

1. Legal Ad

Documents:

[PB LEGAL AD 12-6-17.PDF](#)

2. Agenda

Documents:

[PB AGENDA 12-6-17 REVISED.PDF](#)

3. R-6 Communication

Documents:

[2017_12_6_R6 COMM ALL.PDF](#)

4. 203 Fore Street (THIS ITEM IS BEING POSTPONED)

5. 233 Anderson Street

5.I. Memo And Attachments

Documents:

[ANDERSON ST. - 233 \(MEMO\).PDF](#)
[ANDERSON ST. - 233 \(MEMO ATTACHMENTS\).PDF](#)
[ANDERSON ST. - 233 \(APPLICANTS SUBMITTAL\).PDF](#)
[ANDERSON ST. - 233 \(PLANS\).PDF](#)

5.II. Revised Motions For The Board

Documents:

[FINAL REVISED MOTIONS FOR THE BOARD TO CONSIDER 12.6.17.PDF](#)

6. 94 Free Street (THIS ITEM IS WITHDRAWN FROM THE MEETING AGENDA AND WILL BE REVIEWED ADMINISTRATIVELY)

7. 171 Auburn Street

7.I. Memo And Attachments

Documents:

[AUBURN ST. - 171 \(MEMO\).PDF](#)
[AUBURN ST. - 171 \(MEMO ATTACHMENTS\).PDF](#)
[AUBURN ST. - 171 \(APPLICANTS SUBMITTAL\).PDF](#)
[AUBURN ST. - 171 \(PLANS\).PDF](#)

7.II. Additional Public Comment Received

7.II.i. Principal Of Lyseth School

Documents:

PC1 PRINCIPAL LYSETH - SUPPORT LETTER.PDF

**LEGAL ADVERTISEMENT
PORTLAND PLANNING BOARD
MEETING AGENDA**

The Portland Planning Board will hold a meeting on **WEDNESDAY, December 6, 2017**, 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; Portland II Hotel; 203 Fore Street; Miels Development Group, Applicant. (4:30-5:30 p.m. estimated time). The Portland Planning Board will hold a workshop to consider a six story, 128-room hotel proposed on a 47,473 sq. ft. lot with frontage along Middle, India and Fore Streets. The building footprint is 12,227 sq. ft. with a total floor area of 79,246 sq. ft. The hotel will include retail space, a restaurant, kitchen and common space on one level, a parking garage with 102 spaces and a roof-top bar. The proposal is subject to review under the India Street Form Based Code (ISFBC) zone and Portland's site plan standards.

Public Hearing – 7:00 p.m.

- i. Zoning Map Amendment from IL-b to B1b; 233 Anderson Street; 2 Walnut, LLC., Applicant (7:00-7:30 p.m. estimated time). The Board will hold a public hearing to consider a zoning map amendment application by 2 Walnut, LLC. to change the zoning in the vicinity of 233 Anderson Street from Low Impact Industrial (I-Lb) to Neighborhood Business (B1b). The current zoning for the applicant's vacant lot is split between the two zones and the applicant is seeking to have the entire parcel under the B-1b designation in order to develop a mixed-use development (potentially including multi-family). The proposed map amendment to B-1b includes a portion of City owned property adjoining the site on Anderson Street.
- ii. Conditional Use, Office Use in B-3 PAD District; 94 Free Street; City of Portland, Applicant (7:30-8:00 p.m. estimated time). The Board will hold a public hearing on a conditional use application by the City of Portland to allow the Maine Mariners hockey team to lease 94 Free Street for its administrative office with some limited retail. The City owned space at 94 Free Street is within the B-3 Pedestrian Activity District Overlay zone. The City is seeking a conditional use review under Section 14-218 of the Downtown Business B-3 zone to allow the proposed ground floor office use.

Evening Workshop (immediately following the public hearing)

- i. Level III Site Plan; Lyseth/Lyman-Moore Campus; 171 Auburn Street; Portland Department of Parks, Recreation and Facilities, Applicant (8:00 p.m. estimated time). The Board will hold an evening workshop for site improvements, which re-configure the traffic circulation within the campus to separate bus and vehicle drop off areas, creates well-defined pedestrian accessways and improves the parking layout. The school campus is zoned ROS, R-2 and stream protection. The overall disturbance of the site is over 4 acres and is subject to site plan review.

ELIZABETH BOEPPLE, CHAIR – PORTLAND PLANNING BOARD

PLANNING BOARD



Elizabeth Boepple, Chair
Sean Dundon, Vice Chair
Carol Morrisette
David Eaton
Brandon Mazer
Maggie Stanley
Lisa Whited

AGENDA
PORTLAND PLANNING BOARD MEETING

The Portland Planning Board will hold a meeting on **WEDNESDAY, December 6, 2017**, 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. (WORKSHOP IS CANCELLED)

- i. Level III Site Plan; Portland II Hotel; 203 Fore Street; Miels Development Group, Applicant. (**THIS ITEM IS BEING POSTPONED**)

BREAK FOR DINNER

PUBLIC HEARING – 7:00 p.m.

- 1. ROLL CALL AND DECLARATION OF QUORUM**
- 2. COMMUNICATIONS AND REPORTS**
- 3. REPORT OF ATTENDANCE AT THE MEETINGS HELD ON NOVEMBER 28, 2017:**

Workshop: Boepple, Dundon, Eaton, Mazer, Morrisette and Whited present; Stanley absent.

Public Hearing: Boepple, Dundon, Eaton, Mazer, Morrisette and Whited present; Stanley absent.

4. REPORT OF DECISIONS AT THE MEETINGS HELD ON NOVEMBER 28, 2017:

- i. Level III Subdivision, Site Plan and Conditional Use for Inclusionary Zoning Applications, Stroudwater Preserve Residential Development, 1700 Westbrook Street, Stroudwater Development Partners, LLC., Applicant. Dundon moved and Morrisette seconded a motion to find the application meets the Workforce Housing Conditional Use standards with two (2) conditions of approval. Vote: 6-0, Stanley absent. Dundon moved and Morrisette seconded a motion to waive the requirement for sidewalks on both sides of the street with the condition that the one sidewalk be located on the outer edge of the street network. Vote: 6-0, Stanley absent. Dundon moved and Morrisette seconded a motion to approve the Traffic Movement Permit with three (3) conditions of approval. Vote: 6-0, Stanley absent. Dundon moved and Morrisette seconded a motion to approve the Subdivision plan with eight (8) conditions of approval. Vote: 6-0, Stanley absent. Dundon moved and Morrisette seconded a motion to approve the Site Plan application with four (4) conditions of approval. Vote: 6-0, Stanley absent.

- ii. Level III Site Plan, Subdivision, Conditional Use for a Neighborhood Center, and Inclusionary Zoning Conditional Use; 58 Boyd Street; 58 Boyd St., LP., Applicant. Dundon moved and Morrisette seconded a motion to find the application meets the Workforce Housing Conditional Use standards with two (2) conditions of approval. Vote: 6-0, Stanley absent. Dundon moved and Morrisette seconded a motion to waive the driveway width requirement to allow a 22-foot drive. Vote: 6-0, Stanley absent. Dundon moved and Morrisette seconded a motion to waive the sidewalk requirement along the east side of Franklin Street and the south side of Lancaster Street to the termination point of Franklin Street. Vote: 6-0, Stanley absent. Dundon moved and Morrisette seconded a motion to waive the requirement for a stormwater management plan. Vote: 6-0, Stanley absent. Dundon moved and Morrisette seconded a motion to approve the Subdivision plan with one (1) condition of approval. Vote: 6-0, Stanley absent. Dundon moved and Morrisette seconded a motion to approve the Site Plan application with nine (9) conditions of approval. Vote: 6-0, Stanley absent.
- iii. Level III Site Plan; Parking Garage; 48 Brown Street; Ocean Gate, LLC., Applicant. Dundon moved and Morrisette seconded a motion to waive the corner clearance requirement to allow a curb cut 16 feet from the intersection. Vote: 6-0, Stanley absent. Dundon moved and Morrisette seconded a motion to waive the requirement that no storm drain lines be connected into a storm drain submitted to a condition of approval that the DPW approve the design or a revised stormwater plan is submitted with an acceptable connection. Vote: 6-0, Stanley absent. Dundon moved and Morrisette seconded a motion to approve the Site Plan application with five (5) conditions of approval. Vote: 6-0, Stanley absent.

5. NEW BUSINESS

- i. Zoning Map Amendment from IL-b to B1b; 233 Anderson Street; 2 Walnut, LLC., Applicant. (7:00-7:30 p.m. estimated time). The Board will hold a public hearing to consider a zoning map amendment application by 2 Walnut, LLC. to change the zoning in the vicinity of 233 Anderson Street from Low Impact Industrial (I-Lb) to Neighborhood Business (B1b). The current zoning for the applicant's vacant lot is split between the two zones and the applicant is seeking to have the entire parcel under the B-1b designation in order to develop a mixed-use development (potentially including multi-family). The proposed map amendment to B-1b includes a portion of City owned property adjoining the site on Anderson Street.
- ii. Conditional Use, Office Use in B-3 PAD District; 94 Free Street; City of Portland, Applicant.
Withdrawn from Meeting Agenda. Subject to administrative review.

6. EVENING WORKSHOP (immediately following the public hearing)

- i. Level III Site Plan; Lyseth/Lyman-Moore Campus; 171 Auburn Street; Portland Department of Parks, Recreation and Facilities, Applicant. (8:00 p.m. estimated time). The Board will hold an evening workshop for site improvements, which re-configure the traffic circulation within the campus to separate bus and vehicle drop off areas, creates well-defined pedestrian accessways and improves the parking layout. The school campus is zoned ROS, R-2 and stream protection. The overall disturbance of the site is over 4 acres and is subject to site plan review.



Memorandum

Planning and Urban Development Department

Planning Division

To: Chair Boepple and Members of the Planning Board
From: Caitlin Cameron, Urban Designer
Christine Grimando, Senior Planner
Date: December 6, 2017
Re: R-6 Communication
Meeting Date: December 6, 2017

I. INTRODUCTION

In recent years the Planning Board has asked that City staff conduct a review of significant zoning changes approximately two to three years after adoption, and that process is underway for zoning text amendments to the R-6 zone, adopted in April 2015. The R-6, the predominant residential zone on the peninsula, encompasses much of Munjoy Hill, Parkside, the West End, and portions of Bayside, Bayside, Libbytown and St. John Valley. Sufficient activity has now occurred to allow for an appropriate examination of development characteristics in the area to occur - particularly regarding an increasing prevalence of demolitions of existing houses and an examination of the scale and character of new development on Munjoy Hill. Staff began analyzing the data on new development in the R-6 in the summer of 2017 and is currently finalizing those results for the Planning Board and the City Council.

This communication serves to inform the Planning Board on activities in the R-6 zone since April 2015, as well as provide an update on a moratorium on demolitions and development proposals that the City Council will be considering in December. Included is a summary of the impetus and substance of the 2015 amendments; a summary of construction activity in the R-6 zone since the 2015 amendments; an overview of the design review process; a survey of recent trends in new construction; discussion of the factors influencing the design characteristics of new development, with particular consideration for the impacts of demolitions and new construction being experienced on Munjoy Hill; and next steps to address these findings in the coming months.

II. POLICY OBJECTIVES

In 2015, zoning text amendments to the R-6 zone were aimed to simplify the ordinance,

to enable additional, incremental housing construction - including infill housing development and development of small lots - as well as to allow greater flexibility for alterations and additions of existing structures. The text changes were primarily concerned with the dimensional requirements, including setbacks, lot coverage, density, lot size, and parking standards. The project was specifically consistent with City Council Common Goals for 2014 which called for the City's zoning to allow for greater housing opportunities, specifically *Complete draft rewrites of the R-6, R-7 and B-2 portions of the zoning ordinance to allow for greater housing opportunities and present to Planning Board and Housing and Community Development Committee for review and recommendations to City Council*. In addition to the Council's policy directive, the City was receiving frequent feedback that the R-6 standards did not allow for new housing creation that was consistent with peninsula's housing goals or with existing neighborhood patterns. Prior to the 2015 amendments the great majority of parcels in the R-6 were non-conforming, with greater than 70% of existing lots non-conforming on the basis of lot size alone. There was a marked discrepancy between the residential settlement patterns of the peninsula and what could occur under the zoning ordinance, which impacted new construction as well as modifications and additions to existing homes.

Key changes to the R-6 zone included:

- *Minimum lot size* for residential uses was reduced from 4,500 sf to 2,000 sf.
- *Minimum street frontage* was changed from 40 feet to 20 feet.
- *Minimum side setbacks* ranged from 5-20 feet, and were changed to 5 feet or no less than a cumulative of 10 feet.
- *Maximum lot coverage* ranged from 40-50%, and was raised to 60%.
- *Stepbacks* were introduced for portions of structures above 35ft: no closer than 10ft from the side property line and no closer than 15 feet from the rear property line when the property line abuts a residential zone.
- *Landscaped open space* requirements ranged from 20-30% depending on number of units in a development, and was changed to 20%.
- *Retention of Larger Units*. A previously existing provision that placed limits on the conversion of existing multi-family buildings into additional dwelling units was strengthened to require that creation of new dwellings originating from the alteration of an existing residential structure not result in the creation of any new units of less than 600 square feet of floor area, and not result in any existing dwelling unit being reduced in size to less than 1,000 square feet of floor area. The goal of this change was not to prohibit division of existing units, but to aid in the retention of a varied housing stock, particularly of larger units that could accommodate families. The amendments expanded the requirement to apply not only to multifamily buildings but to single-family and two-family buildings.

- *Garage Opening* limits were introduced so that front façades shall not exceed the greater of nine feet or forty percent of a front façade, and in no garage opening on a front façade shall exceed 20 feet.
- *Parking Standards* were amended from one required space per unit to include exemptions for the first three units as well as a one-time possible exemption for one additional unit for existing buildings.
- *Density* was previously a variable standard of 1,000 sf per dwelling unit for the first three units, and 1,200 sf per dwelling unit thereafter (36 units per acre), and was amended to 725 sf per dwelling unit (60 units per acre). As the majority of development in Portland occurs on parcels of land well below the unit of an acre, it is helpful to look at the implications of the R-6 density standards for smaller lots:

Maximum Permitted Density		
	Former R-6 (1,000-1,200 sf/du)	Current R-6 (725 sf/du)
2,000 sf lot	2 dwelling units	2 dwelling units
3,000 sf lot	3 dwelling units	4 dwelling units
4,500 sf lot	4 dwelling units	6 dwelling units
10,000 sf lot	8 dwelling units	13 dwelling units

Table 1

- *Small Residential Lot Development* provisions for the zone were eliminated. This standard was in place to allow for small, non-conforming lots to be developed, as the 4,500 minimum lot size renders so many small lots unbuildable, but it had proved ineffective. With the change to minimum lot size and the minimum street frontage for the R-6, this section was deemed unnecessary.

The maximum height, 45ft, remained unchanged.

III. 2014-2015 PROCESS

In April 2014, an initial proposal for the R-6 amendments was presented to the Council's Housing and Community Development Committee for direction. Following that, in the summer of 2014 staff met with eight impacted neighborhood associations about the changes, in addition to numerous other meetings with interested groups and individuals. Neighborhood outreach included meetings in the West End Neighborhood, the Western Promenade, St. John Valley, Libbytown, Parkside, Bayside, Munjoy Hill, and East Bayside. Feedback received at these meetings was constructive and creative, and altered the substance of the eventual amendments. In addition to numerous community meetings, the Planning Board held three workshops and a public hearing on the amendments in 2014 and 2015 before forwarding a recommendation to the City Council in March 2015.

IV. FINDINGS TO DATE

The changes in the R-6 zone in the last two years are the result of multiple types of residential projects, including new construction on vacant land (or parcels where no housing exists, such as the recent multi-family project at 17 Carleton Street), demolitions to make way for new construction, additions, and renovations that increased or decreased the quantity of housing overall. There has also been renovation and investment in the existing housing stock in the same period, not included in the summary below, such as deck additions, interior remodels and related.

Housing activity in the zone has included both increase and loss of dwelling units, resulting in a net gain of 89 dwelling units for all development approvals in the R-6 since April 2015. This activity includes two demolitions that do not have corresponding development proposals (one due to fire, resulting in a loss of six units); five developments for new construction on vacant parcels; twenty-six alterations and additions to existing structures; and fifteen demolitions and replacements of existing structures with new housing.

Table 2 shows a summary of all activity that impacted total number of dwelling units. *Dwelling Units Before* refers to number of dwellings units in place on the properties that received development applications, *Dwelling Units After* to total dwelling units for those same properties after approval.

Total R-6 Housing Activity including New Construction, Demolitions, Additions, and Renovations					
	Dwelling Units Before	Dwelling Units After	Net	Affordable Units	Demolitions
Munjoy Hill Totals	44	73	29	0	11
All Other R-6 Totals	61	121	60	38	5
Totals	105	194	89	38	16

Table 2

The distribution of housing types for new construction proposals, not including renovations to existing structures or stand-alone demolitions, shows a range of single family, two-family and multi-family building, as shown in Table 3.

Total R-6 New Housing Construction by Project Type					
	Total Projects Munjoy Hill	Total Projects All Other R-6	Total Projects	Total Units Proposed	Net Total Units
Single-Family	5	0	5	5	-1
Two-Family	3	0	3	6	3
Multi-Family (3)	1	1	2	6	4
Multi-Family (4-10)	6	2	8	52	41
Multi-Family (10+)	0	2	2	48	46
Totals	15	5	20	117	93

Table 3

The above data shows a disproportionate share of demolitions on Munjoy Hill. Three quarters of new construction projects in the R-6 zone have been located on Munjoy Hill, though they are relatively smaller projects (<10 units).

Though the potential impact of the parking exemptions implemented in 2015 on the on-street parking supply was a source of some concern voiced at the time of adoption, new construction applications show that off-street parking provided (124) exceeds the number of approved dwelling units (117) since implementation of the exemption.

The current trend toward increased demolitions, as well as concerns of scale and compatibility of some recent housing designs in the R-6, have prompted the need for an evaluation of additional or modified tools to encourage retention of the existing fabric, and in the case of new construction, promote more contextual contemporary designs. An overview of design trends and current design tools follows in sections V. & VI.

V. DESIGN REVIEW NARRATIVE

Building design in the R-6 is regulated through the zoning dimensional standards and the R-6 Infill Design Principles & Standards found in the *City of Portland Design Manual* (enacted in 2004, revised 2007). When a project is within a historic district, the *Historic Preservation Review Standards* supersedes the R-6 design standards and applies to alterations, new construction, or additions. Two projects (out of 20) received design review through Historic Preservation – 17 Carleton Street (Historic Preservation Board) and 22 Tate Street (advisory review). Design review applies to the front façade and those portions of the building that are readily visible from a public way and is conducted by three staff members including the Urban Designer. Level II and Level III Site Plan or Subdivision applications are ultimately reviewed and approved by the Planning Board on the advisement of staff.

The R-6 design standards are quite rigorous and value contextuality of design as stated in the *Purpose* section:

New residential construction within Portland's compact R-6 zones should relate to the predominant character defining features of the neighborhood. The design

of new development is critical, particularly elements such as the orientation and placement of a building on a site; relationship to the street; and mass, form, and materials.

The design guidelines include seven principle statements and specific standards under each principle – Overall Context, Massing, Orientation to the Street, Proportion and Scale, Balance, Articulation, and Materials. The design standards are based on observation and inventory of predominant characteristics of the existing residential vernacular and context. The applicant is obligated to observe and design in compatibility with the patterns and characteristics of the surrounding context (described as a two-block radius). Some standards prescribe what these predominant characteristics are. For example, there are requirements for regular pattern of windows, simple window types that are rectangular and vertically proportioned, articulation elements such as bay windows, porches, or covered entries, details such as trim and cornices, and prominence of main entries to the street. In other cases, it is open for interpretation from the applicant and reviewers to determine what is compatible and complementary to the specific context – relationship to the street, roof lines, form, materials.

Within the R-6 Infill Design Principles & Standards exists the option for an Alternative Design Review intended to provide flexibility for contemporary design approaches. An applicant may propose an alternative design provided the following conditions are met:

- *The proposed design is consistent with all of the Principle Statements.*
- *The majority of the Standards within each Principle are met.*
- *The guiding principle for new construction under the alternative design review is to be compatible with the surrounding buildings in a two block radius in terms of size, scale, materials and siting, as well as the general character of the established neighborhood, thus Standards A-1 through A-3 shall be met.*
- *The design plan is prepared by an architect registered in the State of Maine.*

The majority of projects rely on the flexibility of the Alternative Design Review. Only four projects (out of 20) have not used the Alternative Design Review process and strictly adhered to meeting every standard – 72 Munjoy Street, 16 Morning Street, 5 Monument Street, and 67 Merrill Street. Those projects are the most similar to or referential of the traditional character – observe referential elements such as the front-end gable roof line, bays, elevated ground floor, vertical proportions.



Figure 1 - 93R Cumberland Avenue

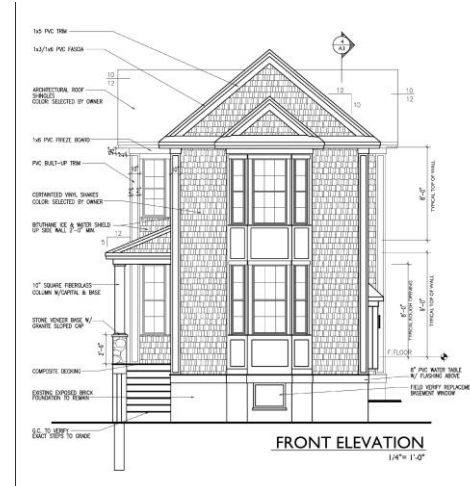


Figure 2 - 16 Morning Street

Over the two years of design review since the R-6 changes, staff have several observations. There are four major factors that contribute to contemporary development patterns different from existing, historic R-6 patterns.

- 1) **Building Code and Life Safety** – Building and life safety codes have changed and become stricter since the era many R-6 projects were built. These codes impact egress (number, size, and placement), proximity of buildings, and size and placement of openings. In addition, City life safety reviewers will sometimes require a larger building separation than allowed by zoning or existing patterns in order to maintain fire access to dwelling units.

Design Impacts – Building placement on the lot is not always able to follow the existing patterns. If a building is four units or more, ADA and Fair Housing Act also affect the design of the ground floor, parking, and entries making it difficult to meet both the accessibility regulation and the design expectations to be contextual – 17 Carleton Street is an example project where it was difficult to find a balance between the historic pattern of a raised first floor and the need to make an accessible building entrance.

- 2) **Car Ownership and Parking** – Car ownership is now much more prevalent than when the built form of the R-6 neighborhoods were established. Past housing design rarely includes attached garages in R-6 neighborhoods. The typical existing pattern places the building to one side of the lot, often a 0' side yard setback, to make room for a side driveway, sometimes leading to a detached garage in the rear of the property. In some cases, lots are too narrow to accommodate a side driveway.

Design Impacts - New construction often includes structured, attached parking (whether it is required by zoning or not). This approach prioritizes garage design rather than following the established patterns. The resulting architecture includes a ground floor dedicated exclusively to parking. This also contributes to the increased heights of new construction because an extra floor of building is needed for the parking. Garage doors facing the street create an inactive, inhospitable

streetscape and also compromise the placement and function of the main entry. Lots that are too narrow for a side driveway will sometimes propose a central drive into a garage disrupting the built pattern and also in conflict with driveway separation and on-street parking technical standards. Thirteen projects (out of 20) include attached structured parking. Seven of those include street-facing garage doors. See examples in Section VI – 40 Quebec Street, 95 Cumberland Avenue, 5 Merrill Street, 34 Howard Street.

- 3) **Materials and Technology** – Building technology and material innovation means changes to building form and exterior character. Contemporary architecture is simpler in character and eschews more historic trends like trim, decoration, and embellishment.

Design Impacts - New buildings rarely include basements making it difficult to follow the established pattern of a raised ground floor with a brick water table. It is expected buildings will include HVAC systems which often translates into taller floor to floor heights and mechanical units and vents more visible on roofs and facades. Panelized materials and metal finishes are more common and are frequently proposed for exterior cladding.

- 4) **Real Estate Market** – Because of the current nature of real estate development many projects, particularly investment properties, are likely to build the maximum allowed under zoning to optimize returns on investment and to minimize overall construction costs.

Design Impacts – New buildings are scaled to create the highest number of units and parking spaces or to maximize views rather than following established patterns of building placement, height, scale, or form. To make units more sellable, developers often insist on building parking spaces (though not always required by zoning) and including features such as roof decks that impact the roof line and height of buildings with stair and elevator towers. See examples in Section VI – 31 Fore Street, 30 Merrill Street.

Design Standards attempt to regulate and evaluate the objective aspects of design. Portland's design guidelines, including for the R-6, emphasize compatibility with context – in some cases this is easy to define but often there is a degree of interpretation that creates a challenge when determining compatibility. Design review does not cover subjective style and aesthetic decisions – contemporary buildings should be allowed to be an architectural expression of their time and not be forced to reproduce historic styles. This is a difficult but important distinction to make. The following observations cover additional design review criteria not mentioned above.

Scale (height, width) – In most cases the scale of new development is larger than the existing context. This manifests in a couple of ways. First, buildings are taller because of increased floor heights to accommodate building systems, because attached, structured parking is occupying the ground floor, and to make the project economically viable, developers maximize the floor area and build as tall as possible for views. Current zoning interpretation allows rooftop appurtenances to exceed height maximums. Second, cars need more space and attached parking can increase the building footprint. Third, though the scale of new buildings is increasing, the proportion of open space or distance

between the new buildings and the adjacent existing buildings is not increasing and therefore exacerbating the perceived scale of the new buildings in relationship to the existing. Since the R-6 zone changes, there have been five new single-family homes developed; none of those single-family homes are taller than 35' or three stories. There are ten projects taller than 35' or three stories, two of those are two-families, and the remaining eight are four or more units. Historically, single-family homes are two and half stories or shorter and the R-6 should continue to promote that scale of development. The numbers show that multi-family buildings of four or more units are the projects to focus on for mitigating scale.

Form (shape, proportion) – The R-6 context includes simple forms and roof lines on small lots. Several factors are creating forms that are not consistent with these historic forms. First, the revised R-6 requires side setbacks after 35' in height – the intention was to mitigate the effects of height and scale. The unfortunate result is strange “pop-up” structures on the fourth floor of buildings that differ from the simple forms and roof lines established (see images below). Second, there is a desire to maximize views and provide rooftop spaces requiring stair towers to overrun the main roof form. Rooftop mechanicals are not being integrated into the overall building form. Designers also struggle to use proportion systems found in the context, especially when trying to fit all the programmatic needs of the project onto the site – the priority has shifted away from the relationship to the street and impact on streetscape.



Figure 3 - 5 Merrill Street



Figure 4 - 34 Howard Street

Articulation, Detail, and Visual Interest – Contemporary design aesthetic favors simplification, flat roofs, limited trim and cornice lines. Some of this is subjective style choice, some of it is related to the evolution of building systems and materials. However, the existing historic buildings have characteristics such as articulated cornice lines, fine-grain materials and details, and façade thickness and depth through the use of plane changes, reveals, massing variation, and bay windows. These elements bring visual interest and a human scale to buildings. Recent proposals struggle to find contemporary ways to introduce similar features without becoming historicist in character. In addition, to minimize cost, buildings are designed to be flat, simple boxes. Where feasible, staff

have asked applicants to introduce elements like bay windows, canopies, more prominent cornice lines, or fine grain materials to address some of these concerns (see image below).



Figure 5 - 70 Anderson Street

Building Placement and Orientation (including main entry) – Buildings in the R-6 zones tend to be vernacular buildings that together create a strong fabric. There are distinct patterns of development in the shape and scale of building footprints and how they sit on a parcel and in relationship to each other. There is also legibility of the buildings – entrances are visible from the street and emphasized with features like stoops, porches, canopies, recesses. New proposals often struggle to follow these patterns because the priority of new development is not to follow context but to accommodate on-site parking and to maximize building envelope.

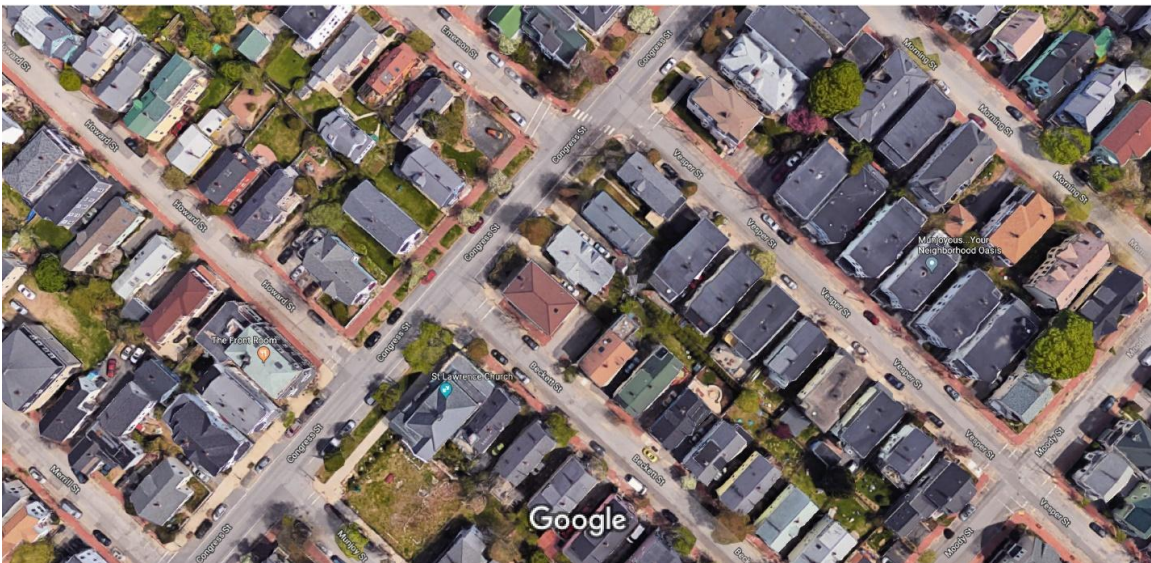


Figure 6 - R-6 Fabric

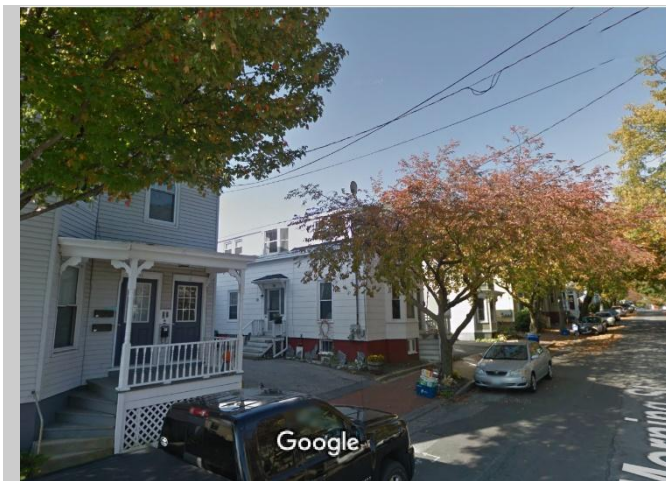
Post-approval Changes – Another trend affecting the quality of design in the R-6 is the modification of designs after the Site Plan approval. Revisions can include window size

and placement, changes to railings, balconies, trim details, placement and visibility of mechanicals and vents. Applicants are supposed to apply for amendments for changes and staff determines whether the changes are substantive or de minimis in nature. In practice, some changes are being made without applying for amendment or consulting City staff. The City has some leverage over this situation through the control of the Performance Guaranty and Certificate of Occupancy but in some cases changes are irreversible and sometimes contribute to the lack of contextuality or sensitivity originally intended by the design standards.

Staff determined that three aspects of the R-6 zone change are contributing to, though not solely responsible for, the less contextual designs – the forms and roof lines are affected by the setbacks; and the increased lot coverage and reduced side yard setbacks allows for larger scale buildings – nine (out of 20) new construction projects took advantage of the higher lot coverage. One important and positive result of the zone change is the size limitation on garage doors. The other design concerns and observations identified existed prior to and regardless of the R-6 zone changes and are impacted by the four factors described in this section.

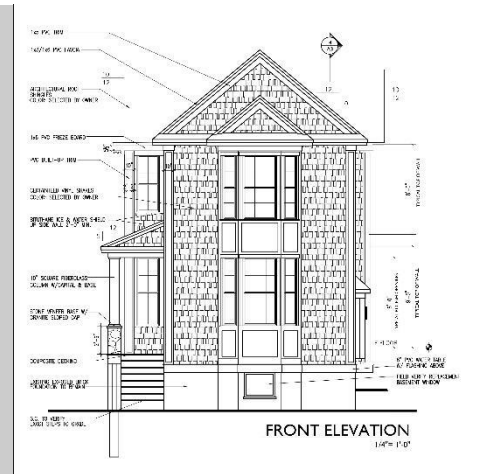
VI. R-6 DEMOLITIONS AND NEW CONSTRUCTION COMPARISON

The following comparison focuses on projects that demolished an existing structure and replaced it with new construction. The intent of the images is to compare the previous and new building scale and architectural character and form. The project data includes number of dwelling units, lot coverage, height in stories, number of parking spaces, and density which is a calculation of lot size divided by number of dwelling units.



16 Morning Street, Munjoy Hill

Dwelling Units = 2 Density = 1,600 sf/du
 Lot Coverage = 36% Height = 2 stories
 Parking Spaces = unknown (no garage)



New Construction

Dwelling Units = 1 Density = 3,200 sf/du
 Lot Coverage = 47% Height = 2 stories
 Parking Spaces = 2 (attached garage)



95 (93R) Cumberland Avenue, Munjoy Hill

Dwelling Units = 2 Density = 1,100 sf/du
 Lot Coverage = 30% Height = 2.5 stories
 Parking Spaces = unknown (no garage)



New Construction

Dwelling Units = 1 Density = 2,200 sf/du
 Lot Coverage = 44% Height = 3.5 stories
 Parking Spaces = 2 (attached garage)



67 Merrill Street, Munjoy Hill

Dwelling Units = 1 Density = 2,312 sf/du
 Lot Coverage = 50% Height = 1.5 stories
 Parking Spaces = 0



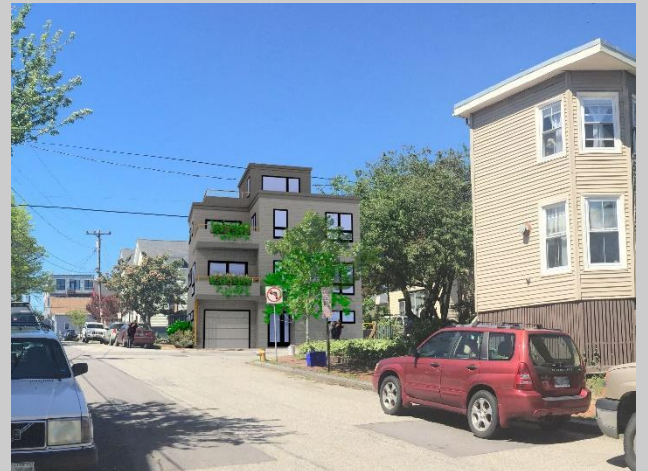
New Construction

Dwelling Units = 1 Density = 2,312 sf/du
 Lot Coverage = 50% Height = 1.5 stories
 Parking Spaces = 0



34 Howard Street, Munjoy Hill

Dwelling Units = 1 Density = 1,670 sf/du
 Lot Coverage = 52% Height = 2 stories
 Parking Spaces = 1 (side driveway)



New Construction

Dwelling Units = 2 Density = 835 sf/du
 Lot Coverage = 56% Height = 4 stories
 Parking Spaces = 1 (attached garage)



107 Monument Street, Munjoy Hill

Dwelling Units = 1 Density = 2,985 sf/du
 Lot Coverage = 28% Height = 2 stories
 Parking Spaces = 1 (side driveway)



New Construction

Dwelling Units = 1 Density = 2,985 sf/du
 Lot Coverage = 33% Height = 3 stories
 Parking Spaces = 1 (side driveway)



40 Quebec Street, Munjoy Hill

Dwelling Units = 1 Density = 2,960 sf/du
 Lot Coverage = 39% Height = 1.5 stories
 Parking Spaces = 0



New Construction

Dwelling Units = 2 Density = 1,480 sf/du
 Lot Coverage = 54% Height = 3 stories
 Parking Spaces = 3 (attached garage)



5 Merrill Street, Munjoy Hill

Dwelling Units = 1 Density = 1,820 sf/du
 Lot Coverage = 64% Height = 2 stories
 Parking Spaces = 1 (side driveway)



New Construction

Dwelling Units = 2 Density = 910 sf/du
 Lot Coverage = 61.5% Height = 4 stories
 Parking Spaces = 2 (attached garage)



31 Fore Street, Munjoy Hill

Dwelling Units = 2 Density = 2,090 sf/du
 Lot Coverage = 43% Height = 3.5 stories
 Parking Spaces = 2 (side driveway)



New Construction

Dwelling Units = 4 Density = 1,045 sf/du
 Lot Coverage = 60% Height = 4 stories
 Parking Spaces = 6 (attached garage)



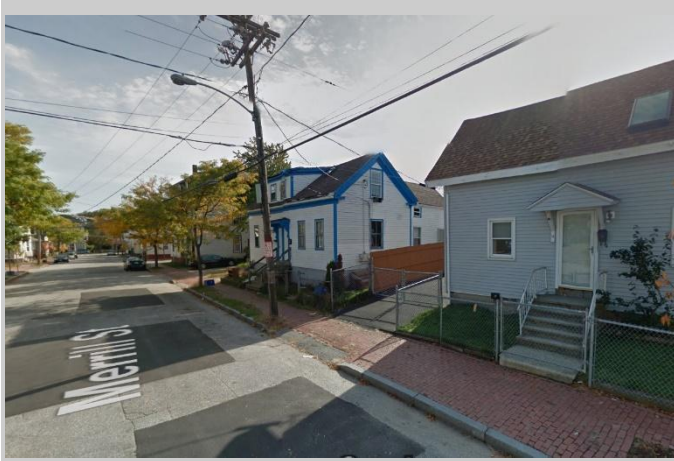
5 Cumberland Avenue, Munjoy Hill

Dwelling Units = 2 Density = 2,232 sf/du
 Lot Coverage = 30% Height = 2.5 stories
 Parking Spaces = 2 (side driveway)



New Construction

Dwelling Units = 6 Density = 745 sf/du
 Lot Coverage = 43% Height = 4 stories
 Parking Spaces = 5 (rear surface)



30 Merrill, Munjoy Hill

Dwelling Units = 2 Density = 2,538 sf/du
 Lot Coverage = 24% Height = 1.5 stories
 Parking Spaces = 1 (side driveway)



New Construction

Dwelling Units = 7 Density = 725 sf/du
 Lot Coverage = 36% Height = 4 stories
 Parking Spaces = 6 (rear surface)



70 Anderson Street, East Bayside

Dwelling Units = 1 Density = 8,400 sf/du
 Lot Coverage = 23% Height = 1.5 stories
 Parking Spaces = 2 (side driveway, detached garage)



New Construction

Dwelling Units = 10 Density = 906 sf/du
 Lot Coverage = 45% Height = 3 stories
 Parking Spaces = 7 (side/rear surface)



22 Tate Street, West End

Dwelling Units = 1 Density = 6,176 sf/du
 Lot Coverage = 18% Height = 2 stories
 Parking Spaces = unknown (side yard surface)



New Construction

Dwelling Units = 8 Density = 772 sf/du
 Lot Coverage = 38% Height = 3 stories
 Parking Spaces = 8 (side yard surface)



161 York Street, West End

Dwelling Units = 2 Density = 5,523 sf/du
 Lot Coverage = 19% Height = 2 stories; 2 str
 Parking Spaces = unknown (side driveway)



New Construction

Dwelling Units = 11 Density = 1,004 sf/du
 Lot Coverage = 54% Height = 4 stories
 Parking Spaces = 20 (attached garage, rear surface)

VII. MORATORIUM

Attachment 1 contains the moratorium, and associated agenda request, being considered by the City Council this month, with a first read scheduled for December 4th and action scheduled for December 18th. It establishes a moratorium on new development applications and demolitions in order to allow the Planning Division to recommend changes to the Land Use Code for the R-6 on Munjoy Hill. The 180-day moratorium is on all demolition applications in the R-6 zone on Munjoy Hill; and any and all Level I, II, or III Site Plan applications and amendments in addition to all demolition applications, for an interim period of the first 45 days of the moratorium (applications for demolitions

or building permits that are the result of a previously approved site plan approved prior to the effective date are not subject to the moratorium).

VIII. NEXT STEPS

The last two years have seen relatively high density, compact infill development and production of needed housing in the R-6 zone, as intended, but it has also seen impacts to the urban fabric that call for modifications to current standards. Though the initial impetus for an assessment of activity in the R-6 zone was the 2015 text amendments, development outcomes are influenced by numerous factors, some of which extend beyond the reach of the amendments. R-6 design guidelines have been in place since prior to 2015, for instance, and some of the recent development could have occurred under the prior iteration of the zone. Findings to date indicate there are multiple factors – including intense market demand, design guidelines, and the sum of R-6 dimensional requirements – influencing development trends in the R-6, and staff will look to tools to address the range of concerns, including:

- Building scale and height in relationship to context and typology
- Building placement including proportion of building scale to setbacks
- Parking types and placement
- Reinforcement of desirable, existing characteristics (form, proportion, street activation, materials, articulation, façade composition)
- Deterrence of demolitions

In the event the City Council passes the moratorium later this month, that will dictate the timeline and sequence of proposals brought forward for Planning Board and City Council review. The moratorium as written has a start date of December 4th, which would require interim zoning changes to be implemented by January 18th, and any other proposals to be developed and implemented within a 180-day window. Interim zoning changes would follow a planning best practice of putting an “interim planning district” or “interim planning overlay district” in place while more permanent changes are considered. These interim districts are designed as a best guess as to what final zoning changes might encompass, and allow for a change to see how they are working while a more extensive process unfolds. In the meantime, staff continues to analyze development trends and will support any proposals with supporting data.

IX. ATTACHMENTS

1. R-6 Moratorium and accompanying agenda request

MEMORANDUM
City Council Agenda Item

DISTRIBUTE TO: City Manager, Mayor, Anita LaChance, Sonia Bean, Danielle West-Chuhta, Nancy English, Julianne Sullivan

FROM: Councilor Belinda Ray

DATE: November 21, 2017

SUBJECT: Development and Demolition of Structures in the R-6 Zone on the East End of the Portland Peninsula

SPONSOR: Councilor Belinda Ray

COUNCIL MEETING DATE ACTION IS REQUESTED:
1st reading December 4, 2017 **Final Action** December 18, 2017

Can action be taken at a later date: ____ Yes__ ☒ No (If no why not?)
Moratorium start date is December 4, 2017 and time is of the essence.

PRESENTATION: (List the presenter(s), type and length of presentation)
Staff will be available to answer questions.

I. ONE SENTENCE SUMMARY

The City is seeking a Moratorium on demolition applications for a one-hundred-and-eighty-day (180) period, with an interim suspension of forty-five (45) days on all Site Plan applications, in the R-6 zone on Munjoy Hill, in order to develop and implement amendments to the City's Land Use Code to mitigate impacts of development pressures in this area.

II. AGENDA DESCRIPTION

The City is seeking a moratorium on new development applications and demolitions in order to allow the Planning Division to recommend changes to the Land Use Code for the R-6 on Munjoy Hill. A recent acceleration of development on Munjoy Hill has hastened the need for prompt changes, and a pause to activity while zone changes are developed and implemented. While the R-6 zone has allowed for much needed housing production, Munjoy Hill has been subject to a particular concentration of this activity, raising concerns about loss of neighborhood fabric, rate of demolitions, and the scale and character of new development not being contextually sensitive.

The proposed one-hundred-and-eighty (180) day moratorium is for: all demolition applications in the R-6 zone on Munjoy Hill (unless the application is part of a previously approved site plan approved prior to the effective date of the moratorium); and any and all Level I, II, or III Site Plan applications and amendments in addition to all demolition applications, for an interim period of the first forty-five (45) days of the moratorium.

III. BACKGROUND

In 2015, zoning amendments to the R-6 zone were aimed on enabling infill housing development, as well as allowing greater flexibilities to alterations and additions to existing properties. Typically, City staff will conduct a review of significant zoning changes after approximately two years, and that process is underway for the R-6. However, a recent acceleration of development on Munjoy Hill has hastened the need for prompt changes, and a pause to development activity while zone amendments are developed and implemented. In the previous two+ years there have been ninety-two (92) net new housing units in the R-6 zone overall, twenty-nine (29) of them on Munjoy Hill. In addition, of the fifteen (15) demolitions in the R-6 zone in the same period, eleven (11) have been concentrated on Munjoy Hill. The moratorium will allow for interim and long term changes to be implemented to improve the R-6 standards so that they continue to allow for infill housing development while minimizing negative impacts on Munjoy Hill related to demolitions, scale, and neighborhood character.

IV. INTENDED RESULT AND OR COUNCIL GOAL ADDRESSED

The intended result is to temporarily pause demolitions and to slow down new residential development on Munjoy Hill so that improvements can be made to the Land Use Code that will further comprehensive plan housing policy goals and strategies, including:

- Encourage additional contextually appropriate housing density in and proximate to neighborhood centers, concentrations of services, and transit nodes and corridors as a means of supporting complete neighborhoods; and
- 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.

V. FINANCIAL IMPACT

As the intent of the moratorium is not to ultimately prohibit development applications beyond the one-hundred-and-eighty-day (180) period, there are no anticipated long term financial impacts.

VI. STAFF ANALYSIS AND BACKGROUND THAT WILL NOT APPEAR IN THE AGENDA DESCRIPTION

A significant proportion of all demolitions in the R-6 zone since 2015 has been on Munjoy Hill (11 out of 14) despite the fact that Munjoy Hill has not seen a similarly disproportionate level of new development compared to the balance of the R-6 zone. For this reason a moratorium on demolitions is warranted, with interim zoning to be put in effect during the term of the moratorium.

Additional analysis will be completed as part of the interim zoning to be proposed, as well as the R-6 audit and drafting of any permanent changes to the district.

VII. STAFF RECOMMENDATION

Planning Staff supports the proposed moratorium in order to provide time to complete the R-6 audit and draft changes to the R-6 zone to address issues related to scale and unnecessary demolitions.

VIII. PLANNING BOARD RECOMMENDATION

N/A

IX. LIST ATTACHMENTS

- A. Moratorium Re: Development and Demolition of Structures in the R-6 Zone on Munjoy Hill
- B. Exhibit A: Area of R-6 Zone on Munjoy Hill

Prepared by: Christine Grimando

Date: November 21, 2017

**Moratorium
Re: Development and Demolition of Structures in the
R-6 Zone on Munjoy Hill**

WHEREAS, in or around April 2015, the City of Portland's Land Use Code was amended to allow for more infill development and reconstruction in the City's R-6 zone in an effort to advance the City's goal to produce additional housing; and

WHEREAS, that change in zoning has helped meet City goals for new housing production, resulting in approximately 92 net new housing units overall; and

WHEREAS, a significant portion of the R-6 zone in the City of Portland is located on Munjoy Hill; and

WHEREAS, of the 92 net new units overall, 29 of them have been on Munjoy Hill; and

WHEREAS, this redevelopment has included the demolition of eleven (11) housing structures and the construction of larger housing structures, many of which do not adequately fit with the neighborhood context; and

WHEREAS, the rest of the R-6 zone has seen demolition of only four (4) housing structures as a result of new development; and

WHEREAS, there is a strong likelihood that the R-6 zone on Munjoy Hill will continue to be subjected to this demolition pressure; and

WHEREAS, at present there may be a need for additional regulation in the City's Land Use Code to address these aforementioned increases in demolitions and to further refine regulations regarding the character and size of permissible replacement buildings in the R-6 Zone on Munjoy Hill; and

WHEREAS, pursuant to 30-A M.R.S. § 4356(1)(B), there is concern that existing City Land Use Code provisions, regulations or other laws are inadequate to address the aforementioned development and demolition pressures in the R-6 zone on Munjoy Hill and to prevent the public harm from these demolitions, the associated residential developments, and their collective impacts on the fabric of this particular neighborhood; and

WHEREAS, after sufficient notice and a public hearing, there is strong support for this Moratorium on the City Council; and

WHEREAS, it is typical for City staff to conduct a review of significant zoning changes after they have been in place for approximately 2 years and to recommend revisions that improve their effectiveness; and

WHEREAS, that process is underway but will require at least one hundred and eighty

(180) days for City staff to fully develop and implement any necessary amendments to address negative impacts of demolitions on Munjoy Hill while also helping to achieve City housing production goals; and

WHEREAS, in the judgment of the Portland City Council, these facts and conclusions outlined above create an emergency within the meaning of 30-A M.R.S. § 4356(1) and the City Charter, and require the following Moratorium as immediately necessary for the preservation of the public health, safety and welfare;

NOW THEREFORE, pursuant to its authority in 30-A M.R.S. §§ 3001 and 4356, the Portland City Council hereby ordains that a Moratorium is imposed on any and all demolition applications [as defined and except as exempted below] in the R-6 zone on Munjoy Hill depicted on the map attached hereto as Exhibit A; and

BE IT ORDERED, that no demolition permit applications for demolition of 50% or more of the exterior surface of and/or the front façade of a structure, shall be accepted, processed, or reviewed by the City, for any and all property located in the R-6 zone on Munjoy Hill in the City of Portland (see Exhibit A) for the entire period of this Moratorium, unless that demolition is part of a site plan application approved prior to the effective date of this moratorium; and

BE IT FURTHER ORDERED, that this Moratorium shall go into effect and be applicable to the above-described applications on December 4, 2017, and remain in effect for one hundred and eighty (180) days thereafter, unless extended, repealed, or modified by the Portland City Council; and

BE IT FURTHER ORDERED, that, in addition to the moratorium on demolition permits outlined above, for an interim period beginning on December 4, 2017 and lasting for forty-five (45) days thereafter, no development applications for properties located in the R-6 zone on Munjoy Hill, specifically including any and all Level I, II or III Site Plan applications and amendments thereto, shall be accepted by, nor shall any approval be issued or granted by, the Planning Authority or the Planning Board; and

BE IT FURTHER ORDERED, that in that interim period the City's Department of Planning and Urban Development shall draft an interim ordinance to govern development in the R-6 zone during the remaining one hundred and thirty-five (135) days of the aforementioned demolition Moratorium for review and approval by the City Council; and

BE IT FURTHER ORDERED, that to the extent any provision of this Moratorium is deemed invalid by a court of competent jurisdiction, the balance of the Moratorium that shall remain shall be considered valid; and

BE IT FURTHER ORDERED, that in view of the emergency cited in the preamble above, that it is hereby found and determined by the Portland City Council that it is necessary that this Moratorium take effect immediately as an emergency pursuant to Article II, Section 8 of the City of Portland Charter.

