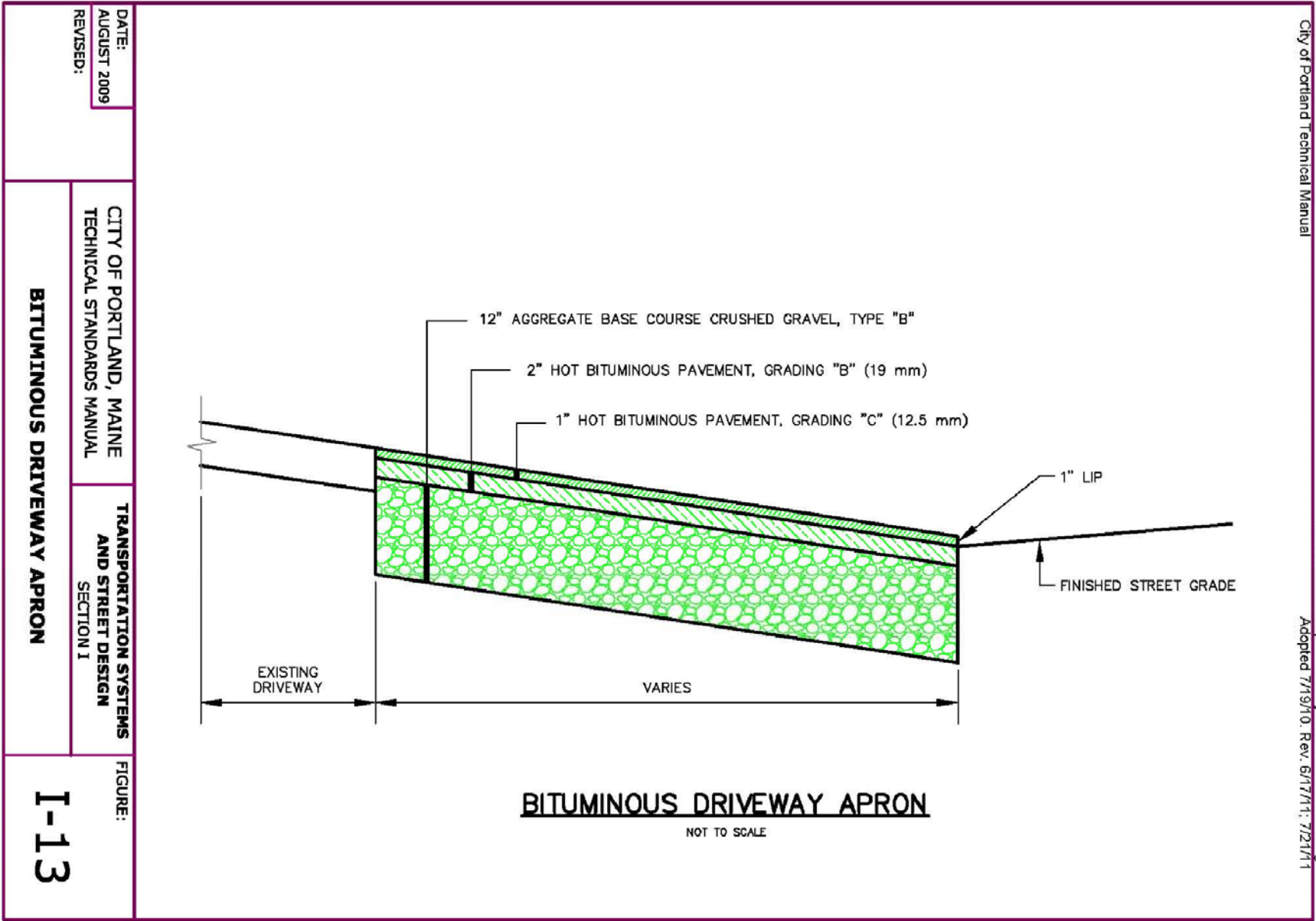
PROJECT NUMBER:	41041
ADDD FILE:	41041-DETAILS.DWG
DATE:	MAY 1, 2018

CONSTRUCTION DETAILS - SHEET 2

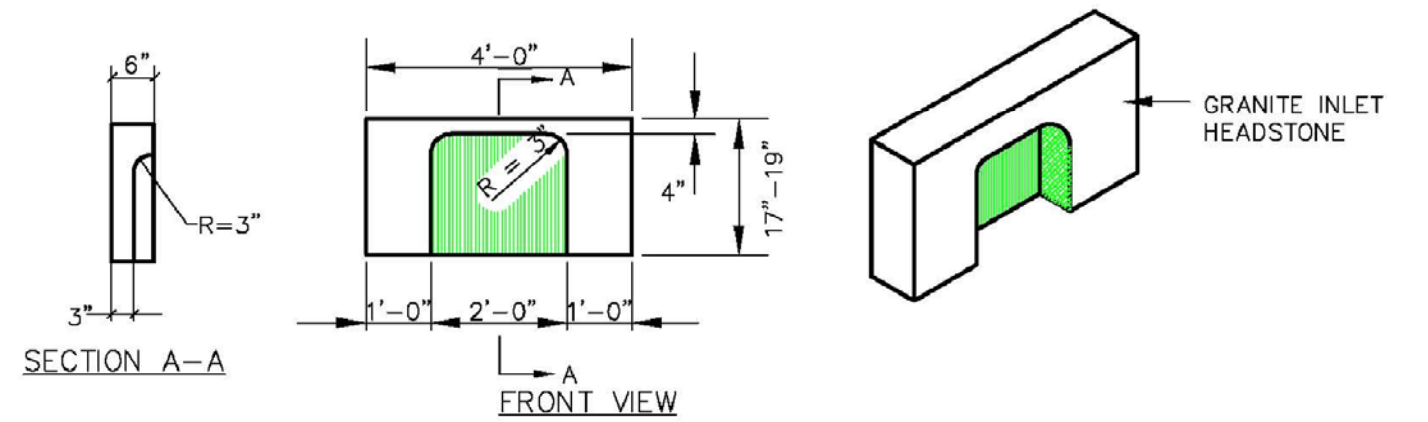
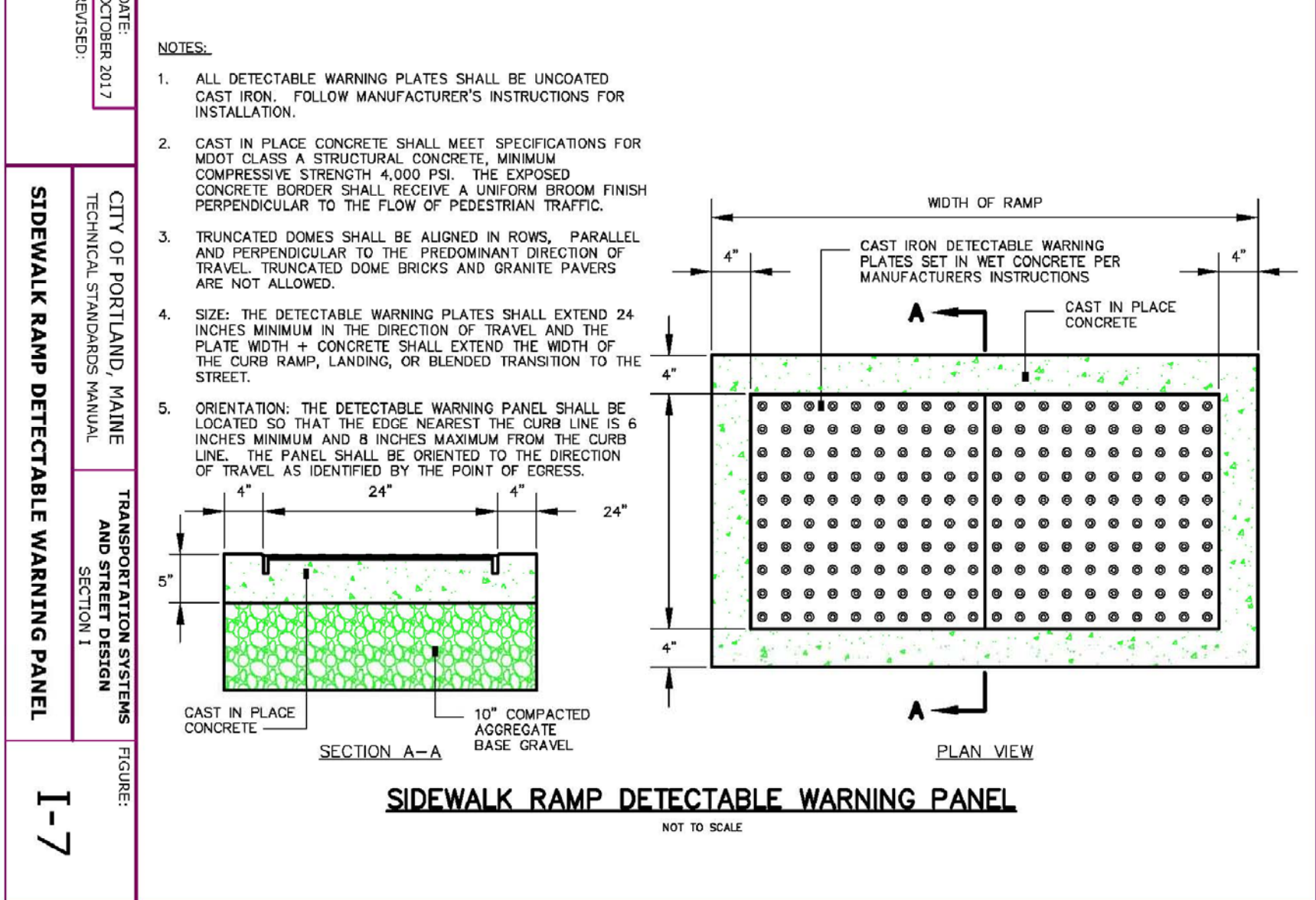
Project Name and Location:
PROPOSED CAPSIC MEADOWS SUBDIVISION
130 BANCROFT STREET, PORTLAND, MAINE 04102
Prepared For:
WB GROUP, INC
130 BANCROFT STREET, PORTLAND, MAINE 04102