This map illustrates the city grid of Portland, Oregon, with the city area highlighted in orange. The grid is bounded by the Willamette River to the west and the Columbia River to the east. Major streets are labeled, including Interstate 205, Eastern Promenade, and various local streets like North, Walnut, Montreal, Melbourne, Quebec, Turner, Emerson, Morning, Vesper, Beckett, Moody, Wilson, Munjoy, O'Brien, Fort Allen, Cutter, Atlantic, St. Lawrence, Waterville, Adams, Fore, Kellogg, Monument, Ponce, Mountfort, Munjoy, Federal, India, Newbury, Hancock, Middle, Hampshire, Franklin, Newbury, Market, Exchange, Silver, Temple, Elm, Chestnut, Stone, Myrtle, Pearl, Wilmot, Oxford, Chapel, and Elm. A compass rose is located in the bottom right corner, indicating North (N), South (S), East (E), and West (W).





PLANNING BOARD REPORT PORTLAND, MAINE

Zoning Map Amendment:
Low Impact Industrial ILb to Neighborhood Business B1b
233 Anderson Street

2 Walnut LLC, Applicant
Project #: 2017-170
CBL: 010 A040001

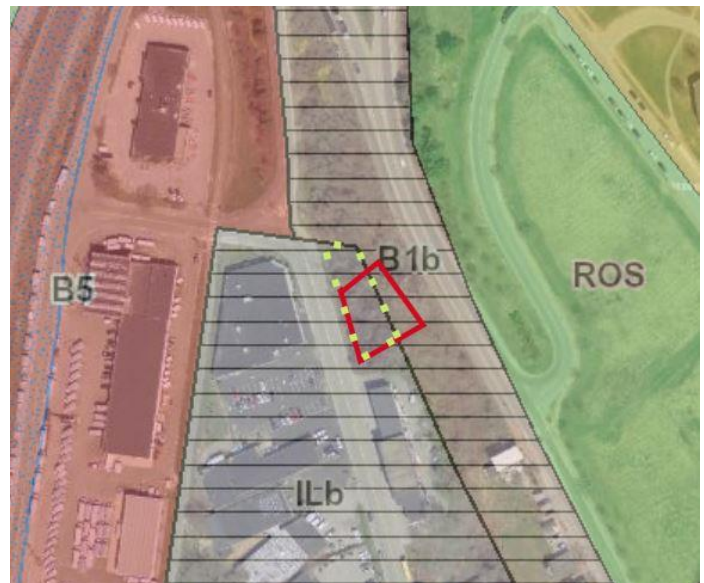
Submitted to: Portland Planning Board Public Hearing Date: December 6, 2017	Prepared by: Jean Fraser Date: December 1, 2017
--	--

I. INTRODUCTION

The Planning Board is requested to make a final recommendation in respect of a zoning map amendment application by 2 Walnut, LLC to change the zoning in the vicinity of 233 Anderson Street from Low Impact Industrial (ILb) to Neighborhood Business (B1b). The current zoning for the applicant's vacant lot at 233 Anderson Street is split between these two zones and the applicant is seeking to have the entire parcel under the B1b designation in order to develop a mixed-use development (potentially including multi-family).

At the October Workshop the Board supported the map amendment to B1b, and had suggested the map amendment be expanded to include a parcel to the north of 233 Anderson Street as it was understood to be City owned property and was a logical addition. The larger site (dashed yellow) was included in the legal advertisement, but since then staff have learned that this additional parcel is not owned by the City. Therefore the staff is not recommending the entire area to be rezoned. Only the area in red outline (the parcel of 233 Anderson) is the area proposed for the amended zoning from ILb to B1b.

The proposal involves a 10,000 sq ft parcel at 233 Anderson Street that is located immediately to the northwest of the recently approved housing proposal for 218 Washington Avenue. The applicants have a Purchase and Sale Agreement for this parcel ([Attachment B](#)).



The submitted narrative ([Attachment C](#)) indicates that the objective of the rezoning is to allow for the development of a mixed use development including commercial uses on the lowest floor and 12 residential units above, as the ILb zone does not allow residential uses. The rezoning to the B1b zone would allow this development but would also allow a wide range of uses not allowed in the ILb zone such as retail, restaurants, general business and professional offices. The applicant's narrative analyzes the site and zoning and concludes that the size and topography of the site would limit industrial uses and it is more suitable for a mixed use development that includes residential.

A legal ad for this hearing was posted on the City's web page and appeared in the *Portland Press Herald* on October 31 and November 1, 2017. Notices were also sent to 118 property owners within 1000 feet of the site and to the interested citizen list. The applicant held a Neighborhood Meeting on November 13, 2017 which was not attended by any neighbors; the documentation is included in [Attachment E](#).

II. PLANNING BOARD WORKSHOP OCTOBER 10, 2017

The Planning Board workshop considered the advantages and disadvantages of the proposed map amendment as compared with the alternative of amending the entire parcel to ILb and discussed the allowed uses of these two zones. The Board generally supported the B1b option as it better integrated with that particular area, and supported housing development.

The Board also considered whether any other abutting ILb parcels should also be included in the map amendment to B1b. The applicant had indicated that the parcel to the north was in city ownership and the Board recommended that parcel be included in the map amendment to B1b at this stage. After further evaluation the staff determined that the parcel is not City-owned and rather is part of a larger land holding held by the State of Maine for I-295.

III. EXISTING CONDITIONS

The parcel has a frontage along Anderson Street of 114 feet and averages 100 feet in depth. The site is vacant and vegetated, with a steep uphill slope. A section of the property line abuts the property known as 218 Washington (subject of recent approval for 45 condo units). The rear and north property lines abut the vacant/vegetated MDOT land associated with I295.

Industrial development abuts the parcel to the south and the west.



IV. PROPOSED MAP AMENDMENT

Current Zoning:	Approximately 2/3 ILb and 1/3 B1b
Proposed Zoning:	Entire parcel at 233 Anderson Street to B1b
Current Uses:	Vacant
Proposed Uses:	As allowed in B1b; narrative and renderings suggest with mixed use including residential
Parcel Area:	approx. 10,000 SF

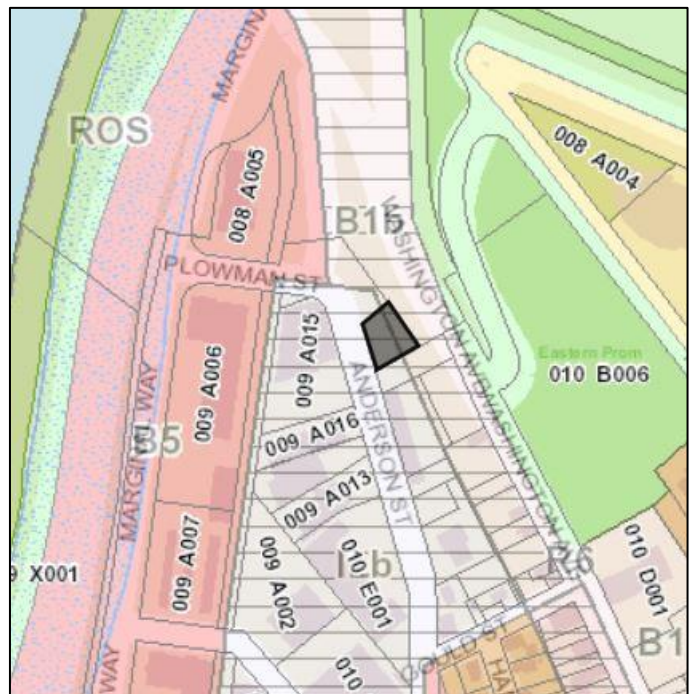
V. ZONING CONTEXT

The parcel proposed to be rezoned sits within a block along the east side of Anderson Street that is zoned both ILb and B1b. A number of the sites in the B1b section are, or are approved to be, residential. The ILb industrial area to the west is changing in nature to include more “craft” industry.

Dimensions

The dimensional requirements that would impact the maximum height allowed for any development are similar as between the two zones. The submitted Narrative ([Attachment C](#)) includes a Figure 2 that illustrates a possible mixed use development based on the maximum “development envelope” if a new B1b building were built to the maximum dimensions allowed.

The applicant has indicated that they intend to move forward with a mixed use development with a smaller footprint, and Figure 3 of the Narrative compares it to the “maximum envelope” in Figure 2.



This submitted information is helpful to understand the potential implications if the parcel is rezoned to B1b, but it should be noted:

- A map amendment to the B1b zone would not imply any approval to a specific development and the applicant is not required to move forward with the indicative development outlined in the Narrative; and
- The heights of any future building on the site would need to meet the 45 ft height requirement based on the height of any proposed building as from the average grade of the proposed building (calculated from grades at the corners of the building). If there is a variation in the contours of the site, the allowed height for a building along Anderson Street could be at a different absolute height than one further up the slope.

Uses

The purpose statements for both zones are included in **Table 1** below. The ILb aims to provide for low impact industrial and similar but neighborhood-friendly uses, while the B1b zone is more focused on the integration of small scale commercial uses with residential.

Table 1: Purpose Statements

ILb	B-1b
The low impact industrial zone is intended to provide areas in which low impact industrial uses and limited other uses serving employees and residents of the surrounding neighborhood will be compatible with adjacent residential uses, will provide a buffer between residential neighborhoods and the I-M or I-H industrial zones, or will stand alone as a smaller scale industrial district. The I-L zone is located adjacent to residential neighborhoods, business uses and other industrial uses where the low intensity nature of the uses, as well as their strict performance standards, will ensure compatibility of the uses with other adjacent industrial and nonindustrial uses. Performance standards for uses in the I-L zone are designed to maintain compatibility between low impact industrial uses and neighboring nonindustrial and industrial uses. Performance standards include full enclosure of uses and requirements for buffers and screening from adjacent properties.	To provide appropriate opportunities for the establishment of small-scale ground floor commercial uses in existing buildings, serving a local market, while preserving residential uses and character above the ground floor of structures. The zone also provides the opportunity for mixed use and high residential density in on-peninsula locations. Building additions are encouraged but not required to meet the maximum setbacks of 14-165(c)(3). Suitable locations for this zone may include street intersections, arterial streets, and sites with existing traditional neighborhood retail and service uses.

The **Table 2** below compares the permitted uses for the two zones.

The existing ILb zone emphasizes, in addition for employment-creating industrial uses, a wide range of uses that are largely small scale (with some exceptions such as indoor amusement and recreation centers, plant and tree nurseries, marinas and lumber yards). It also includes uses that support the surrounding neighborhood such as day care facilities, makers markets, artists studios, and neighborhood centers. This zone does not allow residential or retail uses.

The proposed B-1b zoning designation allows a range of residential on the upper floors (including bed and breakfast and hostels), and permits – on the ground floor only – restaurants, day care facilities, neighborhood centers and a wide range of commercial and institutional uses, including retail establishments, offices, personal services, business services, places of assembly, clinics, municipal uses, and schools.

Both zones allow day care facilities, neighborhood centers, and studios for artists, photographers and craftspeople, with the Bib also allowing combined live/work spaces.

Table 2: Summary of Comparison Ilb and B1b Zones re permitted uses

USE	Ilb	B1b
Low impact industrial uses, including, but not limited to, bakeries, breweries, bottling, printing and publishing, pharmaceuticals, machine shops, musical instruments, precision instruments, watchmakers, toys and sporting goods, wood products, jewelry, assembly of electrical components, tool and die shops and the packaging of food.	✓	
- Indoor amusement and recreation centers. - Plant and tree nurseries, including associated recycling activities. - Lumber yards. - Commercial kitchens or other food preparation, provided that the food is not prepared for service on the premises. - Repair services, including all types of automotive repair.	✓	
Building contractors and outside storage of related construction equipment, provided that there shall be no outside storage of materials and supplies.	✓	✓ (ground floor only)
Day care facilities	✓	✓ (ground floor only)
- Dairies. - Dog training services, including but not limited to obedience, guide, and service training, but not including boarding or kennel services. - Intermodal transportation facilities. - Marinas. - Distribution centers, warehouses and wholesale businesses under ten thousand (10,000) square feet in total building area, with no outside storage permitted. - Back office uses.	✓	
Utility substations	✓	✓
Accessory Uses	✓	✓ (ground floor only)
Specific accessory uses such as makers markets & temp events	✓	
Registered medical marijuana cultivation facilities.	✓	
Neighborhood centers.	✓	✓ (ground floor only)
Places of religious assembly, limited to facilities of 10,000 sf or less.	✓	✓ (ground floor only)
Wind energy systems	✓	✓
Street vendors	✓	
Studios for artists, photographers and craftspeople	✓	✓ (ground floor only)
Residential (as per abutting zone, plus multi family of commercial on ground floor and combined live/work spaces)		✓
Professional, business and general offices		✓ (ground floor only)
Personal Services		✓ (ground floor only)
Retail establishments (limited hours)		✓ (ground floor only)
Beverage Dealers (sub to conds)		✓ (ground floor only)
Restaurants (sub to conds)		✓ (ground floor only)
Municipal offices		✓ (ground floor only)
Elem, middle & secondary schools, nursery & kindergarten		✓ (ground floor only)
Clinics		✓ (ground floor only)
Lodging house		✓ (ground floor only)
Bed and Breakfast		✓
Hostels (sub to conds)		✓

VI. POLICY ANALYSIS OF PROPOSED MAP AMENDMENT

The applicant has indicated that the B1b zone is more appropriate for the entirety of this parcel as it facilitates development for the following reasons (see Narrative in Attachment C):

- Topography: Steep slopes within the small parcel inhibit ILb uses and would support residential by offering views
- Pavement setback of 15 ft is required in the ILb zone and not in the B1b zone, thus the B1b zone would make development more viable and accessible

- Relatively small size of the parcel limits ILb uses
- Uses: Allows live/work_spaces whereas the ILb zone only allows artist studios
- Uses: Allows residential whereas the ILb zone does not allow residential
- Comprehensive Plan: B1b allows development in line with the stated objectives of the Comprehensive Plan eg mixed use with residential on the upper floors

The size of the site and its slope present similar constraints for development under both zones, and most of the dimensional requirements are the same. The key question is whether any of the uses allowed by the B1b zone would have any particular adverse impacts in that location.

The uses that the B1b zone would allow that are not currently allowed, such as retail/restaurants, could increase the level of public access and activity on the site, with potential issues of noise and traffic generation.

- Noise: The B1b zone includes conditions on retail and restaurants that limits the business hours to between 6am and 11 pm and also limits the hours for service deliveries. The zone also includes a 55dBA limit on sound at all times.
- Traffic generation: Typically the consideration of a map amendment involves the assessment of the traffic generation of the most intensive uses in the zone being suggested. The City's consultant Traffic Engineer requested such an assessment in his preliminary comments and the applicant has submitted a Traffic Study (Attachment F).

The Study has been reviewed by the City's Consultant Traffic Engineer and he has confirmed (Attachment 1):

...in response to the City's request, the applicant has conducted a trip generation analysis comparing traffic estimates under the current zone versus the proposed Map Amendment zone designation. Based upon the applicant's development assumptions, the build-out of the currently zoned property would generate 88 AM peak hour trips and 80 PM peak hour trips. Under the Map Amendment zone change, the property would generate 98 AM peak hour trips and 93 PM peak hour trips. In my professional opinion, this level of increased traffic volume (10 AM peak hour trips and 13 PM peak hour trips) would not be noticeable from a traffic mobility or safety impact perspective.

As the Board may recall, there have been discussions in the past regarding zoning proposals in the East Bayside area. At that time, there was support to retain the ILb in the general area, which has served as an economic and employment area for the surrounding neighborhoods. Currently, a planning study of East Bayside is underway by GPCOG that is funded through a Brownfields Grant, which will include future land use recommendations for this area.

The proposal to rezone the single parcel from ILb to B1b raises questions as to whether it would be appropriate to rezone any of the other nearby ILb parcels to B1b and whether the loss of industrial zoned land is an issue in this area. The Board and some neighbors suggested that the ILb parcels to the east of Anderson Street may be appropriate for rezoning to B1b given the topography, size of the parcels and the recent residential development in this part of the City (see Zoning Context Map above).

The staff finds the rezoning of this small parcel does not set a precedent because it is a steeply sloped and small parcel at the end of the ILb zone along that side of Anderson Street, and abuts the State land associated with I-295 and the substantial residential development recently approved at 218 Washington Avenue. The proposed map amendment does not necessarily set a precedent or set a specific zoning direction for the larger area, which is subject to the further evaluation in the GPCOG study and through the City's on-going work to implement the recently adopted Comprehensive Plan.

VII. COMPREHENSIVE PLAN

The Comprehensive Plan includes policies that support both of the options for a map amendment, though the B1b zone at this location more directly addresses the Plan 2030 goals to increase the supply of housing, including housing that allows people to live and work in Portland.

VIII. PUBLIC COMMENT

At the time this report was prepared the Planning Division had not received any public comment.

IX. STAFF RECOMMENDATION

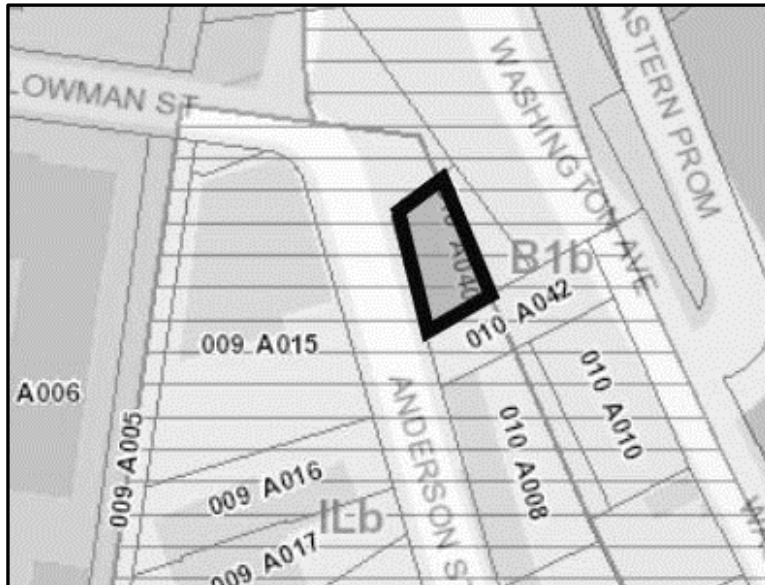
Staff consider the proposed map amendment may facilitate the development of a constrained parcel that is in area where housing would be appropriate and the B1b zone would not appear to present any potential adverse impacts.

X. MOTIONS FOR THE BOARD TO CONSIDER

On the basis of plans and materials submitted by the applicant, the City of Portland Zoning Code, Portland's Comprehensive Plan, public comment, the information provided in public hearing on December 6, 2017 for the project #2017-170 (233 Anderson Street), and/or other findings as follows:

The Planning Board finds that the proposed rezoning to the Neighborhood Business (B1b) zone for the a property located at 233 Anderson Street **[is or is not]** consistent with the Comprehensive Plan for the City of Portland; and

Therefore, the Planning Board **[recommends or does not recommend]** to the City Council approval of the zoning map amendment for 233 Anderson Street from Low Impact Industrial (ILb) zone to Neighborhood Business (B1b) Zone for the area outlined in black below.



XI. ATTACHMENTS

PLANNING BOARD REPORT ATTACHMENTS

1. Traffic Engineer final review (Tom Errico)

PUBLIC COMMENT (none received to date)

APPLICANT'S SUBMITTALS

- A. Application
- B. Right, title and Interest (P&S Agreement)
- C. Narrative and analysis (updated since Workshop)
- D. Cover letter for Hearing
- E. Neighborhood Meeting Certification
- F. Traffic Study

PLANS

- P1 Boundary Survey
- P2 Renderings of potential mixed use development (4 sheets)

233 Anderson Street Map Amendment - Final Traffic Comments

1 message

Tom Errico <thomas.errico@tylin.com>

Wed, Nov 29, 2017 at 3:20 PM

To: Jean Fraser <jf@portlandmaine.gov>

Cc: Keith Gray <kgray@portlandmaine.gov>, Katherine Earley <kas@portlandmaine.gov>, Jeremiah Bartlett <JBartlett@portlandmaine.gov>, "Jeff Tarling (JST@portlandmaine.gov)" <JST@portlandmaine.gov>, Bruce Hyman <bhyman@portlandmaine.gov>

Jean – in response to the City's request, the applicant has conducted a trip generation analysis comparing traffic estimates under the current zone versus the proposed Map Amendment zone designation. Based upon the applicant's development assumptions, the build-out of the currently zoned property would generate 88 AM peak hour trips and 80 PM peak hour trips. Under the Map Amendment zone change, the property would generate 98 AM peak hour trips and 93 PM peak hour trips. In my professional opinion, this level of increased traffic volume (10 AM peak hour trips and 13 PM peak hour trips) would not be noticeable from a traffic mobility or safety impact perspective.

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

[Twitter](#) | [Facebook](#) | [LinkedIn](#) | [Google+](#)

"One Vision, One Company"



Zoning Map, Text Amendment, Contract or Conditional Rezoning Application Portland, Maine

Planning and Urban Development Department
Planning Division

Portland's Planning and Urban Development Department coordinates the review of requests for zoning map amendments, zoning text amendments and contract or conditional re-zoning. The Division also coordinates site plan, subdivision and other applications under the City's Land Use Code. Attached is the application form for a Zoning Map, Text Amendment or Contract/Conditional Rezonings.

Portland's development review process and requirements are outlined in the Land Use Code (Chapter 14), Design Manual and Technical Manual.

Planning Division

Fourth Floor, City Hall

389 Congress Street

(207) 874-8719

planning@portlandmaine.gov

Office Hours

Monday thru Friday

8:00 a.m. – 4:30 p.m.

I. Project Information (Please enter n/a on those fields that are not applicable)

Project Name:	233 Anderson Street
Proposed Development Address:	233 Anderson Street Portland ME 04101
Project Description:	16 unit mixed use building
Chart/Block/Lot:	01-A-013
Right, Title or Interest (<i>Please identify the status of the applicant's right, title, or interest in the subject property – for example a deed, option or contract to purchase or lease the subject property</i>)	Purchaser
Existing Use (<i>Describe the existing use of the subject property</i>)	raw land
Current Zoning Designation:	B1b and IIb
Proposed Use of the Property (<i>Please describe the proposed use of the subject property. If construction or development is proposed, please describe any changes to the physical condition of the property</i>)	16 unit mixed use building
Vicinity Map (<i>Attach a map showing the subject parcel and abutting parcels, labeled as to ownership and/or current use</i>)	
Site Plan (<i>On a separate sheet, please provide a site plan of the property showing existing and proposed improvements, including such features as buildings, parking, driveways, walkways, landscape and property boundaries. This may be a professionally drawn plan, or a carefully drawn plan – to scale – by the applicant. (Scale to suit, range from 1' = 10' to 1' = 50'.) Contract and conditional rezoning applications may require additional site plans and written material that address physical development and operation of the property to ensure that the rezoning and subsequent development are consistent with the comprehensive plan, meet applicable land use regulations, and compatible with the surrounding neighborhood</i>)	

II. Contact Information (Please enter n/a on those fields that are not applicable)

APPLICANT

Name:	Glenn Morse
Business Name:	2 Walnut LLC
Address:	218 Washington Rd
City/State:	Portland ME
Zip Code:	04101
Work #:	207.590.3877
Home #:	
Cell #:	207.590.3877
Fax #:	
E-mail:	gmorse444@gmail.com

OWNER

Name:	Pine State Elevator
Address:	230 Anderson Street
City/State:	Portland ME
Zip Code:	04101
Work #:	
Home #:	
Cell #:	
Fax #:	
E-mail:	travis@pinestateelevator.com

AGENT/REPRESENTATIVE

Name:	Areta Snow
Address:	218 Washington Ave
City/State:	Portland ME
Zip Code:	04101
Work #:	
Home #:	
Cell #:	603.235.1257
Fax #:	
E-mail:	gmorse444@gmail.com

BILLING (to whom invoices will be forwarded to)

Name:	2 Walnut LLC
Address:	218 Washington Ave
City/State:	Portland ME
Zip Code:	04101
Work #:	
Home #:	
Cell #:	603.235.1257
Fax #:	
E-mail:	gmorse444@gmail.com

ENGINEER

Name:	
Address:	
City/State:	
Zip Code:	
Work #:	
Home #:	
Cell #:	
Fax #:	
E-mail:	

SURVEYOR

Name:	Sebago Technics
Address:	75 John Roberts Rd Suite 1A
City/State:	South Portland ME
Zip Code:	04106
Work #:	207.200.2100
Home #:	
Cell #:	
Fax #:	
E-mail:	sfrank@sebagotechnics.com

ARCHITECT

Name:	Carol Morrisette
Address:	21 Chestnut #506
City/State:	Portland ME
Zip Code:	04101
Work #:	207.699.4184
Home #:	
Cell #:	207.6717965
Fax #:	
E-mail:	carol@resdesstudio.com

ATTORNEY

Name:	Tom Jewell
Address:	577 Congress St
City/State:	Portland ME
Zip Code:	04101
Work #:	207.774.6665
Home #:	
Cell #:	
Fax #:	
E-mail:	tjewell@jewellandbulger.com

DESIGNATED PERSON(S) FOR UPLOADING INTO e-PLAN

Name:	Areta Snow
E-mail:	gmorse444@gmail.com
Name:	
E-mail:	
Name:	
E-mail:	

III. APPLICATION FEES (check applicable review)

☒	Zoning Map Amendment from (ILb) zone to (B1b) zone	\$3,000.00
☐	Zoning Text Amendment to Section 14- () (For a zoning text amendment, attach on a separate sheet the exact language being proposed, including existing relevant text, in which language to be deleted is depicted as crossed out (example).	\$3,000.00
☐	Combination Zoning Text Amendment and Zoning Map Amendment	\$4,000.00
☐	Conditional or Contract Zone (A conditional or contract rezoning may be requested by an applicant in cases where limitations, conditions, or special assurance related to the physical development and operation of the property are needed to ensure that the rezoning and subsequent development are consistent with the comprehensive plan, meet applicable land use regulations, and compatible with the surrounding neighborhood. Please refer to Division 1.5, Section 14-60-62.)	\$5,000.00

IV. FEES ASSESSED AND INVOICED SEPARATELY

- Notices to abutters (receipt of application, workshop and public hearing meetings) (\$.75 each)
- Legal Ad in the Newspaper (% of total ad)
- Planning Review (\$52.00 hour)
- Legal Review (\$75.00 hour)
- Third Party Review (all outside reviews or analysis, eg. Traffic/Peer Engineer, are the responsibility of the applicant and will be assessed and billed separately)

VI. APPLICANT SIGNATURE

By digitally signing the attached document(s), you are signifying your understanding this is a legal document and your electronic signature is considered a **legal signature** per Maine state law.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Planning Authority and Code Enforcement's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

This application is for a Map Amendment, Text Amendment, Conditional or Contract Rezoning review. It is not a permit to begin construction. An approved site plan, a Performance Guarantee, Inspection Fee, Building Permit, and associated fees will be required prior to construction. Other Federal, State or local permits may be required prior to construction, which are the responsibility of the applicant to obtain.

Signature of Applicant:	Glenn Morse
Date:	8/2/17

PURCHASE AND SALE AGREEMENT
[218-220 Washington Ave, Portland, Maine]

This Agreement made between **GLENN A. MORSE**, a resident of Portland, Maine and **2 Walnut LLC**, a Maine limited liability company, of Portland, Maine (collectively "the Buyer"), and **Pine State Elevator Co.** of 230 Anderson Street, Portland, Maine ("the Seller").

Seller hereby agrees to sell and the Buyer hereby agrees to purchase the Property hereinafter specified in accordance with and subject to the following terms and conditions:

1. The Property. The property to be sold consists of:

A. **Real Property.** The parcels of property known as 233 Anderson Street, Portland, Maine collectively containing approximately 11,326 square feet of land, being the same Real Property described as Map and lot 10-A-40 recorded in the Cumberland County Accessors Office (collectively "the Property").

2. Price and Payment Terms. The Purchase Price for the Property is [REDACTED] all of which shall be payable in cash or certified check on or before June 1, 2018 May 15, 2018 as follows:

~~The purchase price to be financed by Seller through a note secured by a second mortgage on the Property (the "Second Mortgage Note"). The Second Mortgage Note and accompanying second mortgage shall provide for a 30 day written notice and cure period for defaults and shall be subordinate in collateral and payment priority to Buyer's acquisition/construction financing on such further terms and conditions as Buyer's lender may require and to the Condominium provisions of Section 13 below. The primary principal(s) of Buyer shall personally guaranty the Second Mortgage Note.~~

3.2. Closing. The Closing shall occur on the mutually agreed upon closing date, time and place to be determined after Buyer has obtained all applicable land use, zoning and construction permits, approvals for a residential condominium project containing a minimum of 16 dwelling units and has fully completed and constructed said condominium project in its entirety, and the expiration of any applicable appeal periods, but not earlier than May 15, 2018 and not later than June 1, 2018 May 15, 2018 one (1) year from the date of this Agreement unless otherwise agreed. Buyer agrees to pursue such approvals with due diligence. Provided however that if Buyer is continuing to pursue such approvals in good faith and with due diligence and if such approvals have not been obtained and become final prior to Closing within said one year period notwithstanding Buyer's efforts, then the time for closing shall be extended for an additional six (6) months as may be required to obtain them with due diligence and continuity of effort. In the event that the contract is extended beyond one year, the Price

Formatted: Strikethrough

Formatted: List Paragraph, Indent: First line: 0.5", Right: 0.24", Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0.03" + Indent at: 0.24", Tab stops: 0.94", Left

Formatted: Normal, Right: 0.24", Tab stops: 0.94", Left

Formatted: Strikethrough

set forth in Section 2 herein shall increase to [REDACTED]

[REDACTED] and Buyer agrees to deliver a deposit in the amount of [REDACTED] deposit, to be applied to purchase price prior to closing, of which will become nonrefundable and will be paid over to Seller or financed monthly in three equal installments payable on the first of each month. It is agreed that time is of the essence of this Agreement.

The place of closing shall be at a mutually agreeable location. Buyer shall have the right to extend the Closing for an additional 5 business days by written notice to Seller at least 5 business days prior to the Closing.

4.3. Conveyance. The Real Property is to be conveyed to the Buyer (or to the nominee designated by the Buyer upon written notice to the Seller given at least 10 days before the Closing Time) at the Closing Time by a good and sufficient Quit Claim with Covenant deed of the Seller conveying a good and clear record and marketable title to the same, free from all liens and encumbrances except as expressly identified above and if requested by Buyer utilizing a legal description provided at Buyer's expense, however that Buyer/Purchaser may elect to accept such title as Seller can deliver at Buyer/Purchaser's option.

At the Closing, and in addition to any other documents referred to in this Agreement to be delivered to Buyer, Seller shall execute, acknowledge as necessary and deliver the following documents and such other documents as Buyer's attorneys may reasonably require to complete the transaction contemplated herein:

- (i) **Transfer Documents.** The deed and a Maine Real Estate Transfer Tax Declaration of Value;
- (ii) **Title Affidavits.** Such customary certificates, affidavits or indemnity agreements may be typically required to obtain a title insurance policy;
- (iii) **Non-foreign Person Affidavit.** If applicable, such affidavits and certificates as Buyer shall deem necessary to relieve Buyer of any obligation to deduct and withhold any portion of the purchase price pursuant to §1445 of the Internal Revenue Code;
- (iv) **Maine Resident Affidavit.** If applicable, such affidavits and certificates as Buyer shall deem necessary to relieve Buyer of any obligation to deduct and withhold any portion of the purchase price pursuant to 36 M.R.S.A. §5250-A;
- (v) **Underground Oil Storage Tank Certification.** A written notice certifying either (i) that there is no underground oil storage facility located on the Real Property to the best of Seller's knowledge, or (ii) pursuant to 38 M.R.S.A. §563(6), if there is such a facility on the Real Property, that the facility exists and shall disclose its registration number or numbers, the exact location of the facility,

TM

whether or not it has been abandoned in place, and that the facility is subject to regulation by the Maine Board of Environmental Protection; and

(vi) Authority/Other Documents. Such other documents as are customarily delivered by Sellers to Buyers of real property in the State of Maine, including without limitation evidence of good standing and limited liability company authority, together with a legal opinion of Seller's counsel satisfactory to Buyer regarding the limited liability company's existence, good standing and authority to perform all transactions contemplated by this Agreement.

5.4. Title. Within one hundred twenty (120) days of the Effective Date of this Agreement, Buyer shall notify Seller of any then existing defects in title with respect to the Real Property would reveal that would make Seller unable to deliver title to or convey the Real Property as specified herein and of any matter that an inspection and survey would reveal (the "Defects") that would make Seller unable to convey the Real Property as specified herein. Any then existing Defects outstanding at the expiration of such time period which are not specified in such notice shall be waived, excepting for title defects and such matters subsequently arising after such date. Seller shall be obligated to proceed in good faith to cure any objected to such Defects, provided that Seller shall not be obligated to relocate any structures or utilities. If an objected Defect specified in such notice is not cured within sixty (60) days, then Buyer may elect, by written notice to Seller, to either (i) to accept a conveyance of Real Property subject to such Defects, without deduction and, in such case, Seller may elect to convey the Real Property without warranties as to such Defects, or (ii) to terminate this Agreement, the obligations of all parties hereunder shall cease, and neither party shall have any claim against the other by reason of this Agreement. Notwithstanding the foregoing Seller shall be obligated to obtain a discharge of any outstanding mortgage and to pay any outstanding real estate taxes until the Closing, but Buyer shall not convey, encumber, grant any easements or otherwise impair title pending closing.

If at Closing Seller shall be unable to give title or to make conveyance, or to deliver possession of the Real Property, all as herein stipulated, except as to Defects not objected to or waived as set forth in the initial paragraph of this Section, then Seller shall use commercially reasonable efforts to remove any such Defects in good faith with due diligence, or to deliver possession as provided herein, or to make the Real Property conform to the terms and conditions hereof, as the case may be; for a period of up to 60 days, or such longer period as shall be agreed to by Seller and Buyer. If at the expiration of such extended time Seller shall have failed to remove any defects in title, deliver possession, or make the Real Property conform, as the case may be, all as herein agreed, except as to defects and matters not objected to or waived as set forth in the initial paragraph of this Section, then, at Buyer's option, the cost to cure such defects will be deducted from sales price prior to closing, or Buyer may elect to have deposit returned and all other obligations of the parties hereto shall cease and this Agreement shall be void without recourse of the parties hereto.

To enable Seller to make conveyance as herein provided, Seller may use the purchase money or any portion thereof, other than any required tax withholding, at

JM

Closing to clear the title of any or all encumbrances or interests, provided that all instruments so procured are recorded simultaneously with the deed or binding payoff letters are obtained and the amounts specified are paid at closing.

6.5. Conditions. Buyer's obligations hereunder are conditioned upon compliance with the following:

- (i) Any inspection of the Property reasonably satisfactory to Buyer within 30 days.
- (ii) Written commitment by Lender to extend mortgage financing to Buyer with conditions reasonably satisfactory to Buyer in the amount needed to finance Buyer's acquisition and construction of a residential condominium on the Real Property containing not less than 16 units. Buyer agrees to pursue such financing in good faith with due diligence.
- (iii) Receipt of final land use, zoning and construction approvals for a residential condominium project containing a minimum of 16 condominium dwelling units in a six story building with parking underneath (the "Approvals").

Buyer shall have the right, at its option, to terminate this Agreement, by written notice to Seller ~~no later than 30 days on or~~ on or before Closing, if any of the foregoing conditions are not reasonably satisfied.

Formatted: Strikethrough

Formatted: Strikethrough

11. Seller's Warranties and Representations. Except as otherwise set forth in this Agreement, Seller makes no representations or warranties either expressed or implied as the condition of the premises, including, without limitation, compliance with any laws, rules or regulations pertaining to building codes, zoning, environmental or hazardous waste. Buyer takes the premises **AS IS, WHERE IS, WITH ALL FAULTS** and without recourse. Seller has made no verbal representations concerning the condition of the premises and if any such statements have been made either before or after the date of this contract they are not intended to be relied upon by Buyer. No agent of Seller is authorized to make any representations concerning the condition of the premises. Buyer, or his agents, have made, or will make, a physical examination of the premises and personal property and agree to accept same in the conditions they are in as of that time.

Provided however that notwithstanding the foregoing, Seller warrants and represents as of the date of execution by Seller of this Agreement and as of each date through and including the Closing that:

- (a) There are no material litigation, liens, judgments, violations, or proceedings pending or to the best of Seller's knowledge threatened against or relating to the Real Property;
- (b) There is no pending, or to the best of Seller's knowledge, threatened material action or proceeding (including, but not limited to, any condemnation or eminent

TM

domain action or proceeding) before any court, governmental agency or arbitrator relating to or arising out of the ownership of the Real Property or any portion thereof, or which may adversely affect Seller's ability to perform this Agreement;

(c) No work has been performed or is in progress at, and no materials have been furnished to, the Real Property or any portion thereof which may give rise to mechanic's, materialmen's or other liens against the Real Property or any portion thereof which have not been paid or will not be paid by Seller when due post Closing, excluding work initiated or authorized by Buyer or required to be performed by Buyer under this Agreement; and

(d) Pine State Elevator Co. is a Maine company duly organized and existing under the laws of the State of Maine, with full capacity, power and authority to enter into this Agreement and to fully perform the transactions contemplated hereby; and

(e) During its ownership of the Real Property, Seller has not deposited any hazardous or toxic wastes, substances, matters or materials, including but not limited to any material defined as hazardous or toxic from time to time by applicable state, local and federal law, either on the Real Property or any adjacent property in violation of law nor is Seller aware of any claims by any governmental agencies that it has done so.

In the event that material changes occur as to any warranties and representations set forth in this Agreement of which Seller has knowledge, Seller will promptly disclose same to Buyer within three (3) business days.

~~12. **Condominium Project.** Buyer agrees to construct and legally establish a residential condominium project on the Real Estate in accordance with the Approvals, the Maine Condominium Act and applicable secondary mortgage market documentation requirements (the "Condominium") as established by Buyer.~~

14.12. Closing Warranties. All obligations of the Buyer under this Agreement are (without limitation) conditioned upon Seller's warranties and representations hereunder being materially true, accurate and complete at Closing, with the same force and effect as though such representations and warranties had been made on and as of the Closing. Each such warranty and representation shall survive the closing for the benefit of Buyer.

15.13. Brokers. Seller and Buyer each represent and warrant to the other that no brokers, agents or consultants have been employed with respect to this transaction by either of them and Seller and Buyer agree to indemnify and hold the other harmless from any claim by any broker or agent claiming compensation in respect of this transaction, alleging an agreement with Seller or Buyer, as the case may be.

~~16.14. **General.**~~

(a) This Agreement shall be binding upon and inure to the benefit of the heirs, personal representatives, successors and assigns of the parties.

(b) Any notice relating in any way to this Agreement (except the extension notice referred to in Section 6(b) shall be in writing and shall be sent by (i) registered or certified mail, return receipt requested, (ii) overnight delivery by a nationally recognized courier, or (iii) hand delivery obtaining a receipt therefor, addressed as follows:

To Buyer: 2 Walnut LLC
218 Washington Avenue
Apartment #3
Portland, ME 04101

with a copy to: Buyers Attorney

To Seller: Pine Street Elevator
230 Anderson Street
Portland, ME

with a copy to: Sellers Attorney

and such notice shall be deemed delivered three days after when so posted by certified mail, the next business day in the case of notice by overnight courier and the business day when delivered in the case of notice by hand delivery. Either party may, by such manner of notice, substitute persons or addresses for notice other than those listed above.

(c) All headings in this Agreement are for convenience of reference only and are of no independent legal significance.

(d) This Agreement may not be modified, waived or amended except in a writing signed by the parties hereto. No waiver of any breach or term hereof shall be effective unless made in writing signed by the party having the right to enforce such a breach, and no such waiver shall be construed as a waiver of any subsequent breach. No course of dealing or delay or omission on the part of any party in exercising any right or remedy shall operate as a waiver thereof or otherwise be prejudicial thereto.

(e) Any and all prior and contemporaneous discussions, undertakings, agreements (including without limitation any prior Agreements previously executed by the parties hereto) and understandings of the parties are superseded by and merged in this Agreement, which alone fully and completely expresses their entire agreement.

(f) This Agreement may be simultaneously executed in any number of counterparts, each of which when so executed and delivered shall be an original, but such counterparts shall constitute one and the same instrument. This Agreement may be transmitted between the parties by facsimile machine and signatures appearing on faxed or emailed instruments shall be treated as original signatures. Both a faxed or emailed Agreement containing either original or faxed or emailed signatures of all parties, and multiple counterparts of the same Agreement each containing separate original or faxed or emailed signatures of the parties, shall be binding on them.

(g) If any term or provision of this Agreement or the application thereof to any person or circumstances shall, at any time or to any extent, be invalid or unenforceable, the remainder of this Agreement, or the application of such term or provision to persons or circumstances other than those as to which this Agreement is held invalid or unenforceable, shall not be affected thereby, and each term and provision of this Agreement shall be valid and be enforced to the fullest extent permitted by law.

(h) It is expressly understood and agreed that time is of the essence in respect of this Agreement.

(i) This Agreement shall be governed by and construed and enforced in accordance with the laws in effect in the State of Maine.

~~(j) At the request of Buyer, Seller agrees to execute a short form memorandum of purchase and sale in a form in accordance with Maine practice or to execute a junior mortgage to Buyer securing Seller's performance of this Agreement suitable for recording in the Cumberland County Registry of Deeds and in addition, at or prior thereto to transfer title to the personally owned Real Estate into 2 Walnut Street, LLC, which real estate shall remain the only activity conducted by 2 Walnut Street LLC.~~

~~(j) Buyer agrees to promptly forward to seller, for seller's information, any documentation, permits, geotechnical reports or architectural plans (anything pertinent to the property), when received.~~

Formatted: Font: 12 pt, No underline

Formatted: Indent: Left: 0.74", Right: 0", No bullets or numbering, No widow/orphan control, Tab stops: Not at 1.24" + 1.24"

The effective date of this Agreement is when the Agreement has been signed by the Buyer and Seller as evidenced by their signature and notice of such acceptance has been communicated to the parties.

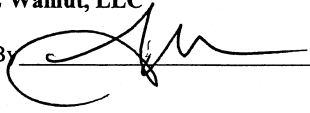
Effective Date: May _____, 2017.

Buyer:

date of Seller's acceptance: May ___, 2017

TM

GLENN A. MORSE (Member)
2 Walnut, LLC

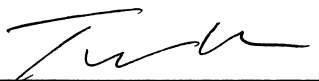
By  president 5/25/17

its: _____

Seller:
PINE STATE ELEVATOR, CO.

date of Buyer's acceptance: May __, 2017

By its: _____

 *U.P. 5/25/17*

Seller's Principals (as to personal guaranty)

WAIVER OF LIEN
(UNCONDITIONAL)

TO WHOM IT MAY CONCERN:

PROJECT NAME: **443 Congress Housing Renovation**

PROJECT ADDRESS ("Premises"): **443 Congress Street, Portland, ME 04101**

OWNER: **JJR 443 Congress, LLC**

CONSTRUCTION MANAGER: **Northland Management Corp**

SUBCONTRACTOR/SUPPLIER: **Morse Builders Inc.**

LENDER: **Saco and Biddeford Savings Institution**

The undersigned, in consideration of the sum of **\$33,820.00**, receipt of which is hereby acknowledged, does hereby WAIVE and RELEASE any and all lien, right of lien or claim of whatsoever kind or character under all pertinent statutes or common law of the State of Maine on said described building(s) and Premises, on account of all labor, services and/or material or both, furnished for or incorporated into said building(s) and premises by the undersigned up to and including **August 31, 2017**, except for retainage (if any) due and not included in the above amount.

Further, the undersigned hereby COVENANTS and REPRESENTS that all of the subcontractors, suppliers, and laborers engaged by the undersigned have been or will be paid in full, for all work done and/or all materials furnished to said Premises through the date shown herein. The undersigned hereby AGREES to INDEMNIFY, DEFEND and HOLD HARMLESS the owner and lender from any and all claims by any party whatsoever based on work done and/or material furnished in connection with the construction by the undersigned and/or its subcontractors or suppliers through the date shown herein.

DATED: 9/22, 2017

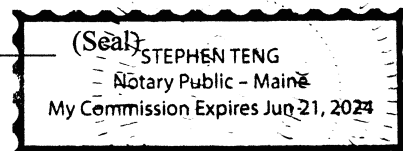
Sworn and subscribed before me this 22nd day

Name of Company: **More Builders Inc.**

of September, 2017

By: [Signature]
Signature
Its: President
Title

[Signature]
Notary Public



CERTIFICATE OF FINAL PAYMENT (upon final payment):

The undersigned certifies that all work to be performed by the undersigned on the Premises has been completed, and that there is no more work or materials to be supplied to the Premises under terms of agreement for work. The payment received herewith constitutes payment in full for all work done and materials supplied to the Premises, and this lien waiver covers all work and materials contracted for by the undersigned.

Name of Company: _____

By: _____

Signature

Its: _____

Title

Is the business incorporated? ☐ Yes ☐ No

Tax ID# or SS#: _____

FINAL WAIVER OF LIEN
(UNCONDITIONAL)

TO WHOM IT MAY CONCERN:

PROJECT NAME: Robert W. Baird & Co., Inc. "Fit-Up"

PROJECT ADDRESS: 129 Middle Street #200, Portland, ME 04101

OWNER: Robert W. Baird & Co., Inc.

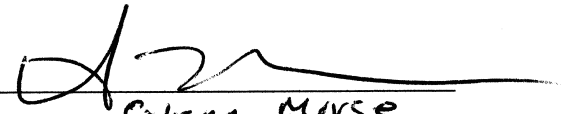
GENERAL CONTRACTOR: Portland Builders, Inc.

The undersigned, in consideration of the sum of **Six Thousand Four Hundred Dollars and 00/100 (\$6,400.00)**, receipt of which is hereby acknowledged, does hereby **WAIVE and RELEASE** any and all lien, right of lien or claim of whatsoever kind or character on said described building(s) and premises, on account of all labor, services and/or material or both, furnished for or incorporated into said building(s) and premises by the undersigned up to and including **August 31, 2017**.

Further, the undersigned hereby **COVENANTS and REPRESENTS** that all of the subcontractors, suppliers, mechanics, and laborers engaged by the undersigned have been paid in full, or shall be paid from the proceeds of this payment for all work done and/or all materials furnished to said property through the date shown herein. The undersigned hereby **AGREES** to **INDEMNIFY and HOLD HARMLESS** the owner and all from any and all claims by any party whatsoever based on work done and/or material furnished in connection with the construction by the undersigned and his subcontractors or suppliers through the date shown herein.

DATED Sept. 21, 2017

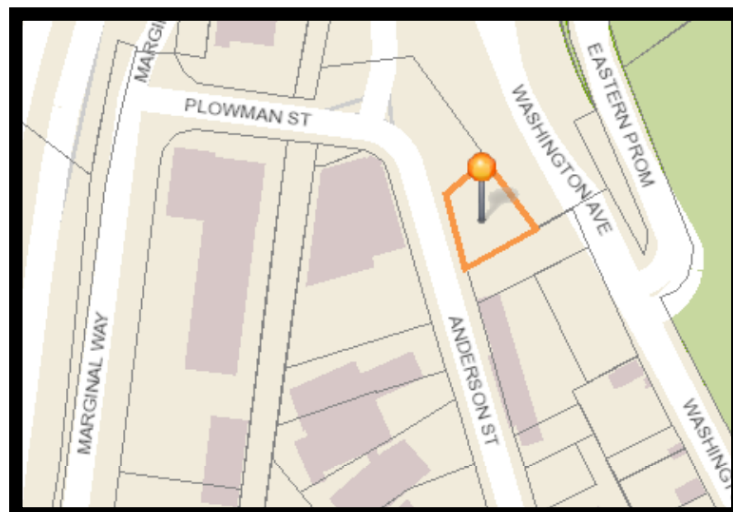
WITNESS Aleta Snow

SIGNED: 
Glenn Morse
Morse Builders Inc
Morse Builders, Inc.

SCATTERGOOD DESIGN

The vacant parcel at 233 Anderson is currently located in *both* the IL-b and B1-b zones. We are requesting a **Zone Map Amendment** in order to bring our entire site into the B1-b Zone. In keeping with the Planning Board's thoughtful approach of evaluating surrounding parcels when considering any zone change, we have graphically included the adjacent, City-owned parcel located to the northwest of 233 Andersen Street in our proposal. By including the adjacent parcel, a cleaner, more regular IL-b and B1-b delineation is achieved.

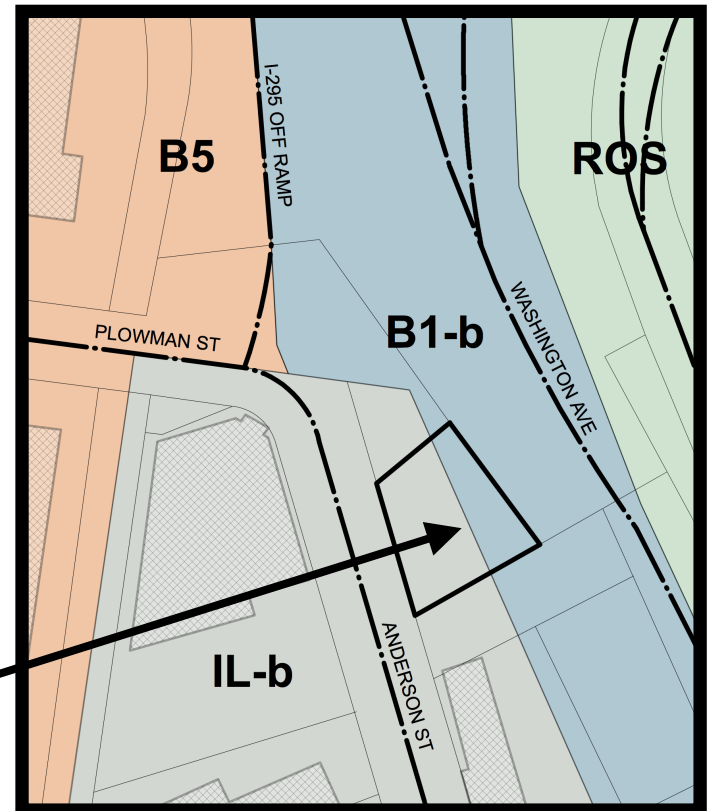
233 Anderson Street is noted in the graphic below with an orange pin. The orange outline represents the 233 Anderson Street parcel, CBL #10-A-40. The lot is located near the corner of Anderson and Plowman Streets, just south of the foot of the Southbound I-295 off-ramp at Exit 8, and "below" Washington Avenue.