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Northeast Civil Solutions
INCORPORATED
381 PANE ROAD, SCARBOROUGH, MAINE 04074
TEL: 207.853.1000 FAX: 207.853.1001
WWW.NORTHEASTCIVILSOLUTIONS.COM

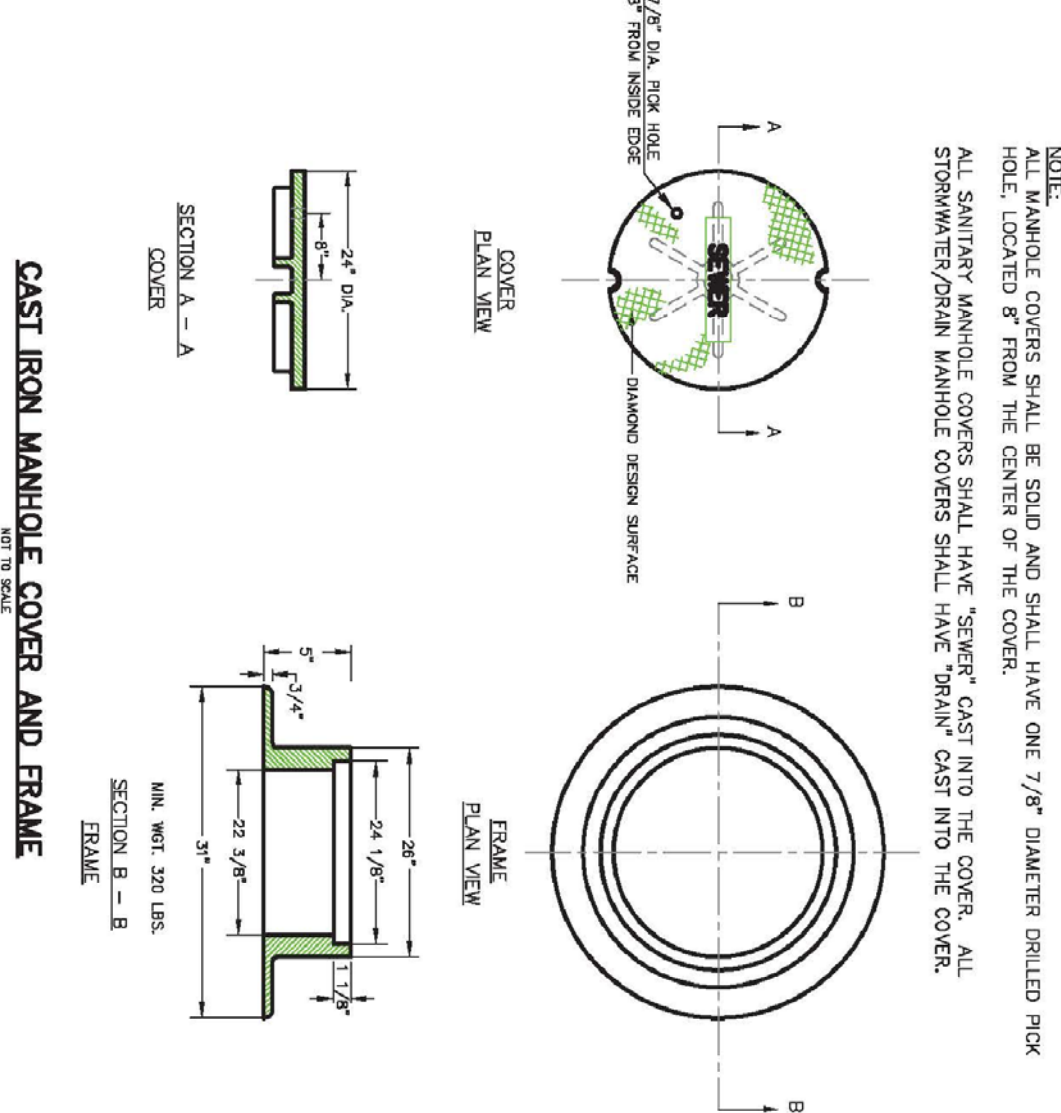




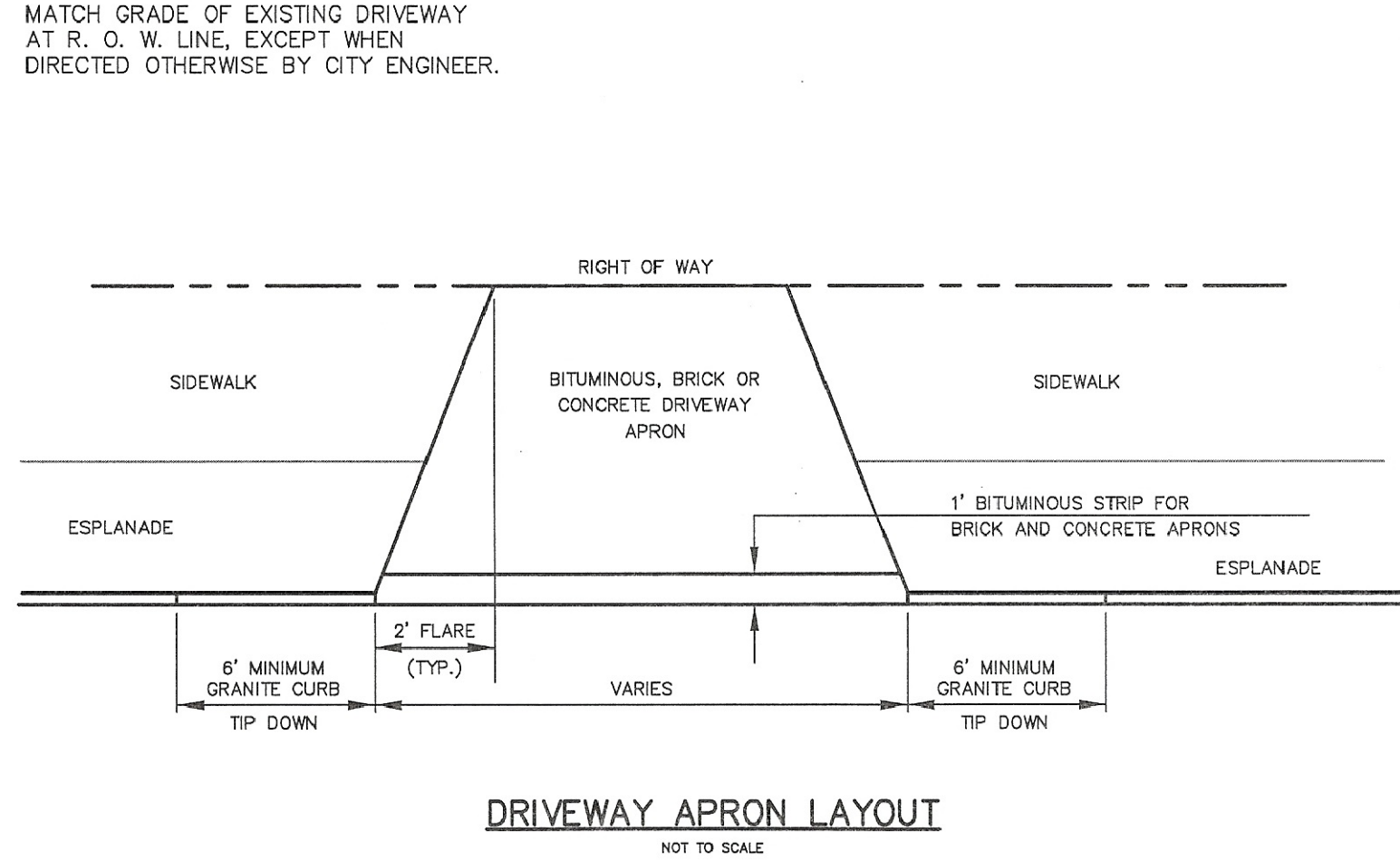