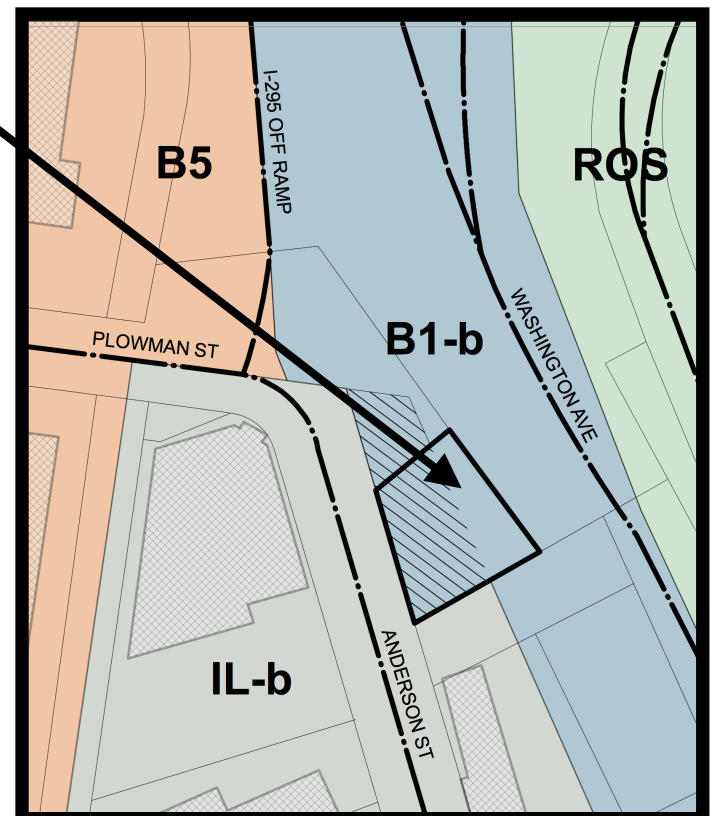
This area of East Bayside is at the confluence of the IL-b, B1-b, and B5 zones, adjacent to the ROS. While the entire area of Bayside is slated for a thorough zoning review, the proposed delineation of zone boundaries appear to be consistent with the intent of the Comprehensive Plan and the future growth of the East Bayside neighborhood.

The line of demarcation between the two zones on the parcel (IL-b and B1-b) runs parallel to Washington Avenue, with the IL-b zone extending along Anderson Avenue for only an additional 81' +/- (over City-owned property) before transitioning to the adjacent B5 zone. The B5 zone is within 125' of the parcel, which allows mixed commercial use, including multi-family residential. The B1-b zone allows mixed commercial use, including multi-family residential. A chart of allowed uses is included on the following pages.

EXISTING ZONE MAP Split IL-b & B1-b Zones

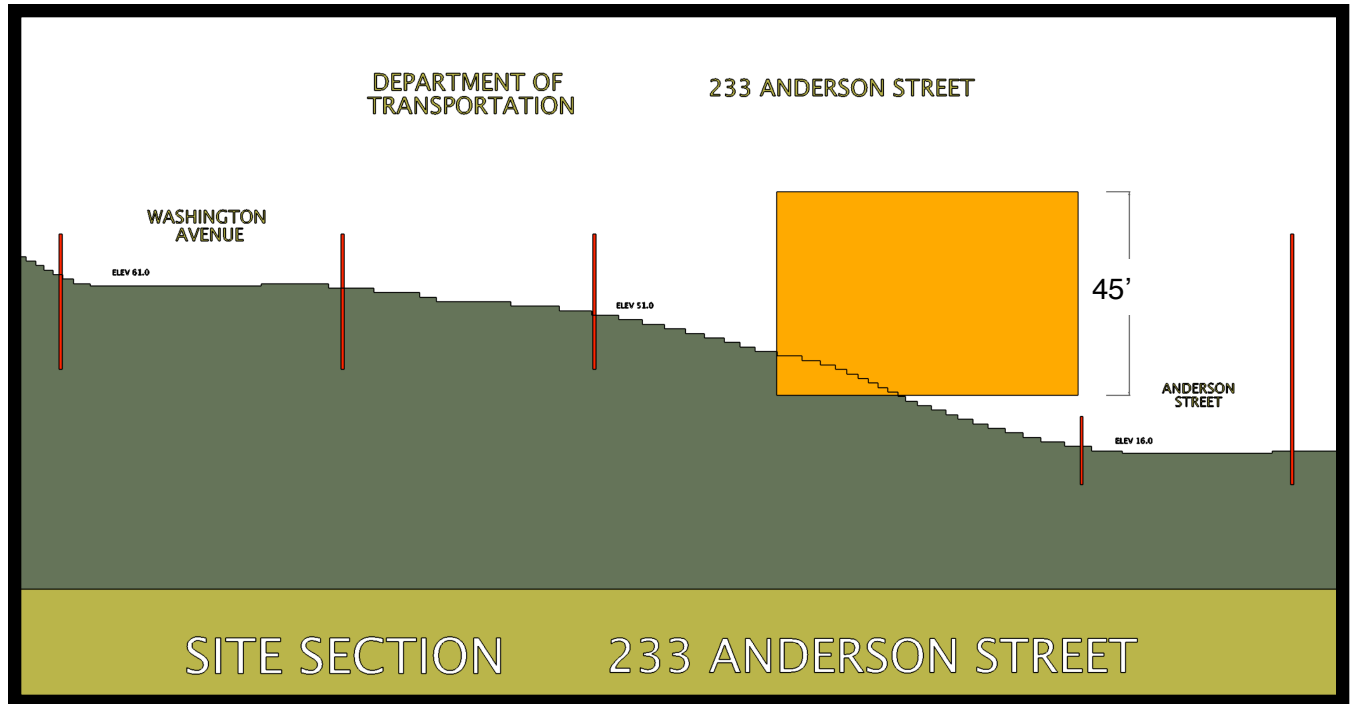


PROPOSED ZONE MAP Change to Single B1-b Zone



The hatched light blue area is the proposed zone map change for the parcel at 233 Anderson Street and the adjacent City-owned parcel. Of course, we are only proposing the map amendment for the parcel of which we have “right, title, or interest”, but felt it prudent to illustrate the potential area that the Planning Board is likely to consider, particularly because it is City-owned land.

233 Anderson Street has a relatively imposing slope over the entire length of the parcel that significantly limits the ability of the site to be developed as currently zoned, particularly with a grade difference in excess of 35' in the downhill, IL-b zone. The elevation at the property line along Anderson Street is approximately 16' and steadily climbs up to 58' at the rear property line. For reference, a 45' building height is shown for scale in the graphic of a typical section through the site, below.



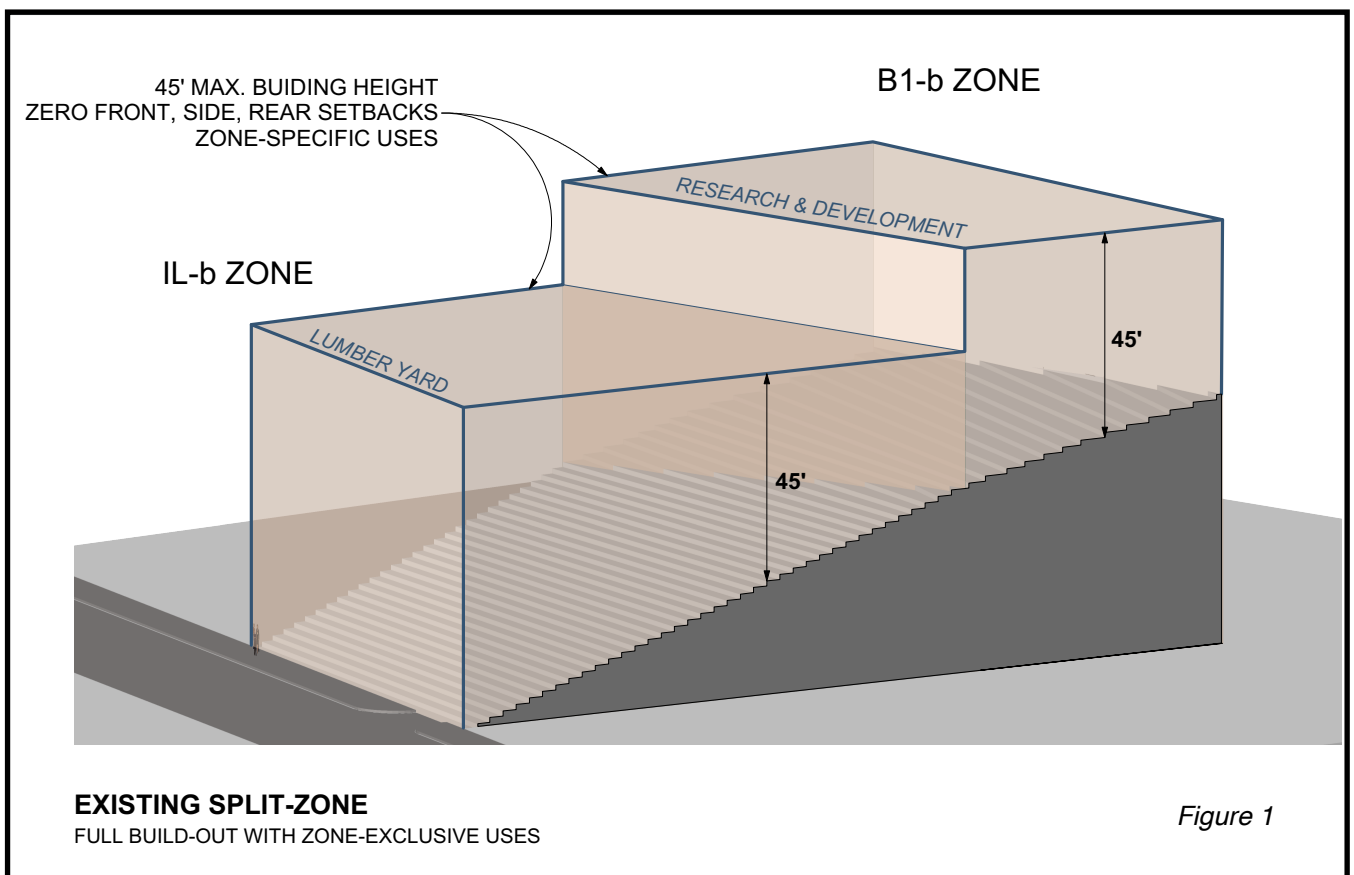
Not only is the slope of the site challenging to develop, but the small size of the parcel contributes to its complexity. Generally, the dimensional standards of the IL-b and B1-b zones vary little between the two zones, with the important exception being the pavement setback from the lot boundaries. As shown in the chart, the pavement setback required in the IL-b zone would push the required light industrial site circulation deeper into the site, and deeper into the hill if developed under the existing zoning. The portion of the site currently zoned IL-b averages roughly 60' deep; a 15' pavement setback from the lot boundary restricts vehicular circulation dramatically, while limiting the one- or possibly two-story building footprint even further. These dimensional restrictions severely restrict the development intent of the IL-b zone on this site.

Applicable Dimensional Standards	B1-b	IL-b
Maximum Impervious Surface Ratio	90%	100%
Maximum Building Height	45'	45'
Minimum Side Yard	None	None
Rear Yard	None	None
Front Yard	None	None
Maximum Front Yard	10'	n/a
Pavement Setback	n/a	15'
Minimum Lot Area per Dwelling Unit	435 sf	n/a

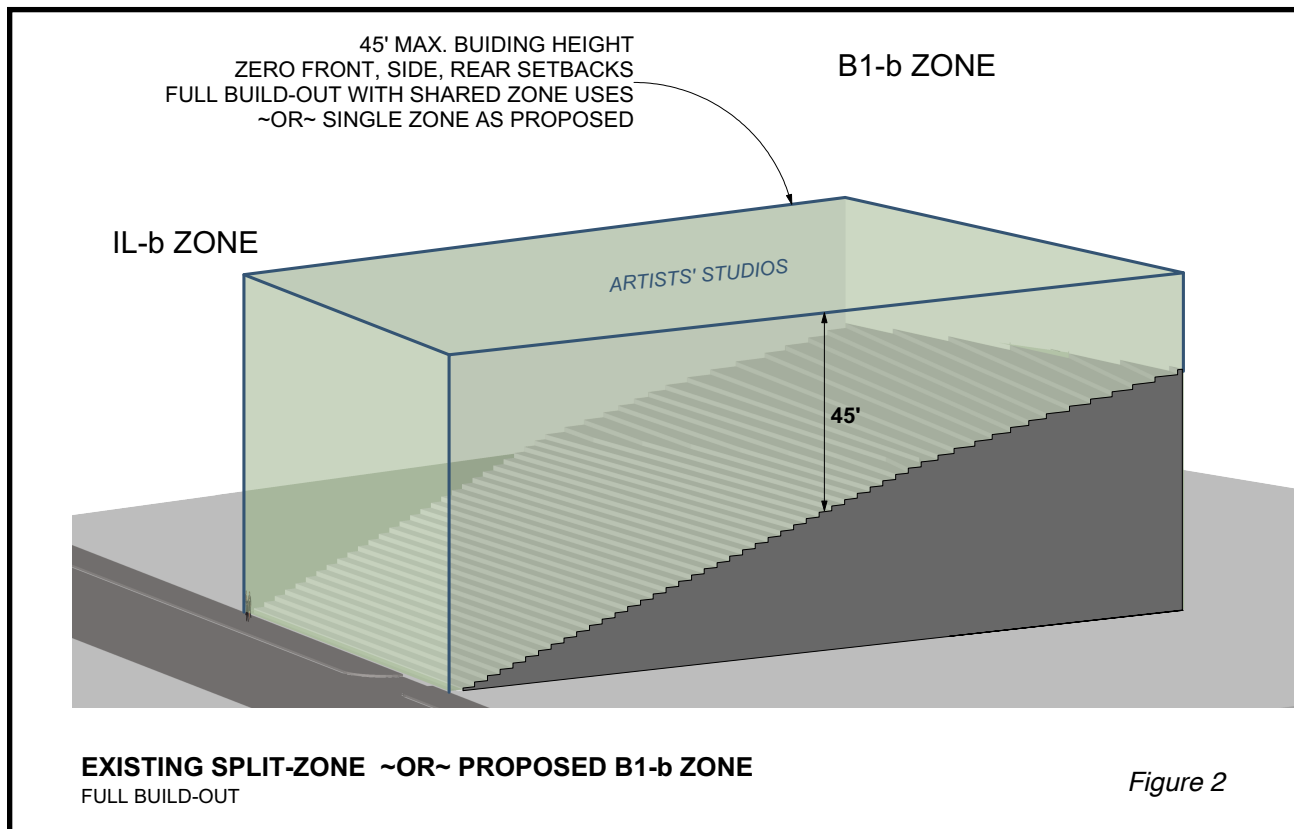
The specific purpose of the IL-b Zone, as stated in the Ordinance is “to provide areas in which low impact industrial uses and limited other uses serving employees and residents of the surrounding neighborhood will be compatible with adjacent residential uses, will provide a buffer between residential neighborhoods and the I-M or I-H industrial zones, or will stand alone as a smaller scale industrial district”. Although we concur that the purpose of IL-b zone is laudable, its application on this specific site is incongruous with its intent, particularly as it relates to the dimensional requirements as stated in Section 14-234.

While the feasibility to develop the site would be greater as a single B1-b zone due to its wider variety of allowable uses, the potential building massing would be similar. The existing zoning allows for similar buildable envelopes, irrespective of use (with the pavement setback requirement, excluded).

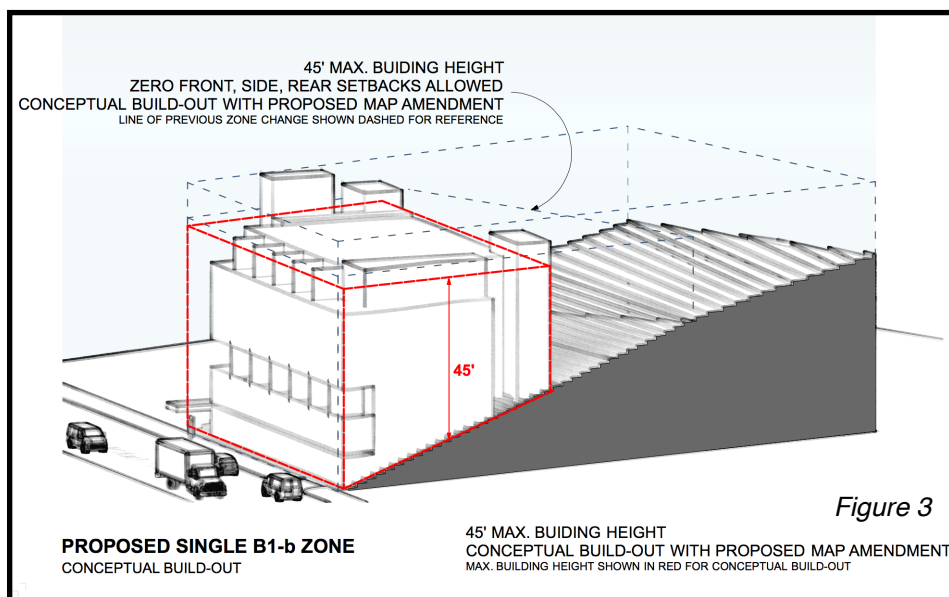
Illustrated in Figure 1, the buildable envelope of each zone is shown with its own 45' high buildable envelope, as if each zone were to be developed with zone-specific uses, dictating the location of the building and uses within the site. For example, a Lumber Yard could only be developed on the downhill side, within the IL-b zone; a Research & Development facility could only be developed uphill, within the B1-b zone.



Should a map amendment be granted, the entire site could be developed for a use allowed in the B1-b zone. Volumetrically, the building enveloped is identical to the development of the entire site for a use allowed in both zones. See figure 2.



Although the map amendment would allow full development of the site as shown in Figure 2, it is highly unlikely to happen, simply due to the constraints of the slope and dimensions of the parcel. With the granting of this map amendment, we hope to return to the Board early this winter with a project similar to the mixed-use massing model shown below, in Figure 3.



The proposed map amendment from IL-b to B1-b for the lower portion of the site along Anderson Street has little impact on the likely allowable uses of the site, with the obvious exception of residential use—which is already allowed on the rear portion of the site. The chart to the right compares allowable uses between the IL-b and the B1-b, with restrictions or conditions noted with an asterisk and specifically prohibited uses in the IL-b Zone noted in red.

Permitted Uses	B1-b	IL-b
Multifamily housing	☒	☐
Live/work spaces	☒	☐
General business & professional offices*	☒	☐
Personal Services (per 14-47)	☒	☐
Offices of building tradesmen	☒	☒
General retail establishments*	☒	☐
Beverage dealers*	☒	☐
Artists' Studios	☒	☒
Restaurants on ground floor*	☒	☐
Accessory uses	☐	☒
Bakeries, breweries, distilleries, commercial kitchens w/ minor retail	☐	☒
Research and development	☐	☒
Uses prohibited in IL-b are noted in Red.		
* with restrictions or conditions		

MOST PROBABLE USES Due to Site Constraints, Slope, & Location

Given the size and slope of the site at 233 Anderson Street, many of the permitted uses in the IL-b Zone would not be feasible. Above is the same chart of uses, simplified to illustrate the *most likely uses* for the parcel, with the proposed map amendment.

Permitted Uses	B1-b	IL-b
1- and 2-family homes	☒	☐
Multifamily housing	☒	☐
Live/work spaces	☒	☐
General business & professional offices*	☒	☐
Personal Services (per 14-47)	☒	☐
Offices of building tradesmen	☒	☒
General retail establishments*	☒	☐
Beverage dealers*	☒	☐
Artists' Studios	☒	☒
Restaurants on ground floor*	☒	☐
Lodging Houses	☒	☐
Utility Substations	☒	☒
Day Care facilities	☒	☒
Accessory uses (per 14-404)	☒	☐
Accessory uses	☐	☒
Municipal Offices	☒	☐
Bed & Breakfasts*	☒	☐
Hostels	☒	☐
Places of religious assembly <10,000 sf	☒	☒
Institutional: Schools (pre-k - 12)	☒	☐
Neighborhood Center	☒	☐
Clinic < 3,000 sf	☒	☐
Wind energy systems	☒	☒
Bakeries, breweries, distilleries, commercial kitchens w/ minor retail	☐	☒
Research and development	☐	☒
Indoor amusement and recreation centers	☐	☒
Plant & Tree Nurseries, including recycling	☐	☒
Lumber Yards	☐	☒
Repair Services, excluding motor vehicle repair	☐	☒
Dairies	☐	☒
Dog Training	☐	☒
Intermodal transportation facilities	☐	☒
Marinas	☐	☒
Distribution centers, warehouses, & wholesale businesses <10,000 sf	☐	☒
Back Office uses	☐	☒
Registered medical marijuana cultivation facility	☐	☒
Neighborhood Center	☐	☒
Street vendors (food trucks)*	☐	☒
Concert Hall	☐	☐
Banquet Facility	☐	☐
Office Uses (other than back offices or accessory to permitted use)	☐	☐
Intense Industrial Use	☐	☐
Uses prohibited in IL-b are noted in Red.		
* with restrictions or conditions		

In closing, the proposed map amendment from a split B1-b/IL-b to a single, B1-b site allows the property to be appropriately developed in concert with the stated objectives of the newly adopted Comprehensive Plan. Our goal is to provide a commercial use in the base of the building with 12 to 18 residential units, above. The exact use and size of commercial space is yet to be determined, as is the precise number of live/work units and apartments in the above residential use. The overarching goal is to provide generously sized two-bedroom units, live/work units, and on-site parking, all within the confines of the B1-b Zone dimensional standards and a powerful design worthy of this newly enlivened neighborhood. We firmly believe that the proposed map amendment is in keeping with Portland's Comprehensive Plan and takes great steps in moving us toward the livable City we envision for 2030.

The following are some highlights relating to Portland's Plan:

Equitable

This proposal is reasonable and **equitable** because the map change does not try to maximize the build ability of the site by requesting the nearby B-5 Zone—it simply brings a physically challenging site completely under one zone and maintains and supports the fabric of the existing East Bayside Neighborhood.

Sustainable

The proposed building, when reviewed during Site Plan Review, will demonstrate our commitment to planning for sea level rise and smart growth. Zone changes of this type are **sustainable** and logical, enabling our City to grow wisely, properly developing vacant land that has environmental challenges.

Dynamic

While the site is not in an Historic District, it does have a significant visual presence at the base of Munjoy Hill. We hope to present an interesting architectural design during Site Plan Review that becomes a **dynamic** part of the lively neighborhood, with nearby access to the Portland Trails System.

Secure

Views of Back Cove will be shared by the proposed residential units, as well as the commercial space(s) at the base of the building. Along with long water and mountain views will come views of the developing Bayside Area. The vibrancy of the area will be visible from the security of well-appointed apartments, at over 1,000 square feet per unit, providing much-needed larger-format housing on the peninsula.

The livability and walkability of the area cannot be overstated. An engaged community of active residents and commercial users provides a **secure** neighborhood unparalleled in its activity and safety.

Authentic

Authentic materials will be used in the building, with particular consideration given to the expression of the materials throughout the facades.

With nearly direct access to I-295, steps from Metro and Breez, and the upcoming bike shares, this site is inextricably **connected** to the City of Portland and specifically, to the East Bayside Neighborhood.

Connected

Community Engagement - On August 22, 2017, we met with the East Bayside Neighborhood Association to ask what the neighborhood would like to see developed, and held our neighborhood meeting on November 14, 2017, at Bayside East. Again, we look forward to discussing this you, further.

SCATTERGOOD DESIGN

November 21, 2017

Barbara Barhydt & Jean Frasier
Development Review Manager
Planning and Urban Development Department
389 Congress Street, 4th Floor
Portland, Maine 04101

Dear Barbara and Jean,

On behalf of 2 Walnut LLC, we are pleased to submit the attached package as an application for a zoning map amendment for 233 Anderson Street in East Bayside.

The Planning Board Workshop held on October 6, 2017 proved to be very informative for us. Per Tom Erico's request to engage a traffic engineer, we have brought Bill Bray of Traffic Solutions onto our team to develop a trip generation comparison of the most intensive uses on the site given the existing and the proposed zoning. Bill's study has been uploaded to e-Plan, but in summary, the proposed zone map amendment results in a net increase of only 10 AM Peak Hour Trips and 13 PM Peak hour trips. As requested, this comparison was generated for the most intense uses for a full build-out of the site, not our specific proposed mixed use of residential, live/work, and commercial space on a portion of the site.

A neighborhood meeting was properly advertised and held on November 14, 2017 in Bayside East of 47 Smith Street. Unfortunately, no one from the neighborhood was in attendance. Given our previous meeting with the neighborhood on August 22, 2017 and the expressed public support during the Planning Board Workshop discussing this map amendment, we are hopeful to maintain the full support of the neighborhood.

In an effort to streamline the review efforts of the Planning Board and City Staff, there are no substantive changes to our previously submitted documents but we have added conceptual sketches and diagrams to illustrate the potential build-out of the site, both with and without the requested map amendment.

We look forward to meeting with you again, for the public hearing.

Sincerely,



T. Scott Teas, AIA



2 Walnut LLC.

218 Washington Avenue
Portland ME 04101

November 13, 2017

233 Anderson Street:
Neighborhood Meeting Certification

I, 2 Walnut LLC hereby certify that a neighborhood meeting was held on November 13th, 2017 at the Bayside East Building at 7:00pm.

I also certify that on October 31, 2017 invitations were mailed to the following:

1. All addresses on the mailing list provided by the Planning Division which includes property owners within 1000ft of the proposed development.
2. Residents on the "interested Parties List"
3. A digital notice was provided to the Planning Division and the assigned planner to be forwarded to those on the interested client list who receive e-mail notices.

Signed,

_____Glenn Morse_____ Date__11/15/17_____

October 31, 2017

Dear Neighbor,

Please join us for a neighborhood meeting to discuss our plans for a map amendment located at 233 Anderson Street.

We will be holding a neighborhood meeting at the Bayside East building on Monday November 13th at 7:00pm in the downstairs meeting room. The address is 47 Smith Street, Portland.

The city code requires that property owners within 1000 feet of the proposed map amendment and residents on the “interested parties” list, be invited to participate in a neighborhood meeting. A sign-in sheet will be circulated and the minutes will be taken. Both the sign-in sheet and the minutes will be submitted to the Planning Board.

If you have any questions, please call us at 603.235.1257

We look forward to seeing everyone.

Thank you

2 Walnut LLC
218 Washington Ave
Portland Maine 04101

207.590.3877



2 Walnut LLC.

218 Washington Avenue
Portland ME 04101

November 13, 2017

233 Anderson Street:
Neighborhood Meeting Minutes

No Attendees

Signed: _____

Date: _____



2 Walnut LLC

218 Washington Avenue
Portland ME 04101

November 13, 2017

233 Anderson St:
Neighborhood Meeting

SIGN IN SHEET

1. No Neighborhood Attendee's
2. Glenn Morse
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____



Traffic Solutions
 William J. Bray, P.E.
 235 Bancroft Street
 Portland, ME 04102
 (207) 774-3603
 (207) 400-6890 mobile
trafficsolutions@maine.rr.com

TECHNICAL MEMORANDUM

TO: Carol Morrisette, Residential Design Studio

FROM: William Bray, P.E., Traffic Solutions

DATE: November 4, 2017

SUBJECT: 233 Anderson Street Property – “Build-out” Traffic Estimates

It is my understanding the 233 Anderson Street property is currently zoned, more or less, equally within the B1-b and IL-b zones. Your office is currently preparing a City Zoning Map Amendment Application that re-zones the parcel exclusively to the B1-b zone. In support of the application, the City has requested comparative traffic generation estimates for both the current and proposed property zones. The City further instructed the trip generation estimates should be based upon the most intensive use for each property zone.

The chart prepared by your office describing the most probable uses of the parcel under each zoning regulation was very carefully reviewed with the following permitted uses selected for the analysis:

IL-b Zone: Research and Development Space

B1-b Zone: General Office Space and 2,000 sf of restaurant space on the ground floor

Your October 31, 2017 memorandum (attached for reference) defines four possible development options for the property. Each option establishes maximum development of the parcel based upon the City’s zoning regulations, lot size, and the developability of the property. Each of the four development options are described as follows:

Option A – Full Build-Out of Existing IL-b Zone Only – 41,700 sf Research & Development Building

Option B – Full Build-Out of Existing B1-b Zone Only – 17,760 sf General Office and 2,000 sf restaurant

Option C – Full Build-Out of Existing Mixed Zone – 41,700 sf Research & Development Building and 9,790 sf General Office Space with 2,000 sf restaurant

Option D – Full Build-Out of Proposed B1-b Zone – 49,000 sf General Office and 2,000 sf restaurant

Traffic Solutions prepared peak hour trip generation estimates for each of the four optional development schemes based upon trip rates presented in the ninth edition of the Institute of Transportation Engineers “TRIP GENERATION” publication. The following land-use codes and trips rates were used:

- Land-Use Code #710 General Office Space
 - 1.56 trips/1,000 sf building area
 - 1.49 trips/1,000 sf building area
- Land-Use Code #760 Research and Development Space
 - 1.22 trips/1,000 sf building area
 - 1.07 trips/1,000 sf building area
- Land-Use Code #932 High-Turnover (Sit-Down) Restaurant
 - 10.81 trips/1,000 sf building area
 - 9.85 trips/1,000 sf building area

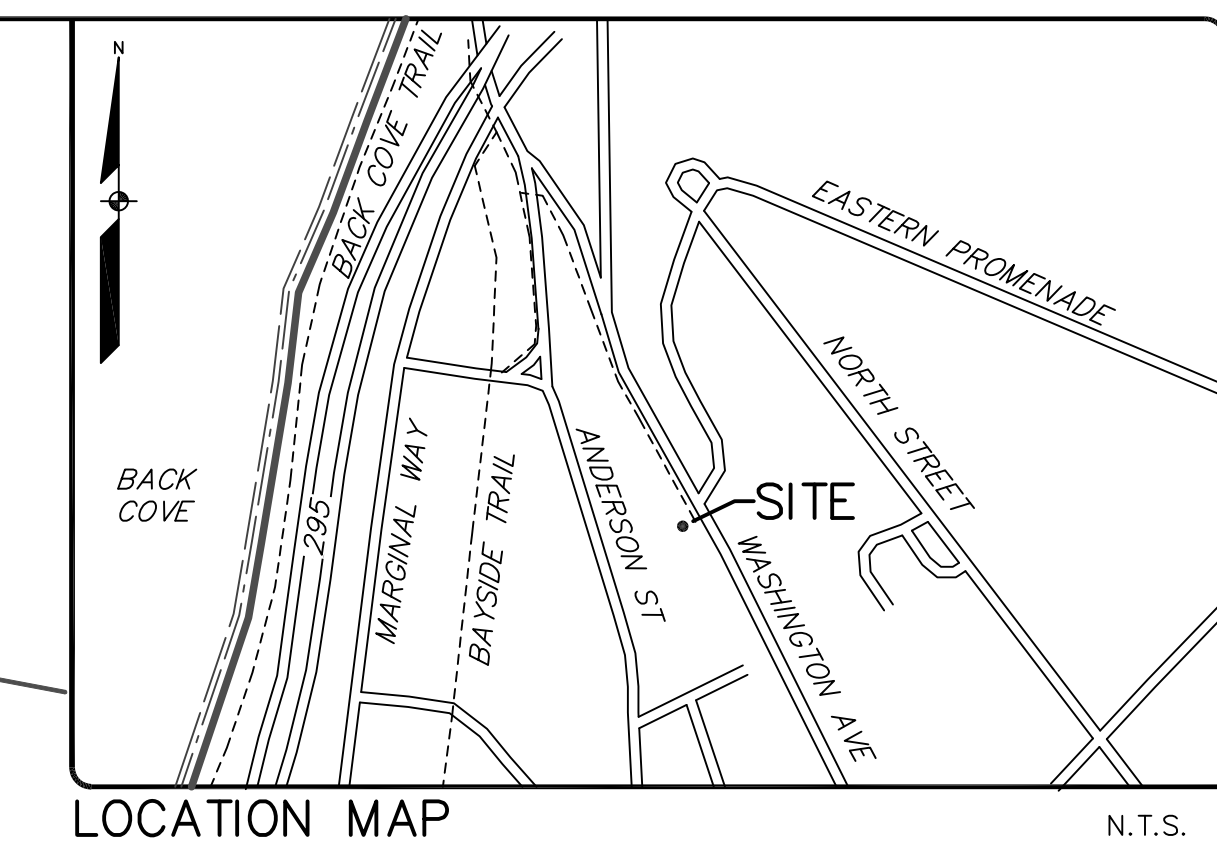
Table 1 summarizes the trip generation analysis conducted for each of the four development options:

Table 1
Trip Generation Summary
Development Schemes
 (233 Anderson Street Property)

Development Option Description	Total Building Area	Projected Land-Use	AM Peak Hour Trips	PM Peak Hour Trips
Option # 1 Full Build-Out IL-b zone ONLY	41,700 sf	Research and Development Space	51 trips	45 trips
Option # 2 Full Build-Out B1-b Zone ONLY	19,650 sf	17,560 sf General Office 2,000 sf restaurant	50 trips	46 trips
Option # 3 Full Build-Out Mixed Zones	IL-b 41,370 sf B1-b 11,790 sf	Research and Development Space; 2,000 sf restaurant; 9,790 sf General Office Space	88 trips	80 trips
Option #4 Full Build-Out Proposed B1-b Zone	51,000 sf	2,000 sf restaurant; 49,000 sf General Office Space	98 trips	93 trips

The 233 Anderson Street parcel is currently regulated by two sperate building zones; Zone #IL-b and B1-b, which more or less subdivides the property. Development Option #1, which only develops the existing IL-b portion of the site and Development Option #2 limits development on the current B1-b portion of the site, are expected to generate nearly the same level of peak hour traffic (approximately 50 peak hour trips). Option # 3, which proposes full build-out of the existing mixed zone, generates a slightly greater volume of peak hour traffic at 88 trips in the AM peak hour and 80 trips in the evening peak hour. Option # 4, which represents full build-out of the property under the proposed B1-b zone, is expected to generate a similar volume of peak hour trips when compared to Option #3 (98 trips in the morning peak hour and 93 trips in the PM peak hour),





GENERAL NOTES:

1. THE RECORD OWNERS OF THE PARCELS ARE AS FOLLOWS:
TAX MAP 10 BLOCK A LOT 15: GLENN MORSE PER DEED BOOK 24651 PAGE 157 WITH REVISIONS IN DEED BOOK 25874 PAGE 165 AND 27839 PAGE 310.
TAX MAP 10 BLOCK A LOT 10: MORGAN GAVIN LLC PER DEED BOOK 29641 PAGE 338.
* ALL DEEDS REFERENCED ARE RECORDED IN THE CUMBERLAND COUNTY REGISTRY OF DEEDS (CORD)
2. BOUNDARY AND TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED UPON AN ON THE GROUND SURVEY BY SEE-AGO TECHNIQS, INC. WITH SUPPLEMENTAL TOPOGRAPHY OBTAINED FROM LIDAR INFORMATION.
3. PLAN REFERENCES:
 - A. STANDARD BOUNDARY SURVEY, AS-BUILT TOPOGRAPHY AND DEED ANALYSIS LOT AT 218 WASHINGTON AVENUE, PORTLAND FOR GLENN MORSE, BY ROSS BOUNDARY SURVEYS, (JOB NO. 20604P), LAST DATED JULY 2013.
 - B. WASHINGTON AVENUE SIDE PATH EXISTING SITE CONDITIONS BETWEEN #198 AND INTERSTATE 295 OFF RAMP, BY THE CITY OF PORTLAND PUBLIC SERVICES DEPARTMENT ENGINEERING DIVISION, PLAN NUMBER 881/35, LAST DATED OCTOBER 28, 2010.
 - C. STREET LINE RETRACEMENT AND EXISTING MONUMENTATION PLAN, ANDERSON STREET, FOX STREET, GORHAM STREET & FLOWMAN STREET, BY THE CITY OF PORTLAND PUBLIC SERVICES DEPARTMENT ENGINEERING DIVISION, PLAN NUMBER 1017/29, LAST DATED FEBRUARY 27, 2005.
 - D. SITE PLAN OF TAX MAP 10 BLOCK A LOT 10, WASHINGTON AVE, PORTLAND MAINE FOR GLENN MORSE, BY STEPHEN SELLECK, JOB NUMBER 2013, LAST DATED FEBRUARY 17, 2013.
 - E. BOUNDARY SURVEY AT 207 ANDERSON STREET, FOR ROCKINGHAM LLC, BY OWEN HASKELL, INC. LAST DATED MARCH 25, 2013, AND RECORDED IN CORD PLAN BOOK 215 PAGE 98.
4. PLAN ORIENTATION IS GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE 1802-NAD83, BASED ON DUAL FREQUENCY GPS OBSERVATIONS AND CHECKED WITH CITY CONTROL POINTS. ELEVATIONS DEPICTED HEREON ARE ON THE CITY OF PORTLAND DATUM BASED UPON 2 BENCHMARKS PROVIDED BY THE CITY.
5. UTILITY INFORMATION DEPICTED HEREON IS COMPILED USING PHYSICAL EVIDENCE LOCATED IN THE FIELD TOGETHER WITH PLANS PROVIDED BY THE CITY. UNDERGROUND UTILITIES WITHIN WASHINGTON AVENUE ARE APPROXIMATE AND MAY NOT HAVE BEEN FIELD VERIFIED. DEPICTED HEREON MAY NOT NECESSARILY REPRESENT ALL EXISTING UTILITIES. CONTRACTORS AND/OR DESIGNERS NEED TO CONTACT DIG-SAFE SYSTEMS, INC. (1-888-DIG-SAFE) AND FIELD VERIFY EXISTING UTILITIES PRIOR TO CONSTRUCTION AND/OR EXCAVATION.
6. PROPOSED PROPERTY LINES AND EASEMENT SHOWN HEREON ARE BASED UPON THIS BOUNDARY SURVEY AND THE CONTRACT FOR THE SALE OF REAL ESTATE DATED OCTOBER 19, 2016.

DESIGNED		CHECKED	
MWE		CDM	
B	WTC	2/6/17	REVISED PROPOSED PROPERTY LINES PER NOTE 6.
A	WTC	12/15/16	CITY SUBMITTAL NO. 1
REV:	BY:	DATE:	STATUS:
THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHINCS, INC. ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHINCS, INC.			

SEBAGO
TECHNICS

WWW.SEBAGOTECHNICS.COM

75 John Roberts Rd.
Suite 1A
South Portland, ME 04106
Tel. 207-200-2100

250 Goddard Rd.
Suite B
Lewiston, ME 04240
Tel. 207-783-5656

EXISTING CONDITIONS PLAN

OF:

218-220 WASHINGTON AVENUE

218 WASHINGTON AVENUE

PORTLAND, MAINE

FOR:

218-220 WASHINGTON AVENUE LLC

199 ELDERBERRY ROAD

SOUTH PORTLAND, MAINE 04106

PROJECT NO.

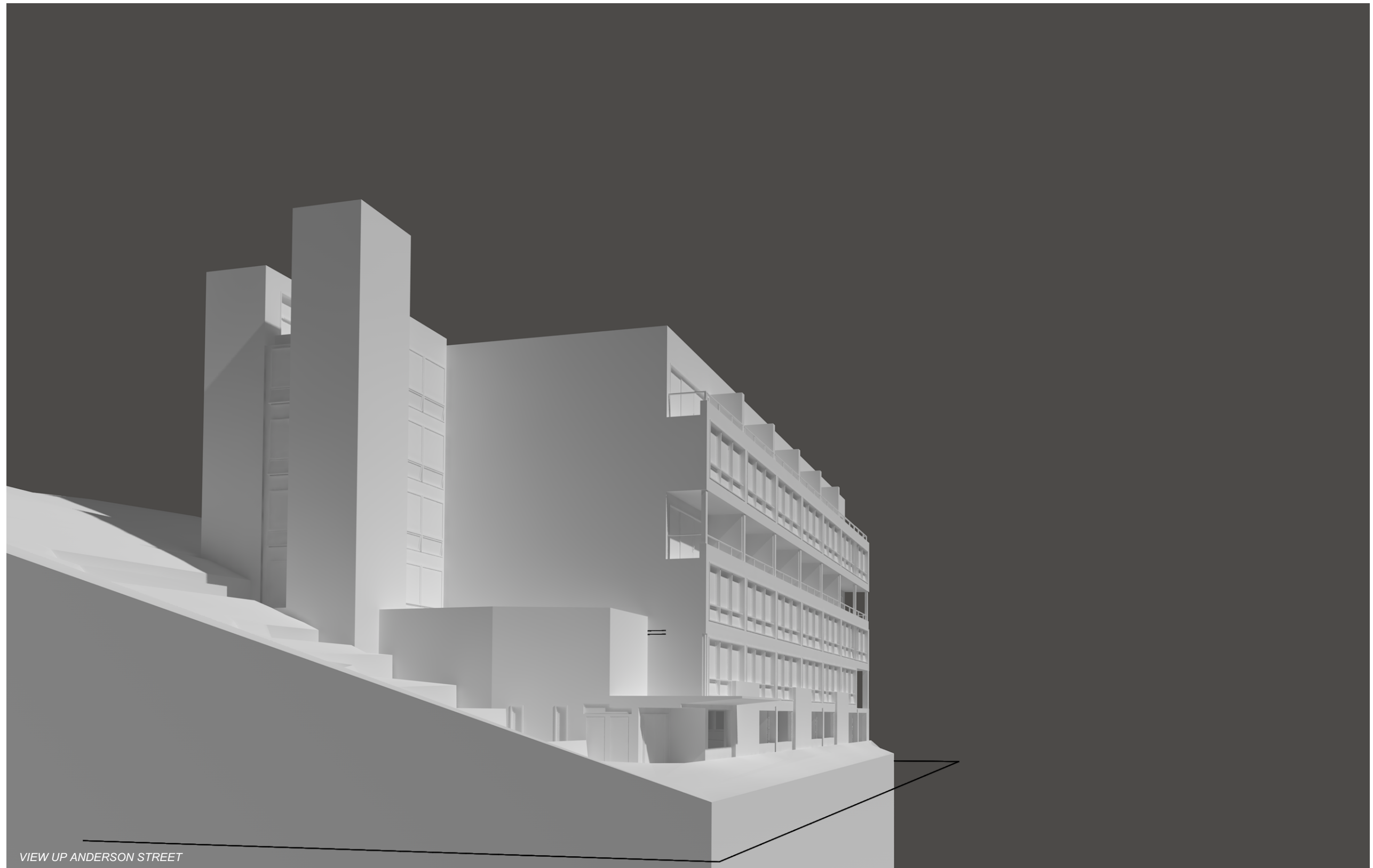
06172

SCALE

1" = 20'

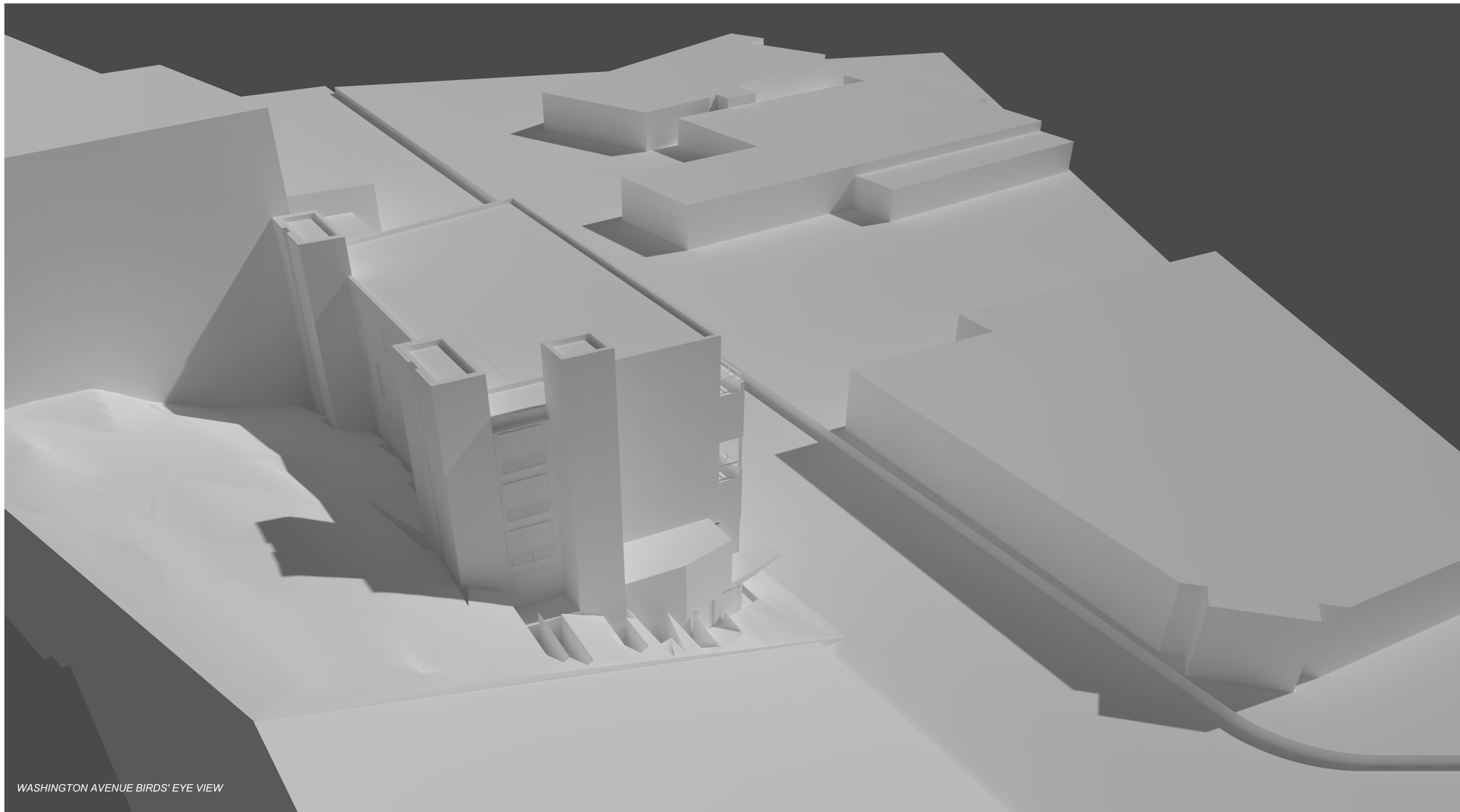
SHEET 2 OF 23

06172EC.dwg, TAB:EC

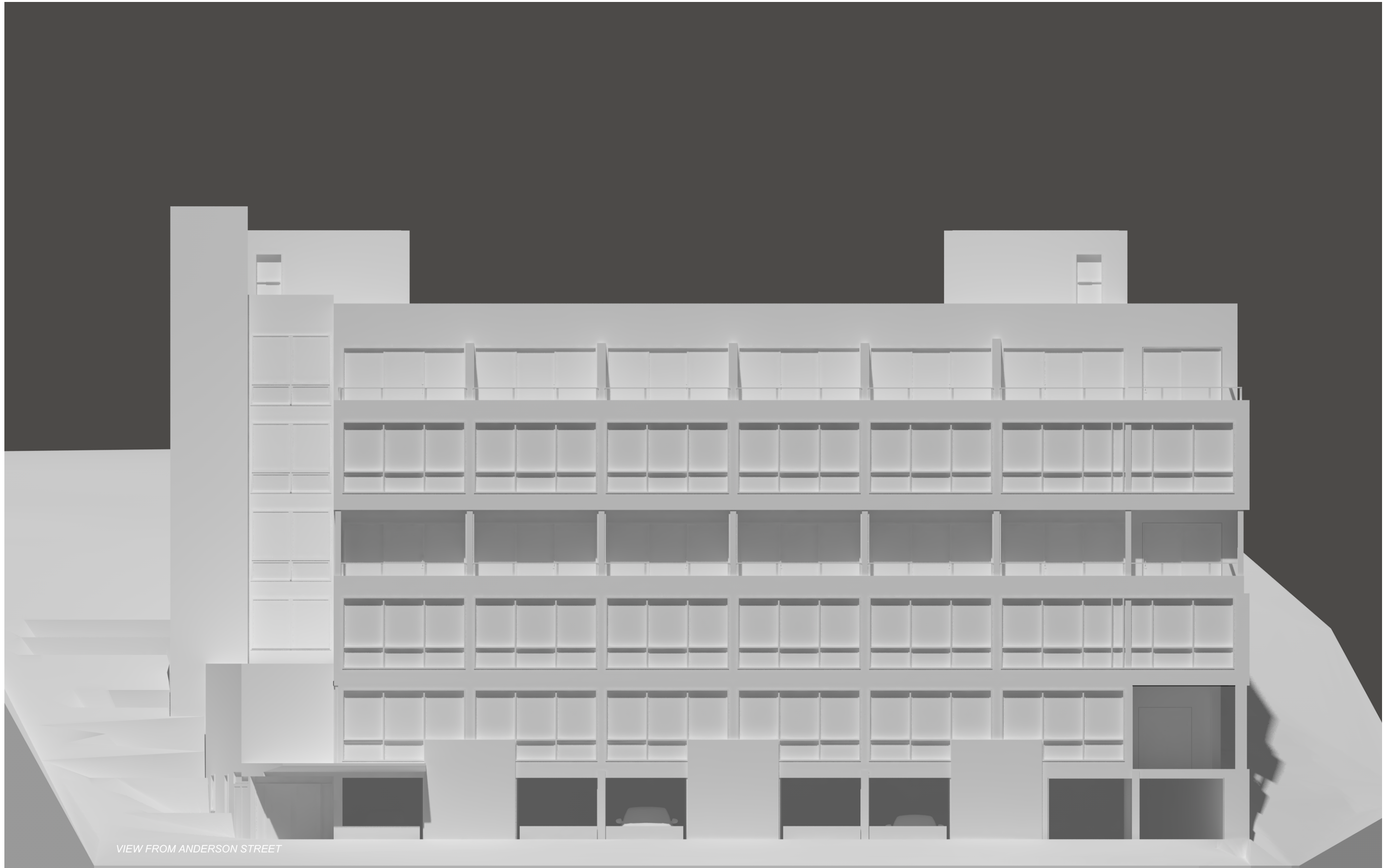


VIEW UP ANDERSON STREET

SCATTERGOOD DESIGN

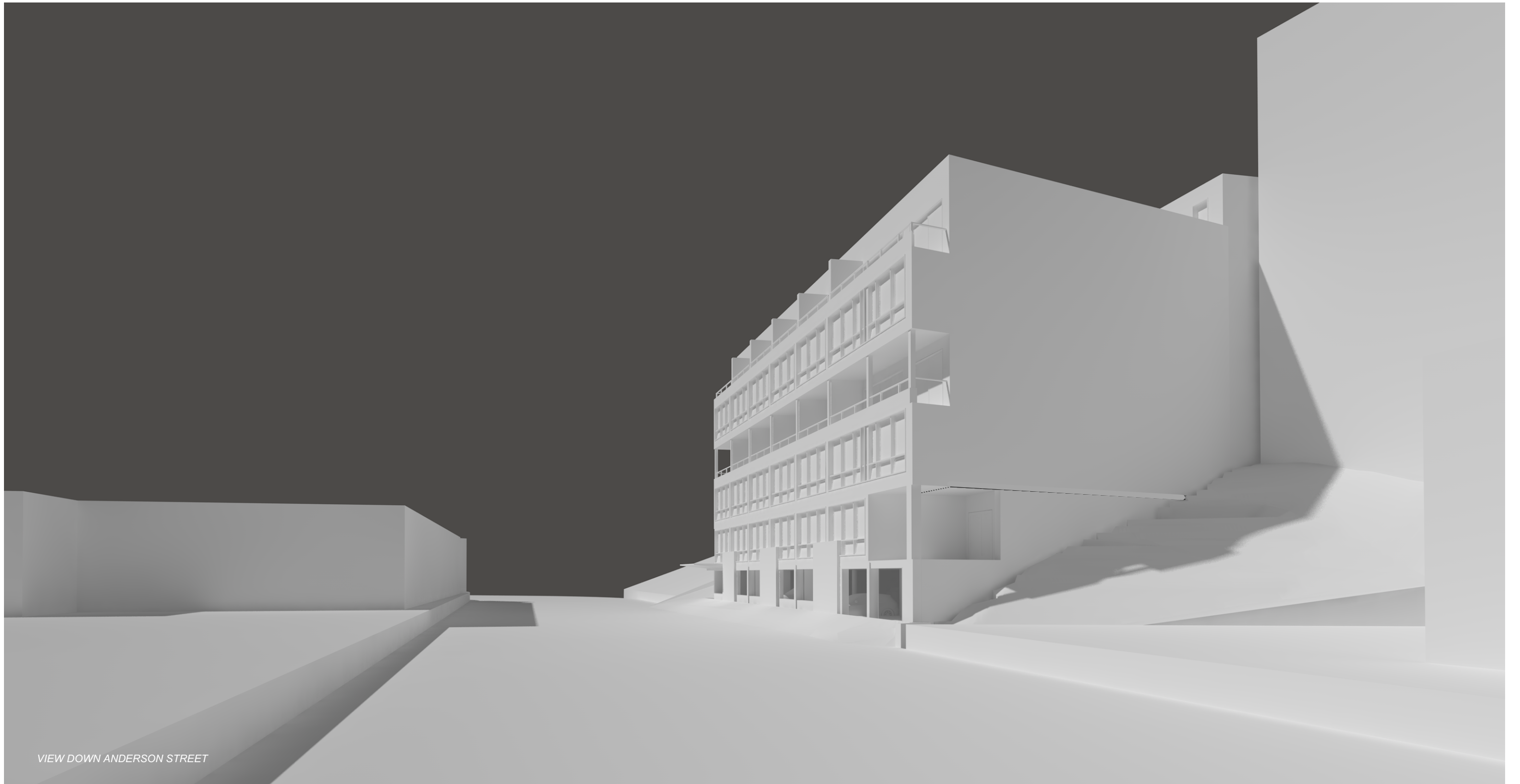


WASHINGTON AVENUE BIRDS' EYE VIEW



VIEW FROM ANDERSON STREET

SCATTERGOOD DESIGN



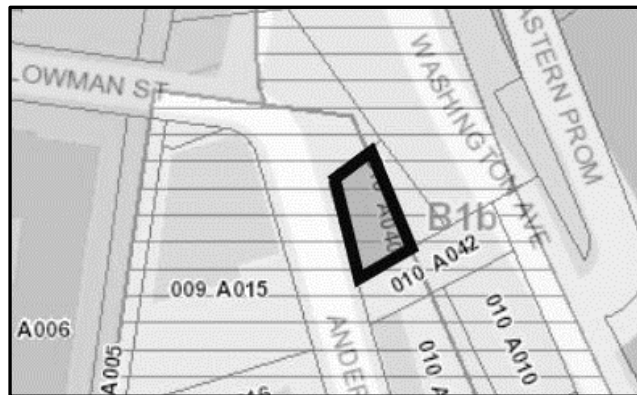
VIEW DOWN ANDERSON STREET

SCATTERGOOD **DESIGN**

X. REVISED MOTIONS FOR THE BOARD TO CONSIDER

On the basis of plans and materials submitted by the applicant, the City of Portland Zoning Code, Portland's Comprehensive Plan, public comment, the information provided in public hearing on December 6, 2017 for the project #2017-170 (233 Anderson Street), and/or other findings as follows:

- i. The Planning Board finds that the proposed rezoning to the Neighborhood Business (B1b) zone for the a property located at 233 Anderson Street **[is or is not]** consistent with the Comprehensive Plan for the City of Portland; and
- ii. Therefore, the Planning Board **[recommends or does not recommend]** to the City Council approval of the zoning map amendment for 233 Anderson Street from Low Impact Industrial (ILb) zone to Neighborhood Business (B1b) Zone for the area outlined in black below; and



- iii. Therefore, if the applicant obtains right, title and interest to the area north of the parcel, that is owned by the State of Maine, then the Planning Board also **[recommends or does not recommend]** to the City Council approval of the zoning map amendment for 233 Anderson Street from Low Impact Industrial (ILb) zone to Neighborhood Business (B1b) Zone for the larger area outlined in black below.





Memorandum

Planning and Urban Development Department

Planning Division

To: Chair Boepple and Members of the Portland Planning Board

From: Jean Fraser, Planner

Date: December 1st, 2017

Re: **December 6th, 2017 Planning Board Evening Workshop**
Level III Site Plan:
Access, Circulation and Parking Improvements
Lyseth/Lyman-Moore School Campus
171 Auburn Street Project # 2017-202
City of Portland Parks, Recreation and Facilities Department, Applicant

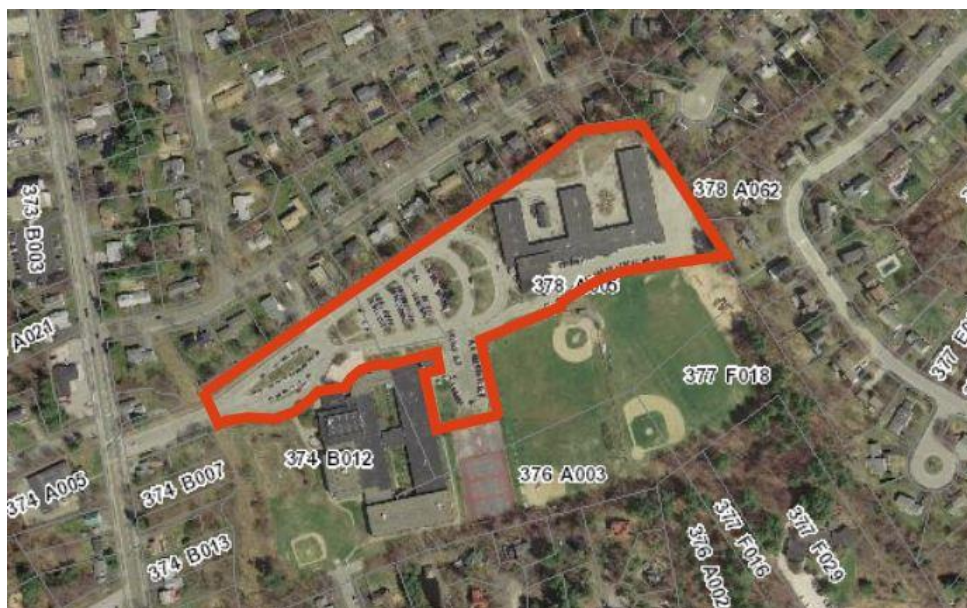
I. INTRODUCTION

The City of Portland Parks, Recreation and Facilities Department has requested site plan approval of a Level III application for a package of circulation, access and parking improvements on the Lyseth Lyman- Moore Campus. The campus is comprised of the Lyman Moore Middle School nearest to Auburn Street, and the Lyseth Elementary School towards the rear of the site.

The site is located primarily in the R2 zone, with a corner within the ROS zone that abuts the schools.

The project is being brought before the Planning Board as it impacts about 25 acres - with extensive site work over about 4.5 acres to improve the drainage, access and parking; the project does not include any new buildings.

The focus of the workshop is to provide the Board with some background regarding the activity on the site and the complexity of the access and stormwater issues.



The applicant held a Neighborhood Meeting on October 18, 2017 at the Lyman Moore Middle School which was attended by seven neighbors; notes are included in Attachment S. This Workshop was noticed to 189 neighbors and interested parties, and the public notice appeared in the *Portland Press-Herald* on November 27th and 28th, 2017. The Planning Division has not received any public comments as of the completion of this Memorandum.

Applicant: City of Portland Parks, Recreation and Facilities Department, (David Onos)
Consultants: Wright-Pierce (Douglas Rice and Michael Guethle)

Required reviews and requested waivers

Applicant's Proposal	Applicable Standards
Site work of over 4.5 acres affecting approximately 25 acres of school grounds and athletic fields	14-523 Site plan Required Approval and Applicability Level III Site Plan and 14-526 Site Plan Standards
Waivers	Applicable Standards
The applicant requests a waiver for the 33% of the parking to consist of compact size parking spaces, which would be used by staff and thus little turnover is expected.	The Technical Manual Standard 1.14 <i>Parking and Parking Lot Design</i> requires that compact parking be a maximum of 20% of parking spaces. The Traffic Engineering Reviewer supports the waiver request (<u>Attachment 1</u>)

II. PROJECT DATA

SUBJECT	DATA
Existing Zoning	R2 (small area ROS)
Existing Use	School and Athletic Fields
Proposed Use	Same uses, improved facilities
Parcel Size	25.12 acres
Impervious Surface Area	
--Existing	371,935 sq ft
--Proposed	347,735 sq ft
--Net Change	2,800 sq ft
Total Disturbed Area	4.56 acres
Building Footprint	N/A
Parking Spaces	
-Existing	135
-Proposed	177
-Net change	+42
Bicycle parking Spaces	
-Existing	0 (conforming)
-Proposed	28
-Net change	28

III. BACKGROUND AND EXISTING CONDITIONS

The campus is located on the east side of Auburn Street just north of the Northgate Shopping Plaza, surrounded by R2 and R3 residential development. Immediately southeast of the schools are athletic fields (3 baseball fields, basketball and tennis courts) that are used by both the school and the community.

View looking east from main access drive; Junior Street to left and main entrance to the Lyman Moore Middle School is to the right.

(Lyseth elementary School in far distance straight ahead)



The main vehicle access is from Auburn Street at signals, but the site can also be accessed by vehicles via Bartley Avenue and Junior Street to the north. There are additional points where pedestrian access to the campus is possible.

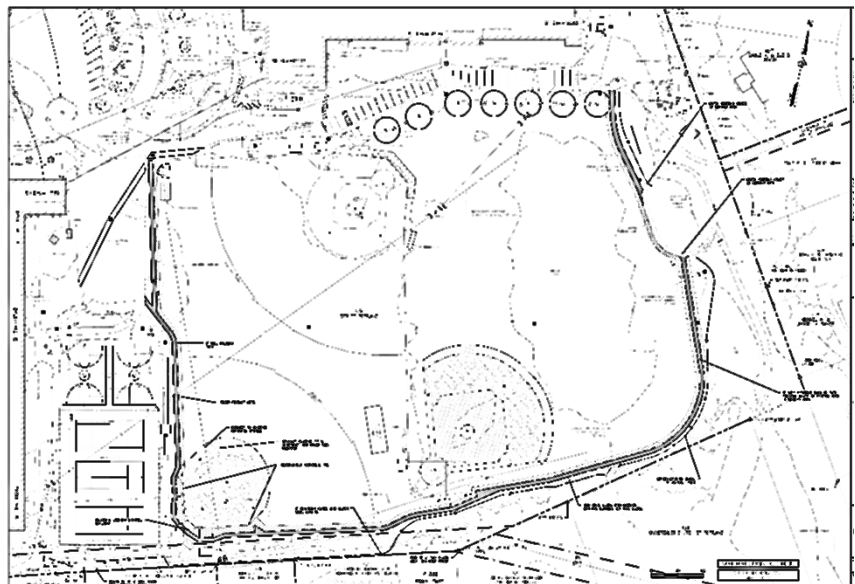
The existing conditions are described in summary in the applicant's submission "*Description of Project*" (*Attachment C*) and also in the 2011 *Report of the Portland District Safe Routes to School Committee* (*Attachment 7*). The latter study explored ways to encourage pupils to walk or bicycle to the schools and included a set of 10 key recommendations that are summarized below to provide a context for the current project:

- 1. Lyman Moore & Lyseth Drop-Off Zone/Parking Lot Redesign & Designation of Remote Bus/Car Drop Locations**
- 2. Relocate Bike Parking at Lyseth & Lyman Moore to encourage use and reduce risk of theft & vandalism**
- 3. Install/Enhance Crosswalks:**
 - a. Across Lyseth-Moore Drive at Junior St.
 - b. Washington Ave. Ext.
- 4. Locate Crossing Guard at Allen Ave. & Bramblewood/Virginia**
- 5. Construct Missing Sidewalk Links (list includes Junior Street)**
- 6. Annual Bicycle & Pedestrian Safety Education, including:**
- 7. Organize Peer Walkpool and/or Bike Train groups for Lyman Moore Students – and Adult-Led Walking School Bus and/or Bike Train groups for Lyseth Students**
- 8. Winter Enforcement & Maintenance of Sidewalks and Paths**
- 9. Use Speed Trailers Twice a School Year and Practice Speed Enforcement on nearby streets**
- 10. Offer Encouragement Campaigns and Incentives for Students and Staff to Walk, Bike, Use Transit, and Carpool to both School and After-School Events**

The two schools include a total of approximately 1000 pupils and 150 staff members with their associated staff parking areas, bus access and waiting areas, and areas where parents drop-off /pick-up children. The adjacent athletic fields are well-used, though more later in the day but parking is disorganized. These access and parking needs create a congested area that is a challenge for pedestrians.

Drainage improvements for the playing fields and a walking trail around them were proposed, and the associated site plans approved (at staff level in early 2017) after a number of discussions with neighbors to the south who were affected by the ROS/athletics activities and proposed trail. The approved site plan is included for information and context below. The work in the athletic fields is somewhat separate from the package of improvements subject of this Level III site plan:

Improvements already approved for athletics fields, including improved drainage

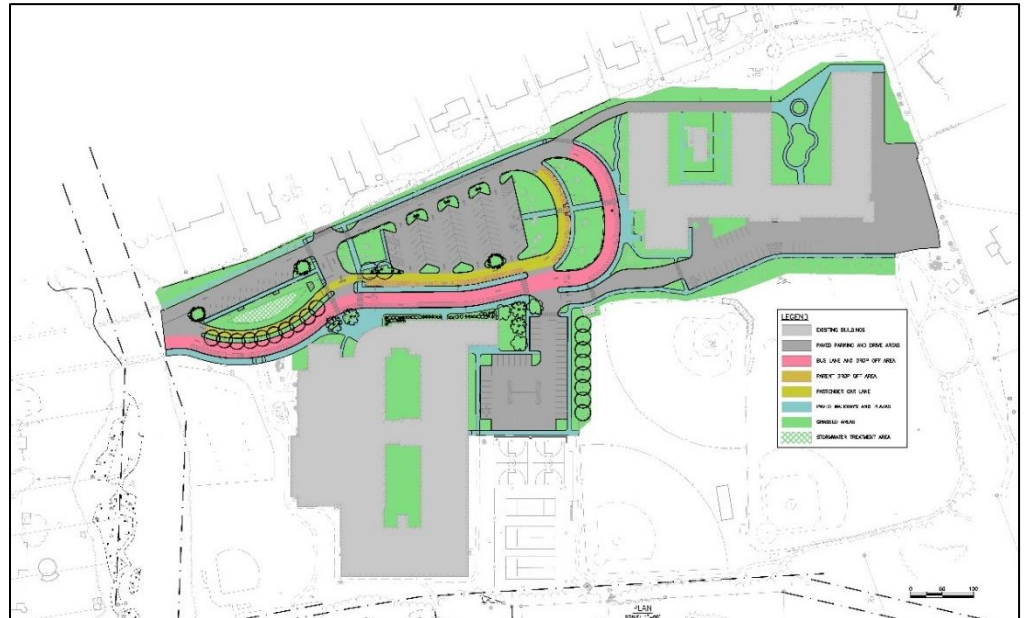


IV. PROPOSED DEVELOPMENT

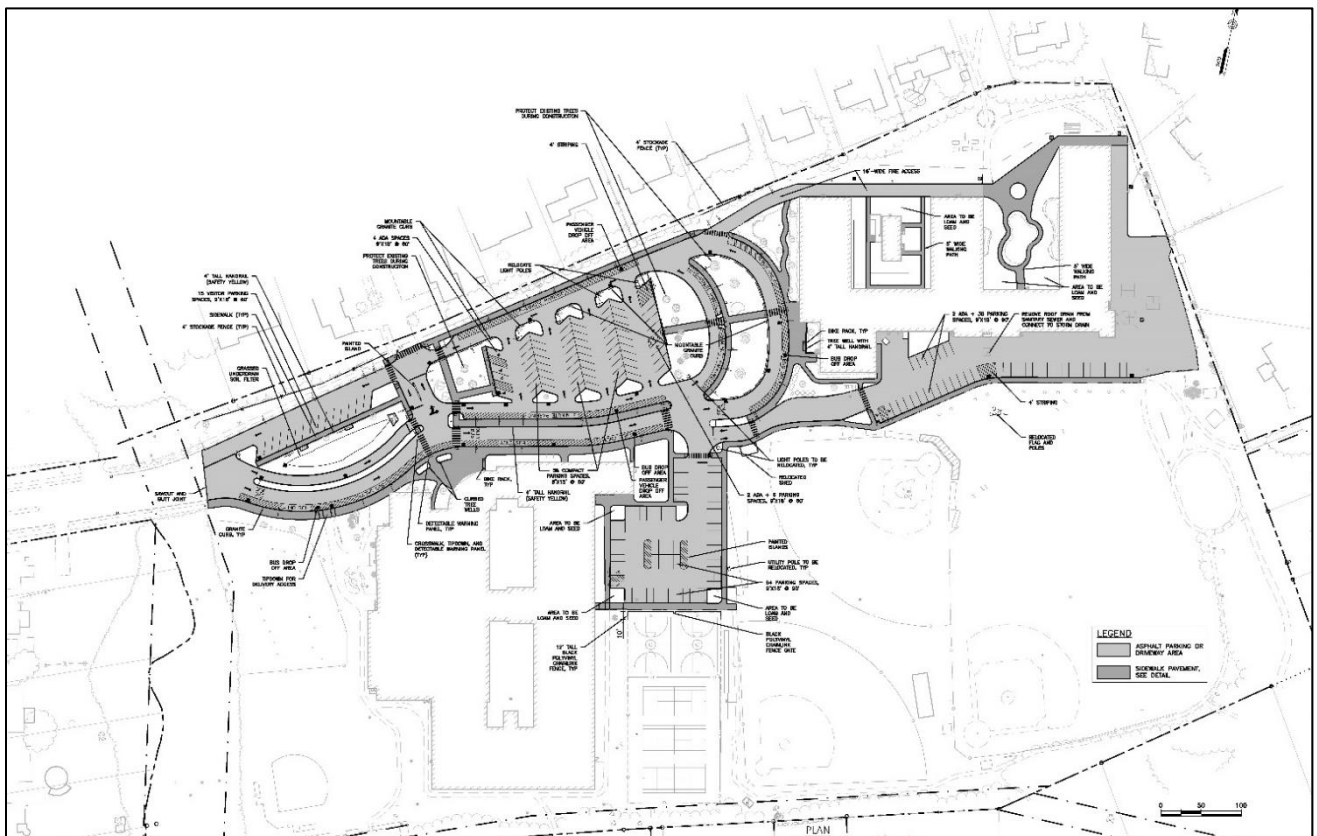
The proposal is for the redevelopment of the current access, circulation and parking facilities in the vicinity of the Lyseth Moore and Lyman schools in order to reduce conflicts between school buses, cars and pedestrians particularly at the beginning and end of the school day. In overall terms the proposals create one loop (pink) for school buses and one loop for passenger cars (yellow), along with improved parking areas and pedestrian crossings and sidewalk areas.

As part of the project, an underdrained grassed soil filter is being introduced into the westernmost “island” and a series of catchbasins plus roofdrains will direct stormwater to this system. (see Stormwater Response letter & Prelim Report in Attachments U & K).

The project also includes landscaping and the proposal have been devleoeed in consultation with the City Arborist (Plans P10/P11 and City Arborist comments in Attachment 5).



Overall Circulation Plan (see Plan P12)



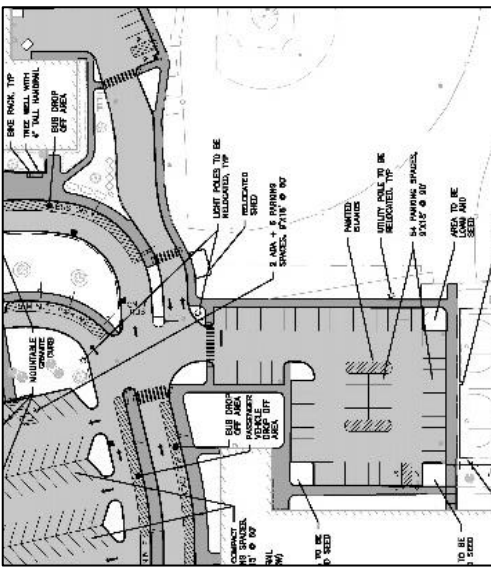
Site Plan (see Plan P5)

page 5

existing impacts on Junior Street and suggestions offered for how this project could limit access at this location. This question was discussed with the DPW Transportation Systems Engineer who has been involved in the previous discussions. Further observations were undertaken in November 2017 which did not indicate any particular problems, and the Engineer concluded: “Based on the observed counts, closing Junior Street to through traffic would add significant activity to the traffic signal at Auburn Street and the school driveway, which may have an adverse impact to movement along this key arterial. As such, closure is not recommended at this time.” (Attachment 4).

The applicant has revised the detailed design of this area to better control traffic and provide for pedestrians and these are considered by staff to be acceptable ([Attachment 1](#))

- **Multi way intersection** between the two schools and rear parking areas is a key intersection located at the back of the site where 6 vehicle driveways come together:



Multi-way intersection plan extract and photo with same orientation

The Traffic Engineer’s review comments raise several concerns about the proposed design ([Att. 1](#)):

- *The plan needs to incorporate a traffic control plan for the multi-way intersection of the circulatory roadway and side parking lot areas. I find the configuration to be confusing and potentially problematic.*
Status: I continue to be concerned about this location. I will review further and provide suggestions in the future.
- *I find the sidewalk connection between the two schools (at the multi-way intersection) to be indirect and thus may lead to pedestrians walking in an uncontrolled location.*
Status: In my professional opinion, pedestrians will walk directly through the intersection, and not follow the routing to the crosswalks. I will review further and provide suggestions in the future.

The DPW Senior Engineer is also particularly concerned that pedestrians - which would include people of all ages and those going to and from the fields - will not follow the crossings as proposed and therefore end up in the middle of the intersection ([Attachment 6](#)). This concern is borne out by the location of the person in the photo above).

Environmental Standards - Water Quality, Storm Water Management and Erosion Control

The site abuts the Fall Brook Stream Protection Zone and Fall Brook is an Urban Impaired Stream (UIS). The preliminary Stormwater Management Report (Attachment K) requested a waiver from the Urban Impaired Stream Standard in view of the fact the proposals were improving treatment and removing the roof drains from the combined sewer. Staff confirmed that the legal requirements related to the Urban Impaired Stream Standard would not allow for a waiver from the standard (Attachment 2.)

The applicant has revised the stormwater management system by increasing the capacity of the underdrained soil filter so that it meets the UIS standard, and this has been reviewed in detail and confirmed to be acceptable (Attachment 2). However, the system interfaces with an existing system that is maintained by DPW and there is a concern that the maintenance responsibilities need to be clarified. The applicant has requested that the maintenance arrangements and the associated agreement be the subject of a Condition of Approval in view of the fact it will be an agreement between the municipal entities involved and further discussions are needed to finalize this aspect of the project. Staff consider that it is acceptable for this issue to be the subject of a condition of approval (Attachment 2).

Phasing and Construction Management Plan

The submitted Phasing Plan (Plan P14) and Construction Management Plan (Attachment H) relate to the area of the parking and access improvements and include minimal information at this stage. Staff recommend that both plans show how the proposed improvements to the athletic fields (which include extensive drainage work) will relate to the work on the northern side of the site that is the subject of this review, both in terms of area and timing. The Construction Management Plan should address the City's technical template and will need to be carefully coordinated to ensure emergency service access at all times and include a high level of pedestrian safety accommodations.

NEXT STEPS

The final submission will need to include:

- Further consideration and revisions to the multi-way intersection, particularly to provide more direct pedestrian crossing routes and simplify the intersection
- Construction Management Plan
- Clarification of phasing and construction over the entire site including the athletic fields
- Further information on the proposed stormwater management system maintenance arrangements
- Any other information or revisions as recommended by the Planning Board

ATTACHMENTS:

Attachments to Memorandum

1. Traffic Engineering Review comments
2. Peer Engineering Review comments
3. Fire Department comments
4. City Transportation Systems Engineer comments
5. City Arborist comments
6. DPW Engineer comments
7. *Safe Routes to School Travel Plan* 2011 (background)

Public Comments (none received at time Memo was completed)

Applicant's Submittal

- A. Cover Page and Table of contents
- B. Site Plan Application
- C. Development Description
- D. Right, Title and Interest
- E. Zoning Compliance
- F. Easements/other burdens
- G. Financial and Technical Capacity
- H. Construction Management
- I. Traffic
- J. Significant Natural Features
- K. Prelim Stormwater Management Plan
- L. Consistency with City Master Plans
- M. Utilities
- N. Solid Waste
- O. Fire Safety & Emergency Services Info
- P. Conformity with Technical Standards
- Q. HVAC Equipment
- R. Site Plan Standards Compliance
- S. Neighborhood Meeting Certification
- T. Circulation Response letter
- U. Stormwater Response letter
- V. Fire Response letter
- W. Landscaping Response letter

Plans

- P1. Cover Sheet
- P2. General Notes and Legend (2 sheets)
- P3. Boundary Survey
- P4. Existing Conditions and Demolition
- P5. Site Plan
- P6. Grading and Utility Plan
- P7. Snow Storage and Dimension Plan
- P8. Signage Plan
- P9. Construction Details (5 sheets)
- P10. Landscape Plan
- P11. Landscape Details
- P12. Circulation Overview
- P13. Pre and Post Development Drainage
- P14. Phasing Plan
- P15. Fire Truck Circulation Plan
- P16. Bus Circulation Plan
- P17. Passenger Car Circulation Plan

Lyman Moore Campus Upgrade - Status Traffic Comments

1 message

Tom Errico <thomas.errico@tylin.com>

Thu, Nov 30, 2017 at 9:11 AM

To: Jean Fraser <jf@portlandmaine.gov>

Cc: Katherine Earley <kas@portlandmaine.gov>, Keith Gray <kgray@portlandmaine.gov>, Jeremiah Bartlett <JBartlett@portlandmaine.gov>, "Jeff Tarling (JST@portlandmaine.gov)" <JST@portlandmaine.gov>, "Hyman, Bruce" <bhyman@portlandmaine.gov>

Hi Jean – the following is a status update of my preliminary traffic comments based upon revised application materials.

- The applicant shall confirm that the diagonal parking spaces meet City standards for width.

Status: The applicant has provided supporting information and has added details to the plans. I have no further comment.

- The applicant is proposing a significant number of compact parking spaces. The applicant should note if the number of compact parking spaces requires a waiver from City standards and if so provide documentation in support of the waiver.

Status: The applicant has noted that 33% of the site consists of compact size parking spaces (the maximum allowable by City standards is 20%). The applicant notes that the compact parking spaces will be used by staff and thus little turnover is expected. I support a waiver from City standards given use. I have no further comment.

- Bus drop-off area dimensions vary throughout the site (10 foot bus lane/10 foot travel lane; 8 foot bus lane/12 foot travel lane; 8 foot bus lane/16 foot travel lane; 8 foot bus lane/14.5 foot travel lane). An explanation shall be provided.

Status: The plans have been revised and the bus drop off area consists of a 16-foot travel lane and an 8-foot parking lane and the parent drop-off consists of a 12-foot travel lane and an 8-foot parking lane. I find the plan to be acceptable and I have no further comment.

- The dimensions of the 15 visitor parking spaces do not meet City standards. An explanation shall be provided.

Status: The applicant has provided supporting information that I find to be acceptable. It is suggested that the 20-foot travel lane be reduced to 19 feet (City standard) and the sidewalk be expanded to 7.5 feet (vehicle encroachment is expected and thus a wider sidewalk would ensure a walkable sidewalk).

- A crosswalk construction detail shall be provided.

Status: A detail has been added to the plans. I have no further comment.

- I would suggest that curb extensions be considered at the 5-Minute parking area center crosswalk near the Lyseth School and at the 5-minute parking area leading to Lyman-Moore School. The curb extensions will prevent vehicles from blocking crosswalks.

Status: The plans have been revised and I find them to be acceptable. I have no further comment.

- It is unclear if vehicle movements from Jr. Street are permitted to proceed straight through to the entry roadway system. Revisions to signage and pavement markings may be required to regulate vehicle circulation.

Status: The plans have been revised and I find them to be acceptable. I have no further comment.

- The plan needs to incorporate a traffic control plan for the multi-way intersection of the circulatory roadway and side parking lot areas. I find the configuration to be confusing and potentially problematic.

Status: I continue to be concerned about this location. I will review further and provide suggestions in the future.

- I find the sidewalk connection between the two schools (at the multi-way intersection) to be indirect and thus may lead to pedestrians walking in an uncontrolled location.

Status: In my professional opinion, pedestrians will walk directly through the intersection, and not follow the routing to the crosswalks. I will review further and provide suggestions in the future.

- During field observations, vehicles tend to park in areas not necessarily designated for parking (grass areas). It is unclear if the plan implements measures to prevent vehicles from parking in undesirable locations.

Status: The applicant notes that vertical curbing, signage and pavement markings will be provided to delineate parking/no parking areas. I find the plan to be acceptable and I have no further comment.

If you have any questions, please contact me.

Best regards,

Thomas A. Errico, PE

Senior Associate

Traffic Engineering Director

TYLININTERNATIONAL

[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

[Twitter](#) | [Facebook](#) | [LinkedIn](#) | [Google+](#)

"One Vision, One Company"

MEMORANDUM



TO: Jean Fraser, Planner
FROM: Lauren Swett, P.E.
DATE: November 27, 2017
RE: Lyseth Lyman-Moore Campus Improvements Peer Review

Woodard & Curran has reviewed the Level III Site Plan Application response to comments for the proposed development project located at 171 Auburn Street in Portland, Maine. The project involves circulation, access and parking improvements for an elementary and middle school campus.

Documents Reviewed by Woodard & Curran

- Response to comments and attachments, dated November 22, 2017, prepared by Wright-Pierce on behalf of the City of Portland.
- Updated Engineering Plans, dated November 21, 2017, prepared by Wright-Pierce, on behalf of the City of Portland.

Comments

- 1) In accordance with Section 5 of the City of Portland Technical Manual, a Level III development project is required to submit a stormwater management plan pursuant to the regulations of MaineDEP Chapter 500 Stormwater Management Rules, including conformance with the Basic, General, and Flooding Standards:
 - a) Basic Standard: The Applicant has provided a plan, notes, and details to address erosion and sediment control requirements, inspection and maintenance requirements, and good housekeeping practices in accordance with Appendix A, B, & C of MaineDEP Chapter 500.
 - b) General Standard: The project is increasing impervious surface by 2,800 SF, and will also incorporate an additional 30,419 SF of roof area via roof drains to be disconnected from the sewer, and is required to include stormwater management features for stormwater quality control. The Applicant is proposing a grassed underdrained soil filter that will provide treatment in accordance with the standard.
 - c) Urban Impaired Stream Standard: The project is located within the Fall Brook watershed and is subject to the Urban Impaired Stream Standard. The Applicant is providing treatment within their proposed underdrained soil filter for additional area on the site beyond the new impervious surface, and has requested mitigation credit for this area. A greater treatment credit has been provided than is required, adequately meeting the standard.
 - d) Flooding Standard: The project is increasing impervious surface by 2,800 SF, and will also incorporate an additional 30,419 SF of roof area via roof drains to be disconnected from the sewer, and is required to control the rate or quantity of stormwater runoff from the site. The project will result in an increase in the 2-year storm, and decreases in the 10- and 25-year storm. We agree that the 2-year storm increase is small and would support a waiver of this standard
- 2) The Applicant has noted that they are working on their options for maintenance and have requested that the formal maintenance agreement be a condition of approval. We have no issues with that.

MEMORANDUM



TO: Jean Fraser, Planner
FROM: Lauren Swett, P.E.
DATE: November 15, 2017
RE: Lyseth Lyman-Moore Campus Improvements Peer Review – Additional comments

Woodard & Curran has reviewed the Level III Site Plan Application for the proposed development project located at 171 Auburn Street in Portland, Maine. The project involves circulation, access and parking improvements for an elementary and middle school campus.

Documents Reviewed by Woodard & Curran

- Level III Site Plan Application and attachments, dated August 31, 2017, prepared by Wright-Pierce on behalf of the City of Portland.
- Engineering Plans, Sheets C1-14 and Figures 1-4, , dated September 1, 2017, prepared by Wright-Pierce, on behalf of the City of Portland.

We have reviewed the project with the City Department of Public Works, and can provide the following clarifications on the Applicant's proposed waivers.

Comments

- 1) The Applicant has requested a waiver of the flooding standard. With only a minor increase in the 2-year storm event, a waiver of the flooding standard can be supported.
- 2) The Applicant has requested a waiver of the urban impaired stream standard. Upon review by the Department of Public Works, it was established that there is no waiver option for the Urban Impaired Stream Standard. The City does not have the authority to waive this standard for a stream that is in non-attainment of the State water quality standards. There are two options for meeting the standard: (1) provide additional stormwater management per the standard; (2) pay into the Compensation Fee Utilization Plan for Fall Brook per the Maine DEP standard calculation. The City is in agreement that the removal of roof runoff from the combined sewer system will help with the overall goal of reducing CSO volumes to Back Cove. However, this action would not have a beneficial impact on Fall Brook, which is the purpose of the UIS Standard, so this work cannot be used to justify a waiver of the standard.
- 3) In addition, a stormwater management agreement will be required for the new stormwater treatment system. The City of Portland Department of Public Works will continue to maintain and inspect the existing gravel wetland. The Applicant will be required to inspect, maintain, and report on the underdrained soil filter in accordance with the Chapter 32 stormwater requirements. Public Works has indicated that arrangements may be made to have the same company perform inspections for the two systems, and that the options can be discussed with the School Department.

MEMORANDUM



TO: Jean Fraser, Planner
FROM: Lauren Swett, P.E., and Amy LeBel, E.I.T.
DATE: October 31, 2017
RE: Lyseth Lyman-Moore Campus Improvements Peer Review

Woodard & Curran has reviewed the Level III Site Plan Application for the proposed development project located at 171 Auburn Street in Portland, Maine. The project involves circulation, access and parking improvements for an elementary and middle school campus.

Documents Reviewed by Woodard & Curran

- Level III Site Plan Application and attachments, dated August 31, 2017, prepared by Wright-Pierce on behalf of the City of Portland.
- Engineering Plans, Sheets C1-14 and Figures 1-4, , dated September 1, 2017, prepared by Wright-Pierce, on behalf of the City of Portland.

Comments

- 1) In accordance with Section 5 of the City of Portland Technical Manual, a Level III development project is required to submit a stormwater management plan pursuant to the regulations of MaineDEP Chapter 500 Stormwater Management Rules, including conformance with the Basic, General, and Flooding Standards. We offer the following comments:
 - a) Basic Standard: The Applicant has provided a plan, notes, and details to address erosion and sediment control requirements, inspection and maintenance requirements, and good housekeeping practices in accordance with Appendix A, B, & C of MaineDEP Chapter 500.
 - Note that the project may require a Notice of Intent to Comply with the Maine Construction General Permit.
 - b) General Standard: The project is increasing impervious surface by 2,800 SF, and will also incorporate an additional 30,419 SF of roof area via roof drains to be disconnected from the sewer, and is required to include stormwater management features for stormwater quality control. The Applicant is proposing a grassed underdrained soil filter. The following comments should be addressed:
 - The Applicant has identified a media exfiltration rate of 0.375 in/hr. As this varies from the Maine DEP standard, justification for this rate should be provided.
 - c) Urban Impaired Stream Standard: The project is located within the Fall Brook watershed and is subject to the Urban Impaired Stream Standard. The Applicant has requested a waiver from the Urban Impaired Stream Standard, due to the existing gravel wetland design condition. We are reviewing this waiver request with the Department of Public Works.
 - d) Flooding Standard: The project is increasing impervious surface by 2,800 SF, and will also incorporate an additional 30,419 SF of roof area via roof drains to be disconnected from the sewer, and is required to control the rate or quantity of stormwater runoff from the site. The project will result in an increase in the 2-year storm, and decreases in the 10- and 25-year storm. We agree that the 2-year storm increase is small and we are reviewing this waiver request with the Department of Public Works. However, the following comments should be addressed:
 - The pre- and post- development project areas do not match. The Applicant should clarify the areas included.
 - The Applicant should review their time of concentration flow paths for Subcatchments S1 (pre) and S2 (post). The TC path for S1 shown on the pre-development drainage plan (pipe flow) does not match the path utilized in HydroCAD (sheet flow). S2 should be reviewed to ensure that the



non-impacted existing area of the site is evaluated in a similar manner to the pre-development model (i.e. similar amounts of sheet flow).

- 2) We suggest, for ease of review and coordination during construction that all of the proposed structures be numbered.
- 3) Snow storage has been designated in an area to the east of the building. This is very close to the property boundary and abutting neighbors. Applicant should verify that adequate buffering is provided from the neighbors, and additional definition of grading should be provided to ensure that the snow melt does not impact the neighbors.

MEMORANDUM

To: FILE
From: Jean Fraser
Subject: Application ID: 2017-202
Date: 11/30/2017

Comments Submitted by: Robert Thompson/Fire on 11/30/2017

After a meeting with the developer, adjustments were made to widen the road. The Fire Dept is comfortable with the new plan.

Fwd: PB Memo this week - 171 Auburn- Lyseth Moore School access and pkg improvments

1 message

Jean Fraser <jf@portlandmaine.gov>
To: "Fraser, Jean" <jf@portlandmaine.gov>

Thu, Nov 30, 2017 at 6:02 PM

From: **Keith Gautreau** <kng@portlandmaine.gov>
Date: Mon, Nov 27, 2017 at 3:10 PM
Subject: Re: PB Memo this week - 171 Auburn- Lyseth Moore School access and pkg improvments
To: Jean Fraser <jf@portlandmaine.gov>
Cc: Jeremiah Bartlett <jbartlett@portlandmaine.gov>, "Errico, Thomas" <thomas.errico@tylin.com>, Keith Gray <kgray@portlandmaine.gov>, "Hyman, Bruce" <bhyman@portlandmaine.gov>, Robert Thompson <rmt@portlandmaine.gov>

Jean,

I am fine with the changes that have been made on the memo and on the plans. Unless Mike Thompson has any other concerns or issues the changes proposed are acceptable to the Fire Dept.

Thank you,
Keith

On Mon, Nov 27, 2017 at 12:41 PM, Jean Fraser <jf@portlandmaine.gov> wrote:
Thank you Jeremiah

On Mon, Nov 27, 2017 at 11:40 AM, Jeremiah Bartlett <jbartlett@portlandmaine.gov> wrote:

Public Works staff have examined speed issues and parking issues in the area of Bartley Avenue and Junior Street. The studies indicate that there are no crashes and speeds are under the legal speed of 25 miles per hour. In early 2017, the City Council approved no parking along Junior Street to avoid potential blocking of driveways.

Additional observations were made of school activities the morning of November 3rd, 2017. No illegal parking was observed, nor speeding, nor blocking of home driveways.

Fwd: PB Memo this week - 171 Auburn- Lyseth Moore School access and pkg improvments

1 message

Jean Fraser <jf@portlandmaine.gov>
To: "Fraser, Jean" <jf@portlandmaine.gov>

Thu, Nov 30, 2017 at 5:57 PM

From: **Jeremiah Bartlett** <jbartlett@portlandmaine.gov>

Date: Mon, Nov 27, 2017 at 11:40 AM

Subject: Re: PB Memo this week - 171 Auburn- Lyseth Moore School access and pkg improvments

To: Jean Fraser <jf@portlandmaine.gov>

Cc: "Errico, Thomas" <thomas.errico@tylin.com>, Keith Gray

<kgray@portlandmaine.gov>, "Gautreau, Keith" <kng@portlandmaine.gov>, "Hyman, Bruce" <bhyman@portlandmaine.gov>

Public Works staff have examined speed issues and parking issues in the area of Bartley Avenue and Junior Street. The studies indicate that there are no crashes and speeds are under the legal speed of 25 miles per hour. In early 2017, the City Council approved no parking along Junior Street to avoid potential blocking of driveways.

Additional observations were made of school activities the morning of November 3rd, 2017. No illegal parking was observed, nor speeding, nor blocking of home driveways.

Based on the observed counts, closing Junior Street to through traffic would add significant activity to the traffic signal at Auburn Street and the school driveway, which may have an adverse impact to movement along this key arterial. As such, closure is not recommended at this time.

Jeremiah J. Bartlett, PE, PTOE
Transportation Systems Engineer
Department of Public Works
City of Portland, Maine
jbartlett@portlandmaine.gov



Jean Fraser <jf@portlandmaine.gov>

Fwd: PB Memo for Lyseth Moore improvements (171 Auburn)

1 message

Jean Fraser <jf@portlandmaine.gov>
To: "Fraser, Jean" <jf@portlandmaine.gov>

Fri, Dec 1, 2017 at 9:22 AM

From: **Jeff Tarling** <jst@portlandmaine.gov>
Date: Fri, Dec 1, 2017 at 8:04 AM
Subject: Re: PB Memo for Lyseth Moore improvements (171 Auburn)
To: Jean Fraser <jf@portlandmaine.gov>

Jean -

The Lyman Moore tree and landscape plans have been updated per our recommendations. Overall the landscape plan should be a positive addition to the proposed project and both schools.

Thanks

Jeff

Jeff Tarling
City Arborist - City of Portland Maine
Parks, Recreation & Facilities Department
Forestry & Horticulture
[212 Canco Road](#)
[Portland, ME. 04103](#)
[\(207\) 808-5446](#)
jst@portlandmaine.gov



Jean Fraser <jf@portlandmaine.gov>

Fwd: 171 Auburn- Lyseth Moore School Imps

1 message

Jean Fraser <jf@portlandmaine.gov>
To: "Fraser, Jean" <jf@portlandmaine.gov>

Fri, Dec 1, 2017 at 1:22 PM

From: **Keith Gray** <kgray@portlandmaine.gov>
Date: Fri, Dec 1, 2017 at 12:46 PM
Subject: Re: 171 Auburn- Lyseth Moore School Imps
To: Jean Fraser <jf@portlandmaine.gov>

Hello Jean,

The applicant has mainly integrated staff comments as discussed at our meeting. An area that is still of concern is the intersection where passenger cars turn across the bus lane to enter the parking lots located around the ball field. The sidewalk connection/orientation at this location is also indirect and unlikely to be followed. Has the applicant looked at any other options for traffic flow in this area?

Thank you,
Keith

Safe Routes to School:

School Travel Plan for Lyman Moore Middle School and Harrison Lyseth Elementary School Campus Portland, Maine

A Report Outlining Recommendations from Extensive Community Input
and Neighborhood Assessments



This report was completed by the Portland District Safe Routes to School Committee, composed of representatives from the Maine Safe Routes to School Program, Portland Public Schools, the City of Portland, the Bicycle Coalition of Maine, Portland Trails, the Greater Portland Council of Governments, and MaineDOT

June 2011

Table of Contents

	Page(s)
Executive Summary	1-2
The Portland Safe Routes to School Program	1
Ten Priority Recommendations	1
Next Steps: Implementation	2
Safe Routes to School: The Full Report	3-13
Background on Safe Routes to School	3
Evaluation and Community Input	4
School Location and Neighborhood Description	5
Student Travel Characteristics	5
Recommendations	5
In-Depth Description of Issues	6
Evaluation and Engineering	6
Enforcement	6
Education	6
Encouragement	6
Implementation	7
Evaluation	13

Appendix I

Portland Safe Routes Committee and
School Administration

Appendix II

June 2010 Harrison Lyseth & Lyman Moore
Student Tally Reports

Appendix III

Lyseth Parent Survey

Appendix IV

Lyman Moore Parent Survey

Appendix V

Lyseth & Lyman Moore Staff Survey

Appendix VI

General Raw Data from Various Stakeholders
& Public Forum

Appendix VII

Pedestrian & Bicyclist Crashes Map

Appendix VIII

Lyseth-Moore Campus Deficiencies/
Recommendations Map

Appendix IX

Deficiencies/Recommendations Map of
Larger Community Area Surrounding Schools

Appendix X

Recommendations - Full Spreadsheet



Executive Summary

The Portland Safe Routes to School Program

The purpose of the Portland Safe Routes to School Program is to improve bicycle and pedestrian safety for students, families, and staff and to encourage more walking and biking to school in Portland. These activities improve academic performance, student behavior and self-confidence. Walking and biking to school also reduce traffic congestion, childhood obesity, busing costs, and air pollution.

The Maine Department of Transportation (MaineDOT), in partnership with the Bicycle Coalition of Maine, provides Safe Routes to School technical and program support to schools and communities. This federal, state and locally funded initiative promotes safe walking and bicycling for Maine's school children. Locally, Safe Routes to School work is facilitated by the Portland District Safe Routes Committee, which includes representatives from the Maine Safe Routes to School Program, Greater Portland Council of Governments, Portland Public Schools, City of Portland, Portland Trails, and the Bicycle Coalition of Maine.

Harrison Lyseth Elementary and Lyman Moore Middle Schools were selected by the Portland District Safe Routes Committee to serve as the pilot campus for a School Travel Plan process. Using the Safe Routes 5 E's framework (Evaluation, Engineering, Enforcement, Education, and Encouragement), the School Travel Plan process evaluates:

- current pedestrian and bicycling travel activity
- physical bicycle and pedestrian infrastructure
- school and community attitudes and concerns regarding walking and biking to school.

The Lyseth-Moore School Travel Plan process relied on parent, staff, and community surveys, key informant and stakeholder meetings, extensive research, and evaluation of existing infrastructure conditions to develop recommended improvements at Lyseth and Lyman Moore. The School Travel Plan then made a prioritized list of recommendations and implementation strategies to increase safe bicycle and pedestrian access and boost the numbers of students safely walking and biking to the Lyseth-Moore campus.

Ten Priority Recommendations

The School Travel Plan process resulted in the development of a "top ten" list of recommendations for the Harrison Lyseth Elementary and Lyman Moore Middle School Travel Plan. The 'top ten' recommendations are presented within the 5 'E's framework. These recommendations are:

Engineering:

- Drop-Off/Pick-Up Area: Redesign of campus Drop-Off/ Pick-Up Zone (incorporating remote drop-off/pick-up locations)
- Bike Parking: Relocate and add more racks to encourage use and reduce risk of theft and vandalism
- Crossings: Install/ enhance crosswalks and/or student crossing signage
- Sidewalks: Construct Missing Priority Sidewalk Links

Enforcement:

- Crossings: Locate Crossing Guard at Allen Avenue and Bramblewood Dr./Virginia St.
- Winter Access: City enforcement and maintenance of sidewalks and paths
- Speed Enforcement: Local law enforcement to use speed trailers twice a school year and practice speed enforcement

Education:

- Annual Bicycle-Pedestrian Safety Education Program

Encouragement:

- Walkpools: Organize walkpools/bike train groups (adult-led groups for younger students; peer groups for middle school students)
- Incentives: Organize encouragement campaigns and incentives for students and staff to walk and bike to school as well as to afternoon and evening events.

The fifth “E” is Evaluation. School communities are encouraged to reevaluate these recommended initiatives as needed to insure momentum and continued progress toward achieving their desired goals.

The Next Steps: Implementation

The final element of the School Travel Plan includes implementation strategies for the ‘top ten’ recommendations. These strategies provide schools with a basic framework, intended to be a starting point upon which each school community can build its own Safe Routes to School Team. Ultimately, it is the responsibility of each school community to continue the momentum generated by the District Safe Routes Committee – organizing school and community resources to work together to implement the recommendations and address the priority issues raised.



Safe Routes to School: The Full Report

Background on Safe Routes to School

Through the 5 E's, a variety of evaluation, education, encouragement, enforcement, and engineering strategies, the Safe Routes to School Program seeks to help local communities make walking and biking to school a safe and routine activity.

In the last 30 years there has been a sharp decline in the number of children walking and biking to school. At the same time, we have a similar increase in obesity rates and related comorbidities among children. According to the Centers for Disease Control and Prevention, fewer than 16 percent of children ages 5 to 15 walk or bicycle to school, compared with 48 percent three decades ago. More parents are choosing to drive their children to school, citing factors like longer distances to school and a lack of adequate safe walking and bicycling infrastructure (which is due in part to the growth of automobile-centric neighborhoods and suburbs). As motor vehicle traffic and speed increases, parents conclude that conditions are even more unsafe for their children to walk or bicycle to school. It becomes a self-sustaining, self-perpetuating cycle – communities are citing as safety issues what they and their automobiles are partly responsible for creating.



The Maine Department of Transportation (MaineDOT) began Safe Routes to School research and programming in 2001, based on work done in California, New York and other countries. In 2005, Safe Routes to School became a federal program. MaineDOT, in partnership with the Bicycle Coalition of Maine, provides Safe Routes to School technical support and consultation to schools and communities. To date, Maine Safe Routes to School has worked with more than 200 schools to encourage walking and biking and has assisted in funding infrastructure improvements - such as sidewalks, signage, and traffic calming treatments - in more than 30 communities to make walking and bicycling safer.

The Benefits of Walking and Biking to School

Walking and biking to school has been linked to the following benefits:

- Improved academic performance and class-room behavior
- Reduction in traffic congestion and vehicle speed near schools
- Increased physical activity, improvements in health status, and reduction in obesity-related health concerns
- Reduction in busing costs for school districts
- Reduction in air pollution (and associated child respiratory effects) and fewer greenhouse gas emissions
- Improved social networks between students – also between adults and students
- Building of student independence and self-confidence
- Reclamation of community streets so that they are safer for walking and bicycling for all users

School Travel Plan

Evaluation and Community Input

Part of Maine Safe Routes to School's work involves facilitating the development of School Travel Plans in different communities – to address traffic congestion and ultimately boost the number of students who can safely walk and bike to school.



In 2010, the Maine Safe Routes to School Program - in partnership with the Portland Public Schools, the City of Portland, the Bicycle Coalition of Maine, Portland Trails and the Greater Portland Council of Governments - assembled a Portland District Safe Routes to School Committee. The initial goal of this committee was to identify elements of the physical environment, community attitudes, and safety issues impeding students' ability to walk and bike to schools in the City of Portland. Harrison Lyseth Elementary and Lyman Moore Middle Schools were chosen by the committee to be the pilot campus for a School Travel Plan process.

The recommendations in this report are a true collaboration among many interested groups, and were developed from information gathered using the following tools:

- Site Observations & Evaluation
- Infrastructure Inventory & Assessment
- Classroom Walk & Bike Tallies
- Outreach & Feedback from Local Stakeholders
- Parent & Staff Surveys
- Multiple Public Forums
- Presentation of Draft Recommendations to Stakeholders for Edits/Suggestions

Students, families, staff, community residents, business owners, and experts identified barriers to students walking and biking – as well as potential solutions to these barriers.