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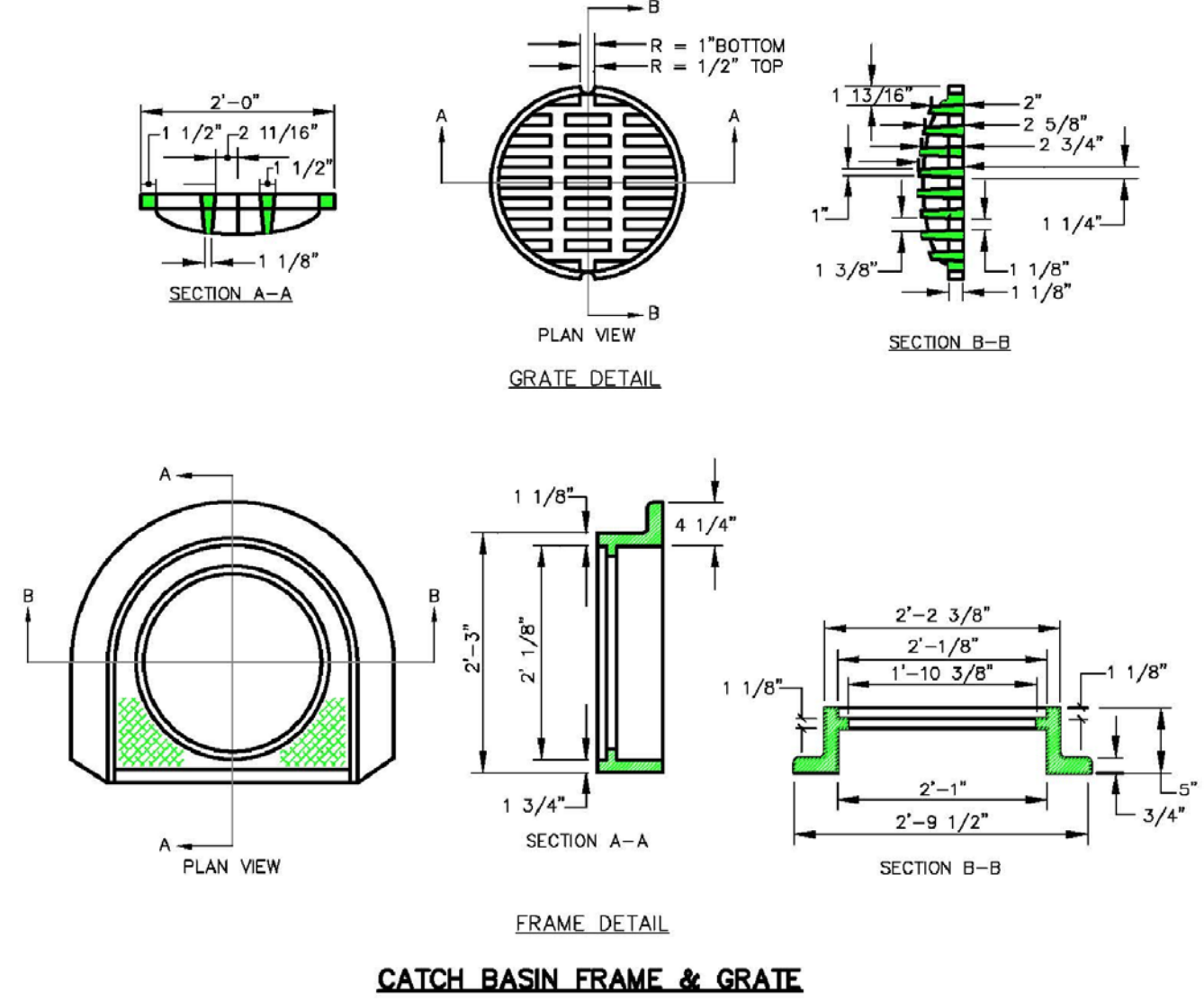
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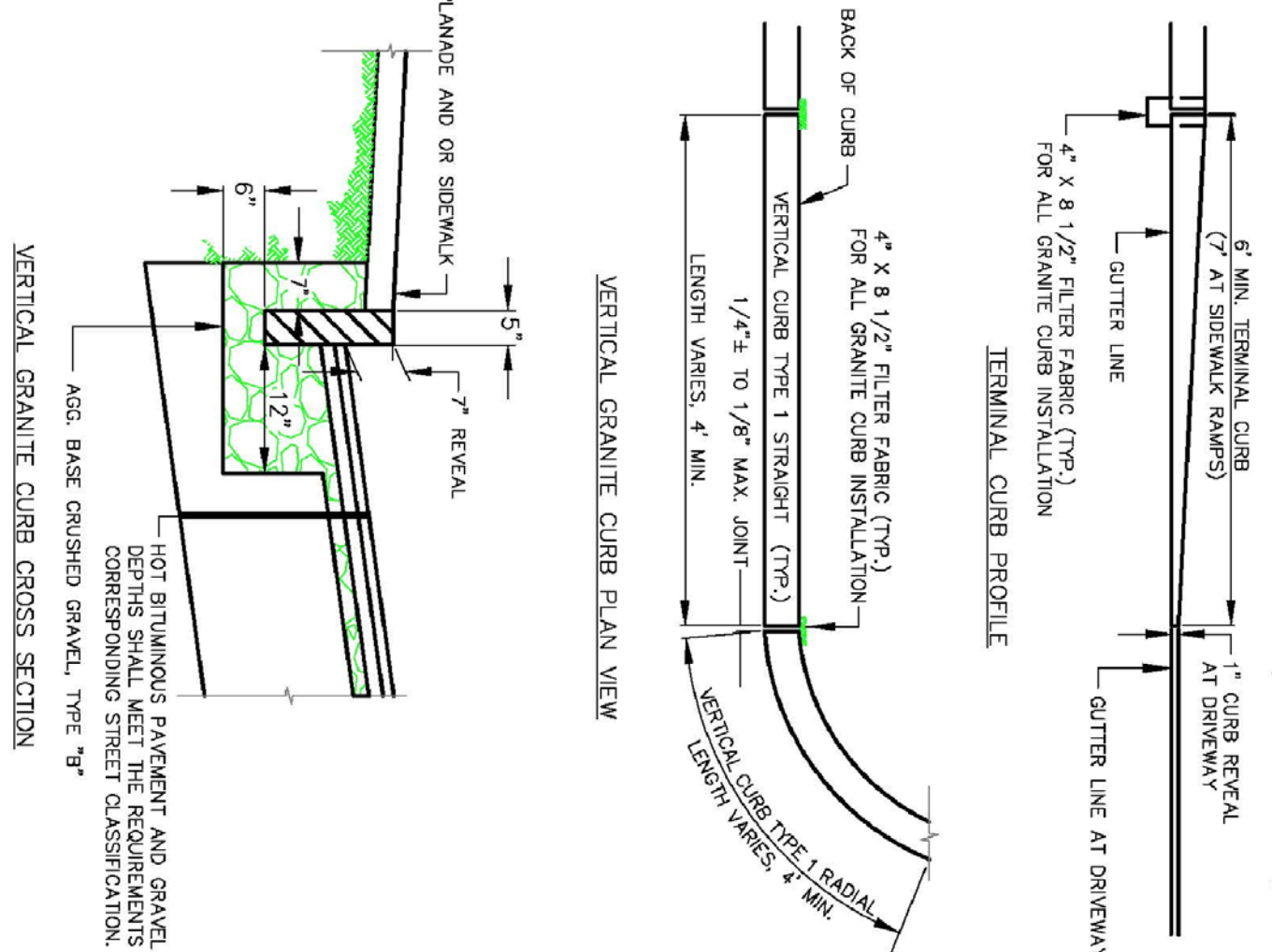
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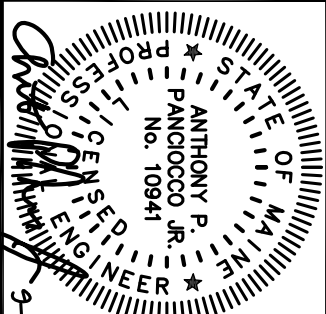