Subsequently, the School Travel Plan produced recommendations and strategies to improve safety, and ultimately encourage more children to walk and bike to school - including:

- Analysis of current policies that impact travel at and near the school
- Recommendations to decrease the volume of automobile traffic on and near the site
- Suggestions for bicycle and pedestrian infrastructure improvements
- Encouragement strategies for students and staff to walk and bike
- Recommendations for designated safe walk and bike routes to the schools
- Additional recommendations for work on:
 - safety education programs
 - traffic law enforcement
 - organizing walkpools and bike trains

Once this pilot program's process is assessed and made as effective and efficient as possible, the Portland Safe Routes to School Committee plans to offer technical assistance to all K-8 grade schools in Portland to conduct their own individual School Travel Plans.



School Location and Neighborhood Description

Lyman Moore Middle School and Harrison Lyseth Elementary School are located at 171 and 175 Auburn Street, in the North Deering neighborhood of Portland, Maine. The schools are situated adjacent to one another in a campus setting. Lyseth Elementary is on the north end of the parcel and Lyman Moore is along the southern end. The driveway entrance to the schools is on the eastern side of Auburn Street, a busy road that includes a mix of residential, institutional, and commercial uses. It is just north of the intersections of Auburn Street with Allen Ave. and Washington Avenue. The campus is adjacent to significant residential areas located both to the north and east of the campus. Another heavily residential area lies west across Washington Avenue. Lyseth has 489 students and 75 staff members; Lyman Moore has 552 students and 75 staff members.

Current Student Travel Characteristics

At Harrison Lyseth Elementary, 263 out of 489 (54%) students are eligible for bus transportation. This figure includes kindergarten students who live more than a half mile from school, students in grades 1-5 residing more than one mile from the school, and students residing within these ‘walkout’ distances (but because of dangerous intersections, lack of sidewalks or other safety concerns the school district has determined that these students should be “hazard” bused).



In June 2010, a Student Travel Tally Report (Appendix III) was conducted among the students in both schools. The survey asked students which mode of transportation they took to and from school over a three day period. At Harrison Lyseth, although 52% of students are eligible for bus transportation, the highest category each day (and overall) was parent drop off/pick up (44% AM, 38% PM). The school bus ranked a distant second (35% AM and PM), walking was third (16% AM, 22% PM), biking and carpooling were fourth (both AM/PM about 2%), and public transportation registered 0%. These results clearly indicate many students residing within the walking perimeter are traveling to and from school in a family vehicle.

At Lyman Moore, although the modes were more evenly distributed, results revealed similar trends. On average, the numbers of walkers and bus riders were fairly equivalent. However, the results show more students walk in the afternoon than in the morning. Additionally, the results for the family vehicle option show a higher percentage of drop offs in the morning than the afternoon. These results would indicate that many Lyman Moore students are dropped off by a parent in the morning but walk home in the afternoon. This pattern is important because it clearly demonstrates that Lyman Moore students are able and willing to walk, but many are still dropped off by a family vehicle before school. These vehicle trips add to the congestion and safety issues experienced on campus in the morning and afternoon drop off/pick up times and this pattern demonstrates that the volume could easily be reduced.

Recommendations:

This School Travel Plan process - after pursuing an extensive feedback process that incorporated comments from students, parents, school staff, school administrators, local business people, and representatives from neighborhood organizations –has resulted in this report, including a “top ten” list of recommendations for the Harrison Lyseth Elementary and Lyman Moore Middle School Travel Plan. The following are the “Top Ten” Recommendations as they relate to the Five E’s of the Safe Routes to School Program: evaluation, engineering, enforcement, education, and encouragement strategies.

Quick List of Top Ten Recommendations

Evaluation & Engineering:

- Redesign of Campus Drop Off/ Pick Up Zone (incorporating remote drop off/pick up locations)
- Bike Parking: Relocate and add more racks to encourage use and reduce risk of theft and vandalism.
- Install/ Enhance Crosswalks and/or student crossing signage
- Sidewalks: Construct Missing Priority Sidewalk Links

Enforcement

- Crossings: Locate Crossing Guard at Allen Avenue and Bramblewood Dr./ Virginia St..
- Winter: Enforcement of maintenance of sidewalks and paths.
- Speed Enforcement: Use speed trailers twice a school year and practice speed enforcement (local police).

Education

- Annual Bicycle-Pedestrian Safety Education Program

Encouragement

- Walkpools: Organize walkpools/ bike train groups (adult-led groups for younger students; Peer groups for middle school students).
- Incentives: Organize encouragement campaigns and incentives for students and staff to walk and bike to school as well as afternoon/evening events.



In-Depth Description of Issues and Details Pertaining to Top Ten Recommendations

Evaluation & Engineering Campus Redesign:

Both Harrison Lyseth Elementary and Lyman Moore Middle School share a single campus and are served by the same driveway connecting to Auburn Street, turnaround areas, and parking areas. A secondary point of access to the campus is located on the north side of the campus along Junior Street, circulating traffic through an adjacent residential neighborhood. Many student walkers and bikers also use Junior Street as an entry/exit to the campus to avoid the Auburn Street entry.

Elementary School parents arriving by car at the school enter from either Auburn Street or Junior Street and continue down the driveway (Lyseth Moore Drive) to the Lyseth School turnaround, drop off/pick up their child in front of the school, and then either exit directly to Auburn Street or take Junior Street to Bartley Street to Auburn Avenue. Middle School parents follow a similar traffic circulation; however, they tend to enter from Auburn Avenue and exit via Junior Street or directly back to Auburn Avenue. The flow of traffic circulating through the campus is not well coordinated. There is little striping, and what exists is faded, or covered with snow, salt and sand most of the year. The pavement is in very poor condition, creating large potholes and other driving obstructions, and will have to be resurfaced in the next few years.

There appears to be no formal “pick up/drop off” policy for either school, and the entire area is poorly served by signage, curb cuts, or road surface markings to indicate appropriate traffic flow. During high volume times, particularly morning drop off, there can be a mix of pedestrian, bicycle, vehicle, and bus activity. The unofficial “Parent Drop-Off Area” is located in the center of the bus turnarounds, forcing children to cross in front of buses and vehicle traffic. Additionally, parents cannot see their children until they have already crossed traffic. This creates a chaotic situation in which parents may exit vehicles or move vehicles to try to locate a child. This also results in a particularly dangerous situation for students who must navigate across the busy driveway to and from the school.

Recommendations:

This is perhaps the highest priority of administrators, parents, students and staff - all having expressed strong concerns about the campus layout, parent drop off, and traffic circulation challenges. Based on this extensive input, this report suggests several possible traffic circulation improvements for the “pick up/ drop off” area. However, these solutions are short-term safety improvements. Ultimately, the preferred alternative for this area is a complete infrastructure redesign. In the meantime, designating one location for parent pick-up and drop-off, and a separate location for school bus pick-up and drop-off may improve the safety of the current situation. Additionally, creating remote drop off locations adjacent to campus, potentially staffed by parent volunteers, will divert a significant amount of parent vehicle traffic from campus. Finally, removing some of the unneeded paved areas and replacing this paved surface with additional green space will reduce the chaos of the current circulation plan, keeping vehicles and buses visible and moving in a more predictable circulation. Creating additional green space at the front of the campus will also improve its general curb appeal and enhance it as a safe destination for walkers and bikers.



Bicycle Facilities:

Bicycle racks are inadequate and overcrowded or bicyclist activity far exceeds the available infrastructure to store bicycles. Existing racks are located in the courtyard of Lyseth and to the west side of Lyman Moore. Due to the severe lack of bicycle racks, students also secure bikes anywhere possible around campus. A major complaint from the older Lyseth students is that they don't like to walk through the younger students playing in the courtyard to reach the racks. Moore students also have concerns about theft and vandalism to bicycles.

There are designated bicycles lanes located in front of the campus on Auburn Street. These lanes are part of a discontinuous segment of bike lanes that end prior to reaching Allen Avenue to the south and Exit 10 on I-295 to the north. Currently there is not enough street right-of-way to add additional bike lanes near the campus.

Recommendations:

This report suggests relocating and adding more bike parking to encourage increased use and reduced risk of theft and vandalism.

Crosswalks/Sidewalks:

Beyond the campus, there are many missing sidewalk and crosswalk links, as well as locations where an additional crossing guide could increase safety. Consistently heard through this planning process was that a primary deterrent to walking is the lack of safe pedestrian facilities. Through infrastructure observations several priority missing sidewalk links were identified.

Recommendations:

To improve safety and enable more parents to allow more walking to school, priority sidewalk links that are missing should be constructed along Washington Avenue Extension, Auburn, Junior, Pineloch, Ray, and Virginia Streets. Locations where crosswalks are missing or should be enhanced, and/or student crossing signage should be added include Junior Street (at Lyseth Moore Drive), Washington Avenue Extension (various intersections), Allen Avenue (various intersections), Auburn Street, and the intersection of Washington and Allen Avenue. Additionally, feedback from stakeholders has clearly indicated a Crossing Guide should be located at Allen Avenue where it intersects with Bramblewood Dr. and Virginia St..



Enforcement

Portland Police currently run intermittent traffic enforcement patrols near the Lyseth-Moore campus, especially on heavier trafficked streets. Four crossing guides are in place at three locations: two on Auburn Street directly in front of the school (per Planning Board requirements for installation of the new traffic signal), one at Sumac and Summit, and one at Washington Ave. Extension and Regan. There were a number of requests for a crossing guide at the intersection of Allen Ave. and Bramblewood/Virginia, as well as at other locations in the neighborhood. Students, staff, and families reported through surveys and public forums great difficulty navigating sidewalks that haven't been shoveled in the winter months and deep concerns about student safety when they have to walk along neighborhood streets, sandwiched between passing vehicle traffic and large snow banks.

Recommendations:

This report recommends a Crossing Guide be located at Allen Avenue and Bramblewood/Virginia. Also recommended is that the City of Portland do more concerted enforcement of winter sidewalk maintenance. In addition, community members suggested that the campus conduct a “doorknob” flyer and signage campaign reminding neighbors to clear sidewalks and all commuters to drive especially carefully in the area of the campus in the winter months. Local law enforcement is also encouraged to use speed trailers twice a school year on each of the main streets surrounding the campus and practice speed enforcement campaigns at least twice a year as well.

**Education**

Currently there is only intermittent bicycle and pedestrian safety education done by Physical Education staff at both schools, sometimes on a seasonal basis. Elementary physical education staff especially are also time-limited each week with what they can offer.

Recommendations:

This report recommends both schools adopt and support an annual Bicycle and Pedestrian Safety Education Program – using no-cost presentations and resources through the Bicycle Coalition of Maine and MaineDOT. This should include Bike-Ped Safety Education presentations at least once a year via school assemblies and/or in-class time. This Plan also supports Lyman Moore physical education staff who are interested in starting a spring Bike Club through the Bicycle Coalition for 6th grade students (who are currently not allowed to participate in spring sports).

Encouragement

Both schools have demonstrated enthusiasm for encouragement tools to increase the number of students and staff safely walking and biking to the campus. Currently there are no formal encouragement strategies in place – although there is at least one informal parent-led walkpool – or walking school bus - at Lyseth.

Recommendations:

This report recommends the school community help organize Walkpools (a.k.a. Walking School Buses) to help students get to school. These should be adult-led groups for younger students – with adult leaders switching off to share the responsibility day-to-day. At Lyman Moore the formation of peer Walkpools (without heavy adult supervision) is suggested to increase the likelihood that students will take part and so that students can walk in a group together. This report also strongly supports any efforts by the school community to organize encouragement campaigns and incentives for students and staff to walk and bike to school - as well as to afternoon and evening events on campus.

Implementation Strategies

This report has developed implementation strategies for each of the ten recommendations listed above. These strategies offer a framework upon which the schools can refine and evolve the implementation plan. However, the ultimate success of this initiative will depend on the motivation and leadership within the school communities. Administration, staff, and especially students from both schools will have to initiate, refine, and implement these strategies. And while the District Safe Routes Committee (the authors of this report) should be available for technical assistance, each school’s most valuable resource is its own community.

To achieve success in making improvements the first and most important step for every school community is to form a Safe Routes to School Team. As Lyseth and Lyman-Moore share a campus, and both school administrations worked together with the community and the Portland District Safe Routes Committee to create this travel plan, it's recommended to create one joint campus Safe Routes Team. Regardless of team structure chosen, it is essential to maintain open lines of communication between the two schools, and ensure a unified message and plan. The following strategies were created to facilitate the implementation of the top ten recommendations from the School Travel Plan process.

Recommendation #1-

Improve Campus Layout and Traffic Circulation for Walkers, Bicyclists, Buses, and Autos

Suggested First Steps:

- Educate parents and teachers of the safety issues (flyers, social media, etc.).
- Encourage use of alternate drop-off sites (e.g. parking on nearby streets and walking with students the last couple of blocks to school).
- Encourage teachers and staff to lead by example in walking, bicycling, using public transit, and carpooling.
- Encourage students to create signage promoting alternate transportation modes and drop-offs.
- Campus Safe Routes Team should identify specific circulation issues and possible short and long term solutions for each issue.
- Meet with transportation engineer, School District transportation staff, City Bike-Pedestrian Coordinator, and Campus Safe Routes Team to examine and redesign current campus vehicular and pedestrian traffic circulation.
- Work with Portland Trails to enhance trail access to campus and encourage all trails to be ADA accessible.

Other Suggestions:

- Temporary measures - use cones, paint or other methods to control speed and access.
 - Temporary measures allow experimentation and could provide valuable information before significant money is spent on design/engineering and construction.
 - NOTE: Any alteration of campus circulation should be vetted by transportation professionals, including the Portland School District Transportation Office.
- Work with neighbors, areas businesses and other constituents to create a larger network supporting campus improvements and integration with the surrounding community.
- Develop Campus Master Plan.
 - Consider limiting vehicle access to interior of campus.
 - Consider alternate/satellite parking areas (on and off-campus).
 - Circulation routes should consider current travel routes, including short-cuts and dirt paths through campus. Recognize origins and destinations.
 - Consider multi- use circulation paths (jogging track, access to fields, walking routes, etc.).
 - Take advantage of City plans and funds for pavement re-surfacing.
 - Investigate City Tree Trust and other sources of trees and plants.
 - Consider storm water management, and reduction of impervious areas.
 - Campus re-design has the opportunity to solve safety issues, but also to reflect school culture, improve aesthetics, and improve the environment.

Recommendation #2- Bicycle Parking

- Relocate and add more bicycle racks/parking
- Lyseth: Move one rack to rear (east end) of school for older students:
- Lyman Moore: Move bike parking to both sides of Moore entryway
- Encourage the use of bike locks; Consider starting a simple lock lending/rental library



Recommendation #3 -

Install/Enhance Crosswalks at Key Locations

- Locations identified:
 - Lyseth-Moore Drive and Junior Street
 - Washington Avenue Extension intersections
 - Allen Avenue
 - Auburn Street
 - Washington and Allen Avenue intersection
- For the existing crosswalks at the above locations, further improvements could include:
 - Student crossing signage/signals
 - Curb-extensions to shorten crossing distance and improve visibility for drivers and walkers
 - More visible “block style” or textured/colored crosswalks
 - Raised crosswalks
- Crosswalks other than those on school property need to be requested of the City Crosswalk Committee. Contact Bruce Hyman (Bicycle Pedestrian Coordinator) at 874-8801

Recommendation #4 - Construct Missing Sidewalk Links (See Appendix XX)

- Locations identified:
 - Junior Street
 - Washington Avenue Extension (Lester to Riverside)
 - Auburn Street (Sanborn to Chapman)
 - Auburn Street (Armstrong to Garsoe)
 - Pineloch Street (Summit to Roaring Brook)
 - Ray Street (Merrymeeting to end of street)
 - Virginia Street (Wyoming to Jersey Avenues)
- Sidewalk requests should be directed to the Department of Public Services – Bicycle Pedestrian Coordinator, Bruce Hyman (874-8801), or via the District City Councilor(s).



Recommendation #5 - Add Crossing Guide at Key Location

- Primary location identified is Allen Avenue at Virginia St./Bramblewood Dr.
- Portland Trails has requested and received approval for a new crosswalk on Bramblewood connecting to the paved trail to the Lyseth playground
- Crossing Guides are hired by the City Parking Division. Contact John Peverada at 874-8443.

Recommendation #6 - Winter Enforcement and Maintenance of Sidewalks and Paths

- Coordinate with local businesses, and City of Portland Department of Public Works to ensure they clear snow along as much of the area sidewalks as possible in a timely manner.

- Conduct “door knob” or posted signage campaign at the onset of heavy snowfall to remind neighbors to shovel and all commuters to drive especially carefully.
- If a local resident is unable to shovel and/or cannot afford to hire someone to shovel, mobilize local businesses, neighborhood and school volunteers, and student groups to “adopt a sidewalk/path” and commit to maintaining it throughout the winter months.

Recommendation #7 - Twice Annual Use of Speed Trailers and Speed Enforcement

- Make arrangement with local police to place speed trailers twice during the school year along busy corridors known for excessive speed where students often travel. Also request that local police conduct speed enforcement on high traffic streets twice annually.

Recommendation #8 - Bicycle/Pedestrian Safety Education

- Ideas identified:
 - Host once or twice a year assemblies or in-class (PE/Health) presentations, no cost through the Bicycle Coalition of Maine and MaineDOT
 - Organize Youth Bike Club for Lyman Moore 6th Graders; Utilize school bicycle club coordinator training opportunities through the Bicycle Coalition of Maine (<http://www.bikemaine.org/training> schedule): This training provides the information necessary to launch a six week School (or After School) Bike Club. It covers logistical info on how to identify and work with a school champion, get permissions, manage a group ride of kids, deal with rainy days and includes weekly rides.
 - Hold an annual Bike Rodeo Skills Fair
- All educational presentations/initiatives should include special emphasis on
 - Navigating major intersections
 - Use of neighborhood paths
 - How to enter school grounds
 - Preparation for winter walking and biking
- Other considerations and ideas:
 - Raise money to purchase bike helmets to use during the bike education events – recommend only purchase helmets with turn-rings in the back for easy adjustments. Contact Maine Safe Routes to School (Sarah Cushman, 841-7186, sarah@sarahcushman.com) for ideas for where to purchase. Also pursue local donations through the Kiwanis Club.
 - Two Lyseth/Lyman Moore “safer” walking routes have been identified and directional signage will be placed by Healthy Portland, most likely in Summer of 2011. Schools could use this opportunity to encourage students and educate drivers about students walking and biking to school.
 - Connect with Maine Safe Routes to School Program for mini-grant opportunities (Sarah Cushman, 841-7186, sarah@sarahcushman.com)
 - Connect with Healthy Portland for mini-grant opportunities (Joan Ingram, 541-6954 – jbi@portlandmaine.gov)

Recommendation #9 – Organize Walkpools & Bike Trains

- Organize adult-led walkpools (walking school buses) for Lyseth students and peer walkpools for Lyman Moore students – as well as adult-led Bike Trains for both schools. (Contact Maine Safe Routes to School Program for technical assistance – Sarah Cushman, 841-7186, sarah@sarahcushman.com)
- Reach out to local businesses and stakeholders for support for walking and/or bike clubs.
- Promote walking school bus “leaders” among the middle school. They could help lead elementary students to school.

Recommendation #10 - Encouragement Campaigns and Incentives

- Offer incentives such as a prize for the students who walk to school a certain number of times/

month (use a frequent walker/bike rider punch card system and have students turn those in when full – see examples from elsewhere: http://www.saferoutesinfo.org/guide/case_studies/case_study.cfm?CS_ID=CS653&CHAPTER_ID=C386).

- Two Lyseth/Lyman Moore “safer” walking routes have been identified and directional signage will be placed by Healthy Portland, most likely in Summer of 2011. Host a “kick-off” event to launch use of the routes. School Safe Routes Team could provide small incentives such as stickers to those who walk to school that day (via any route). (Joan Ingram, 541-6954 – jbi@portlandmaine.gov)
- Offer incentives to staff members who commute actively a certain number of times per month. They can track their own progress with the Maine Green Commuting Data Entry Tool: <http://www.mainebrook.com/GreenStreets/?entry=GS>
- Connect with the Maine Safe Routes to School Program (Sarah Cushman, 841-7186, sarah@sarahcushman.com) and Healthy Portland (Joan Ingram – 541-6954, jbi@portlandmaine.gov) for technical assistance and mini-grant opportunities.

Evaluation

Evaluation is the final step in the process of creating a successful Safe Routes Program. This step should occur on a regular basis to insure progress towards program goals is being made and the program is sustainable. Continued assessment of implementation strategies is essential to identify if adjustments or changes are necessary, or if the issues have changed since the inception of the program. The school should assign a date within the next six months to a year to evaluate progress towards completing the above recommendations.



Safe Routes to School:

School Travel Plan for
Lyman Moore Middle School and
Harrison Lyseth Elementary School Campus
Portland, Maine

APPENDICES I THROUGH X



This report was completed by the Portland District Safe Routes to School Committee, composed of representatives from the Maine Safe Routes to School Program, Portland Public Schools, the City of Portland, the Bicycle Coalition of Maine, Portland Trails, the Greater Portland Council of Governments, and MaineDOT

June 2011

Appendix I- Portland District Safe Routes to School Committee

Sarah Cushman

Southern Maine Planner,
Maine Safe Routes to School Program

Stephanie Carver

Planner,
Greater Portland Council of Governments

Bill Needelman, AICP

Senior Planner, Planning and Urban Development Department,
City of Portland, Maine

Bruce Hyman, AICP

Bicycle and Pedestrian Program Coordinator, Dept. of Public Services,
City of Portland

Joan B. Ingram, MPH

Program Coordinator,
Healthy Portland, A Healthy Maine Partnership,
Portland Public Health & Human Services

Rebecca Shaffner-Touissant

Regional Planner,
Greater Portland Council of Governments

Maryellen Thoma, M.A.

Program Coordinator, Communities Putting Prevention to Work,
Portland Public Schools

Chanda P. Turner, MEd

School Health Coordinator,
Portland Public Schools

Jaime Parker

Trails Manager,
Portland Trails

Jim Tasse, PhD

Education Program Director,
Bicycle Coalition of Maine

School Administrators:

Lyman Moore Middle School

Lee Crocker, Principal

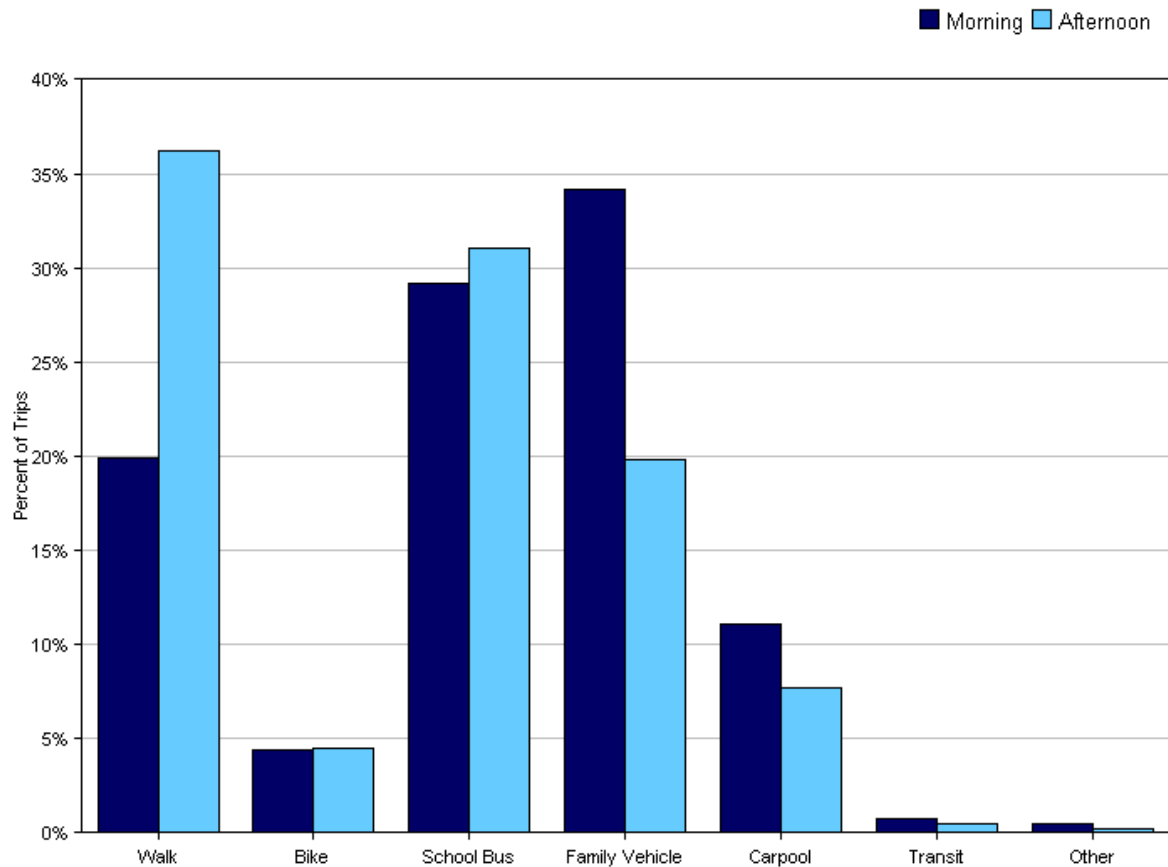
Harrison Lyseth Elementary School

Lenore Williams, Principal

Appendix II – June 2010 Lyman Moore & Harrison Lyseth Student Tally Reports

Program Name:	Portland Safe Routes to School Team	Month and Year collected:	June 2010
School Name:	Lyman Moore Middle	Set ID:	4480
Reported Enrollment:	552	Reported Number of Classrooms:	30
Date Report Generated:	09/29/2010	Number of Classrooms Included in Report:	30

Morning and Afternoon Travel Mode Comparison

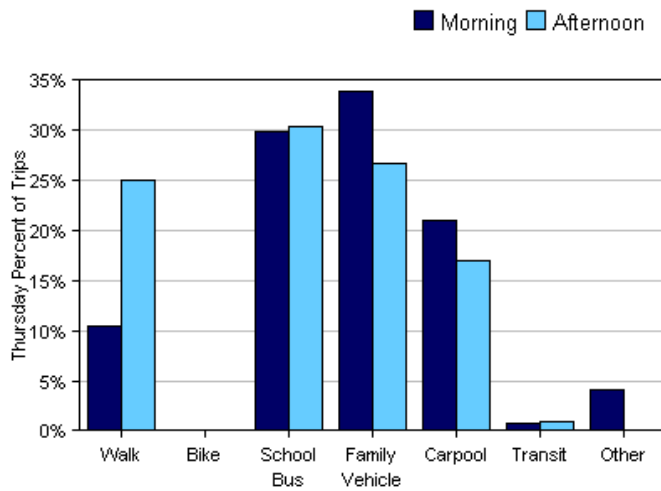
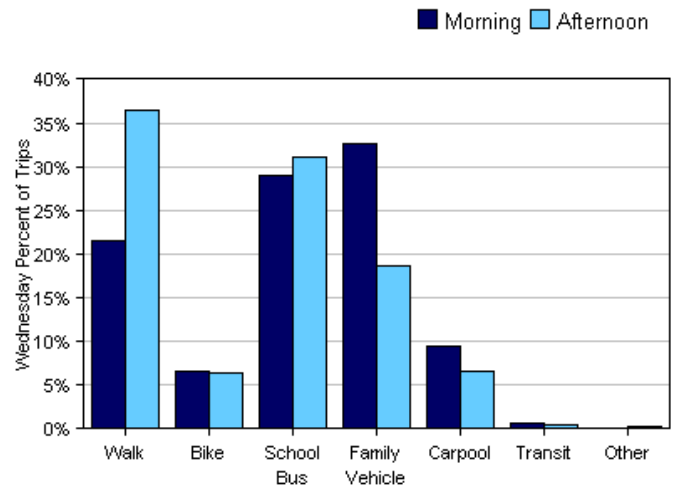
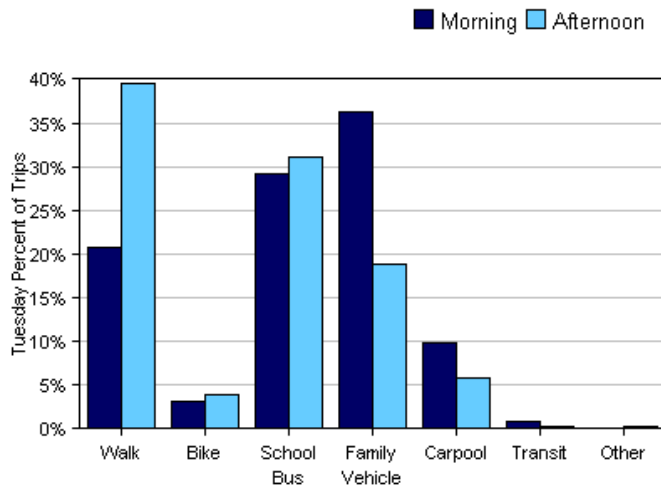


Morning and Afternoon Travel Mode Comparison

	Number of Trips	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Morning	971	20%	4%	29%	34%	11%	0.7%	0.5%
Afternoon	861	36%	5%	31%	20%	8%	0.5%	0.2%

Percentages may not total 100% due to rounding.

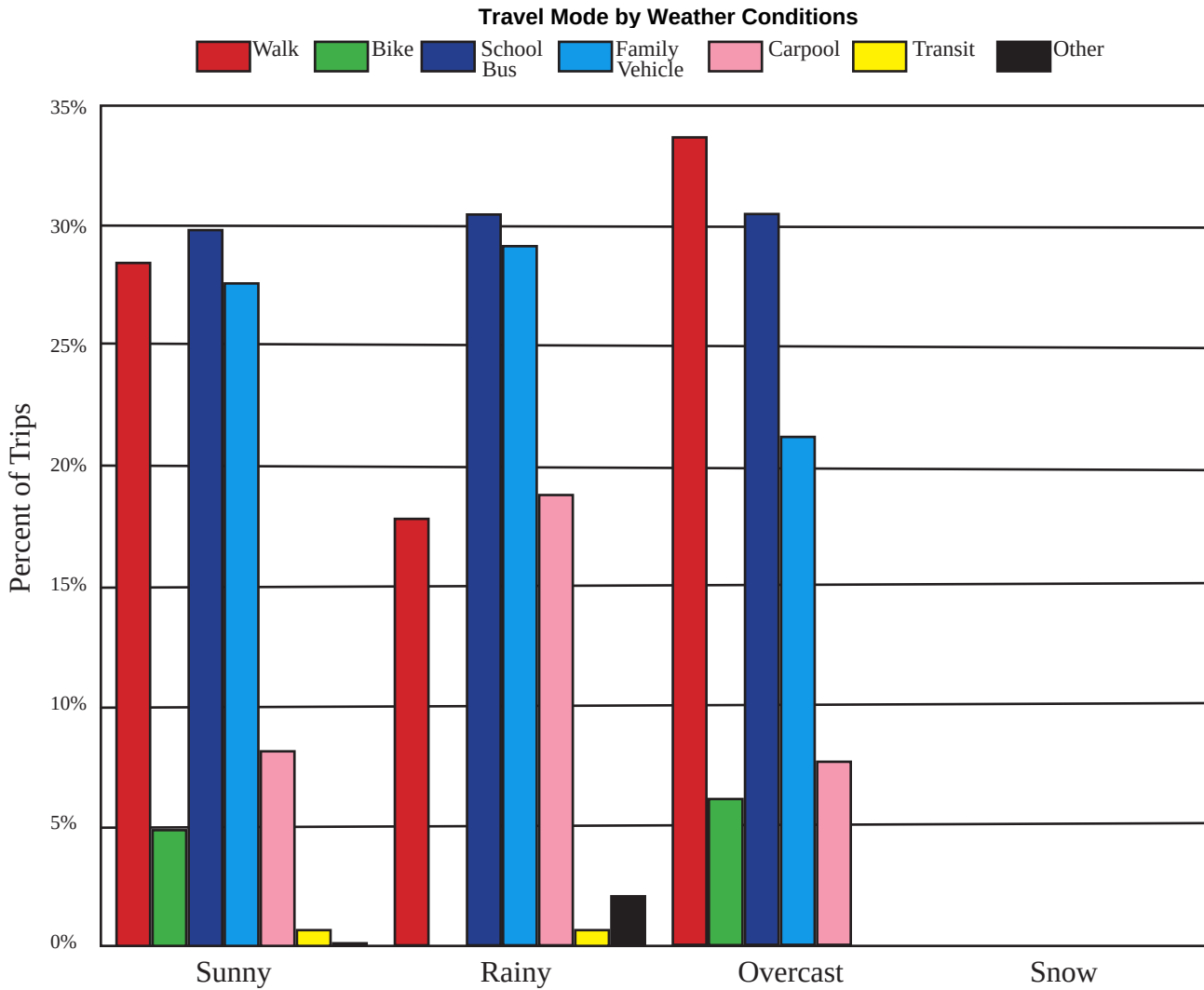
Morning and Afternoon Travel Mode Comparison by Day



Morning and Afternoon Travel Mode Comparison by Day

	Number of Trips	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tuesday AM	384	21%	3%	29%	36%	10%	0.8%	0%
Tuesday PM	354	40%	4%	31%	19%	6%	0.3%	0.3%
Wednesday AM	463	22%	7%	29%	33%	10%	0.6%	0%
Wednesday PM	395	36%	6%	31%	19%	7%	0.5%	0.3%
Thursday AM	124	10%	0%	30%	34%	21%	0.8%	4%
Thursday PM	112	25%	0%	30%	27%	17%	0.9%	0%

Percentages may not total 100% due to rounding.



Travel Mode by Weather Condition

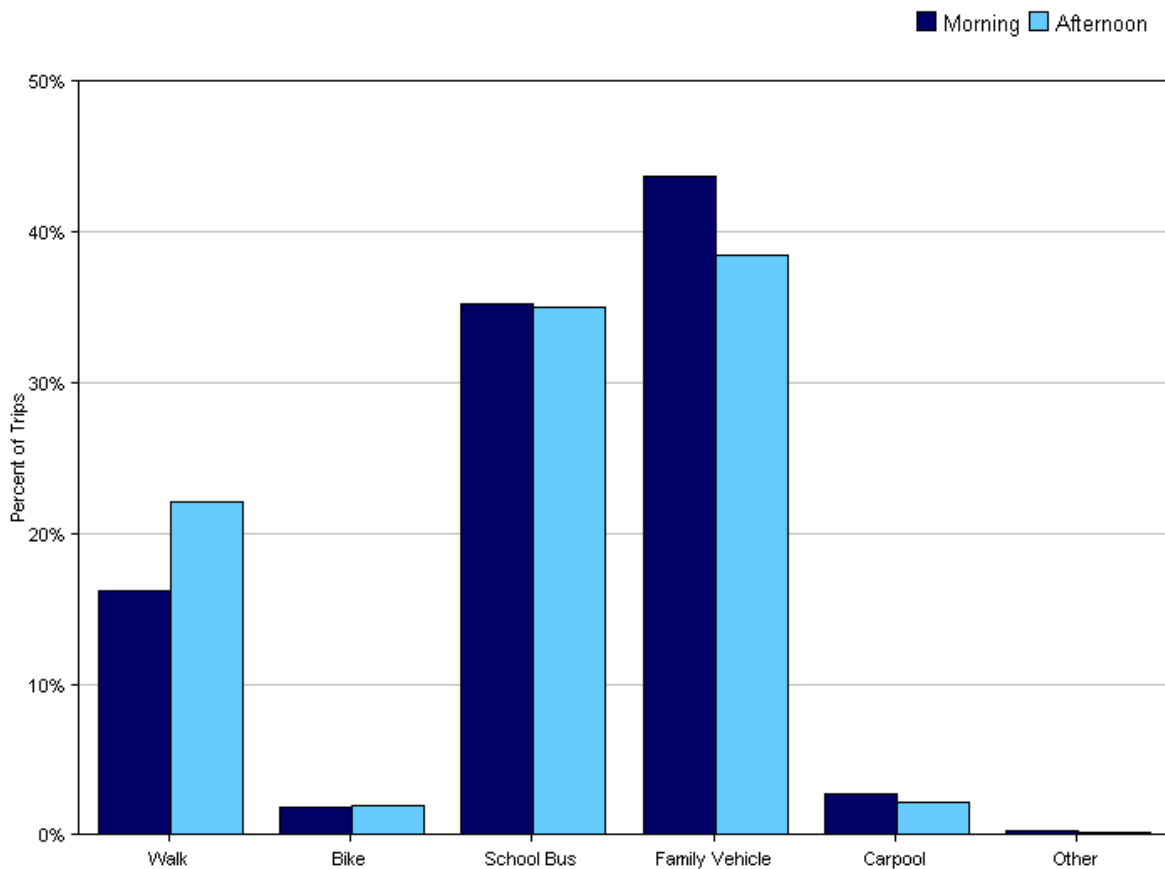
Weather Condition	Number of Trips	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Sunny	1483	28%	5%	30%	28%	8%	0.6%	0.1%
Rainy	222	18%	0%	31%	29%	19%	0.9%	2%
Overcast	127	34%	6%	31%	21%	8%	0%	0%
Snow	0	0%	0%	0%	0%	0%	0%	0%

Percentages may not total 100% due to rounding.

Appendix II – June 2010 Lyseth Student Tally Report

Program Name:	Portland Safe Routes to School Team	Month and Year collected:	June 2010
School Name:	Lyseth Elementary	Set ID:	4479
Reported Enrollment:	500	Reported Number of Classrooms:	22
Date Report Generated:	09/29/2010	Number of Classrooms Included in Report:	22

Morning and Afternoon Travel Mode Comparison

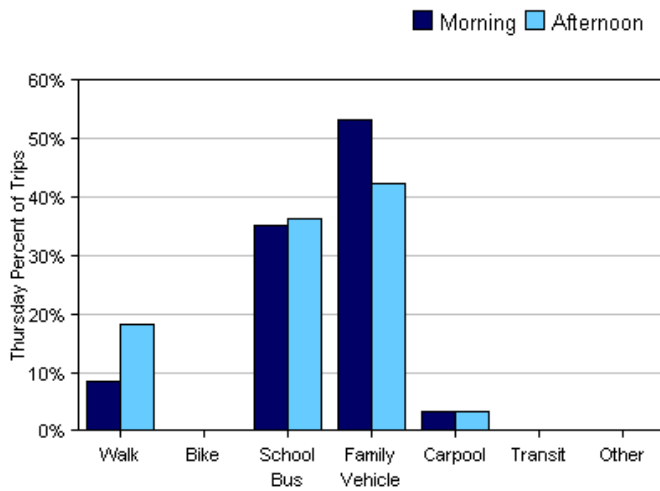
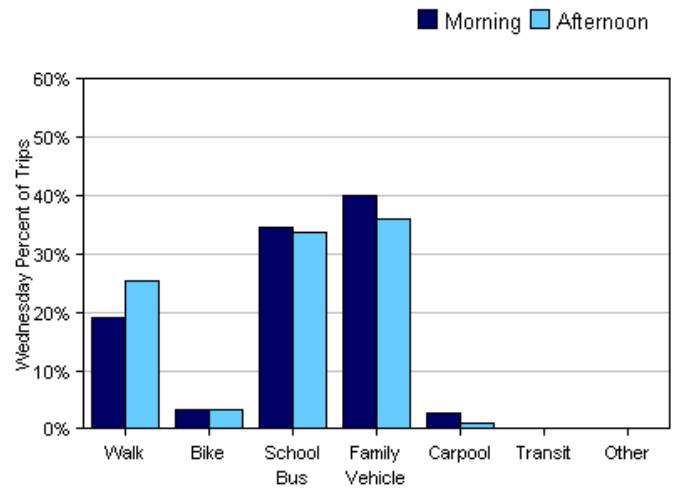
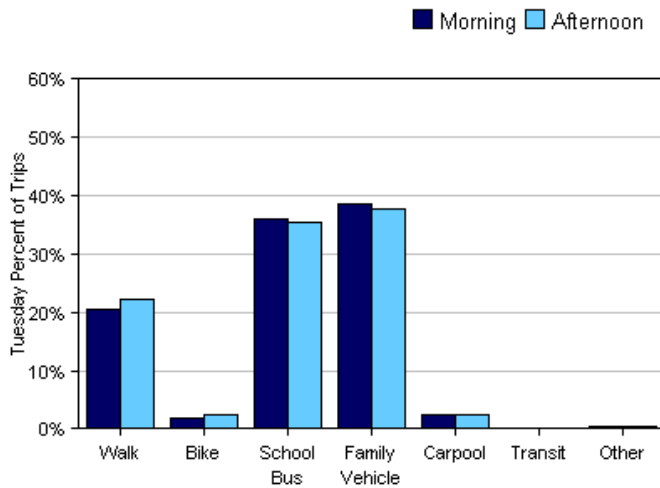


Morning and Afternoon Travel Mode Comparison

	Number of Trips	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Morning	1222	16%	2%	35%	44%	3%	0%	0.2%
Afternoon	998	22%	2%	35%	38%	2%	0%	0.2%

Percentages may not total 100% due to rounding.

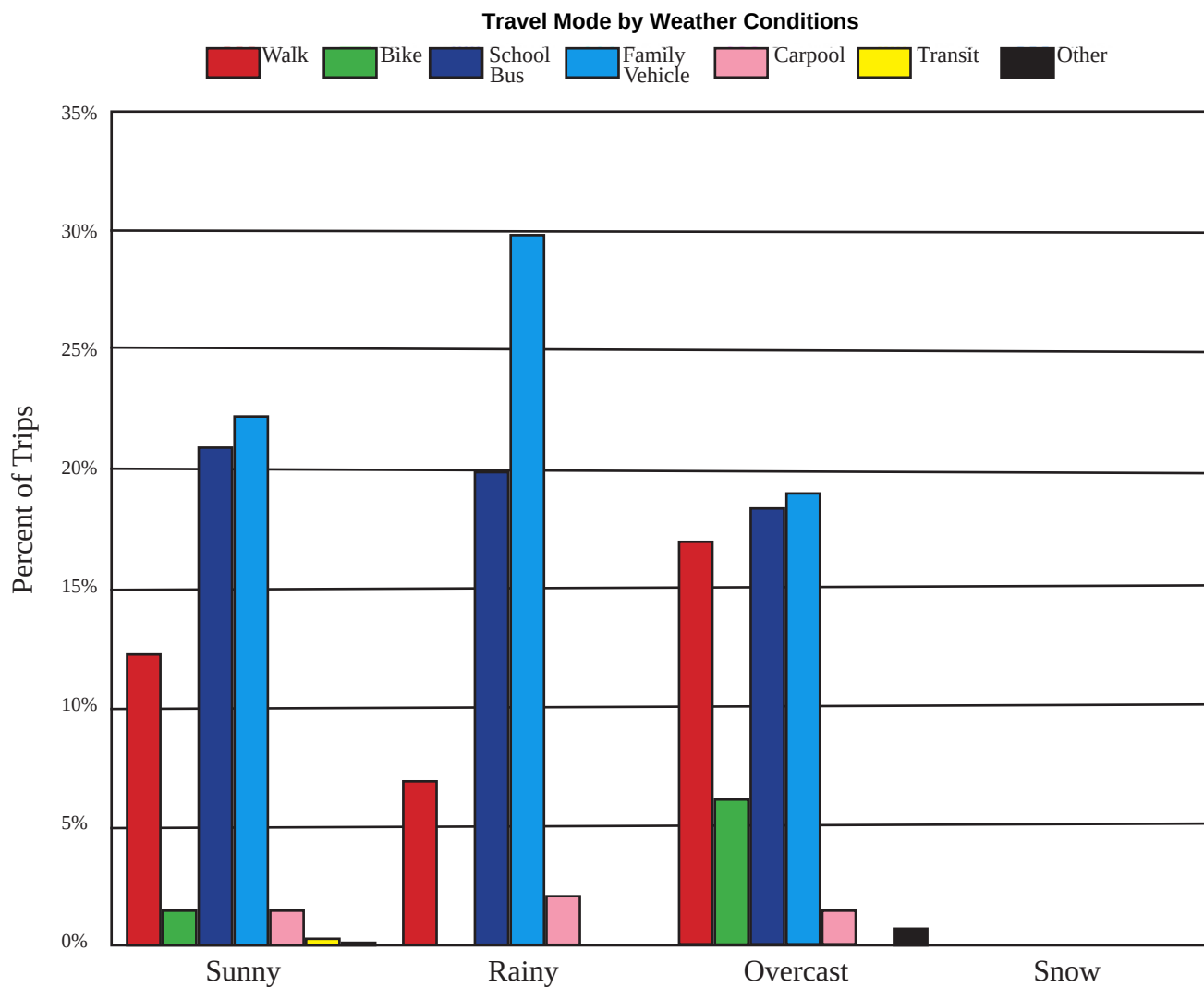
Morning and Afternoon Travel Mode Comparison by Day



Morning and Afternoon Travel Mode Comparison by Day

	Number of Trips	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tuesday AM	405	20%	2%	36%	39%	2%	0%	0.5%
Tuesday PM	348	22%	2%	35%	38%	2%	0%	0.3%
Wednesday AM	438	19%	3%	35%	40%	3%	0%	0.2%
Wednesday PM	357	25%	3%	34%	36%	1%	0%	0.3%
Thursday AM	379	8%	0%	35%	53%	3%	0%	0%
Thursday PM	293	18%	0%	36%	42%	3%	0%	0%

Percentages may not total 100% due to rounding.



Travel Mode by Weather Condition

Weather Condition	Number of Trips	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Sunny	1533	21%	3%	36%	38%	2%	0%	0.3%
Rainy	604	12%	0%	34%	51%	3%	0%	0%
Overcast	83	29%	4%	31%	33%	2%	0%	1%
Snow	0	0%	0%	0%	0%	0%	0%	0%

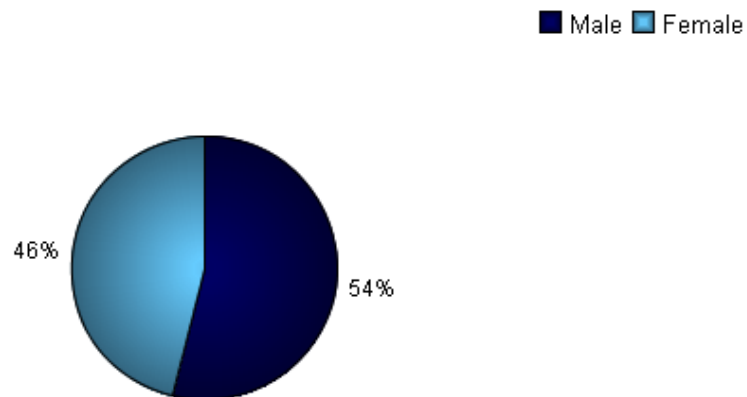
Percentages may not total 100% due to rounding.

Appendix III – Lyseth Parent Survey

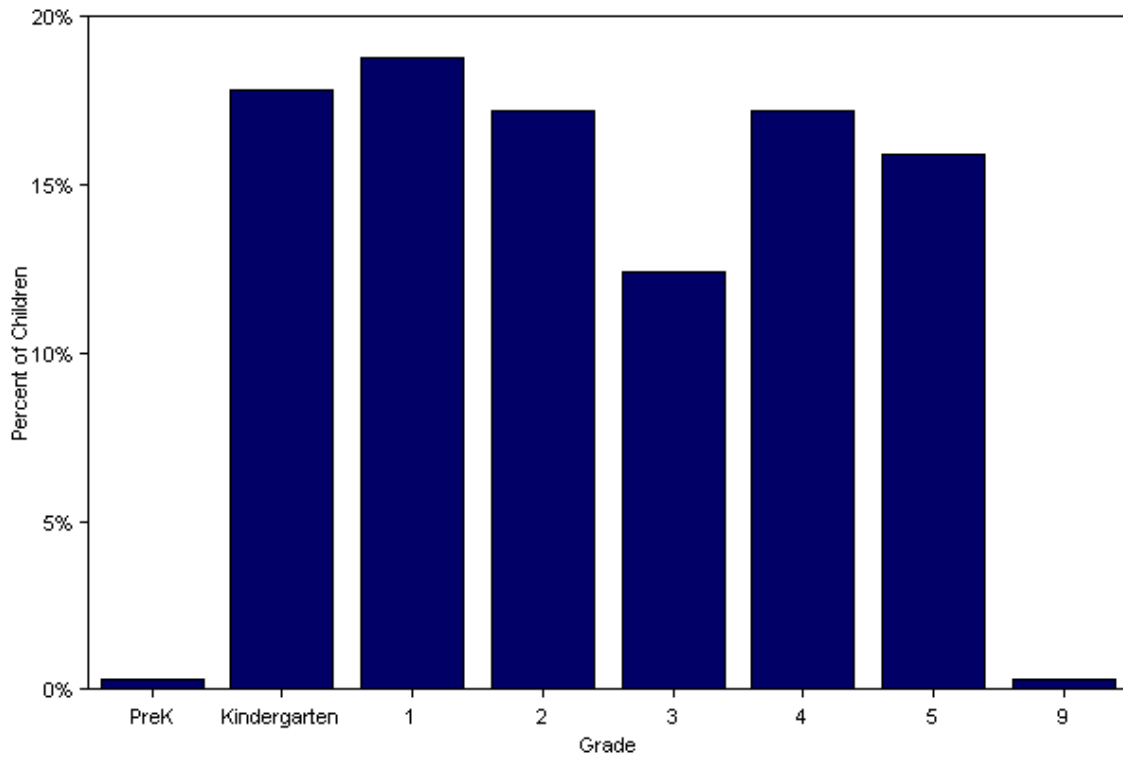
Program Name:	Portland Safe Routes to School Team	Month and Year Collected:	October 2010
School Name:	Lyseth Elementary	Set ID:	4385
School Enrollment:	500	Date Report Generated:	12/09/2010
Enrollment within Grades Targeted by SRTS Program:	500	Number of Questionnaires Analyzed for Report:	320
Number of Questionnaires Distributed:	495		

This report contains information from parents about their children's trip to and from school. The report also reflects parents' perceptions regarding whether walking and bicycling to school is appropriate for their child. The data used in this report were collected using the Survey about Walking and Biking to School for Parents form from the National Center for Safe Routes to School.