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INTENDED FOR CONSTRUCTION
OR RECORDING

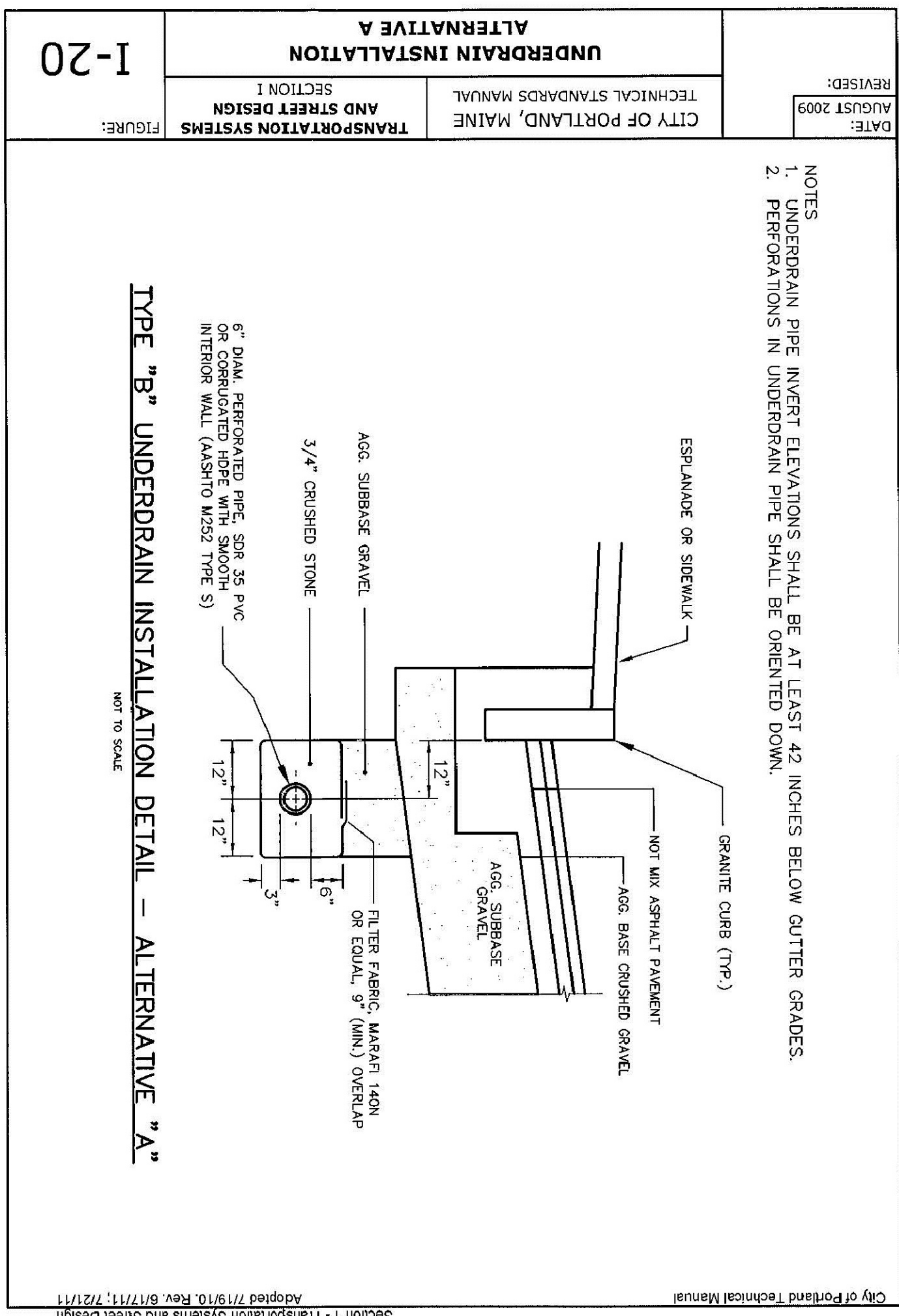
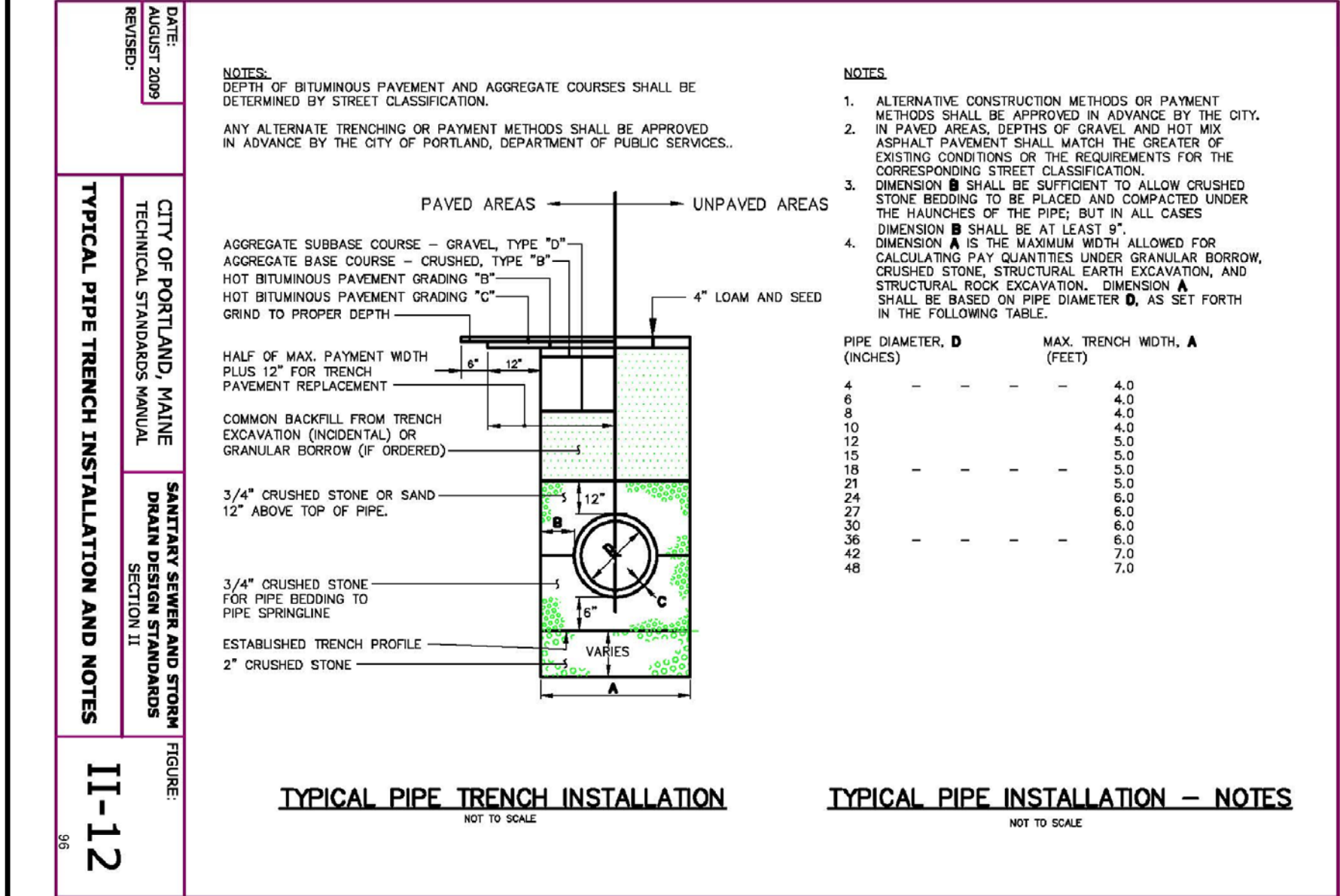


Prepared for:
WB GROUP, INC.
130 BANCROFT STREET, PORTLAND, MAINE 04102

Project Name and Location:
PROPOSED CAPSIC MEADOWS SUBDIVISION
130 BANCROFT STREET, PORTLAND, MAINE 04102

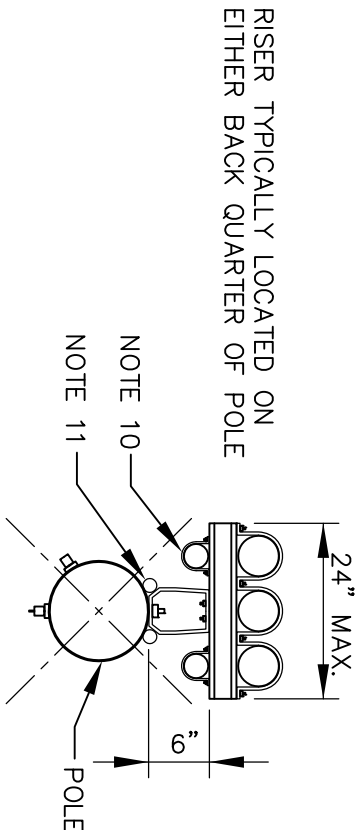
CONSTRUCTION DETAILS - SHEET 3

Revised	By	Date	Change
3	SMA	9/7/18	SUBMITTED FOR FINAL SITE PLAN/SUBDIVISION REVIEW
2	SMA	5/11/18	SUBMITTED FOR PRELIMINARY SITE PLAN/SUBDIVISION REVIEW
1	SMA	5/4/18	SUBMITTED FOR WRP TIER 1 REVIEW
PROJECT NUMBER: 41041			SCALE: AS NOTED
DATE: MAY 1, 2018			



TRAFFIC SIGNS						
IDENTIFICATION NUMBER	SIGN NUMBER	SIGN HEIGHT	SIGN WIDTH	POST PER SIGN	TEXT	NUMBER OF SIGNS REQ'D
R1-1	30"	30"	1		STOP	1
						6.25
						6.25
						PER MUTCD