Sex of children for parents that provided information



Grade levels of children represented in survey



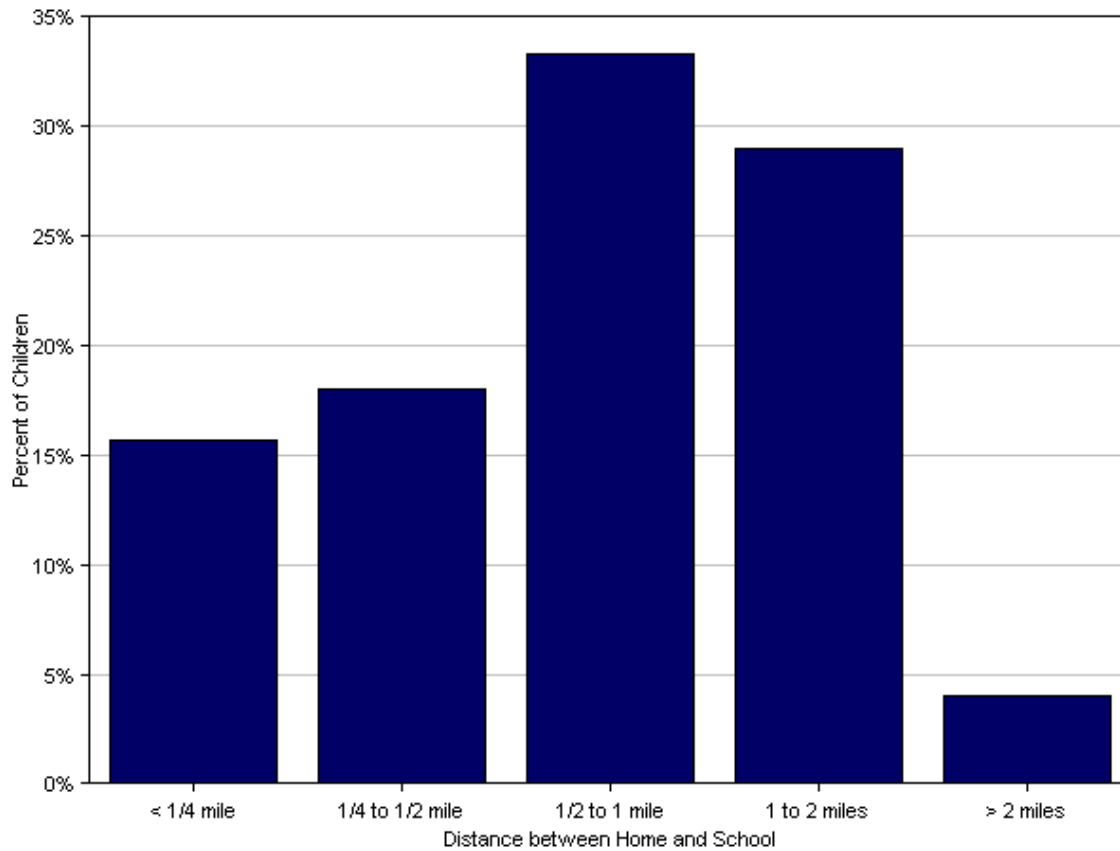
Grade levels of children represented in survey

Grade in School	Responses per grade	
	Number	Percent
Kindergarten	56	18%
1	59	19%
2	54	17%
3	39	12%
4	54	17%
5	50	16%

No response: 0

Percentages may not total 100% due to rounding.

Parent estimate of distance from child's home to school



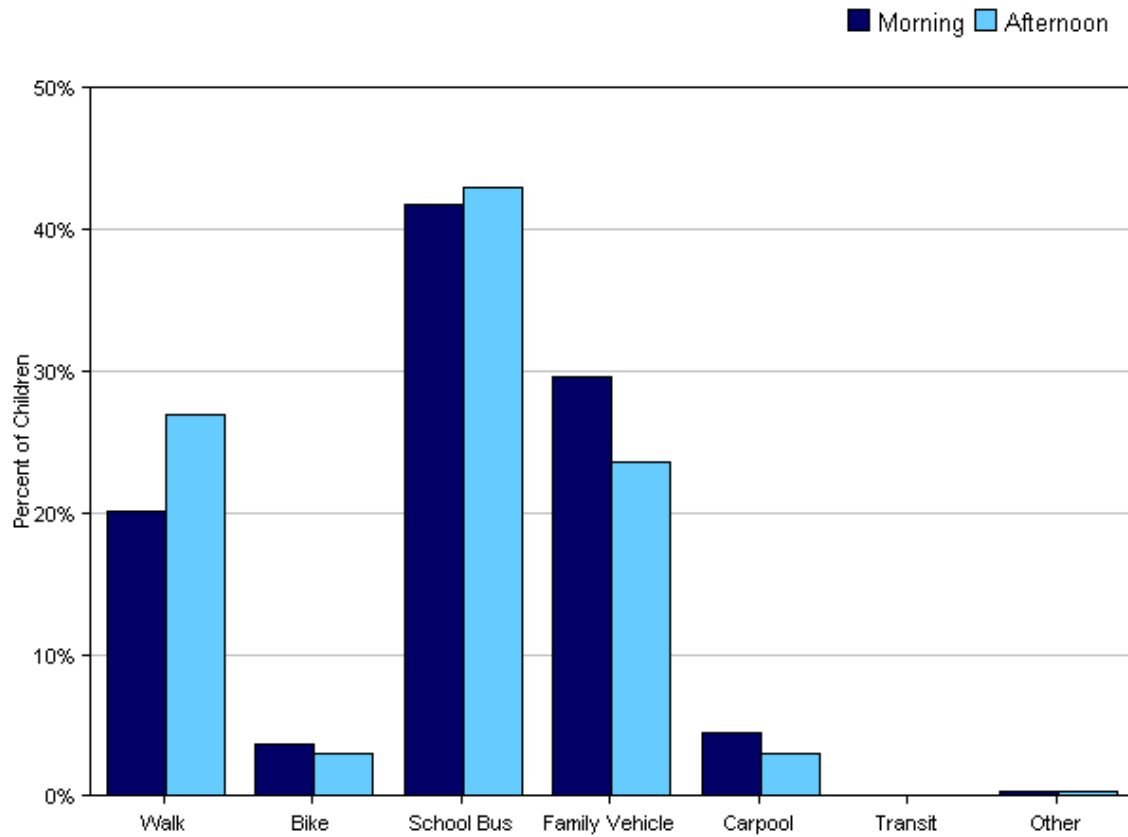
Parent estimate of distance from child's home to school

Distance between home and school	Number of children	Percent
Less than 1/4 mile	47	16%
1/4 mile up to 1/2 mile	54	18%
1/2 mile up to 1 mile	100	33%
1 mile up to 2 miles	87	29%
More than 2 miles	12	4%

Don't know or No response: 20

Percentages may not total 100% due to rounding.

Typical mode of arrival at and departure from school



Typical mode of arrival at and departure from school

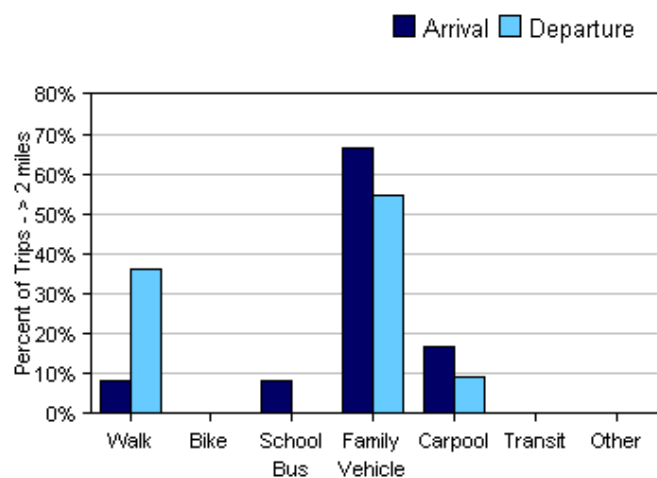
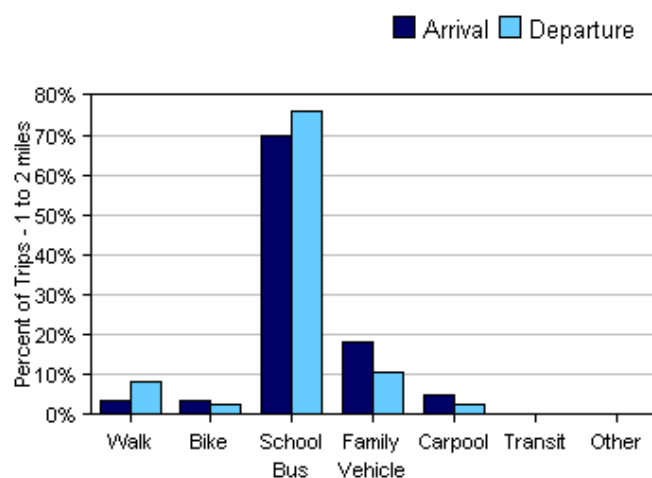
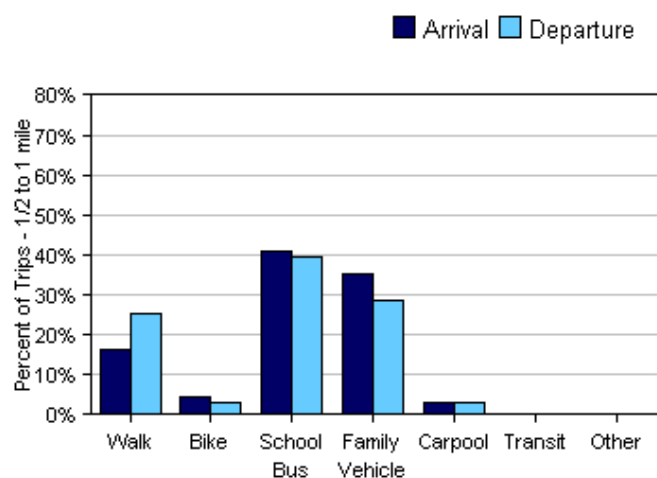
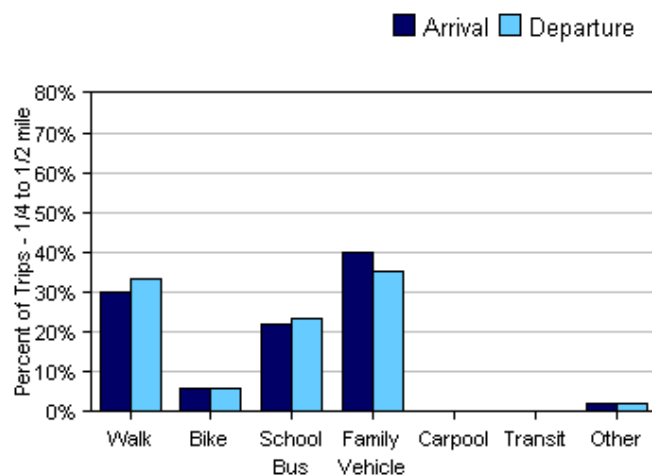
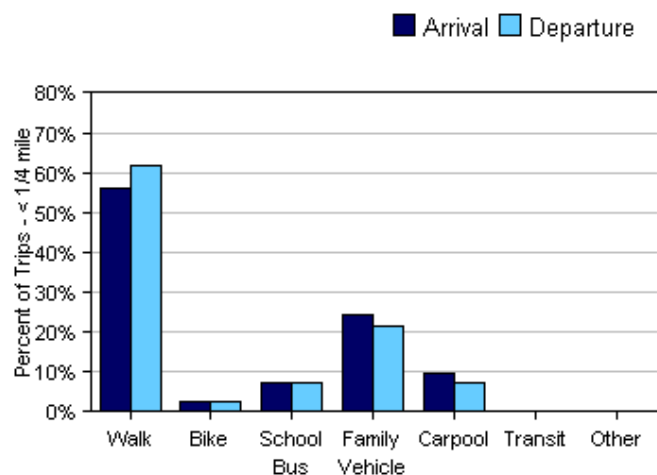
Time of Trip	Number of Trips	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Morning	294	20%	4%	42%	30%	4%	0%	0.3%
Afternoon	293	27%	3%	43%	24%	3%	0%	0.3%

No Response Morning: 26

No Response Afternoon: 27

Percentages may not total 100% due to rounding.

Typical mode of school arrival and departure by distance child lives from school



Typical mode of school arrival and departure by distance child lives from school

School Arrival

Distance	Number within Distance	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Less than 1/4 mile	41	56%	2%	7%	24%	10%	0%	0%
1/4 mile up to 1/2 mile	50	30%	6%	22%	40%	0%	0%	2%
1/2 mile up to 1 mile	93	16%	4%	41%	35%	3%	0%	0%
1 mile up to 2 miles	83	4%	4%	70%	18%	5%	0%	0%
More than 2 miles	12	8%	0%	8%	67%	17%	0%	0%

Don't know or No response: 41

Percentages may not total 100% due to rounding.

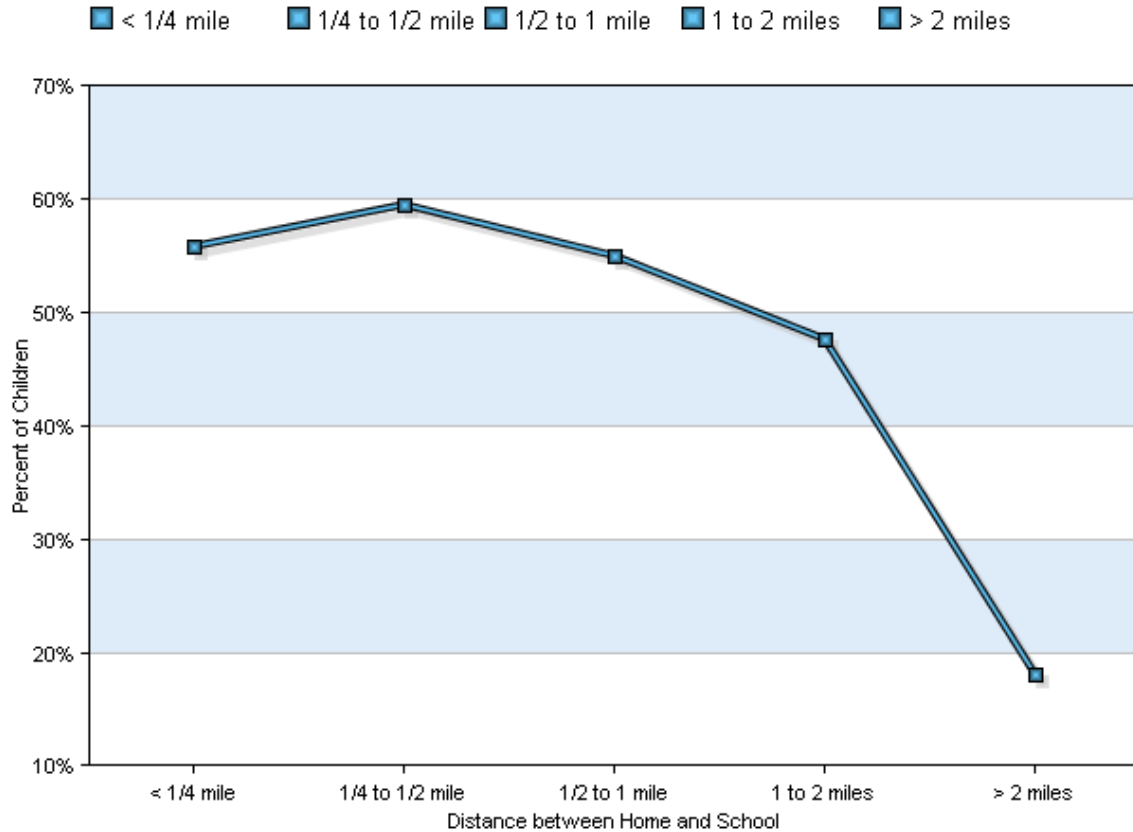
School Departure

Distance	Number within Distance	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Less than 1/4 mile	42	62%	2%	7%	21%	7%	0%	0%
1/4 mile up to 1/2 mile	51	33%	6%	24%	35%	0%	0%	2%
1/2 mile up to 1 mile	91	25%	3%	40%	29%	3%	0%	0%
1 mile up to 2 miles	83	8%	2%	76%	11%	2%	0%	0%
More than 2 miles	11	36%	0%	0%	55%	9%	0%	0%

Don't know or No response: 42

Percentages may not total 100% due to rounding.

Percent of children who have asked for permission to walk or bike to/from school by distance they live from school



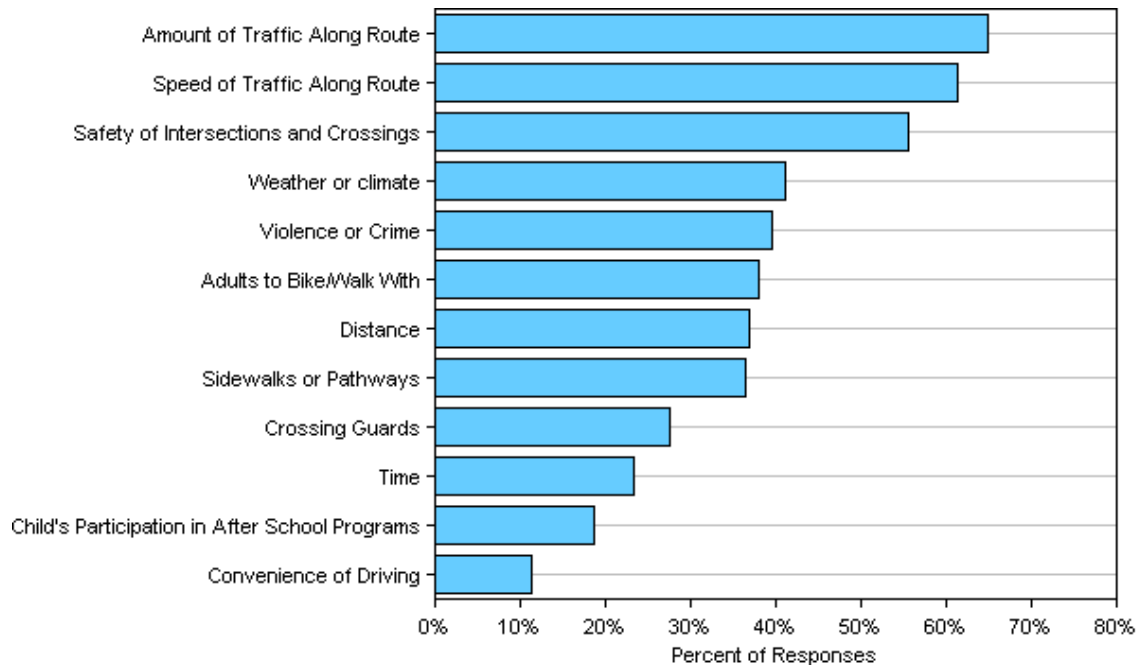
Percent of children who have asked for permission to walk or bike to/from school by distance they live from school

Asked Permission?	Number of Children	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles
Yes	151	56%	60%	55%	48%	18%
No	137	44%	40%	45%	52%	82%

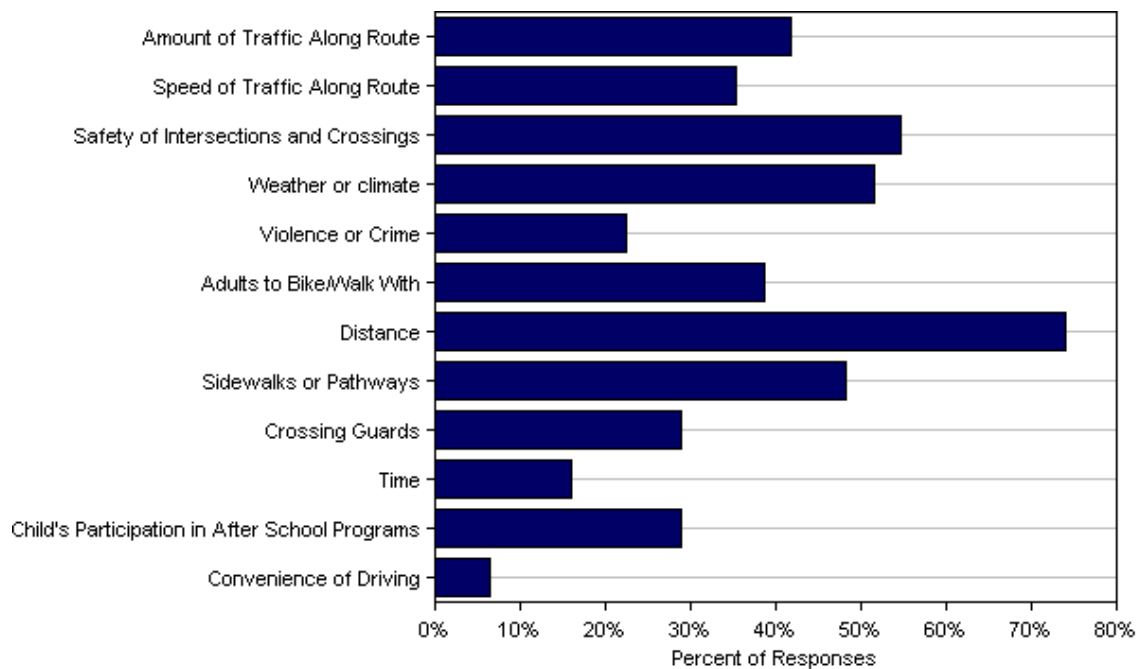
Don't know or No response: 32

Percentages may not total 100% due to rounding.

Issues reported to affect the decision to not allow a child to walk or bike to/from school by parents of children who do not walk or bike to/from school



Issues reported to affect the decision to allow a child to walk or bike to/from school by parents of children who already walk or bike to/from school



**Issues reported to affect the decision to allow a child to walk or bike to/from school by
parents of children who already walk or bike to/from school**

Issue	Child does not walk/bike to school	Child walks/bikes to school
Amount of Traffic Along Route	65%	42%
Speed of Traffic Along Route	61%	35%
Safety of Intersections and Crossings	56%	55%
Weather or climate	41%	52%
Violence or Crime	40%	23%
Adults to Bike/Walk With	38%	39%
Distance	37%	74%
Sidewalks or Pathways	36%	48%
Crossing Guards	28%	29%
Time	23%	16%
Child's Participation in After School Programs	19%	29%
Convenience of Driving	11%	6%
Number of Respondents per Category	192	31

No response: 97

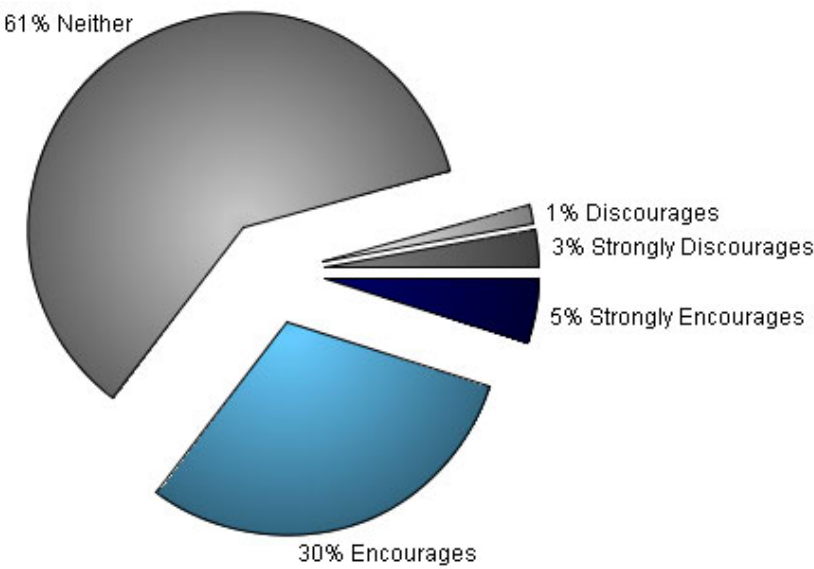
Note:

--Factors are listed from most to least influential for the 'Child does not walk/bike to school' group.

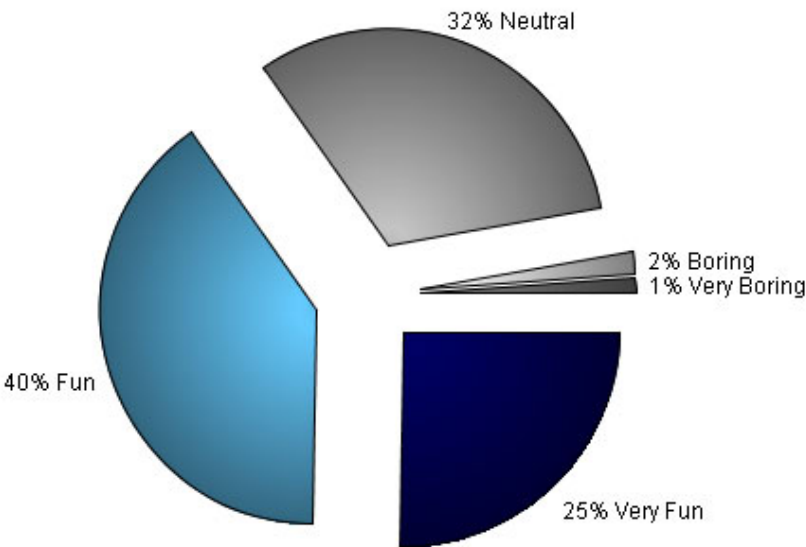
--Each column may sum to > 100% because respondent could select more than issue

--The calculation used to determine the percentage for each issue is based on the 'Number of Respondents per Category' within the respective columns (Child does not walk/bike to school and Child walks/bikes to school.) If comparing percentages between the two columns, please pay particular attention to each column's number of respondents because the two numbers can differ dramatically.

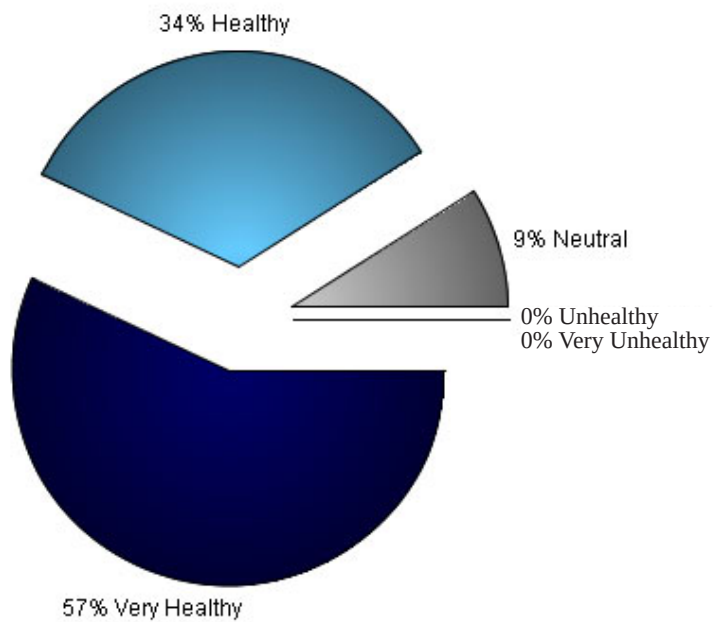
Parents’ opinions about how much their child’s school encourages or discourages walking and biking to/from school



Parents’ opinions about how much fun walking and biking to/from school is for their child



Parents' opinions about how healthy walking and biking to/from school is for their child



Comments Section

SurveyID	Comment
492896	TOO MANY KIDS BIKE THE BUS TO SCHOOL. WE COULD SAVE OUR CITY A LOT OF MONEY & HELP OUR KIDS STAY HEALTHY BY ENCOURAGING BIKING/WALKING & DISCOURAGING RIDING THE BUS.
492613	I HAVE A 7 YR OLD AND 5 YR OLD. MY GREATEST CONCERNS ARE THAT THEY WOULD BE KIDNAPPED OR HIT BY A CAR.
492615	I THINK BIKING OR WALKING TO SCHOOL IS A GREAT IDEA AS LONG AS IT'S SAFE FOR EACH CHILD. I LIVE ON WASHINGTON AVE AND I DO NOT ALLOW MY CHILDREN TO RIDE THEIR BIKES WITHOUT AN ADULT.
492617	QUESTION #10 - PARENTS WORK - NEED BEFORE & AFTER SCHOOL CARE. (CAN'T CHANGE THIS BUT I'D LOVE TO BE ABLE TO WALK THE KIDS TO SCHOOL)
492625	MY CHILD ATTENDS BEFORE & AFTER SCHOOL CARE @ A LOCAL DAYCARE WHERE BUS PICKS HER UP. UNLESS OUR WORK HOURS CHANGED WALKING WOULD NOT BE AN OPTION - NO SUPERVISION FOR HER OR HER YOUNGER SIBLINGS.
492634	RAY STREET WAS RECENTLY IMPROVED WITH FEDERAL STIMULUS MONEY AND SIDEWALKS WERE NOT INSTALLED. I DO NOT CONSIDER WASHINGTON AVE TO BE A SAFE ROUTE OF TRAVEL FOR MINORS. THE INTERSECTION OF ALLEN AVE & WASHINGTON NEEDS CROSSING GUARDS FOR THOSE CHILDREN WHO DO WALK TO/FROM SCHOOL.
492669	IF THERE WAS A CROSSING GUARD AT THE INTERSECTION AND AS LONG AS SHE WAS IN A GROUP OR A FEW SO NOT ALONE I WALK THEM SOMETIMES
492673	QUESTION 39 - TOO MUCH TRAFFIC BY LYSETH & LYMAN MOORE - NO SIDEWALKS ON JUNION ST AND NO CROSSING GUARDSS BY BOTH SCHOOLS.
492677	I FEEL STRONGLY ABOUT WALKING/BIKING TO SCHOOL. WE HAVE NO SIDEWALKS IN SOME AREAS SO I GO WITH MY DAUGHTER. SHE IS ON A BUS AND DOES RIDE OCCASIONALLY BUT PREFERS TO WALK. IN TERMS OF RIDING I AM INTERESTED IN THE SAFETY OF THE BIKES @ SCHOOL - ARE KIDS ALLOWED TO GET ON THEM. DO WE NEED A LOCK FOR SAFETY?
492679	MY CHILD GOES WITH ME TO WORK AT LYMAN MOORE AND THEN WALKS OVER TO LYSETH.
492681	EVEN WALKING TO SCHOOL CARS GO WAY TOO FAST. I FEEL KIDS SHOULD BE BUSED TO SCHOOL. REGARDLESS OF DISTANCE.
492685	BUS TRANSPORTATION IS GREAT; EXCELLENT. HOWEVER I HAVE TO TRANSPORT CHILD TO SCHOOL IN CAR DUE TO ACTIVITIES AND TIME. CHILD HAS TO WAKE UP EARLIER FOR "BEFORE SCHOOL ACTIVITIES". WALKING WOULD MEAN GETTING UP EVEN EARLIER.
492691	THERE NEED TO BE BETTER TRAFFIC CONTROLS BETTER CLEAR SIDEWALKS SIDEWALKS ON BOTH SIDES & AT LEAST ONE SIDE OF STREET MORE ADULTS & SAFETY PATROLS - WINTER ENFORCEMENT OR CLEANING BY THE CITY OF WALKWAYS PATHS STREETS - SPEEDING CONTROL
492706	QUESTION #10 - SIDEWALKS OR PATHWAYS - ON RAY ST!
492707	IF FEEL THAT CHILDREN SHOULD BE AT LEAST IN 5TH GRADE. I DON'T SEE ANYTHING WRONG WITH LETTING THEM PICK UP HIS/HER SIBLING AS LONG AS THE SIBLING IS IN FIRST GRADE AND UP. I THINK FIRST GRADE IS TOO YOUNG TO BE WALKING WITHOUT AN ADULT.
492713	I WORK 3RD SHIFT (7PM-7AM). I DO NOT ARRIVE HOME IN TIME TO WALK THEM TO SCHOOL BUT ON MY OFF DAYS WE DO WALK TO SCHOOL.
492714	MY CHILD IS TOO YOUNG TO STAY HOME ALONE AS I WORK FULL TIME I ALSO WOULDN'T FEEL COMFORTABLE HAVING MY KIDS CROSS BUSY STREET ALONE.
492716	MAGGIE WILL BE 8 IN JANUARY & I AM PLANNING TO ALLOW HER TO WALK TO SCHOOL NEXT SPRING (OCCASIONALLY). WE ARE LUCKY TO LIVE THRU THE WOODS & FIELD FROM THE SCHOOL WHICH IS HOW SHE WOULD TRAVEL RATHER THAN WALK THE ROAD-WAY!! THANK YOUR FOR CONSIDERING MY INPUT.
492740	THOUGH WE OFTEN USE THE TRAILS TO GET TO SCHOOL WE REALLY NEED A SIDEWALK ON RAY ST ESP OVER THE DANGEROUS HILL NEAR PINE GROVE PARK. A "CHILDREN CROSSING" SIGN @ THE TRAIL ENTRANCE ON ALLEN AVE EXT & CROSSING GUARD @ VIRGINIA WOULD BE HUGE ASSETS. THANKS FOR YOUR WORK!

492756	ALL OF US WOULD WALK OR BIKE MOST DAYS IF ONLY WE HAD A SIDEWALK FOR THE STRETCH BETWEEN GARSOE & ARMSTRONG ON AUBURN STREETS - UNFORTUNATELY MR COHEN WON'T HELP ACCOMPLISH THIS ALTHOUGH WE PAY A RIDICULOUS SUM OF TAXES - THIS NEIGHBORHOOD IS UNFAIRLY TAXED W/OUT BENEFIT!
492761	STILL IN SCHOOL
492774	THANK YOU FOR PROBLEM SOLVING THIS SITUATION
492786	I'M PLEASED THAT THERE IS A CROSSING GUARD FROM SUMMIT ST TO THE ROAD THAT LEADS TO LYSETH BUT MY CHILDS STILL HAS TO CROSS MANY SIDE STREET INTERSECTIONS ALONG SUMMIT ST.
492798	WE HAVE A WALKING GROUP WITH AN ADULT FOR 5 LYSETH STUDENTS
492799	I WOULD LOVE MY CHILD TO WALK TO SCHOOL BUT DON'T FEEL COMFORTABLE HAVING HER WALK WHERE THERE ARE NO SIDEWALKS
492802	I TRIED MY BEST BUT MY ANSWERS MIGHT NOT BE ACCURATE. I LIVE IN WESTBROOK WHICH IS ABOUT 30 MINUTES DRIVING TO SCHOOL FROM MY HOUSE.
492817	WE HAVE TO DROP OUR CHILD EARLY & BEFORE SCHOOL - AT 1ST LUTHERAN. WE DON'T WANT HER ALONE AT HOME BEFORE OR AFTER SCHOOL. WE WORK FULL TIME.
492820	MAIN CONCERN - SAFETY ON PINELOCH BETWEEN SUMMIT AND ROARING BROOK. NO SIDEWALK CURVY-BLIND SPOTS FOR DRIVERS/KIDS)
492826	I HAVE AN ISSUE WITH THE SCHOOL NOT PROVIDING A BUS FOR US AND MY CHILDREN DO NOT HAVE SIDEWALKS TO WALK ON (PINELOCH) THIS IS A CURVY ROAD AND VERY DANGEROUS FOR THE CHILDREN. IF THE EXPECTATION IS TO WALK AT LEAST PROVIDE SIDEWALKS FOR THERE ENTIRE ROUTE! QUESTION #9 - I DON'T FEEL COMPLETELY COMFORTABLE BUT LET HIM
492839	CROSSING GUARDS ARE A HUGE ISSUE. ALLEN AVE IS WAY TO BUSY.
492848	MY BIGGEST CONCERN IS TRAFFIC & LACK OF ATTENTION OF DRIVERS - RECKLESS DRIVING DUE TO USING CELL PHONES WHILE DRIVING
492854	QUESTION #10 - LIVING DIRECTLY ON ALLEN AVE IS THE MAJOR LIMITATION ALLOWING WALKING/BIKING TO SCHOOL. SIDEWALKS OR PATHWAYS-NOW BEING INSTALLED ON ALLEN AVE. QUESTION #11 - WHEN SHE'S OLD ENOUGH.
492862	IT IS PRIMARILY MY CONCERN WITH ALLEN AVE. DRIVERS DRIVE TOO FAST AND HARDLY EVER STOP EVEN WITH FLASHING LIGHTS (TOTALLY USELESS AND WASTE OF MONEY IN MY MIND)
492871	THE CARS ALMOST NEVER STOP WHERE VIRGINIA/BRAMBLEWOOD CROSSES ALLEN AVENUE. THERE ARE NO SIDEWALKS ON VIRGINIA WHERE MY CHILDREN WOULD WALK. I SOMETIMES WALK THEM BUT GET FRUSTRATED W/ THE SPEED OF CARS/NO SIDEWALK.
492875	ANSWER TO NUMBER 10. AGE - MY CHILD IS FIRST GRADE - TOO YOUNG TO WALK ALONE.
492893	KINDERGARTEN IS TOO YOUNG TO BIKE/WALK ALONE AND I DON'T HAVE THE TIME TO DO IT WITH HER. SHE BIKES IN THE NEIGHBORHOOD AND PLAYS SPORTS. QUESTION #10 - AGE OF CHILD
492895	WE NEED LESS THAN 1/4 MILE & SIDEWALK ON AUBURN ST & OUR CHILDREN WOULD WALK NEARLY EVERYDAY. MR. COHEN WOULD NOT HELP AT ALL. THE LYMAN MOORE HOODLUMS FREQUENTLY HARASS LITTLE KIDS & SHOULD BE DISMISSED AFTER NOT BEFORE THE YOUNG CHILDREN!
492595	I WOULD LOVE MY CHILDREN TO WALK/BIKE TO SCHOOL BUT DON'T FEEL COMFORTABLE AS SOME OF THE WAY HAS NO SIDEWALKS.
492597	WE MOVED TO PORTLAND SO WE COULD WALK/RIDE TO SCHOOL. WE NOTICED MANY FOLKS ON VIRGINIA ST PUT SOD/LAWN OVER THEIR SIDEWALKS. THAT IS VERY SAD & SHOULD BE FIXED!
492603	MY CHILD WALKS SUPERVISED TO SCHOOL FROM FIRST LUTHERINE.
492604	ONE ADDITIONAL ADULT PRESENCE NEAR TO CURTIS MIGHT PROVIDE THE SECURITY I NEED TO ALLOW ALEX (1ST GRADE) TO WALK ALONG SUMMIT ST. SPEED BUMPS WOULD ALSO SLOW PEOPLE DOWN. SUMMIT HAS BECOME A THOROUGHFARE FOR PEOPLE WHO WISH TO AVOID WASHINGTON AVE/AUBURN ST. A POLICE PRESENCE ON SUMMIT WOULD DISCOURAGE SPEEDING AS WELL (DURING AM HOURS 8:30-9 & PM 3-3:30)
492614	QUESTION #9 - DEPENDING ON MATURITY LEVEL

492622	WE DRILL OUR CHILD DAILY TO "WATCH OUT FOR THE OTHER GUY BECAUSE THEY DON'T WATCH OUT FOR YOU". TRAFFIC IS A MAJOR CONCERN.
492631	MY SON WALKS TO & FROM SCHOOL EVERYDAY WITH US BEFORE AND AFTER SCHOOL PROGRAM AT FIRST LUTHERAN. IF HE DIDN'T I'M NOT SURE HE WOULD WALK BECAUSE OF THE EXTRA TIME IT WOULD TAKE ME TO WALK HIM THERE.
492637	ALLEN AVENUE DESPERATELY NEEDS A CROSSING GUARD. VIRGINIA ST. NEEDS SIDEWALKS.
492645	I WORK FULL TIME AND MY KIDS ARE TOO YOUNG TO STAY HOME ALONE. ALSO TOO YOUNG FOR ME TO FEEL COMFORTABLE CROSSING BUSY STREETS.
492663	I WOULD ALLOW CHILD TO WALK BUT CHILD DOES NOT WISH TO DO SO.
492675	MY CHILD IS VERY YOUNG SO I DO NOT KNOW WHEN I WILL FEEL COMFORTABLE LETTING HIM WALK (ALONE) BUT DO STRONGLY SUPPORT ADVOCATING WALKING TO NEIGHBORHOOD SCHOOLS.
492686	MY CHILD WALKS OR BIKES TO SCHOOL ROUGHLY 50% OF THE TIME
492687	SAFETY AND THE ENJOYMENT OF WALKING WITH OUR KIDS
492704	I WOULD BE MORE COMFORTABLE WITH HIM WALKING HOME THEN WALKING TO SCHOOL. THERE IS LITTLE VERIFICATION THAT HE MADE IT THERE SAFELY.
492708	DUE TO THE TIME HE HAS TO BE AT SCHOOL WE CANNOT WALK OR BIKE WITH HIM TO SCHOOL & GO BACK HOME & GET TO WORK ON TIME. MORE BIKE STORAGE!! I HAVE SUGGESTIONS & CAN BE REACHED @ 207-650-9778 IF INTERESTED.
492723	CURRENTLY ATTENDS FIRST LUTHERAN'S CHILDREN PROGRAM & WALKS TO AND FROM SCHOOL W/ GROUP OF CHILDREN & COUNSELORS
492728	I WORK FULL TIME SO POLICY NEEDS TO TAKE INTO ACCT WORKING PARENTS. PLEASE
492749	ONLY ALLOWED TO WALK IF OTHER CHILDREN ARE WALKING TOO. NEVER ALONE.
492785	QUESTION #9 - UNLESS WITH A BUDDY
492787	CARS RARELY STOP ON ALLEN AVENUE. PLUS W/ THE WIDTH OF VIRGINIA CARS SPEED & THERE ARE NO SIDEWALKS. I OFTEN WALK THEM BUT WOULD NEVER LET THEM WALK OR BIKE UNDER THESE CONDITIONS.
492794	AS WORKING PARENTS WE NEED TO BE AT WORK BY 8:00 BUT THE SCHOOL DOES NOT ALLOW STUDENTS ON PREMISE TILL 8:40. IF OUR CHILD STARTED WALKING AT 7:45/8:00 HE WOULD BE AT SCHOOL BY 8:15. THEN WHAT DOES HE DO? ALSO WE DON'T FEEL COMFORTABLE WITH NO CROSSING GUARD AT VIRGINIA/ALLEN AVE CROSSING OVER TO BRAMBLEWOOD.
492812	IF WE HAD LESS THAN 1/4 MILE OF SIDEWALK ON AUBURN ST. MY CHILDREN WOULD WALK NEARLY EVERYDAY. MR. COHEN WON'T HELP US.
492814	WE ARE A TRANSFER STUDENT WHO LIVES IN THE RIVERTON DISTRICT. IF THERE WERE ACCESS HALF WAY WE WOULD TAKE ADVANTAGE OF THIS PROGRAM. WE HAVE PARKED IN A NEIGHBORHOOD AND BIKED TO SCHOOL.
492819	QUESTION #10 - SIDEWALKS OR PATHWAYS-NO SNOW PLOW FOR SIDEWALKS
492863	NEED A CROSSING GUARD @ ALLEN AVENUE!
492905	NO ANY ADDITIONAL COMMENTS.
492907	I HAVE A FIRST GRADER AND SECOND GRADER WHO ARE TOO YOUNG TO WALK OR BIKE TO SCHOOL W/O AN ADULT. WE ARE ALSO TOO CLOSE TO SCHOOL FOR Busing. (WHICH I DO NOT AGREE) MY CHILDREN WOULD NEED TO WALK/BIKE UP A STREET W/O SIDEWALKS TO A BUSY STREET TRAVEL DOWN THE STREET TO A CROSSING GUARD TO ANOTHER STREET AND THROUGH A PATH. DRIVING IS OFTEN EASIER EVEN THOUGH WE DO WALK AND BIKE.
492623	MY DAUGHTER LOVES THE BUS
492646	IT TAKES UNTIL ABOUT 10:30AM FOR THE SCHOOL TO CALL YOU IF YOUR CHILD IS ABSENT. THERE IS NO WAY TO KNOW IF HE/SHE GETS THERE SAFELY UNTIL THAT TIME - WAY TOO LATE IF SOMETHING WENT WRONG.

492811	WHY DO YOU NEED THE QUESTION #15?
492818	THE SECTION OF WASHINGTON AVE MY CHILD COULD HAVE TO WALK ON HAS NO SIDEWALK MAYBE IF THE CITY COULD DO SOMETHING ABOUT THAT WALKING TO SCHOOL WOULD BE AN OPTION.
492836	MY SON SOMETIMES WALKS OR BIKES WITH A FRIEND
492838	THE SAFETY OF CHILDREN IN THE SCHOOL PARKING LOT AND DROPOFF/PICKUP AREA IS ALSO A CONCERN
492850	THE TRAFFIC (INTERSECTION) IN FRONT OF OUR HOUSE MAKES IT NEARLY IMPOSSIBLE TO GET ACROSS THE STREET WE ARE AT 659 ALLEN AVE AND THE TRAFFIC IS LINED UP ON SUMMIT ST TO GET TO ALLEN WHERE MY CHILDREN MUST TRY TO CROSS TO GET TO SCHOOL. QUESTION #9 - (HE IS VERY HAPPY WITH TAKING THE BUS).
492851	I DON'T FEEL THAT MY KID IS RESPONSIBLE ENOUGH TO GET TO/FROM SCHOOL ON HIS OWN. IF WE DIDN'T HAVE THE BUS I WOULD DRIVE THEM WHICH JUST ADDS MORE TRAFFIC IN/AT OF SCHOOL. I WORK AND THE RIDE TO SCHOOL ON THE BUS ALLOWS ME TO LEAVE EARLIER. SCHOOL STARTS TOO LATE! WE NEED OUR BUSES!
492882	SCHOOL AT LYSETH STARTS TOO LATE I CAN'T WALK WITH HIM & STILL GET TO WORK. THE GENERAL THOUGHT IS THAT THEY AREN'T SAFE UNTIL GRADE 3 TO WALK ALONE I THINK MY SON SHOULD BE BUSSED.
492888	BEFORE I FEEL "SAFE" TO LEAVE FOR WORK I NEED TO KNOW MY KID IS WHERE HE NEEDS TO BE OR THAT "CUSTODY" HAS BEEN TRANSFERRED. SCHOOL STARTS TOO LATE TO MAKE WALKING AN OPTION. RIDING THE BUS GIVES ME A 1/2 HOUR MORE TIME.
492899	FEEL YOU SHOULD BE LOOKING MORE AT SAFETY AT LYSETH WITH WHERE THE BUSES DROP OFF & PARENTS DROP OFF. BUSES SHOULD DROP OFF ON SIDE OF SCHOOL - CHILDREN CROSS BETWEEN SCHOOL BUSES AT DISMISSAL & ENTERING SCHOOL IN THE A.M. I FEEL THIS IS A VERY DANGEROUS SET UP BETWEEN THESE 2 CIRCLES. THERE HAS TO BE A BETTER WAY FOR OUR KIDS.
492611	MY CHILD IS FIVE YEARS OLD AND I FEEL SHE IS TOO YOUNG TO WALK TO SCHOOL. WE HAVE TRIED TO WALK TO SCHOOL BEFORE AND I HAD TO CARRY HER MOST OF THE WAY.
492624	WE ARE CURRENTLY LIVING OUT OF DISTRICT & MOVING TO PORTLAND OCT. 8TH. ALL COMMENTS LISTED ABOVE REPRESENT WHAT OUR NEW LIVING SITUATION WILL ENTAIL WHEN WE MOVE TO PORTLAND.
492883	I ALLOW MY DAUGHTER TO WALK BECAUSE SHE DOES NOT HAVE TO CROSS A STREET AND A PATHWAY IS MAINTANED.
492717	QUESTION #15 - NEVER WENT TO SCHOOL
492748	NOT SURE WHEN SON MAY BE READY TO WALK OR BIKE TO SCHOOL - HE'S AUTISTIC & THE ROUTE FROM OUR HOUSE IS STILL WAY TOO DANGEROUS FOR HIM. ALSO TOO FAR IN BAD WEATHER.
492753	I WILL CONTINUE TO WALK WITH MY CHILD TO SCHOOL (WEATHER PERMITTED) AND I WILL EVENTUALLY LET HIM WALK OR RIDE HIS BIKE WHEN HE IS OLD ENOUGH TO DO IT BY HIMSELF.
492776	I LIVE AT THE CORNER OF A 3 WAY STOP SIGN. MANY PEOPLE INCLUDING TEACHERS FROM BOTH LYSETH & LYMAN MOORE GO OVER THE SPEED LIMIT OF 25 MPH AND DO NOT STOP AT THE STOP SIGN. THERE IS NO SIDEWALK FOR THE CHILDREN ON ONE OF THE STREETS AND WHEN PEOPLE ARE SPEEDING OR NOT STOPPING AT THE SIGN IT PUTS THE KIDS IN JEOPARDY!! I HAVE CALLED THE POLICE 5 TIMES!!
492828	I WILLNOT LET MY KIDS WALK TO/FROM SCHOOL "ALONE" UNTIL @ LEAST 5TH GRADE & EVEN THEN THEY NEED TO BE W/ ANOTHER KID - NEVER ALLOW TOTALLY 'ALONE' - ESPECIALLY NEAR OR IN PORTLAND TRAILS
492743	RE: QUESTION 12/13/14; OUR CHILD HAS MORE THAN ENOUGH PHYSICAL ACTIVITY AND A HEALTHY LEVEL OF FITNESS. WALKING/RIDING HER BIKE TO SCHOOL AT THIS AGE WITH SPEEDING ISSUES @ ROUTE LACK OF SIDEWALKS PATH IN WINTER AND QUESTIONABLE PEOPLE WHO HOVER THE AREA @ DROP OFF/PICK UP MAKE WALKING OR RIDING NOT AN OPTION.
492865	OUR DAUGHTER IS IN KINDERGARTEN SO SHE IS TAKING THE BUS RIGHT NOW BUT AS SHE GETS USE TO SCHOOL ROUTINE AND A BIT OLDER I AM SURE SHE WILL BE WALKING TO SCHOOL SO THIS SURVEY DOESN'T APPLY TO HER RIGHT NOW. QUESTION #10 - NONE APPLY THIS YEAR SHE IS IN KINDERGARTEN AND IS TOO YOUNG TO WALK ALONE

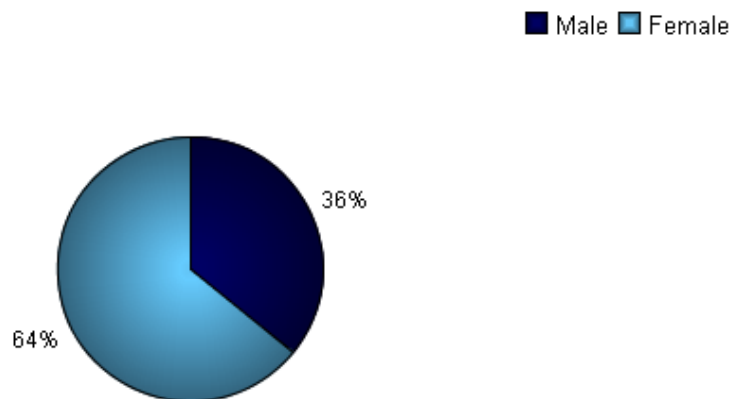
492909	SAFETY AND THE ENJOYMENT OF WORKING WITH OUR KIDS.
492855	THE ROUTE MY SON WOULD WALK WOULD HAVE LOW VISABILITY AND THIS WOULD CAUSE CONCERN'S REGARDING HIS SAFETY.