NOTE: ALL SIGNS SHALL CONFORM TO MUTCD STANDARDS



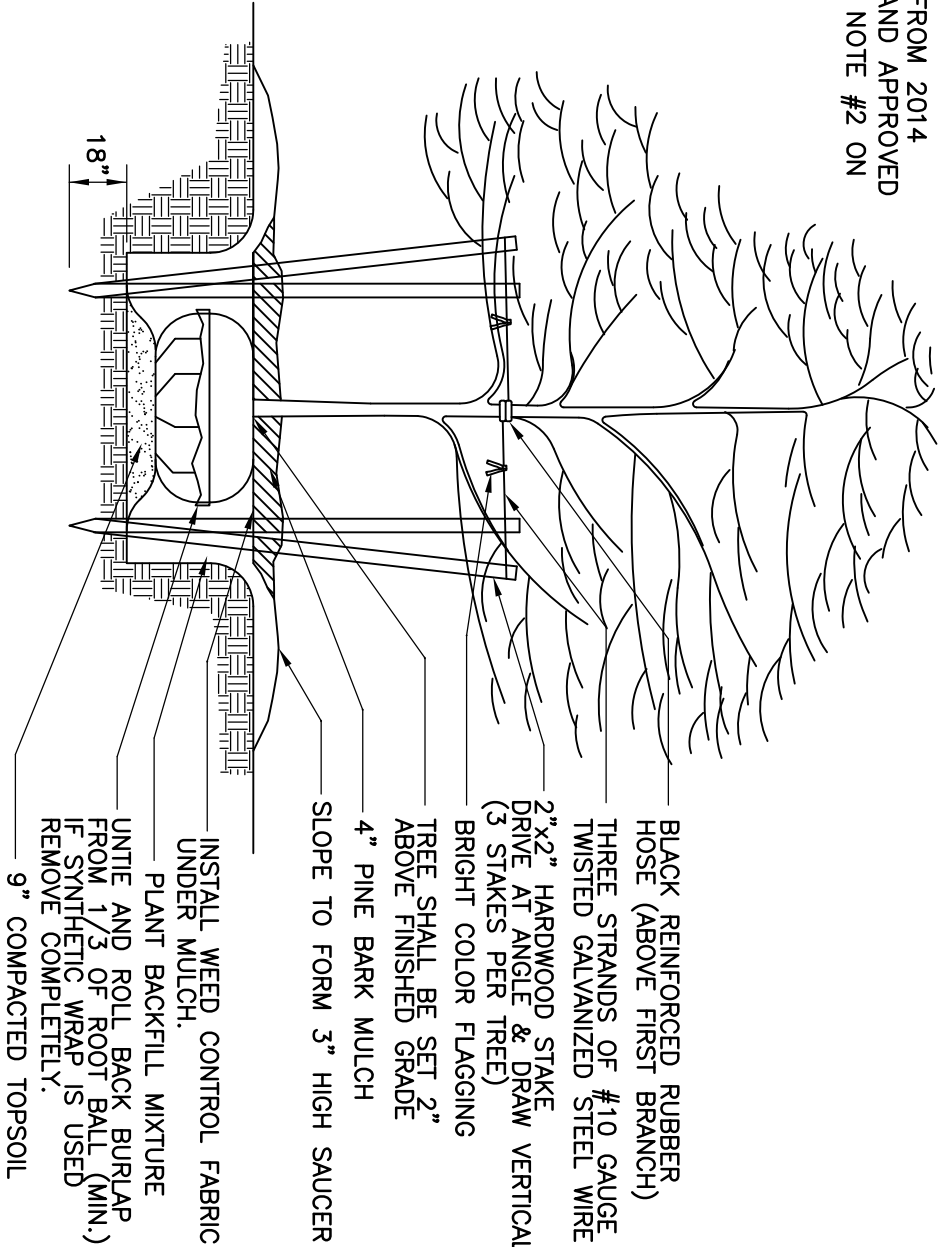
- NOTES:
- STAND OFF BRACKETS ARE REQUIRED WHEN MORE THAN ONE CONDUIT PER UTILITY IS TO BE INSTALLED ON A POLE.
 - ALL THREE PHASE PRIMARY RISERS, WHETHER STAND OFF BRACKETS ARE USED OR NOT, SHALL BE RIGID STEEL FOR THE FIRST SECTION.
 - ON SINGLE PHASE PRIMARY, SECONDARY AND SERVICE URD RISERS USING STAND OFF BRACKETS, RIGID STEEL OR SCHEDULE 80 MAY BE USED.
 - WHERE RIGID STEEL OR SCHEDULE 80 PVC IS USED FOR EACH SECTION OF CONDUIT UP TO 10 FEET IN LENGTH, EACH BRACKET IS TO BE PLACED JUST BELOW THE RISER CONDUIT COUPLING.
 - CONDUIT SECTIONS FOR A SINGLE PHASE OR THREE PHASE RISERS USING STAND OFF BRACKETS SHALL BE RIGID STEEL OR SCHEDULE 80 PVC CONDUIT ONLY (SEE NOTE #2), WITH THE EXCEPTION THAT SCHEDULE 40 PVC SUNLIGHT RESISTANT CONDUIT MAY BE USED FOR THE TOP SECTION OF THE RISER (NOT LONGER THAN 10'). IF TOP SECTION IS LONGER THAN 24' IT MUST BE SUPPORTED WITH A MINIMUM OF TWO STAND OFF BRACKETS. IF TOP SECTION IS LONGER THAN 40' IT MUST BE SUPPORTED BY NO FEWER THAN TWO STAND OFF BRACKETS.
 - WHERE PVC IS USED FOR THE RISER, EACH STAND OFF BRACKET SHALL BE RIGID STEEL OR SCHEDULE 80 PVC CONDUIT. WHERE STEEL IS USED FOR THE RISER ONE STAND OFF BRACKET SUPPORTING THE STEEL IS REQUIRED TO BE GROUNDED.
 - SWEEPS, WHEN USED, ARE REQUIRED TO BE STEEL.
 - IF RISER IS ALL STEEL CONDUIT, INSTALL INSULATED GROUNDING BUSHING AT TOP OF RISER.
 - LOWEST BRACKET SHALL BE A MINIMUM OF 8 FEET ABOVE FINISHED GRADE.
 - ALTERNATE LOCATION FOR COMMUNICATION CABLE IF RUN IN METAL CONDUIT OR SCHEDULE 80.
 - COMMUNICATION CABLE MAY BE ATTACHED DIRECTLY TO POLE ADJACENT TO BRACKETS.

TYPICAL RISER DETAIL
NOT TO SCALE

- PAVEMENT MARKING NOTES :**
- ALL PAVEMENT MARKING WORDS AND SYMBOLS SHALL BE RETROREFLECTIVE WHITE AND SHALL CONFORM TO THE **MUTCD** AND MDOT ITEM 627.
 - WORDS AND SYMBOLS SHALL BE CENTERED LATRALLY WITHIN THE LANE. THE LONGITUDINAL DIMENSION SHALL BE PARALLEL TO THE LANE.
 - MULTI-WORD MESSAGES SHALL READ "UP"; THAT IS, THE FIRST WORD SHALL BE NEAREST THE APPROACHING DRIVER.
 - THE WORD "ONLY" SHALL NOT BE USED WITH THROUGH OR COMBINATION ARROWS, AND SHALL NOT BE USED ADJACENT TO A BROKEN LANE LINE. A TURN ARROW SHALL PRECEDE THE WORD "ONLY".
 - COMBINATION ARROWS MAY BE COMPRISED OF 2 SINGLE ARROWS (e.g. TURN AND THROUGH ARROWS). HOWEVER, THE SHAFTS OF THE ARROWS SHALL CONCOIDE.
 - PERFORMED TAPE WORDS AND SYMBOLS SHALL BE PRE-CUT, EITHER BY THE MANUFACTURER OR THE CONTRACTOR.
 - WRONG-WAY ARROWS SHALL NOT BE SUBSTITUTED FOR THROUGH ARROWS.
 - LONGITUDINAL SPACING BETWEEN SUCCESSIVE WORDS AND/OR SYMBOLS SHOULD BE AT LEAST 4 TIMES THE HEIGHT OF THE LARGEST CHARACTER.