Appendix IV – Lyman Moore Parent Survey

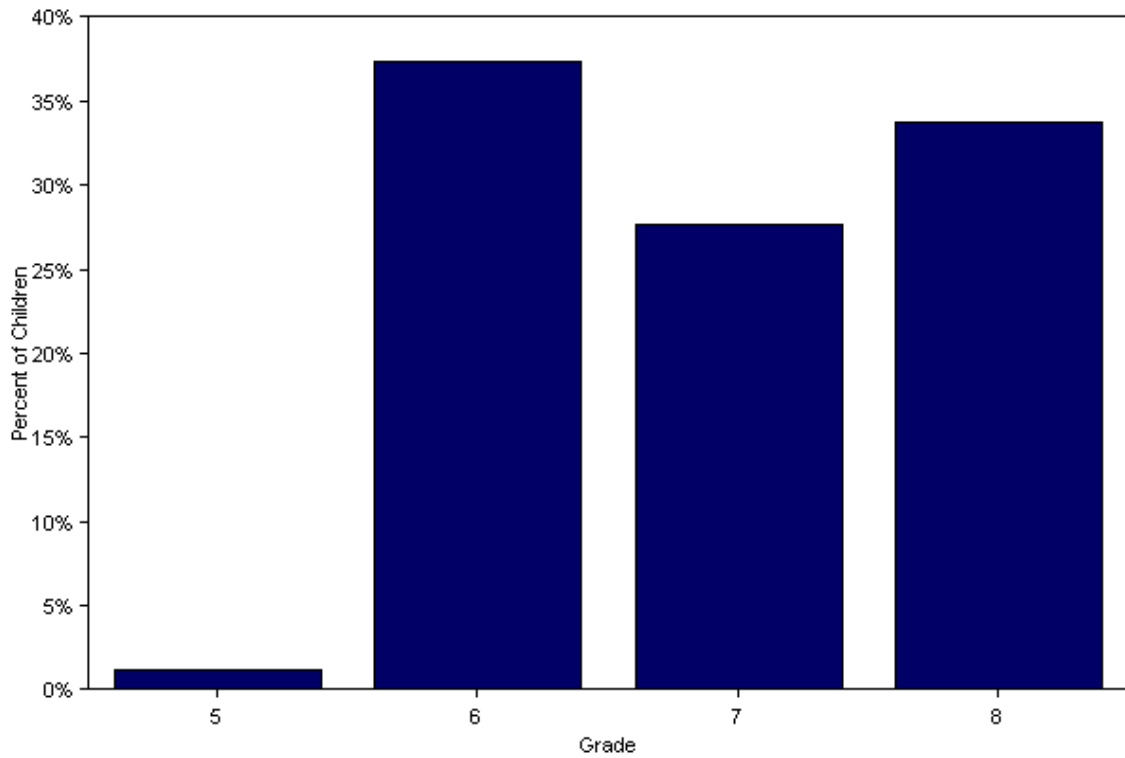
Program Name:	Portland Safe Routes to School Team	Month and Year Collected:	November 2010
School Name:	Lyman Moore Middle	Set ID:	4786
School Enrollment:	552	Date Report Generated:	01/14/2011
Enrollment within Grades Targeted by SRTS Program:	552	Number of Questionnaires Analyzed for Report:	84
Number of Questionnaires Distributed:	552		

This report contains information from parents about their children's trip to and from school. The report also reflects parents' perceptions regarding whether walking and bicycling to school is appropriate for their child. The data used in this report were collected using the Survey about Walking and Biking to School for Parents form from the National Center for Safe Routes to School.

Sex of children for parents that provided information



Grade levels of children represented in survey



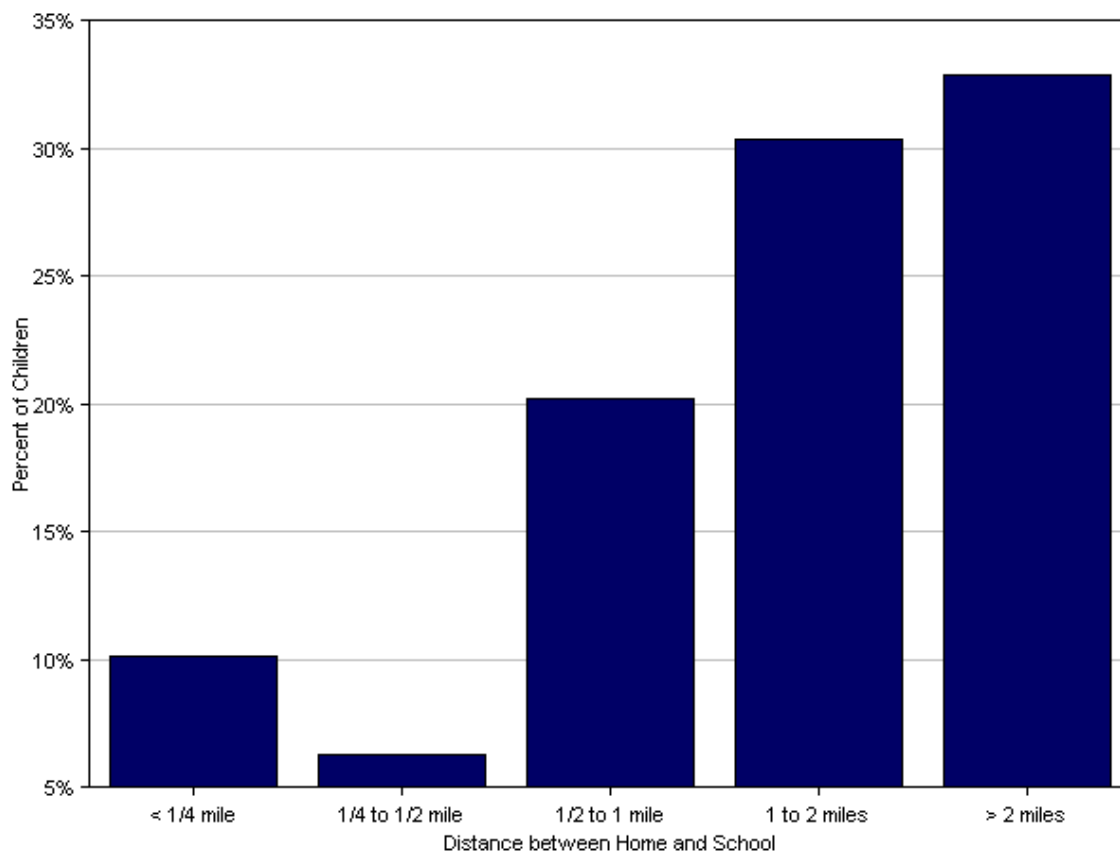
Grade levels of children represented in survey

Grade in School	Responses per grade	
	Number	Percent
5	1	1%
6	31	37%
7	23	28%
8	28	34%

No response: 0

Percentages may not total 100% due to rounding.

Parent estimate of distance from child's home to school



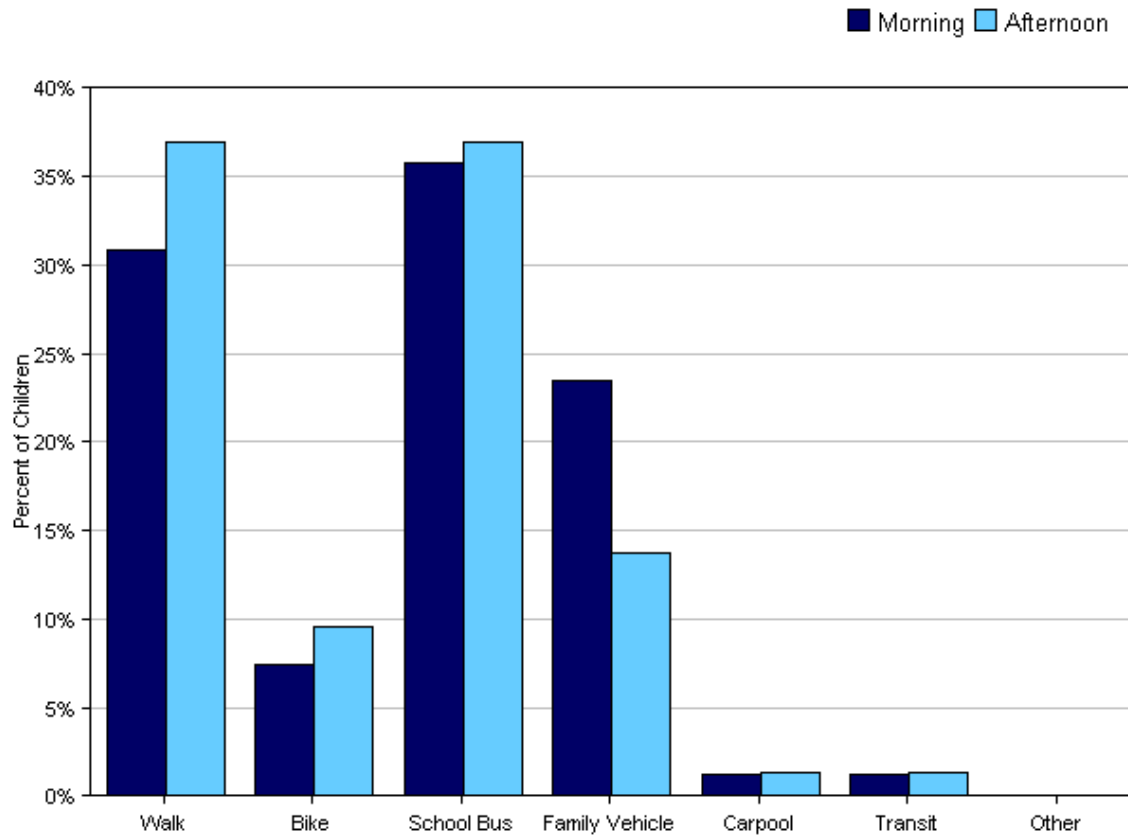
Parent estimate of distance from child's home to school

Distance between home and school	Number of children	Percent
Less than 1/4 mile	8	10%
1/4 mile up to 1/2 mile	5	6%
1/2 mile up to 1 mile	16	20%
1 mile up to 2 miles	24	30%
More than 2 miles	26	33%

Don't know or No response: 5

Percentages may not total 100% due to rounding.

Typical mode of arrival at and departure from school



Typical mode of arrival at and departure from school

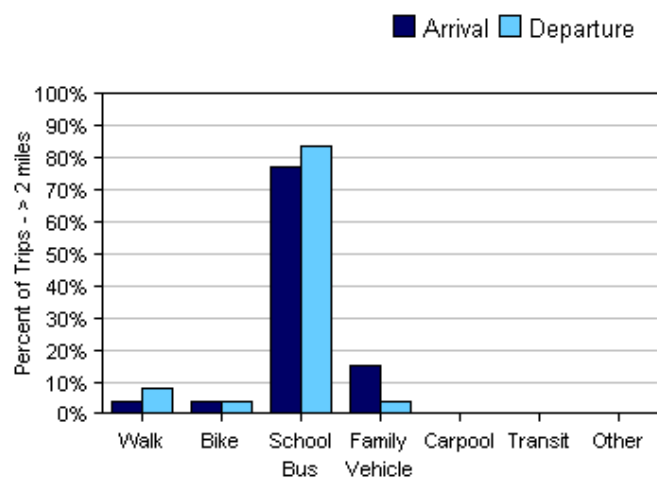
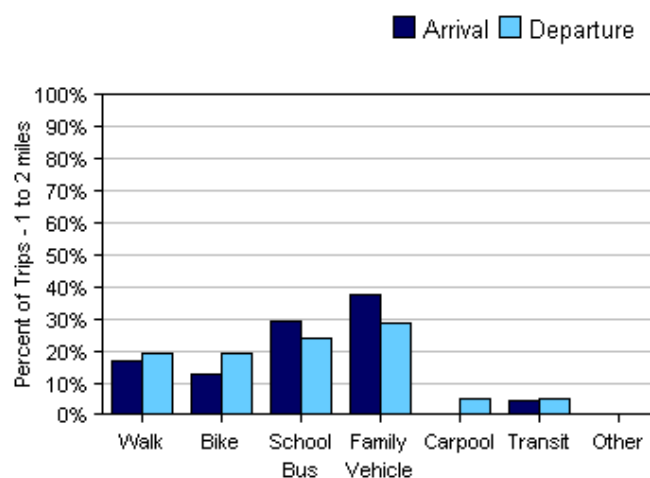
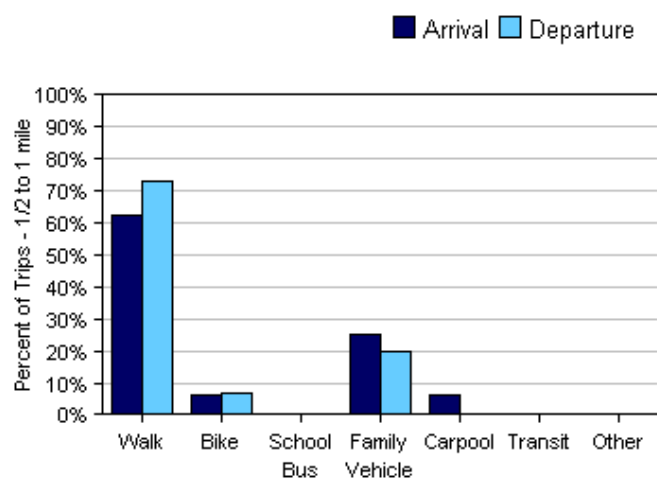
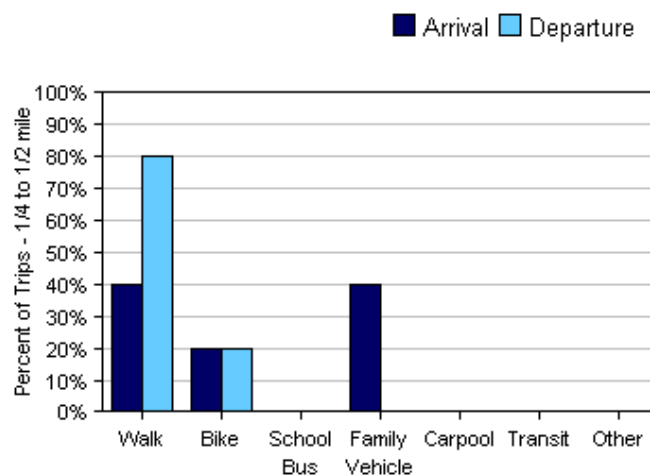
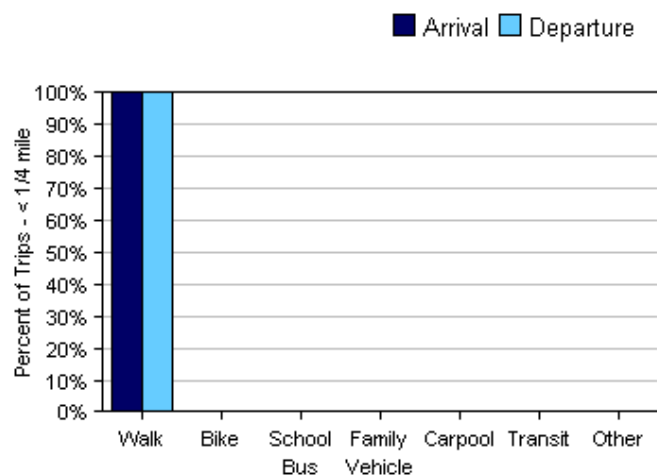
Time of Trip	Number of Trips	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Morning	81	31%	7%	36%	23%	1%	1%	0%
Afternoon	73	37%	10%	37%	14%	1%	1%	0%

No Response Morning: 3

No Response Afternoon: 11

Percentages may not total 100% due to rounding.

Typical mode of school arrival and departure by distance child lives from school



Typical mode of school arrival and departure by distance child lives from school

School Arrival

Distance	Number within Distance	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Less than 1/4 mile	8	100%	0%	0%	0%	0%	0%	0%
1/4 mile up to 1/2 mile	5	40%	20%	0%	40%	0%	0%	0%
1/2 mile up to 1 mile	16	63%	6%	0%	25%	6%	0%	0%
1 mile up to 2 miles	24	17%	13%	29%	38%	0%	4%	0%
More than 2 miles	26	4%	4%	77%	15%	0%	0%	0%

Don't know or No response: 5

Percentages may not total 100% due to rounding.

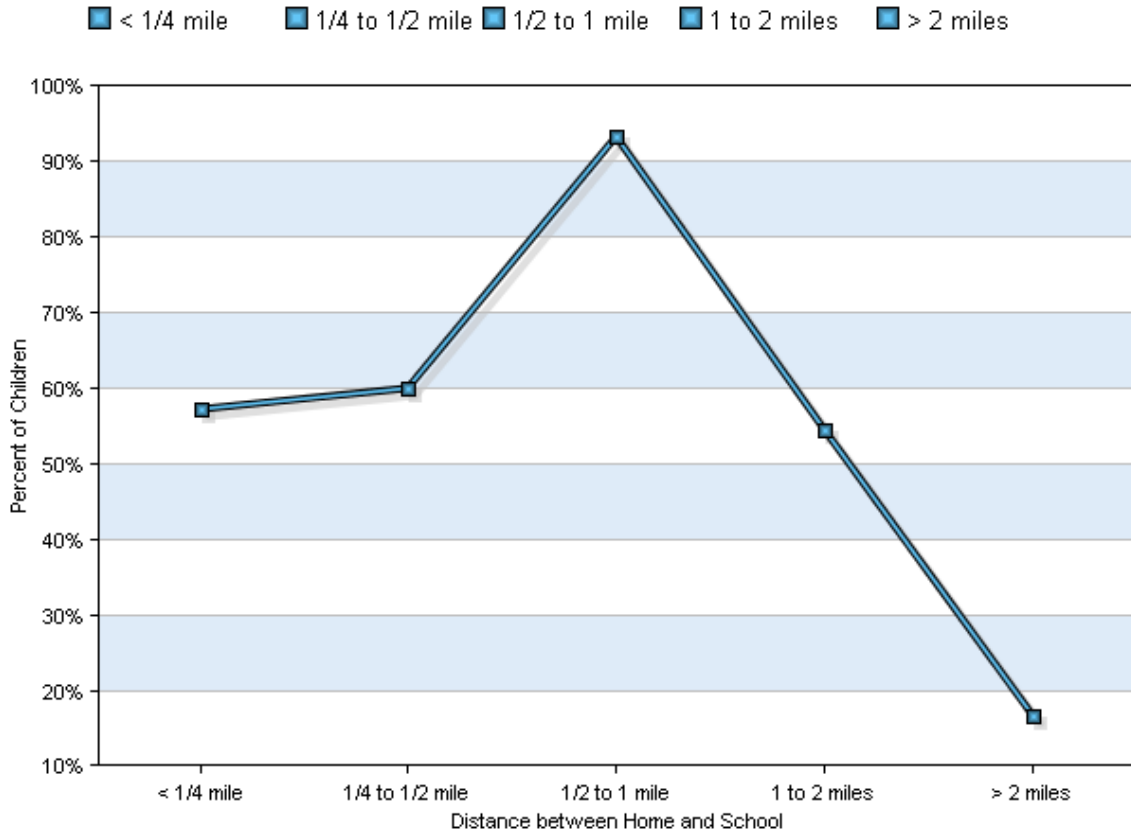
School Departure

Distance	Number within Distance	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Less than 1/4 mile	6	100%	0%	0%	0%	0%	0%	0%
1/4 mile up to 1/2 mile	5	80%	20%	0%	0%	0%	0%	0%
1/2 mile up to 1 mile	15	73%	7%	0%	20%	0%	0%	0%
1 mile up to 2 miles	21	19%	19%	24%	29%	5%	5%	0%
More than 2 miles	25	8%	4%	84%	4%	0%	0%	0%

Don't know or No response: 12

Percentages may not total 100% due to rounding.

Percent of children who have asked for permission to walk or bike to/from school by distance they live from school

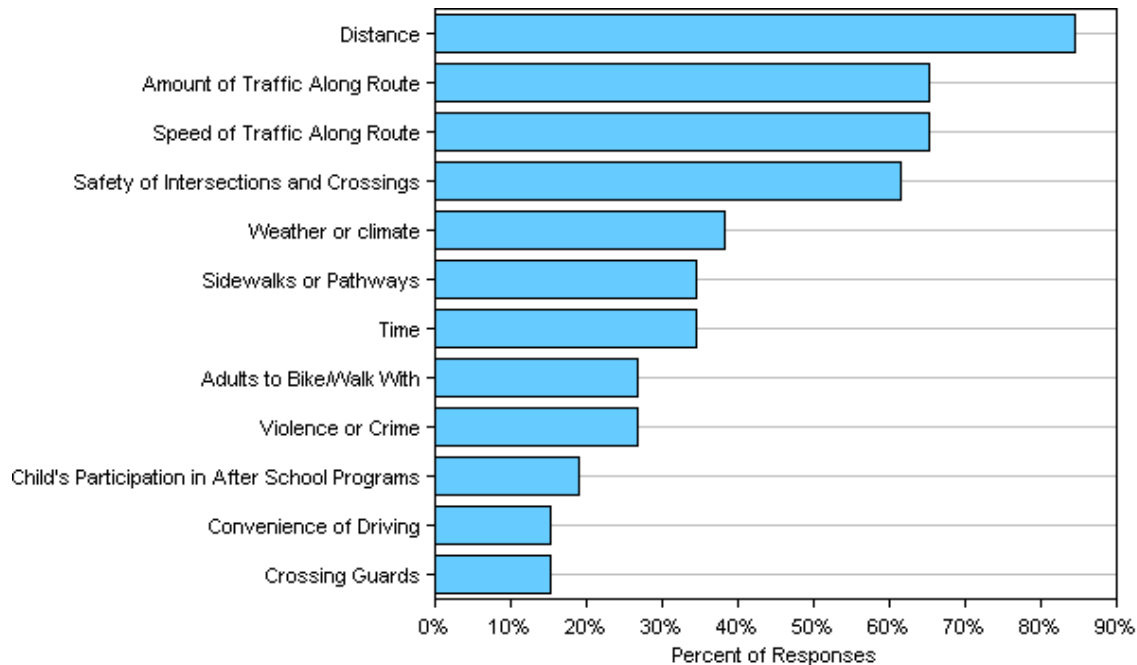


Percent of children who have asked for permission to walk or bike to/from school by distance they live from school

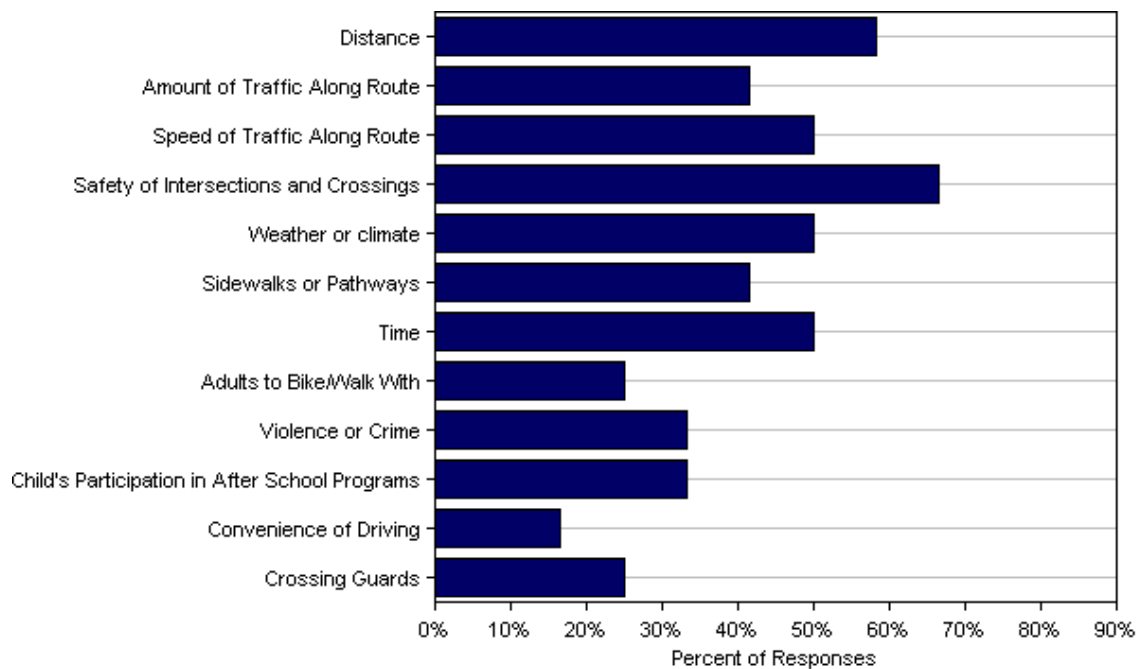
Asked Permission?	Number of Children	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles
Yes	37	57%	60%	93%	55%	17%
No	36	43%	40%	7%	45%	83%

Don't know or No response: 11
 Percentages may not total 100% due to rounding.

Issues reported to affect the decision to not allow a child to walk or bike to/from school by parents of children who do not walk or bike to/from school



Issues reported to affect the decision to allow a child to walk or bike to/from school by parents of children who already walk or bike to/from school



**Issues reported to affect the decision to allow a child to walk or bike to/from school by
parents of children who already walk or bike to/from school**

Issue	Child does not walk/bike to school	Child walks/bikes to school
Distance	85%	58%
Amount of Traffic Along Route	65%	42%
Speed of Traffic Along Route	65%	50%
Safety of Intersections and Crossings	62%	67%
Weather or climate	38%	50%
Sidewalks or Pathways	35%	42%
Time	35%	50%
Adults to Bike/Walk With	27%	25%
Violence or Crime	27%	33%
Child's Participation in After School Programs	19%	33%
Convenience of Driving	15%	17%
Crossing Guards	15%	25%
Number of Respondents per Category	26	12

No response: 46

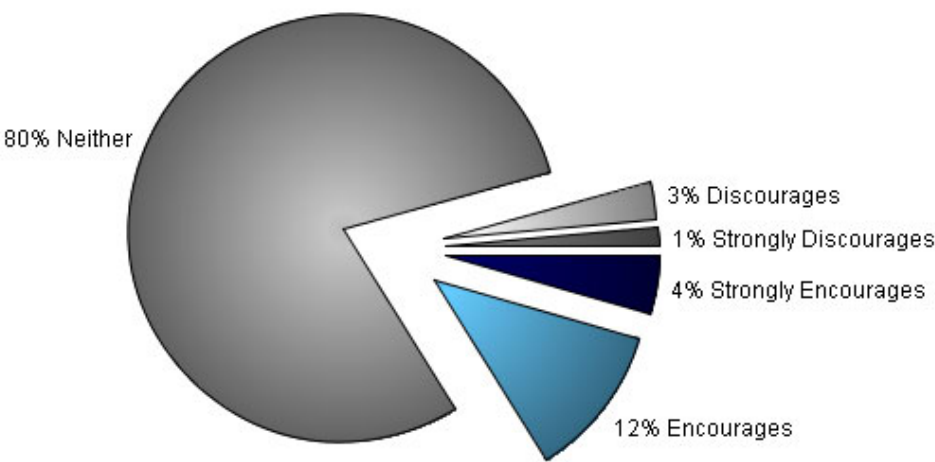
Note:

--Factors are listed from most to least influential for the 'Child does not walk/bike to school' group.

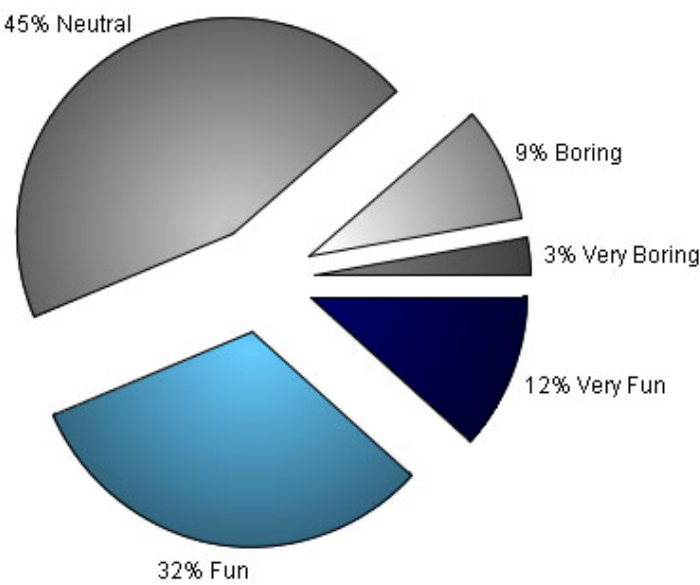
--Each column may sum to > 100% because respondent could select more than issue

--The calculation used to determine the percentage for each issue is based on the 'Number of Respondents per Category' within the respective columns (Child does not walk/bike to school and Child walks/bikes to school.) If comparing percentages between the two columns, please pay particular attention to each column's number of respondents because the two numbers can differ dramatically.

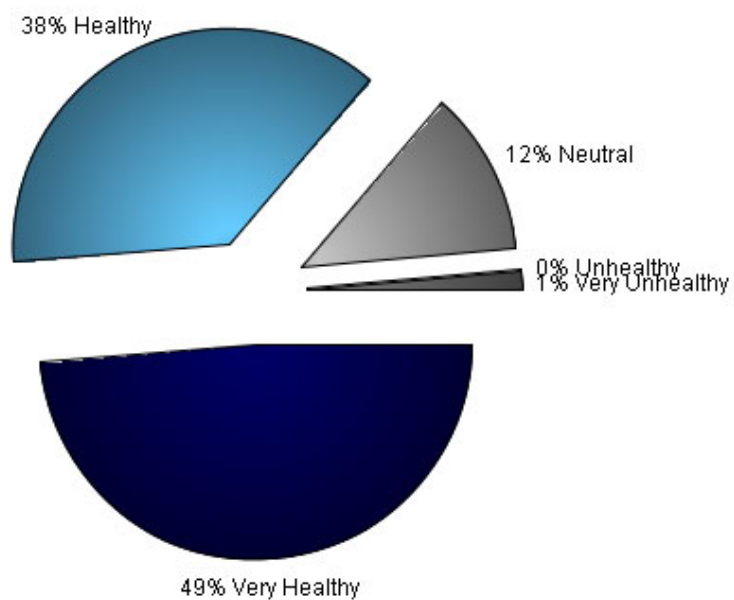
Parents’ opinions about how much their child’s school encourages or discourages walking and biking to/from school



Parents’ opinions about how much fun walking and biking to/from school is for their child



Parents' opinions about how healthy walking and biking to/from school is for their child



Comments Section

SurveyID	Comment
512537	My children often take Metro bus if afterschool activities run long.
521364	would allow child to walk/bike with a friend, not alone.
502115	Ronald Hall - 797-6904
502165	beloiroc1@gmail.gov
524788	It depends on weather, how late we are running in a.m., wheter he has instrument, after-school activities.
504868	I am a RN.
521235	We live almost 2 miles to school, so it really isn't a safe walk/bike ride.
521259	We live across the street!
521363	The Allen ave. intersection is the reason why I don't let my younger child walk to Lyseth.
521233	How hard would it be to have a stop sign on Summit Ave to slow traffice between Pinlock & Bramblewood. We have already had one child hit by a car. How many more does it take?
525463	Ph.D. in statistics [per last question]
512555	We have a child who is bused. A child that rode bike until high school and then stopped due to no storage. One chaild that we walk to school.

Appendix V – Lyseth & Lyman Moore Staff Survey

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

I'm a staff person at the following school:	City/Town Where You Live	How far do you live from Lyseth & Lyman Moore Schools?	How do you get to school most often?	How many days a month do you walk, bike, take the bus, or carpool to school from April - October?	How many days a month do you walk, bike, take the bus, or carpool to school from November - March?	If you sometimes use a means other than a personal vehicle to get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding using local bus service:	Please choose the answer that best fits your situation regarding walking:	Please choose the answer that best fits your situation regarding bicycling:	Please choose the answer that best fits your situation regarding carpooling:	Please check all of the following barriers - some or all of the car - that keep you from using alternate transportation vs. a car	From those items you checked in the above question, please enter the 3 barriers that affect you most often:
Lyseth	Portland	1-3 miles	Personal Vehicle			Bicycle	A. I have access to one or more local bus routes and I use the bus at least occasionally	A. I am able to walk a mile or so and do so at least occasionally for transportation (e.g. for errands, to see friends, to get to work).	A. I have access to a bicycle and use it at least occasionally for transportation	A. I have access to a carpool/vanpool and I use it at least occasionally	Rain, Snow, Ice, Lack of time/overscheduled	Lack of time Snow Rain
Lyseth	Portland	1-3 miles	Personal Vehicle				B. I have access and I do not use the bus	B. I am able to walk a mile or so and do not do so for transportation	B. I have access to a bicycle and I do not use it for transportation	C. I don't have access to a carpool/vanpool	Rain, Snow, Ice, Cold, Lack of time/overscheduled, Worried about wardrobe/appearance/grooming, Need to carry cargo, Need vehicle for children/family transportation/activities, Fear of being too limited, Want to just be by myself in my own car, Lack of motivation	carrying cargo need car for after-school activities/errands lack of time
Lyseth	Gorham	16-20 miles	Personal Vehicle				C. I don't have access to a local bus route	C. I don't have access to a bicycle	C. I don't have access to a bicycle	C	I'm not really sure how to find out about public transit near me, I'm not really sure how to find out about carpool options near me, Live too far from work to walk or bike, No access to public transit where I live and/or work, I can't get to work reliably without my own car, Fear of getting stranded	live too far from work don't know about public transportation
Lyseth	South Portland	7-15 miles	Personal Vehicle				B	B	C	C	Lack of time/overscheduled, Need to carry cargo, Live too far from work to walk or bike, Want to just be by myself in my own car	Live too far to walk/bike Lack of time Need to carry cargo
Lyseth	Portland	Up to 1 mile	Walk	Every day I need to be at school	Every day I need to be at school	Walk	B	A	D. I don't know	D. I don't know	Snow, Cold	Ice, snow, too cold
Lyseth	Falmouth	7-15 miles	Personal Vehicle				B	A	C	C	Need vehicle for site visits/work-related duties	Being limited Time constraints Too far
Lyseth	Portland	Up to 1 mile	Personal Vehicle				C	B	B	B	Lack of time/overscheduled, Don't like planning ahead, Fear of being too limited	Don't want to feel limited without my own transportation to and from work. I also frequently go home for

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

I'm a staff person at the following school:	City/Town Where You Live	How far do you live from Lyseth & Lyman Moore Schools?	How do you get to school most often?	How many days a month do you walk, bike, take the bus, or carpool to school from April - October?	How many days a month do you walk, bike, take the bus, or carpool to school from November - March?	If you sometimes use a means other than a personal vehicle to get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding using local bus service:	Please choose the answer that best fits your situation regarding walking:	Please choose the answer that best fits your situation regarding bicycling:	Please choose the answer that best fits your situation regarding carpooling:	Please check all of the following barriers - some or all of the time - that keep you from using alternate transportation vs. a car	From those items you checked in the above question, please enter the 3 barriers that affect you most often:
Lyseth	Falmouth	4-6 miles	Personal Vehicle			Carpool	B	B	A	A	I'm not really sure how to find out about carpool options near me, Lack of time/overscheduled, Fear of biking on roads/in traffic, Don't like planning ahead, Need to carry cargo, Live too far from work to walk or bike, Fear of being too limited	I have carpooled with a friend when our cars are being serviced. But I like getting to work earlier than she does. My bike route would be scary and I don't know how I would carry my teacher bag.
Lyseth	Portland	4-6 miles	Personal Vehicle	0	0	0 none of the above	B	C	C	C	Lack of time/overscheduled, Need to carry cargo, Need vehicle for children/family transportation/activities, I can't get to work reliably without my own car, Fear of getting stranded, Want to just be by myself in my own car, Lack of motivation	lack of time/overscheduled Need vehicle for family activities Need to carry cargo
Lyseth	topsham	21+ miles	Personal Vehicle	0	0	0 Carpool	B	B	B	B	I'm not really sure how to find out about carpool options near me, Snow, Ice, Lack of time/overscheduled, Need vehicle for children/family transportation/activities, Live too far from work to walk or bike	need van for my children's transportation from daycare live to far from work to walk or bike lack of time/over scheduled
Lyseth	Gorham	7-15 miles	Carpool	Every day I need to be at school	Every day I need to be at school	Carpool	C	A	B	A	Stranger danger/fear of crime, Fear of walking on roads/against traffic, Need to carry cargo, Need vehicle for children/family transportation/activities, Live too far from work to walk or bike, No access to public transit where I live and/or work, I can't get to work reliably without my own car	No public transportation in my area Need to carry cargo (school stuff) each day I live to far from school to ride my bike and be there in a reasonable amount of time considering the morning commute traffic
Lyseth	Saco	21+ miles	Personal Vehicle			Carpool	C	B	C	A	Lack of time/overscheduled, Need vehicle for children/family transportation/activities, Live too far from work to walk or bike	I only checked 3 barriers.

I'm a staff person at the following school:	City/Town Where You Live	How far do you live from Lyseth & Lyman Moore Schools?	How do you get to school most often?	How many days a month do you walk, bike, take the bus, or carpool to school from October?	How many days a month do you walk, bike, take the bus, or carpool to school from April - November - March?	If you sometimes use a means other than a personal vehicle to get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding using local bus service:	Please choose the answer that best fits your situation regarding walking:	Please choose the answer that best fits your situation regarding bicycling:	Please choose the answer that best fits your situation regarding carpooling:	Please check all of the following barriers - some or all of the time - that keep you from using alternate transportation vs. a car	From those items you checked in the above question, please enter the 3 barriers that affect you most often:						
Lyseth	Saco	16-20 miles	Personal Vehicle	Every day I need to be at school	Every day I need to be at school	0	0	0	0	0	Carpool	Get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding using local bus service:	Please choose the answer that best fits your situation regarding walking:	Please choose the answer that best fits your situation regarding bicycling:	Please check all of the following barriers - some or all of the time - that keep you from using alternate transportation vs. a car	Lack of time/overscheduled, Need vehicle for site visits/work-related duties, Live too far from work to walk or bike	Lack of time Use car to go from school to school Live too far from work to walk
Lyseth	Cumberland	7-15 miles	Personal Vehicle	0	0	0	0	0	0	0	Carpool	Get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding using local bus service:	Please choose the answer that best fits your situation regarding walking:	Please choose the answer that best fits your situation regarding bicycling:	Please check all of the following barriers - some or all of the time - that keep you from using alternate transportation vs. a car	I'm not really sure how to find out about carpool options near me, Lack of time/overscheduled, Worry about wardrobe/appearance/grooming, Need vehicle for children/family transportation/activities, Live too far from work to walk or bike, No access to public transit where I live and/or work, Want to just be by myself in my own car, Not interested/It's sort of a silly notion to not use my car	Live too far--Time of biking or walking to work Need Vehicle to pick up my children after school Want to be by myself in my own car
Lyseth	westbrook	7-15 miles	Personal Vehicle	0	0	0	0	0	0	0	Bus	Get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding using local bus service:	Please choose the answer that best fits your situation regarding walking:	Please choose the answer that best fits your situation regarding bicycling:	Please check all of the following barriers - some or all of the time - that keep you from using alternate transportation vs. a car	Need ownw vehicle for work related issues need own vehicle for family I have to disabled sisters that I need to be available for My home is to far to walk to would take to long	need ownw vehicle for work related issues need own vehicle for family I have to disabled sisters that I need to be available for My home is to far to walk to would take to long
Lyseth	westbrook	7-15 miles	Personal Vehicle	0	0	0	0	0	0	0	just my car	Get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding using local bus service:	Please choose the answer that best fits your situation regarding walking:	Please choose the answer that best fits your situation regarding bicycling:	Please check all of the following barriers - some or all of the time - that keep you from using alternate transportation vs. a car	Rain, Snow, Ice, Cold, Lack of time/overscheduled, Stranger danger/fear of crime, Live too far from work to walk or bike, Fear of getting stranded, Fear of being too limited, Want to just be by myself in	Stranger Danger Fear of being too limited Live too far to walk or bike

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

I'm a staff person at the following school:	City/Town Where You Live	How far do you live from Lyseth & Lyman Moore Schools?	How do you get to school most often?	How many days a month do you walk, bike, take the bus, or carpool to school from April - October?	How many days a month do you walk, bike, take the bus, or carpool to school from November - March?	If you sometimes use a means other than a personal vehicle to get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding using local bus service:	Please choose the answer that best fits your situation regarding walking:	Please choose the answer that best fits your situation regarding bicycling:	Please choose the answer that best fits your situation regarding carpooling:	Please check all of the following barriers - some or all of the time - that keep you from using alternate transportation vs. a car	From those items you checked in the above question, please enter the 3 barriers that affect you most often:
Lyseth	Gray	7-15 miles	Personal Vehicle			Nothing, the program made me fill it in	C		C	C	Lack of time/overscheduled, Need vehicle for children/family transportation/activities	I'm a runner, not a biker (falling hurts a lot less), so there's that. Although, biking is FUN! Running 10 miles is great, but forget teaching all day and running back home. Also, bikers on Rt 26/100 between Dutton Hill and Portland - really should only during daylight hours ... and then they're still slightly suicidal. ☹️
Lyseth	Portland	4-6 miles	Personal Vehicle	0	0	Bicycle	B	A	C	C	Lack of time/overscheduled, Live too far from work to walk or bike	time
Lyseth	Pownal	16-20 miles	Personal Vehicle			Carpool	C	B	C	A	Live too far from work to walk or bike	Live too far
Lyseth	Hollis	16-20 miles	Personal Vehicle			Carpool	C	B	A	A	Live too far from work to walk or bike, No access to public transit where I live and/or work	distance schedule little availability to carpool

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

I'm a staff person at the following school:	City/Town Where You Live	How far do you live from Lyseth & Lyman Moore Schools?	How do you get to school most often?	How many days a month do you walk, bike, take the bus, or carpool to school from April - October?	How many days a month do you walk, bike, take the bus, or carpool to school from November - March?	If you sometimes use a means other than a personal vehicle to get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding walking service:	A	Please choose the answer that best fits your situation regarding walking:	C	Please choose the answer that best fits your situation regarding bicycling:	C	Please choose the answer that best fits your situation regarding carpooling:	Please check all of the following barriers - some or all of the time - that keep you from using alternate transportation vs. a car	From those items you checked in the above question, please enter the 3 barriers that affect you most often:
Lyseth	Portland	1-3 miles	Personal Vehicle		0 Bus									Rain, Snow, Ice, Need vehicle for site visits/work-related duties	The barrier that affects me the most often is that I need my car for work. As the social worker, I am often called upon to transport students to school who missed the bus, transport students home who are sick, etc. ☐ The only other barrier would be weather such as rain or snow.
Moore	Portland	Up to 1 mile	Walk	Every day I need to be at school	Walk			B	A	B	B			I'm not really sure how to find out about public transit near me	I had to check something in the above box to submit this survey I think. I walk every day to school so I don't need public transportation.
Moore	Portland	1-3 miles	Personal Vehicle	0	0 None			C	C	C	C			Need vehicle for site visits/work-related duties, Need vehicle for children/family transportation/activities, Live too far from work to walk or bike	Live too far
Moore	Portland, Maine	1-3 miles	Personal Vehicle	0	0 none of the above			B	A	C	B			Lack of time/overscheduled, Need to carry cargo, I can't get to work reliably without my own car, Fear of being too limited	* arrive early to work ☐ * leave late from work ☐ * need own vehicle for other activities
Moore	Falmouth	7-15 miles	Personal Vehicle	16-21	Bicycle			B	B	A	C			Rain, Snow, Ice, Cold, Lack of time/overscheduled, Need to carry cargo	Cold, Dark, Snow
Moore	Portland	1-3 miles	Personal Vehicle	0	0 Carpool			B	B	B	D			Rain, Snow, Ice, Cold, Lack of time/overscheduled, Fear of biking on roads/in traffic, Need to carry cargo	Need to carry cargo and lack of time ☐ If I didn't have all the cargo and was able to get everything to school that I needed via bike, I still wouldn't do so because of it being unsafe!

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

I'm a staff person at the following school:	City/Town Where You Live	How far do you live from Lyseth & Lyman Moore Schools?	How do you get to school most often?	How many days a month do you walk, bike, take the bus, or carpool to school from April - October?	How many days a month do you walk, bike, take the bus, or carpool to school from November - March?	If you sometimes use a means other than a personal vehicle to get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding using local bus service:	Please choose the answer that best fits your situation regarding walking:	Please choose the answer that best fits your situation regarding bicycling:	Please choose the answer that best fits your situation regarding carpooling:	Please check all of the following barriers - some or all of the time - that keep you from using car alternate transportation vs. a car	From those items you checked in the above question, please enter the 3 barriers that affect you most often:
Moore	Lewiston	21+ miles	Carpool	Every day I need to be at school	Every day I need to be at school	Carpool	B	C	C	A	Lack of time/overscheduled	I use carpooling everyday. The only barrier is that my carpool person and I have a conflicting schedule.
Moore	Portland	4-6 miles	Personal Vehicle	0	0	Carpool	B	A	A	C	I'm not really sure how to find out about carpool options near me, I have a hard time understanding the bus schedule, Lack of time/overscheduled, Fear of biking on roads/in traffic, Lack of proper gear, Worry about wardrobe/appearance/grooming, Need to carry cargo, Live too far from work to walk or bike, Fear of being too limited, Want to just be by myself in my own car	Bus schedule unreliable Lack of time
Moore	Portland	4-6 miles	Personal Vehicle	0	0	0 # of Personal Vehicle	C	C	B	D	Rain, Snow, Ice	osteoarthritis
Moore	North Yarmouth	7-15 miles	Personal Vehicle			0 Bicycle	C	A	A	C	Snow, Ice, Cold, Lack of time/overscheduled, Need to carry cargo, Need vehicle for site visits/wood-related duties	Snow, ice, and need to use for work related activities, i.e. meetings
Moore	portland	1-3 miles	Bicycle	16-21	16-21	car	B	A	A	B	Snow, Ice, Lack of time/overscheduled, Need vehicle for children/family transportation/activities	What prevents me most often from taking the bike is having to pick up son for after school activities. Rarely is there snow or ice on the roads even in mid-winter. However, the shoulders where the cycle routes are located are the places where patches of ice or snow piles collect and create hazards.

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

I'm a staff person at the following school:	City/Town Where You Live	How far do you live from Lyseth & Lyman Moore Schools?	How often do you get to school most often?	How many days a month do you walk, bike, take the bus, or carpool to school from April - October?	How many days a month do you walk, bike, take the bus, or carpool to school from November - March?	If you sometimes use a means other than a personal vehicle to get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding using local bus service:	Please choose the answer that best fits your situation regarding walking:	Please choose the answer that best fits your situation regarding bicycling:	Please choose the answer that best fits your situation regarding carpooling:	Please check all of the following barriers - some or all of the car - that keep you from using alternate transportation vs. a car	From those items you checked in the above question, please enter the 3 barriers that affect you most often:
Moore	Freeport	21+ miles	Personal Vehicle	0	0	0 always drive	C	A	C	C	Need vehicle for site visits/work-related duties, Need vehicle for children/family transportation/activities, Live too far from work to walk or bike, No access to public transit where I live and/or work	I have an 8 month old; I live in Freeport; don't have someone else that I could carpool with that is on the same schedule as I am (with daycare, etc.)
Moore	Waterboro	21+ miles	Personal Vehicle	0	1/5/2011	Carpool	B	B	B	B	Lack of time/overscheduled, Need vehicle for children/family transportation/activities, Live too far from work to walk or bike, I can't get to work reliably without my own car	Distance, time and transporting children.
Moore	Portland	Up to 1 mile	Walk	Every day I need to be at school	Every day I need to be at school	Walk	B	A	B	C	Lack of time/overscheduled	None. I walk every day. I live very close to the school!
Moore	Old Orchard Beach	16-20 miles	Personal Vehicle	0	0	0 Carpool	B	B	B	A	Live too far from work to walk or bike, I can't get to work reliably without my own car	.
Moore	Portland	1-3 miles	Carpool	Every day I need to be at school	Every day I need to be at school	Carpool	B	B	B	A	Lack of time/overscheduled, Worried about wardrobe/appearance/grooming, Need to carry cargo, Need vehicle for children/family	Need to carry cargo Lack of Time Children to transport
Moore	Portland	4-6 miles	Carpool	Every day I need to be at school	Every day I need to be at school	Bus	A	A	A	A	Lack of time/overscheduled	I don't own a car, and choose to carpool, bike, and bus regularly. That said, the bus schedule is the factor that really determines whether I use it. It's not the fastest method.
Moore	South Portland	7-15 miles	Personal Vehicle	1/5/2011	0	0 Bus	A	A	C	C	Rain, Snow, Ice, Cold, Lack of time/overscheduled, Fear of biking on roads/in traffic	Lack of time fear of traffic and inattentive drivers cold

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

I'm a staff person at the following school:	City/Town Where You Live	How far do you live from Lyseth & Lyman Moore Schools?	How do you get to school most often?	How many days a month do you walk, bike, take the bus, or carpool to school from April - October?	How many days a month do you walk, bike, take the bus, or carpool to school from November - March?	If you sometimes use a means other than a personal vehicle to get to school - what is the 2nd most common way you get to school?	Please choose the answer that best fits your situation regarding walking:	Please choose the answer that best fits your situation regarding bicycling:	Please choose the answer that best fits your situation regarding carpooling:	Please check all of the following barriers - some or all of the car - that keep you from using alternate transportation vs. a	From those items you checked in the above question, please enter the 3 barriers that affect you most often:
Moore	Portland	Up to 1 mile	Personal Vehicle	1/5/2011	0	0 Walk	A	B	C	Need vehicle for children/family transportation/activities	Need vehicle for children/family transportation/activities
Moore	Cumberland	7-15 miles	Personal Vehicle	0	0 None	0 None	B	B	D	I'm not really sure how to find out about carpool options near me, Need vehicle for children/family transportation/activities, Live too far from work to walk or bike, I can't get to work reliably without my own car	Need vehicle for additional purpose and errands after school-
Moore	Portland	1-3 miles	Personal Vehicle	1/5/2011	0 Bicycle	B	A	A	B	Rain, Snow, Ice, Cold, Lack of time/overscheduled, Worry about wardrobe/appearance/grooming, Need to carry cargo	time before and after school is limited because of a pet at home, weather, and no place to shower and change at school
Moore	Portland	1-3 miles	Bicycle	0	0 Walk	B	A	C	B	Lack of time/overscheduled, Need to carry cargo, Need vehicle for children/family transportation/activities	Schedule - Often do not go home from school. Have second job on other side of town Convenience - sometimes I leave during the day and having my own car is convenient. Family - 4 kids and a wife that works until 4:30. Often times I am the transporter after school for appointments, activities,
Moore	Portland	Up to 1 mile	Walk	Every day I need to be at school	Every day I need to be at school	Carpool	A	B	A	Rain	Rain Snow After School Plans
Moore	Portland	1-3 miles	Personal Vehicle	0	0 always drive	D. I don't know	B	C	D	Lack of time/overscheduled, Need vehicle for children/family transportation/activities	Lack of time Need to be able to pick up and transport my children who are at different schools

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

I'm a staff person at the following school:	City/Town Where You Live	How far do you live from Lyseth & Lyman Moore Schools?	How do you get to school most often?	How many days a month do you walk, bike, take the bus, or carpool to school from April - October?	How many days a month do you walk, bike, take the bus, or carpool to school from November - March?	If you sometimes use a means other than a personal vehicle to get to school - what is the 2nd most common way you get to school?	B Please choose the answer that best fits your situation regarding using local bus service:	A Please choose the answer that best fits your situation regarding walking:	A Please choose the answer that best fits your situation regarding bicycling:	C Please choose the answer that best fits your situation regarding carpooling:	Please check all of the following barriers - some or all of the time - that keep you from using car alternate transportation vs. a car	From those items you checked in the above question, please enter the 3 barriers that affect you most often:
Moore	Portland	1-3 miles	Personal Vehicle	1/5/2011	0 Bicycle						Rain, Snow, Ice, Cold, Lack of time/overscheduled, Fear of biking on roads/in traffic, Need to carry cargo, Need vehicle for site visits/work-related duties, Lack of motivation	I often have quite a bit of cargo - books, papers, lunch, work I take home and it doesn't all fit on the back of my bike easily. I have to bike through Morrill's and Allen's Corner and the whole route is not set up for bikers especially Allen's corner and down Washington and Auburn Street. I do worry about my safety. Weather and I need to get up earlier to get there in time BUT I love the exercise and being outside in the AM.
Moore	Portland	Up to 1 mile	Walk	Every day I need to be at school	Every day I need to be at school	Walk	A			D	Snow, Ice, Fear of biking on roads/in traffic	If it is extremely icy and I am afraid of falling, I will bring my car to work. Also, if it has snowed the night before and my car will need to be moved for plowing, I will bring my car to work. I do not feel safe riding a bike with traffic and it would only add stress to my morning.