PLANTING SCHEDULE			
QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE
14 *	ACER RUBRIVM	RED SUNSET *	RED SUNSET MAPLE *
			6"-7"

* VARY SPECIES FROM 2014 CITY OF PORTLAND APPROVED TREE LIST (SEE NOTE #2 ON SITE PLAN)



TYPICAL STREET TREE PLANTING
NOT TO SCALE

THIS PLAN IS FOR REVIEW PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION OR RECORDING

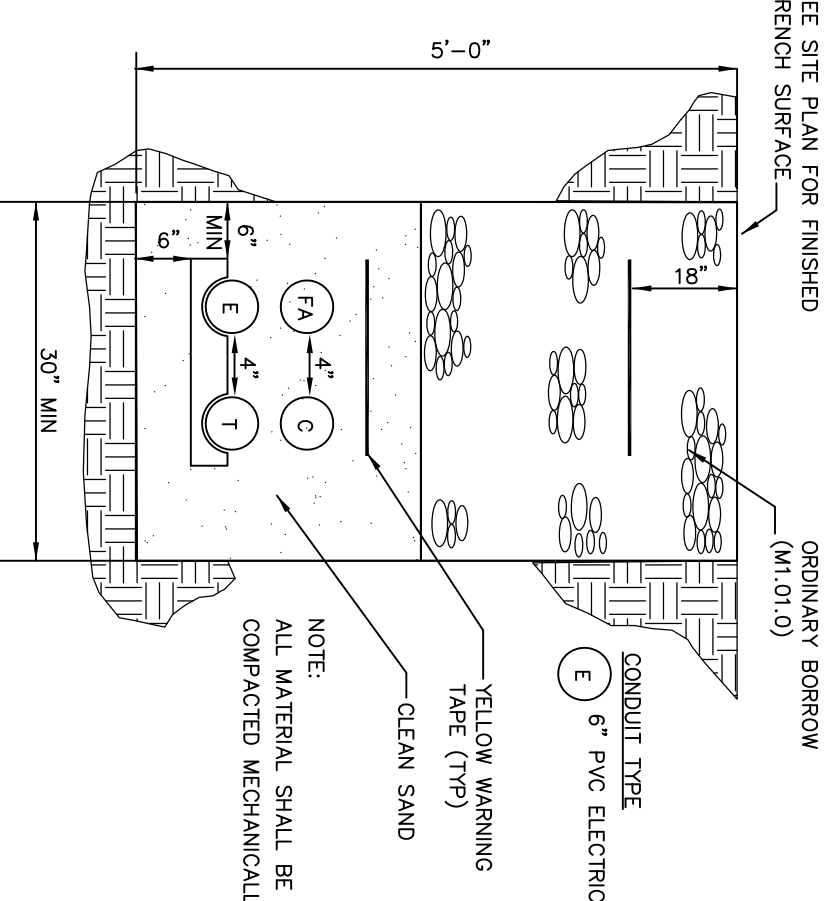
Revised	By	Date	Change
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1	SMA	5/4/18	SUBMITTED FOR WEP TIER 1 REVIEW
PROJECT NUMBER: 41041			
ADDD FILE: 41041-DETAILS.DWG			
SCALE: AS NOTED			
DATE: MAY 1, 2018			
CONSTRUCTION DETAILS – SHEET 4			
Project Name and Location: PROPOSED CAPSIC MEADOWS SUBDIVISION 130 BANCROFT STREET, PORTLAND, MAINE 04102			
Prepared For: WB GROUP, INC 130 BANCROFT STREET, PORTLAND, MAINE 04102			

ALL TRENCH CONDUITS SHALL BE SCHEDULE 40 PVC, UNLESS OTHERWISE NOTED

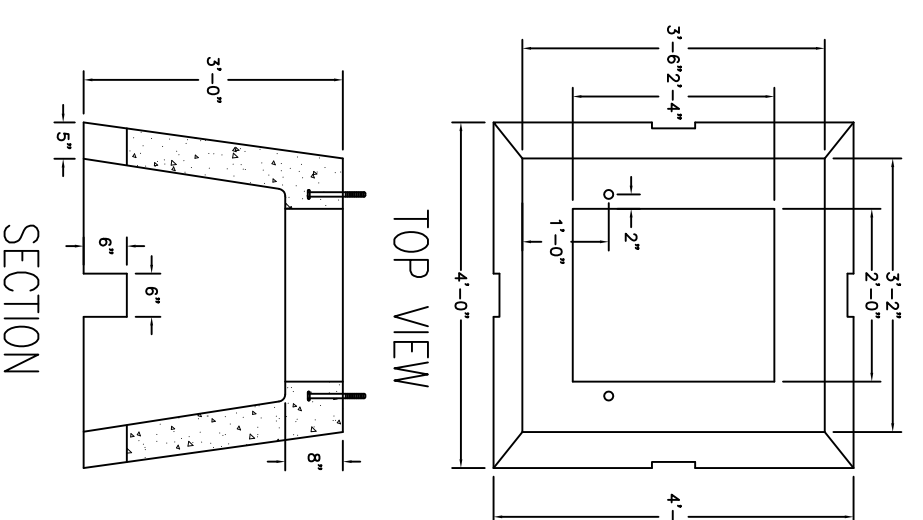
COMMON TRENCH DETAIL

ELECTRIC/TELEPHONE/FIRE ALARM/CABLE

NOT TO SCALE



- DESIGN NOTES:
- 1 - CONCRETE 4000 PSI AT 28 DAYS.
 - 2 - REINFORCING 4X4 W.W.M.
 - 3 - (2) - 5/8" DIA X 8" LONG BOLTS



PRECAST CONCRETE PRODUCTS OF MAINE, INC. PHONE (207) 729-1628 FAX (207) 729-8710

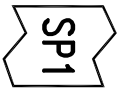
CMP RESIDENTIAL TRANSFORMER PAD

(25 – 167 KVA)

ITEM #B-1

WEIGHT – 3,160 LBS

LEGEND

-  STUDY POINT
-  SUBCATCHMENT
-  POND
-  PRE-DEVELOPMENT DRAINAGE SUBCATCHMENT
-  TIME OF CONCENTRATION PATH
-  SOIL BOUNDARY

SOILS LEGEND

SYMBOL	SOIL TYPE	HSG
HfB	HOLLIS FINE SANDY LOAM, 3%-8% SLOPES	D
Wq	WALPOLE FINE SANDY LOAM	A/D
Wmb	WINDSOR LOAMY SAND, 0%-8% SLOPES	A

THE SOURCE OF THE SOIL TYPES AND BOUNDARIES IS THE NATIONAL COOPERATIVE SOIL SURVEY (NCSS).

NOTES

Tc PATH TABLE

SUBCAT	Tc PATH	FLOW	LENGTH	SLOPE (FT/FT)
OS1	A-B	SHEET	75	0.053
	B-C	SHALLOW CONC	81	0.049
	C-D	SHALLOW CONC	118	0.118
	D-E	SHALLOW CONC	483	0.014
OS2	A-B	SHEET	75	0.073
	B-C	SHALLOW CONC	85	0.094
	C-D	SHALLOW CONC	544	0.014
S1	A-B	SHEET	75	0.080
	B-C	SHALLOW CONC	117	0.017
	C-D	SHALLOW CONC	50	0.020
	D-E	SHALLOW CONC	121	0.024
S2	A-B	SHEET	75	0.080
	B-C	SHALLOW CONC	111	0.045
	C-D	CHANNEL FLOW	128	0.029
	D-E	SHALLOW CONC	154	0.016
	E-F	SHALLOW CONC	123	0.008
	F-G	CHANNEL FLOW	123	0.008
S3	A-B	SHEET	75	0.053
	B-C	SHALLOW CONC	121	0.026
	C-D	SHALLOW CONC	171	0.006

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Revised	By	Date	Change
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2	SMA	5/11/18	SUBMITTED FOR PRELIMINARY SITE PLAN/SUBDIVISION REVIEW
1	SMA	5/4/18	SUBMITTED FOR WMP TIER 1 REVIEW

PROJECT NUMBER: 41041	ACAD FILE: 41041-DRAINAGE.DWG	SCALE: 1" = 60'	DATE: MAY 1, 2018
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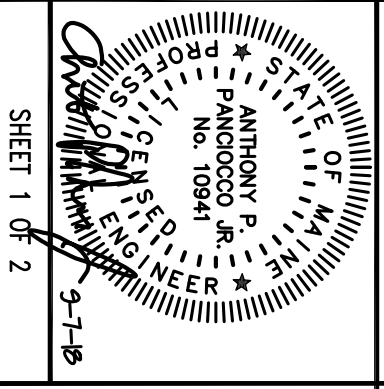
PRE-DEVELOPMENT DRAINAGE AREA PLAN

Project Name:
PROPOSED CAPSIC MEADOWS SUBDIVISION

130 BANCROFT STREET, PORTLAND, MAINE 04102

Owner/Client:
WB GROUP, INC

130 BANCROFT STREET, PORTLAND, MAINE 04102





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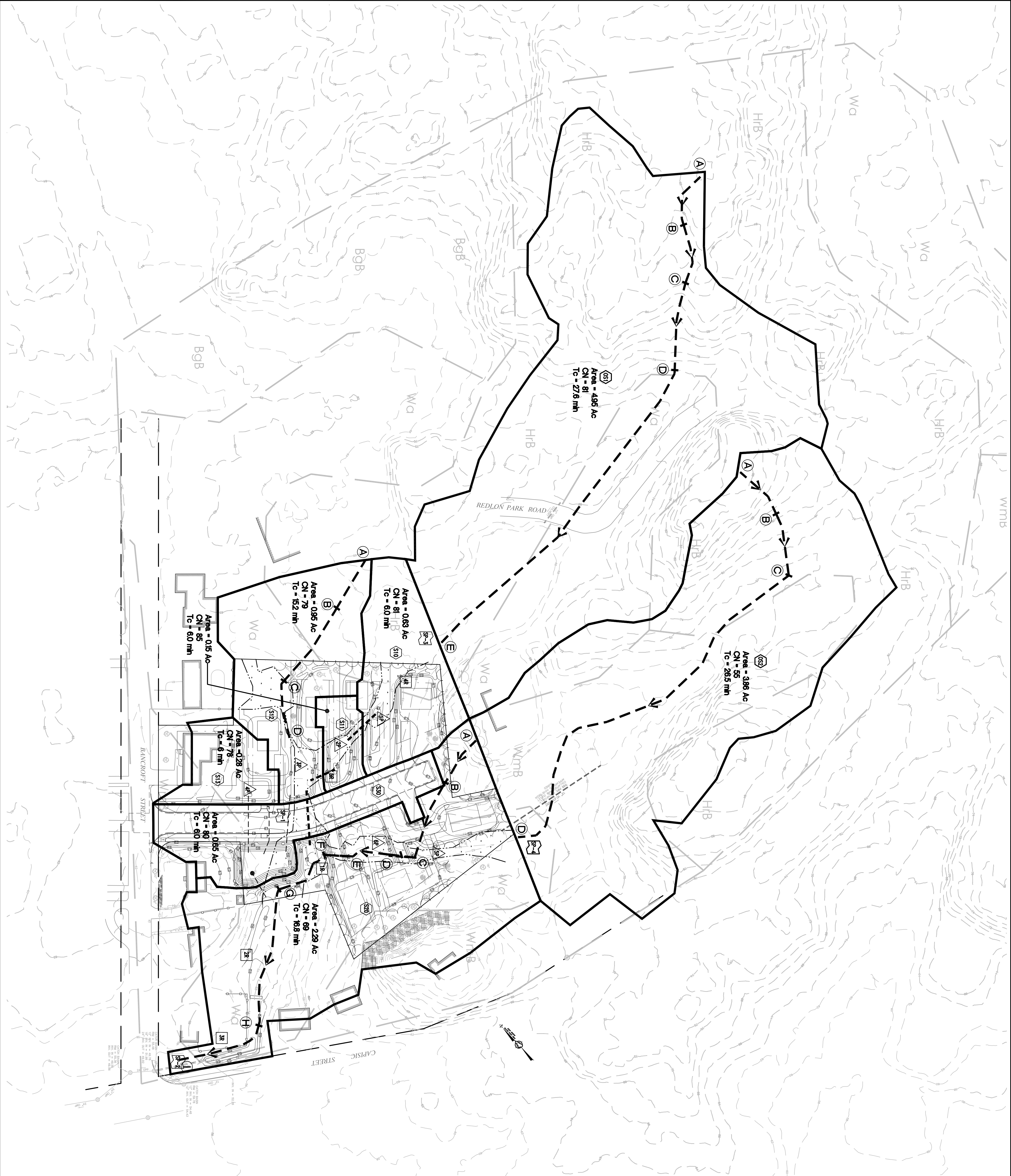
381 PINE ROAD, SCARBOROUGH, MAINE 04074

TEL: 207.853.1000 FAX: 207.853.1001

www.northeastcivilsolutions.com

0 80' 160'

240'



LEGEND

SP1

STUDY POINT

S1

SUBCATCHMENT

P1

POND

R1

REACH

POST-DEVELOPMENT DRAINAGE SUBCATCHMENT

TIME OF CONCENTRATION PATH

SOIL BOUNDARY

SOILS LEGEND

SYMBOL

SOIL TYPE

HSG

HHB

HOLLIS FINE SANDY LOAM, 3%-8% SLOPES

D

WG

WALPOLE FINE SANDY LOAM

A/D

WMB

WINDSOR LOAMY SAND, 0%-8% SLOPES

A

THE SOURCE OF THE SOIL TYPES AND BOUNDARIES IS THE NATIONAL COOPERATIVE SOIL SURVEY (NCOSS).

NOTES

Te PATH TABLE

SUBCAT	Te PATH	FLOW	LENGTH	SLOPE (FT/FT)
OS1	A-B	SHEET	75	0.053
	B-C	SHALLOW CONC	81	0.049
	C-D	SHALLOW CONC	118	0.118
	D-E	SHALLOW CONC	483	0.014
OS2	A-B	SHEET	75	0.073
	B-C	SHALLOW CONC	85	0.094
	C-D	SHALLOW CONC	544	0.014
10S	---	DIRECT	---	---
11S	---	DIRECT	---	---
12S	A-B	SHEET	75	0.053
	B-C	SHALLOW CONC	121	0.028
	C-D	CHANNEL FLOW	77	0.008
13S	---	DIRECT	---	---
20S	A-B	SHEET	75	0.080
	B-C	SHALLOW CONC	103	0.048
	C-D	PIPE	39	0.025
	D-E	SHALLOW CONC	59	0.016
	E-F	CHANNEL FLOW	83	0.030
	F-G	CHANNEL FLOW	184	0.005
	H-I	CHANNEL FLOW	123	0.008
30S	---	DIRECT	---	---

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PROJECT NUMBER: 41041

Revised: 5/7/18

Drawn: 5/11/18

Checked: 5/4/18

Submitted for Final Site Plan/Subdivision Review

Submitted for Preliminary Site Plan/Subdivision Review

Submitted for Map Tier 1 Review

Scale: 1" = 60'

Date: May 1, 2018

POST-DEVELOPMENT DRAINAGE AREA PLAN

Project Name: PROPOSED CAPISIC MEADOWS SUBDIVISION

Owner/Client: WB GROUP, INC

Address: 130 BANCROFT STREET, PORTLAND, MAINE 04102

SEAL

ANTHONY P. BLANCOCO, JR.

MAINE PROFESSIONAL ENGINEER

NO. 10941

9-7-18

PROJECT: 41000/41041-WAGNER-PORTLAND/PLANSET/41041-DRAINAGE.DWG

DATE: MAY 1, 2018

NCS

160

207.853.1000

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207.853.1001

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