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

Anything else you would like to add? We would love to hear your thoughts, concerns & ideas!					With the horrible entrance to Lyseth school - it is actually quicker for me to walk to school than it is to drive.		It is very difficult for a teacher to walk/ride a bike to school for several reasons--one if you're dressed appropriately not always conducive to walking/biking. Also, we have too much to carry home and back quite often with paperwork we need for school each day.
--	--	--	--	--	--	--	---

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

Anything else you would like to add? We would love to hear your thoughts, concerns & ideas!	I love what you are doing. I think it's really important. I love walking (I do so every day with my dog). I wish I could walk to work, but four miles with a teacher bag is too far and too time consuming. I would consider carpooling, but I need to be at work early so I can be prepared for the day and it would add stress to my life if others caused me to be late.
	I live in the Riverton area. For me to get to Lyseth I would need to take a bus intown and then transfer to a No. Deering bus. It would take a 15 minute commute to more than 1 hour. Public transportation is very limited for cross town commuting.
	Would love to connect with PPSchool employees who live in Topsham and commute to Portland
	I would use the public transportation system if it were available in my area.^[2] The USM bus goes to Portland numerous times a day from my town, and I would love to have the option to ride it as a paying community member. It seems like a win-win deal as the bus gets filled and they also get a little revenue to offset there costs.

Anything else you would like to add? We would love to hear your thoughts, concerns & ideas!				
--	--	--	--	--

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

Anything else you would like to add? We would love to hear your thoughts, concerns & ideas!	
While I drive to work, we live in walking distance to Hall School and my children walk to and from school most days.	
My knee issues prohibit me from riding a bike.	

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

Anything else you would like to add? We would love to hear your thoughts, concerns & ideas! I think it would be nice to organize a staff day or maybe 2 a year where staff use other transportation to school such as bus, walk, carpool, etc.				*appreciate your work for a healthier Portland.		
--	--	--	--	--	--	--

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

Anything else you would like to add? We would love to hear your thoughts, concerns & ideas!	I carpool everyday as I drive from Lewiston to Portland.
I play basketball at school three mornings a week starting at 6:30 am. No one from my neighborhood plays. Other teachers don't arrive until 8:00 am. So, carpooling doesn't work. I like to leave after working a while - usually that is after almost all others have gone. Then, I want to get home directly so that I can spend time with my family.☹ The bus schedule, um, sucks.	After TKR I hope to bike in reasonable weather
Would be nice to have a staff bike club for riding regularly and info sharing.	Parents have legitimate concerns about safety. The status/primacy of cyclists has risen dramatically in Portland in recent years, however it is seen as recreational use, sportive, not transportation. I believe the only way kids will regard cycling as transportation is if/when adults do. The target group for cycling to work is adults: parents and teachers first. It's a small but growing group. ☹ One way to promote cycling is to encourage local bike sellers to promote 'office travel' bikes: upright, comfortable with skirts, briefcase/laptop carriers, lights, etc. Another idea is to have one on display in school entrances (hanging out of reach) with promotional suggestions: photos of school personnel, students, parents who ride. ☹ Love that the government is providing some support for this. They need to do more, including bolstering signage along routes - kids on bikes etc. Some cycle shoulders diminish suddenly especially at treacherous intersections. ☹

Anything else you would like to add? We would love to hear your thoughts, concerns & ideas!	
	If I lived closer to my work, and did not have children to transport every morning, I would try to bike or take alternative transportation to work. ☐
	Safety around neighborhood sidewalks is a problem. When I come down Junior street, from Bartley, the sidewalk is never shoveled and I have to walk in the street. Any students that access the school from that direction must do the same!☐ ☐ Would love to work with you further on this as we live in the neighborhood we work in and it is an active concern for us! Thanks for your help!☐ Kathy Farrel☐
	I car pooled for 16 years but the other person changed schools and at this time there is no other person to share with.
	I am lucky to carpool with a LMMS teacher, and so appreciate the convenience (for me), as well as the company. It would be great for carpooling to be a more common mode of transportation.

Staff Survey for Lyseth Elementary Lyman Moore Middle Schools - 2010-2011 School Year

Anything else you would like to add? We would love to hear your thoughts, concerns & ideas!			There are no facilities for teacher at school for changing and or cleaning up after a bike ride. There's been more emphasis on "professional dress" throughout the district. Work clothes and limited changing and no showering facilities makes biking tricky.			
---	--	--	---	--	--	--

Anything else you would like to add? We would love to hear your thoughts, concerns & ideas!	Auto drivers need to be educated as well as bicyclists and walkers.
	I feel fortunate that I live close enough to work to walk. I'm not sure that if I lived in another town that I would be organized enough to car-pool. I did take the city bus quite often when I worked at DHS and it's an experience that everyone should share occasionally if they can. I met some of my neighbors for the first time!

Appendix VI – General Raw Data from Various Stakeholders & Public Forum

Stakeholder Survey & Public Forum Feedback for Lyseth-Lyman Moore School Travel Plan			
Bus/Parent Drop-Off Area at Lyseth & Lyman Moore			
Team # or Stakeholder Name	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
1	Drop-off area		Alternate drop off outside entrance on Auburn St.; Restructuring of parking lot [& entrance]; Buses [could] drop off at Bramblewood
1	[In front of L.M.]	No crosswalk at Junior St. for middle school students that walk	
1	Auburn St. Entrance		2 Crossing guards on Auburn St -> possible movement of one to Virginia & Allen Ave
2	Bus/Car Drop Loops	Kids crossing; Confusing area; Whole area is wasted space;	Could make room for 2 bike lanes and increase safety
2	Junior St.	No sidewalk; Lots of kids walking; Winter is trouble;	Save the trees [if an work done?]
2	Back of Lyseth	Kids walk [across rear parking lot] – cars back up; Kids enter here [Lyseth south entrance]	Parking lots are full all day but would be good to pull cars from back [south side] of Lyseth; Organize parking better
2	Triangle wedge with sidewalk between Jr. St & front entrance of Lyman Moore	Bushes too high [on west side of triangle wedge for students to see]	
4	[Bus/Car Drop Loops in front of Moore]	Poor condition & striping	
4	[Bus/Car Drop Loops in front of Moore]	Parking at island obstructs peds x-ing	
4	Junior St.	(Staff) spillover parking	
Off. Napijalo, Senior Lead Officer		A large number of cars and busses coming in and out.	Designate separate travel lanes for cars and busses. Better signalization (traffic/no parking signs), road signalization (mark lanes for cars, busses and bikes).
Terri Grover, A2U2, & former parent	Front steps of the school; bus lane in front of school	To meet parents, students have to go in between large buses and cross to parent drop off circle. If a bus were to pull out or jump forward, a child could be killed; also, parents cannot see their children from their cars; very crowded. Very confusing	Bring bus pickup area to a different area, on the side of the building perhaps, allowing a clear area for parents to pick up students and walking students to find the walkway without dealing with huge buses; Adults to direct children to walking paths. buses parent pickup
Terri Grover	Playground path	No clear path to get to walkway, walking in parking lot	Adult leads children to walkway; dismiss from back door

Gretel Varney, Portland Public Services; & former parent	Lyseth parent drop off	Parents trying to get as close as possible to door; park anywhere without regard to signage, other drivers, or students	Education/awareness for parents and students; encourage students to help parents follow the rules; enforce designated bus lane; enforce regard for crosswalks (ie: don't park in a crosswalk or block access to pedestrian ways)
Lorraine Taylor, Lyseth Teacher		Children are let off in front of the school and can not get to a playground area without walking through either an area without supervision on the right-hand side of the building or the parking lot on the left-hand side of the school. The primary students should not have to walk these two routes unsupervised before school starts and they are not allowed to access these areas by coming into the building.	
Tina Singer, Lyseth PTA & parent of students at both Lyseth & Lyman Moore	In front of both schools	Too crowded; cars going around each other	Change routing
Ed Turner, Crossing Guide, Summit & Sumac	Summit & Sumac Streets		I feel this is a real safe area, open, with nice homes around, cul de sac at the end of Sumac with path between 2 homes that leads very close to school property.
Regina Erskine, Health Teacher at Lyman Moore	Lyman Moore Entrance	Too many vehicles	Other drop-off areas that have students walk part of the way to school.
Ned Doughty, Lyseth parent; Fire Dept. Rep	Bus Drop-off area/parking lot	Congestion is terrible	Find alternate parking; Encourage parents to park and walk further; Provide additional road onto campus;
Lyseth Parent Survey (7 comments)	Bus Drop-off area/parking lot	No sidewalks on Junior St. and no crossing guards within drop-off area; Long delay before walkers are dismissed; Traffic safety concerns in parking lot and drop-off area; Students crossing between buses; Buses should drop off on side of school; [Jr. St.]: "Many people including teachers from both Lyseth & Lyman Moore go over the speed limit of 25mph and do not stop at the stop sign....I have called the police 5 times!!"	
Sidewalks/Paths in Surrounding Neighborhood			

Team # or Stakeholder Name	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
1	Biking (& Walking) from areas close (Brookfield Apts, Auburn Terrace)	Unsure of barrier?	Pair up with older kids? Bike buddy?
1	Path from Sumac to back of Lyseth	Congestion on the path	
1	Near 123 Auburn	Sidewalks in front sections on Auburn [missing link(s)];	
1	Pinelock	No sidewalks on Pinelock between Summit and Roaring Brook	
1	Ray St.	Sidewalks [needed] on Ray St. from Merrymeeting St. towards [Allen]. Ave. (big hill - dangerous - [lack of visibility])	
2	Informal/private trails [on south side of schools] to Med Center (check permission); Shaws; Cottage Park Road (private); UU Trail from Allen Ave	Behind Shaw's is "sketchy", perceived as nobody's watching; UU Trail from Allen Ave doesn't feel safe, some kids not allowed;	[Build] Jogging track around fields - links to other trails;
2	Trail opposite main entrance on Auburn - goes to Washington Ave.;		Portland Trail @ Shalom is an important connection
2	Wash Ave. Ext.	Non-continuous sidewalks;	Want continuous sidewalks on Wash Ave. North & crossing guards would allow access to crosswalks
2	Parsons Pond	Parson's Pond is posted, so no connections for Wash Ave. Ext - must go to PT & Shalom or Sanborn;	
2	General neighborhood:	streetscape isn't friendly, should be welcoming and fun	Good access for Summit St. area;
2	Univ. Park area & Washington Ave. Ext	[no good access?];	
4	Junior St.	"Walking down Jr. St. doesn't feel safe" (Lauren, 4th grader)	Restrictions on Time of Day "Thru Traffic" on Junior St??

4	Auburn St. [b/t Lib's & Grace Lutheran]	No sidewalk; Where no sidewalk it's steep	
4	[southern Moore boundary]		Access from Shaw's!!
4	[Bramblewood compared to [PT path from Allen Ave?]]		Use Bramblewood not path from Allen Ave?
4	Bartley Ave & back of Lyseth		Drop-off spot?; Safe??
4	Bartley & Jr. St; Bartley & Fall Lane	Short cuts; Snowbanks in winter; (School buses, too)	
Terri Grover, A2U2, & former parent	Path to Bramblewood; path to Sumac; Allen Avenue; going to playground to take the Bramblewood path	Needs evening and night lighting; feels scary through the playground for evening events; very steep; no sidewalk on one side of Allen; children have no path to walk on from the school to reach the playground path; they are walking behind parked cars	Install motion lighting; better paving, shallower incline; install sidewalks on both sides of Allen; install a safe pathway for children to follow, including a marked crosswalk to a path off the parking lot; dismiss walking students from back door to the playground
Lorraine Taylor, Lyseth Teacher	There are a lot of wooded paths going to Lyseth.	Personally, I would not want my five or six year old to be on those paths without supervision.	
Tina Singer	Washington Ave.	Sidewalks are only on one side of the road	Need more crossing guards or sidewalks on both sides of Washington Ave.
David & Susan Wallace, grandparents of Lyseth Student		We live on upper Pineloch Drive. There are no sidewalks on this section of Pineloch which is sharply curved as you make the turn from Summitt. Cars often cut the corner when turning onto Pineloch while travelling down towards Pineloch Woods at a good rate of speed.	This stretch of Pineloch should enjoy the benefits of a sidewalk so kids can safely walk to school, have a safe spot to learn to ride their bikes and just to walk on in the winter when the snowbanks are piled high.
Ed Turner	Summit & Sumac Streets		New sidewalks installed recently with curb down Sumac St.
Lyseth Parent Survey (4 comments)	Ray St.	Missing sidewalk links despite recent road work. Not comfortable with students walking on Ray.	

Lyseth Parent Survey (3 comments)	Auburn St (between Armstrong Hts & Garsoe St.)	Missing sidewalk link; Neighborhood unfairly taxed without benefits; Mr. Cohen did not help; Students could walk everyday if sidewalk link existed	
Lyseth Parent Survey (4 comments)	Pineloch between Summit and Roaring Brook	Missing sidewalk link; Blind curve(s) dangerous for drivers and students walking	Construct missing sidewalk links;
Lyseth Parent Survey (1 comment)	Summit St.	Summit has become a thoroughfare for people who wish to avoid Washington Ave/Auburn St.	One additional adult presence near Curtis might provide security I need to allo [student name] (1st grade) to walk along Summit St. Speed bumps would also slow people down. A police presence on Summit would discourage speeding as well (during AM hours 8-30-9 & PM 3-3-30)
Lyseth Parent Survey (1 comment)	Washington Ave. Ext.	Missing sidewalk link between Lester & Riverside	Maybe if the City could do something about that walking to school would be an option
Bicycle Treatments (poorly designed or lack thereof) (signage, bike lanes, etc.)			
Team # or Stakeholder Name	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
2	Campus	No defined bike route through campus; Bikes not allowed on campus;	Build bike path on North end of playing fields from Lyseth playground to edge of Lyseth/Lyman Moore parking lots and around rear Lyman Moore parking lot to rear entrance; Bike route needs to connect to Lyseth crosswalk?; Bikes/skateboards/scooters should be allowed on campus
4	Campus	No defined "bike lane" - separate??	Path for bikes [along north edge of playing fields]; Need connection from path from Bramblewood
4	Campus	Bike - Pavement is poor & build up of sand/gravel	
Off. Napijalo	Allen Avenue, Auburn Street, Washington Avenue	It is important to share roads with bicycles so we need to improve infrastructure and signs to achieve this goal.	Installing bike signs on outer Washington Avenue (none exist), painting bike lanes on Auburn (between Allen and Sanborn), painting bike lanes and signs on Allen Avenue between Summit and Washington would help with bike safety for kids that ride bikes to school from that area of the city.
Terri Grover	No bike lanes to Lyseth, and not clear to Moore	Easy for children on bikes to be hit by cars and buses, as there is no clear place for them to be; Bikes in traffic; No decent bike racks at Lyseth	Bike safety sessions; helmet education and giveaways; separate, well-marked bike paths on school grounds and surrounding neighborhoods, including through the playground to connect with paths to neighborhoods

Gretel Varney, Portland Public Services	Auburn St. - Allen to Sanborn; Washington & Allen Ave. intersection	Auburn St - Allen to Sanborn: no bike lane and no room for bike lane; Washington Ave and Allen Ave intersection: no room for bikes	
Ed Turner, Crossing Guide, Summit & Sumac	Summit & Sumac Streets		No specific bike lanes, but small amount of traffic down Sumac which is dead end. Summit Street does have bike lanes and a sidewalk.
Regina Erskine, Health Teacher at Lyman Moore	Allen Ave. & Auburn St/Washington Ave.	Lack of bike lanes; Dangerous intersection at Allen & Washington; Too many distracted drivers! I don't think I would ever feel safe biking to school. Too many drivers on the road that do not respect bicycles using the road. Also too many distracted drivers and lack of bike lanes.	More bike lanes; Education drivers on sharing the road
Road Crossings & Intersections			
Team # or Stakeholder Name	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
1	Allen Ave by Yale or near PATHS		Cross guard or light [needed near PATHS/Yale]
1	Allen Ave.		Better signage at busy crosswalks (esp. Allen Ave)
1	Virginia and Allen Ave.		Crossing guard [needed]
1	Allen Ave. & Washington Ave.	No crossing guard at Allen Ave. ext.	
1	PT Crossing at Allen Ave.		Crosswalk needed
2	Traffic light at Sanborn	People are running light	Need longer yellow
2			More crossing guards needed further out from school
4	Allen Ave & Washington Ave.		
4	Rustic & Auburn	Lots of turning traffic - a barrier	
4	Auburn & Lyseth-Moore Drive		Good signal!
4	Junior St. & Lyseth- Moore Drive		Blind spot for drivers; x-ing guard ?? needed at this location

Terri Grover	Crossing Bramblewood across Allen; crossing Allen at end of Portland Trails	Cars may not always stop for crossing light; children may not always use it, or cross in the crosswalk; no crossing light at all by the trail; no crossing guard at all on Allen	Have a crossing guard at the crossing light at Bramblewood and Allen; clearly mark path at end of trail
Gretel Varney, Portland Public Services	Intersection of Allen and Washington/Auburn	Turning traffic tends to not stop on red before making right; only looking to left for vehicular traffic and don't look to see walk signals; kids tend to assume drivers will see them and yield whether they are in or out of crosswalk or with or against walk light.	Enforcement of stop on red; education/awareness for students to take responsibility for their own safety.
Tina Singer	Washington Ave. Ext.	No guards at crosswalks higher up on Wash. Ave. Ext. I watched 7 cars speed past the crosswalk while my son was at the crosswalk waiting	More crossing guards. Would mean more supervision also, making everyone feel safer. Needs to be enforced [by police]; Speed bumps before each crosswalk; Not sure why there are 2 crossing guards at our new light and crosswalk on Auburn St.
Ed Turner	Summit & Sumac Streets		Students cross Summit Street to go down Sumac. Crossing well marked with white lines. This is where I am stationed.
Off. Napijalo	326 Auburn St.		Putting an additional crosswalk in front of 326 Auburn Street (Huntington North complex) would be a good idea because a lot of kids from North Deering Gardens and Huntington North attend Lyman Moore School. This way kids can cross Auburn Street little safer and they could walk to school on the other side of Auburn Street using the existing sidewalk.
Off. Napijalo	Washington Ave. Ext.	I saw an increase of accidents and speeding offenses on this stretch of the road. I also received numerous complaints from residents that their kids are not safe when they go to school due to this traffic issue.	I would put crosswalks and some type of signalization at Greenwood Street, Skylark Street and Regan Lane intersections with Washington Avenue North.
Regina Erskine	Allen & Washington intersection	Dangerous for walkers and bikers	
Ned Doughty, Lyseth parent; Fire Dept. Rep	All major streets	Need for more student crossing signage	

Steve Niles, parent	Allen Ave. @ VA & Bramblewood	My son has biked to school every day for the last two years (except for during icy road conditions).... biggest impediment our neighborhood faces...is Allen Ave...many families that walk or bike this route and that intersection is dangerous. The addition of a small island a few years ago was welcome but did not change the fact that there is a massive volume of traffic at a higher speed with a degree of inattentiveness that makes for a dangerous combination. I have personally almost been killed in this intersection while walking my kids to school. Although a driver stopped to let us cross, the inattentive driver following him did not stop and plowed into the first car thereby pushing the first car into the place we would have been if I had not grabbed my son and pulled him back.	A crossing guard at the intersection of Allen and Virginia/Bramblewood would go a long way to fixing this problem.
Steven Caminiti	Allen Ave crossings	Have crossing guards for Allen Ave. at Virginia and Ray streets.	
Lyseth Parent Survey (10 comments)	Allen Ave crossings	No crossing guards on Allen Ave.; Low visibility trying to cross Allen at Summit St. to reach crossing guard further down (2 of 10 comments)	Put at least one crossing guard on Allen Ave. (perhaps at Washington and Allen or Virginia and Allen Ave.)
Lyman Moore Parent Survey (1 comment)	Allen Ave & Washington Ave. intersection	The Allen ave. intersection is the reason why I don't let my younger child walk to Lyseth.	
Traffic Speed			
Team # or Stakeholder Name	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
1	Allen Ave	Speed	
2	Washington Ave.	Speed & Traffic	
Off. Andjelko Napijalo	Auburn St. & Washington Ave.	Speeding	We are working on installing one of our portable radars on Washington Ave to reduce the speed. More police patrols and traffic details in the school zone on Auburn St. Placing a larger sign somewhere on Auburn Street to let motorists know that this is a school zone and that they should respect the speed limit and other city and state ordinances or laws.

Terri Grover	Allen Avenue; Bramblewood Dr.	Cars often go way too fast, and do not watch for children crossing Allen; cars often speed around the corner on Bramblewood going between Summit and Allen	Frequent speed traps, crossing guard, better signage (hate the idea of speed bumps, but . . .; speed traps on Bramblewood occasionally, better signage, crosswalk painted on Bramblewood between the path and crossing the street
Tina Singer	Washington Ave. Ext.	Too fast	Enforcement; Speedbumps before each crosswalk
Lyman Moore Parent Survey (1 comment)	Summit St.	How hard would it be to have a stop sign on Summit Ave to slow traffic between Pinelock & Bramblewood. We have already had one child hit by a car. How many more does it take?	[H]ave a stop sign on Summit Ave to slow traffic between Pinelock & Bramblewood
Volume of Traffic/Busiest Streets			
Team # or Stakeholder Name	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
1	All of Allen Ave & Washington/[Auburn]		
2	Washington Ave.	Speed & Traffic	
Off. Napijalo	Auburn St.	High volume of traffic	Police presence and traffic enforcement.
Terri Grover	Allen Avenue; school driveways; Auburn St	Lots of cars traveling to/from Falmouth;	
Tina Singer	Wash. Ave, Auburn	Rush hour	Speed bumps
Ed Turner	Summit St.	heaviest mornings going to work	
Regina Erskine, Health Teacher at Lyman Moore	Allen Ave; Washington Ave; Auburn St.	Streets are very busy!	Less traffic, if parents are not dropping off students
Weather as it Impacts Physical Infrastructure (Water issues, Snow removal, Ice patches, Sun glare, etc.)			
Team # or Stakeholder Name	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
1	[Connecting trails?]		Maintain trails in the winter time
1	Bus drop-off area/parking lot	Drainage issues (flooding - spring/fall) Ice jams in winter; Asphalt surfaces dangerous - holes/rough/unsafe	
1	[Bus drop-off/parking area]	Poor "seasonal" visibility due to high snowbanks	
2	Parson's Pond	Team 2: Parson's Pond pushes snow onto sidewalks (private plowers)	General – sidewalks are well plowed

4	[General - larger radius map]	Sidewalks a mess in winter	
4	Bartley & Jr. St; Bartley & Fall Lane	Short cuts; Snowbanks in winter; (School buses, too)	
Terri Grover	Bramblewood	Only one side plowed	Sidewalk plows actually do a good job on [one side] Bramblewood; not sure about other areas; Plow both sides [of Bramblewood]
Gretel Varney	Sidewalks near/at intersection of Allen Ave and Washington/Auburn	Local businesses do not keep sidewalk clear; parking areas are frequently plowed into adjacent sidewalk	Enforcement of city ordinance for clearing sidewalks adjacent to property
Tina Singer	Portland Trail connecting Wash. Ave. & Auburn	Narrow, overgrown, hidden and not paved - as a result, not plowed in winter	Pave and plow
Tina Singer	Pathways and sidewalks [general?]	Not plowed	Need to plow; [Under enforcement section]
Tina Singer	Bike Parking	Not covered during weather	
Ed Turner	Summit & Sumac Streets	Sometime sidewalk down Sumac St had not been plowed, or piled up snow at corner	If City of Portland could plow sidewalk a little earlier in the morning
Regina Erskine		Lack of snow removal sometimes an issue	
Lyseth Parent Survey (3 comments)		Better clear sidewalks needed; Winter enforcement or cleaning by the City of walkways, paths, and streets; No snow plow for sidewalks	Need to plow sidewalks or do better enforcement [Enforcement section]
Lyman Moore Parent Survey (1 comment)		It depends on weather, how late we are running in a.m., whether he has instrument, after-school activities.	
Access to Local After-School Sites			
Team # or Stakeholder Name	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
Terri Grover	Students are walked to First Lutheran		
Ed Turner	Summit & Sumac Streets	Most students in this area are going directly home. However some do go back to school for sports.	
Lyman Moore Parent Survey (1 comment)			My children often take Metro bus if afterschool activities run long.
Bicycle Parking			

Team # or Stakeholder Name	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
1	Lyman Moore	Lacking bike racks	
1	[Not sure if referring to specific school]		More bike racks; more visible
2	Lyman Moore	Bike racks not visible; Kids concerned about theft; Bike racks full	[2 bike racks suggested to be installed on either edge of the front cement entrance way to Lyman Moore]
4	Lyman Moore		more bike parking; consolidate?
4	Lyseth Campus		Bike racks [on eastern edge of property, directly behind school building]
Off. Andjelko Napijalo	Lyman Moore & Lyseth		Installing bike racks in front of both schools. Have some kind of locking mechanism in place or donate locks to kids who ride their bikes to school.
Terri Grover	Lyman Moore & Lyseth		Good at Moore; lousy at Lyseth
Tina Singer	Bike Parking	Not covered during weather	
Ed Turner	Bike Parking at Lyman Moore	I went by (9/15/10) to check on this. The racks seemed full.	I find this spring many boys are riding bikes; Solution - a few more racks to hold bikes.
Regina Erskine	Lyman Moore		Could use another bike rack
Ned Doughty, Lyseth parent; Fire Dept. Rep	Lyseth & Lyman Moore	Bike theft concerns	Need more space to keep bikes from getting damaged; Consider installing video camera to observe racks
Lyseth Parent Survey	Lyseth	More bike storage needed; Concerns about safety of bikes when stored; Are locks needed?	Increase the amount of bike parking; Encourage the use of locks; Provide a bike lock library
Distance			
Team # or Stakeholder Name	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
Terri Grover		Students right in the neighborhood are being bused to Lyseth; waste of resources, lack of exercise	
Ed Turner	Pineloch and Roaring Brook Roads	Many walkers and bikers come from Pineloch and Roaring Brook roads. They can stay on the same side of street until they come to my crossing.	
Lyman Moore Parent Survey (1 comment)		We live almost 2 miles to school, so it really isn't a safe walk/bike ride.	

Violence/Crime			
Team #	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
1	Crime on Allen Ave	[First week walking home from school son threatened with a knife by a young person crossing near Allen Ave.]	
1		Help students feel safe	
2		Fear factor – perceived threats to kids; Not enough people “paying attention”; If we make the routes, are they safe? Need “supervision”; Cell phone use is a problem - “no cell phones” in the District; Lighting	Team 2: Paid bicycling leader?; Lighting sufficient in area?
4	Auburn St.	"Stranger Safety" (need adult I can trust to walk w/)	
Terri Grover	Playground Path	No lighting	Motion lighting
Ned Doughty, Lyseth parent; Fire Dept. Rep	General neighborhood:	Formerly was dispatcher; Knows violence and crime are rare, sometimes domestic disputes withing families, but still concerned about younger students walking alone	
Lyseth Parent Survey (4 comments)		Concerned about kidnapping, walking unsupervised	
Lyseth Parent Survey (1 comment)		[T]he Lyman Moore hoodlums frequently harass little kids and should be dismissed after not before the young children!	
Other Physical Barriers			
Team # or Stakeholder Name	Specific Location	Challenges/Safety Issues	Possible Solutions/Additional Comments
1	At School	Football player can't fit gear in locker; [students bringing large items for after-school have difficulty storing; [Also building locked during practices so students can't get back to gear]	Lee had ideas about where gear could be stored; Keeping building open to [students at] practices
1		For cultural issues	Contact the Minority Health program @ PHD [Public Health Dept.)
2		Perceived risk; Kids aren't educated on bike safety;	
2		Parents too nervous	
		Proper equipment for kids	
4		Redistricting issues driving +; Reduced # that can take the bus	

Lyseth Parent Survey (14)		Parents work too early to be able to walk & bike their children to school and still get to work	Adult supervised walkpools/walking school buses that get kids there safely, and allow parents to go about their work day
Lyseth Parent Survey (35)		Too young to walk alone; Before 10 may not possess brain development to make good pedestrian safety decisions; Concerns about delay in verification if child does not make it to school.	Adult supervised walkpools/walking school buses that get kids there safely, and allow parents to go about their work day
Lyman Moore Parent Survey (1 comment)		It depends on weather, how late we are running in a.m., whether he has instrument, after-school activities.	
Lyman Moore Parent Survey (1 comment)		would allow child to walk/bike with a friend, not alone.	
Lyseth Parent Survey (1 comment)		It is discouraging how long they make walking kids wait to be dismissed. Walking kids should be allowed to leave first because parents are waiting.	
Enforcement Program Feedback/Ideas			
Team # or Stakeholder Name	Specific Action	Challenges/Opportunities	Possible Solutions/Additional Comments
2			More crossing guards needed further out from school
2			Riding crossing guard?
	Organize a School Safety Patrol		13 votes @ Public Forum; 3 Stakeholder votes
	Review Drop-Off and Dismissal Policies and Locations for What Works Best for Walkers and Bikers		10 votes @ Public Forum; 5 Stakeholder votes
	Strategize with Current Crossing Guards on Need/Concerns - Plan for Regular Communication		9 votes @ Public Forum; 3 Stakeholder votes (including one crossing guard)
	Work with Local Law Enforcement - Enforce Child Helmet Law		10 votes @ Public Forum; 5 Stakeholder votes for all Work with Local Law Enforcement

	"Ticket students for "doing good"			1 vote @ Public Forum; 1 Stakeholder vote on this specifically
	Using Portable Speed Trailers			2 votes @ Public Forum
	Progressive ticketing of motorists			1 vote @ Public Forum
Ned Doughty, Lyseth parent; Fire Dept. Rep	Set up Hotline for reporting issues			
Ned Doughty, Lyseth parent; Fire Dept. Rep	If D.A.R.E. officers still in operation, have patrol 1 mile radius; Have Bike Police officers patrol during morning & afternoon; Work on funding for both programs			
Lyseth Parent Survey (2 comments)	Need to plow sidewalks or do better enforcement	Better clear sidewalks needed; Winter enforcement or cleaning by the City of walkways, paths, and streets; No snow plow for sidewalks		
Education Program Feedback/Ideas				
Team # or Stakeholder Name	Specific Action	Challenges/Opportunities	Possible Solutions/Additional Comments	
	<i>Bike & Ped Safety Education</i>		16 votes @ Public Forum; 6 Stakeholder votes	
	<i>After-School Bike Club</i>		10 votes @ Public Forum; 2 Stakeholder votes	
	<i>Bike Safety Fair/Rodeo</i>		12 votes @ Public Forum; 2 Stakeholder votes	
	<i>Include Ped & Bike Safety Education & Practice within the PE Curriculum</i>		11 votes @ Public Forum; 4 Stakeholder votes	

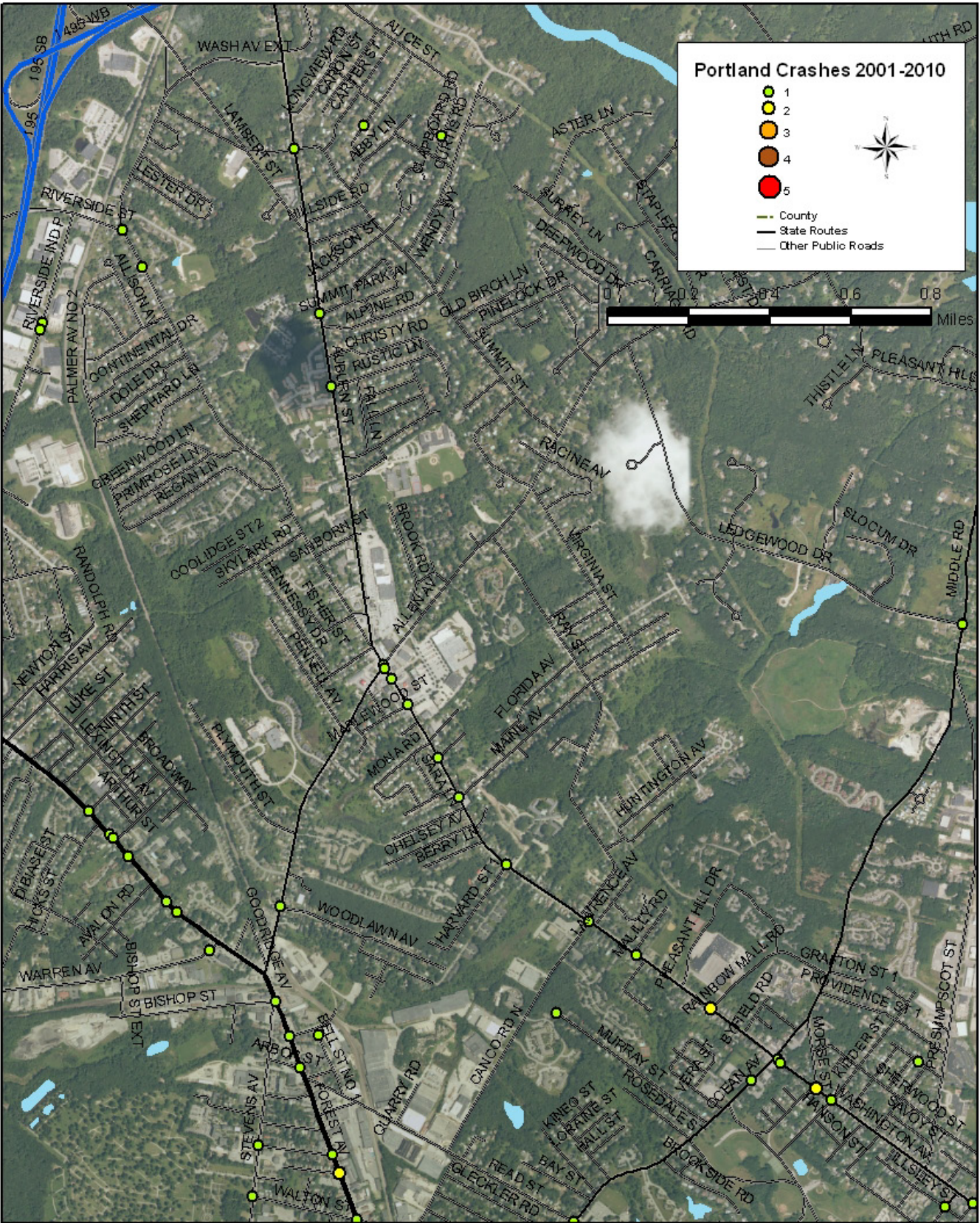
	<i>Include Alternate Transportation Education as Part of Lyseth & Lyman Moore Schools Curricula</i>		12 votes @ Public Forum; 4 Stakeholder votes
Off. Napijalo	<i>Bike-Ped Safety Ed with Police Help</i>		Better education of kids about safety would be another way to tackle this problem. We should have police officers and other officials talk to kids about safety.
Gretel Varney	<i>Parent education/awareness [campaign] - following posted speed and parking signage; car pools for neighborhood</i>		
Encouragement Program Feedback/Ideas			
Team # or Stakeholder Name		Challenges/Opportunities	Possible Solutions/Additional Comments
1		Moore staff that live close to school good role models; 25-30% of Lyman Staff live within 1 mile of the school	Outreach to staff: Bike Commuter education program (free); Healthy Portland Worksite Wellness grants; Offer staff incentives;
1		Many students don't have access to a bike; 49% of Moore [students qualify for] free & reduced lunch	Earn-a-Bike program; Bike giveaway (Portland PD); Access to bicycles for student population
1		Walk Pool [informal, currently exists] in the neighborhood; Walking line coming from Rustic & Christy Road	
2		Proper equipment for kids	
	<i>Organize Walk & Bike to School Days Once or Twice a Month</i>		7 votes @ Public Forum; 4 Stakeholder votes
	<i>Organize Walking School Buses and/or Bike Trains</i>		8 votes @ Public Forum; 3 Stakeholder votes

	<i>For Bused Students: Organize Daily, Weekly, or Twice Monthly Remote Drop-Offs</i>	[Written comment @ Public Forum - do this activity in tandem with Walk & Bike to School Days] ["Who would supervise students at Remote Drop-Off?]	7 votes @ Public Forum; 1 Stakeholder vote
	<i>Hold Multi-Week or Year-Long Contest for Walking & Biking</i>	[Written comment @ Public Forum - "Homework pass" reward] ["Hard to monitor"]	6 votes @ Public Forum; 3 Stakeholder votes
	<i>Encourage Walking & Biking Field Trips</i>		12 votes @ Public Forum; 4 Stakeholder votes (including one from teacher)
	<i>Walk & Bike, Use Transit, & Carpool to Evening Events</i>		5 votes @ Public Forum
	<i>Offer Incentives to Peds & Bikers Following the Rules & Walking/Riding Safely</i>		5 votes @ Public Forum; 3 Stakeholder votes

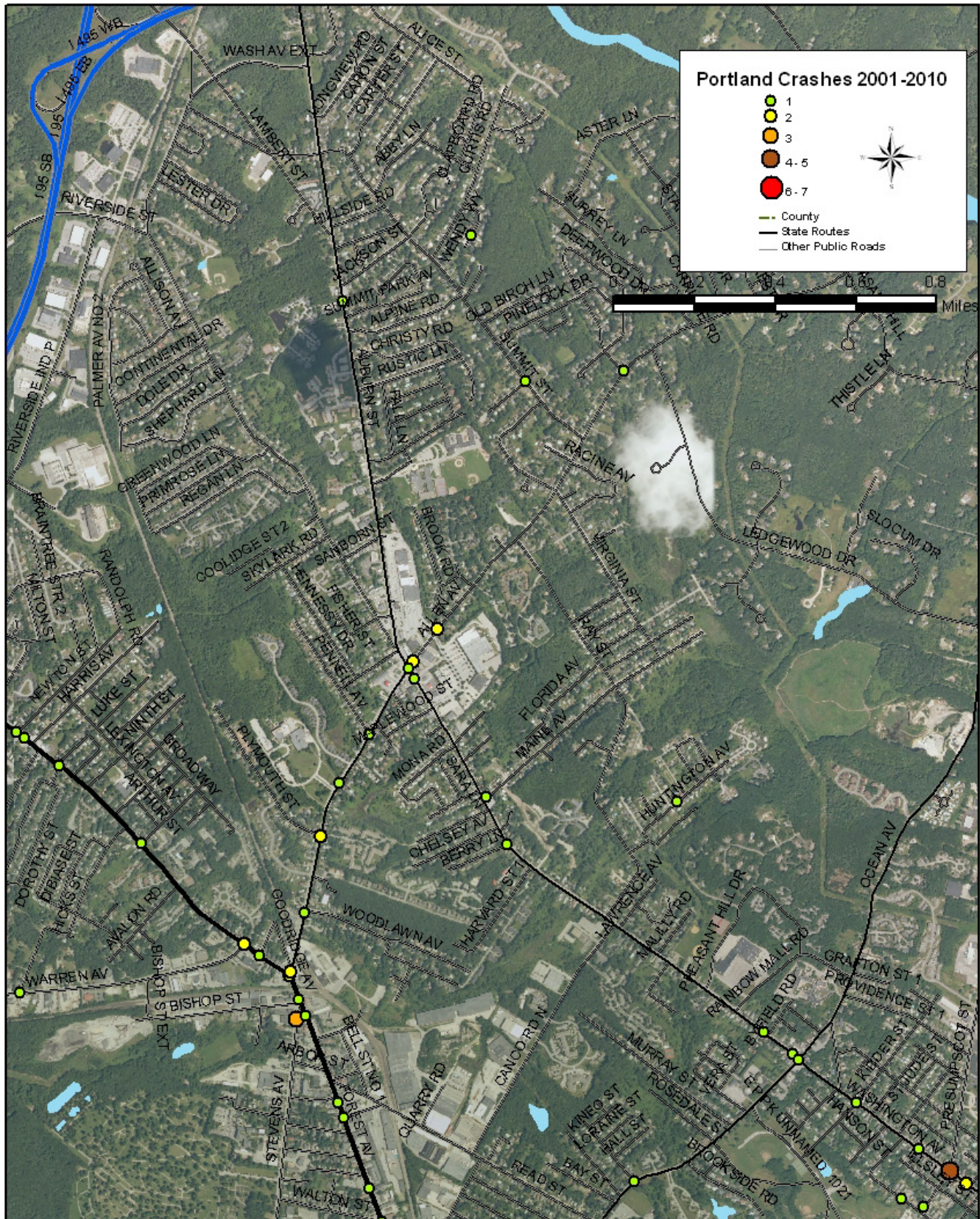
Team Final Priorities			
<i>Team #</i>	<i>Priorities</i>		
1	Organizing Walking School Buses		
1	Find Alternate/Remote Bus Drop-Off Location		
1,2	Allen Ave. & Washington Ave (main part) - safer crossings, missing sidewalk links (Wash); Speed & traffic on Washington		
1	Alternate plans for Winter-Proofing the Walk/Bike experience		

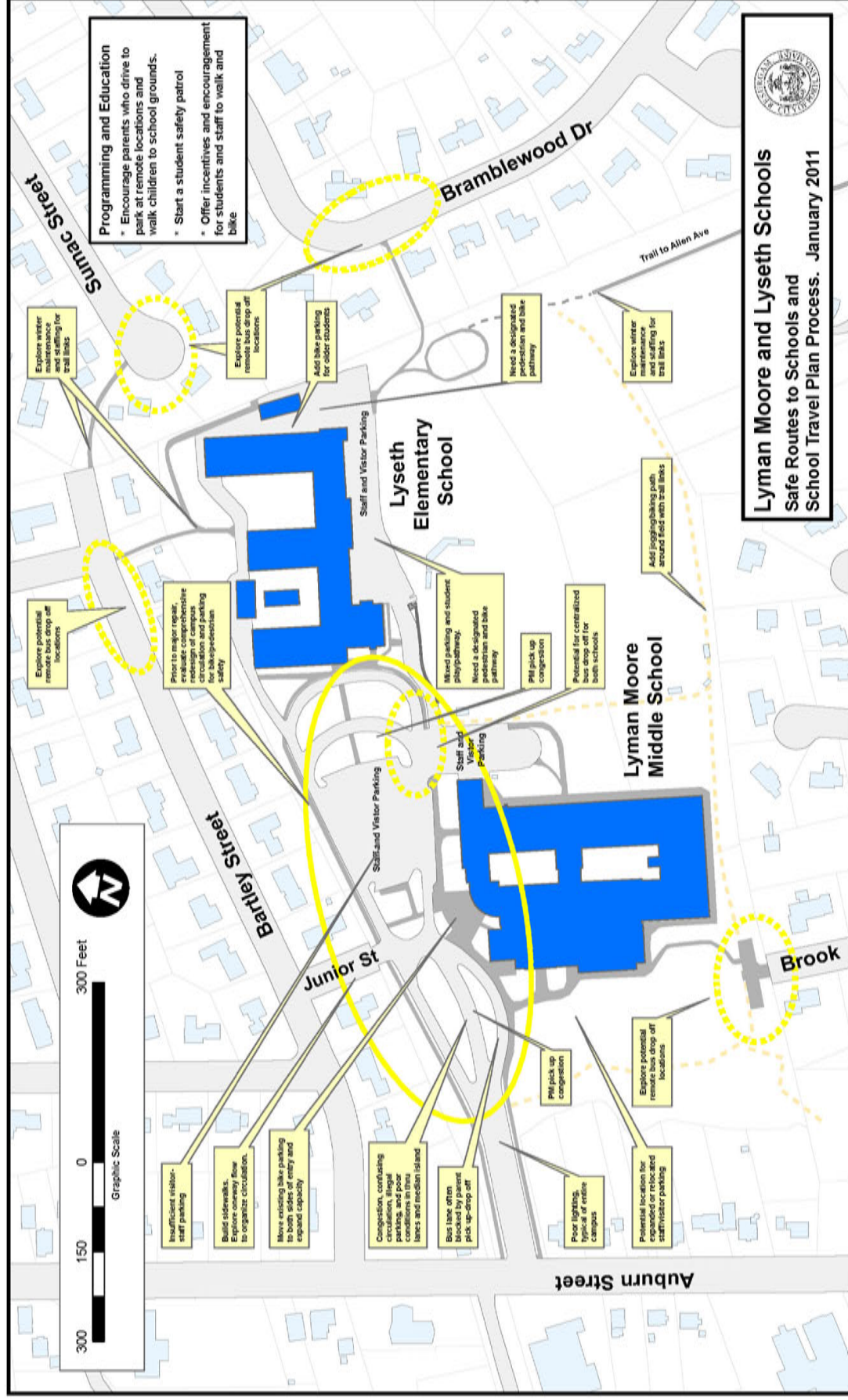
1	"In order to sell it [to students & families], it has to be safe"		
2	No bike path on campus		
2	Bike racks aren't visible so kids concerned about vandalism		
2	Sidewalk connectivity (lack of)		
4	Junior St. Management		
4	Reconfigure Parking		
4	Drop-off Sanity (limit access)		
4	Paths[PATHS?] Connect/Bike Lanes; Connectivity		

Portland Crashes Involving Bicyclists (2001-2010)



Portland Crashes Involving Pedestrians (2001-2010)

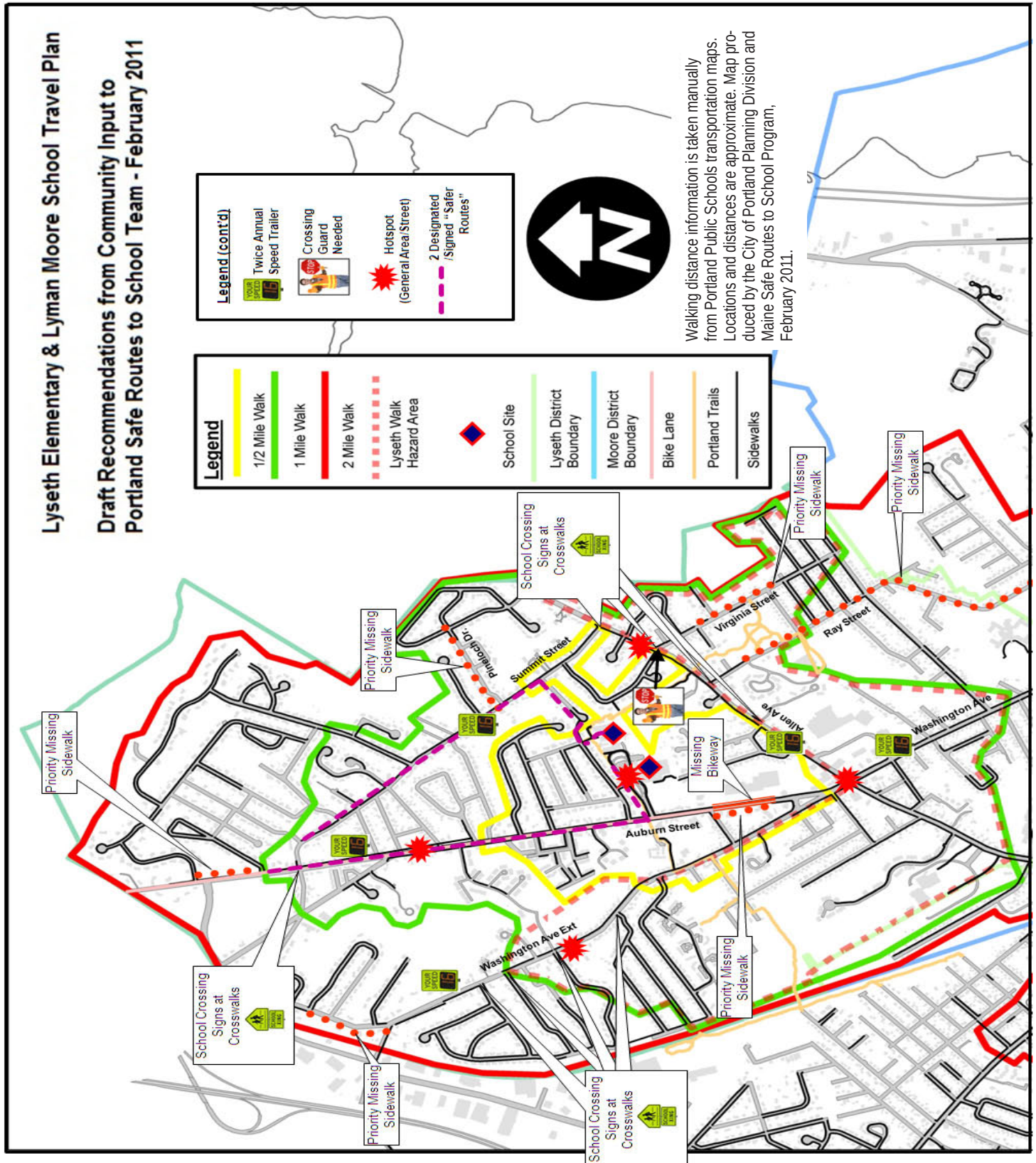




Campus Map with Areas of Issues, Concerns, and Potential Solutions

Appendix IX –

Deficiencies/Recommendations Map of Larger Community Area Surrounding Schools



Appendix X - Recommendations - Full Spreadsheet

Lyseth Elementary & Lyman Moore Middle - School Travel Plan Input & Recommendations (Working Draft)			
# Item	Specific Location	Challenges/Safety Issues	Recommendations/Possible Solutions
1a	Lyman Moore & Lyseth Drop-Off Zones	Poor infrastructure: Bike-Ped access, lighting, condition; Confusing for all users	Create alternate drop-off sites for bus/ car traffic *
1b			Reconfigure auto parking to improve bike-pedestrian safety crossing campus *
1c			Offer encouragement and incentives to staff to carpool, use transit, walk, or bike*
1d			Build/Designate bike lanes/paths across campus*
1e			Produce concept design/Redesign/re-engineer entire drop-off area; Include lighting improvements; Once re-engineered/rebuilt: organize Student Safety Patrol*
2a	Junior St./Bartley St./Fall Lane*	Staff spillover parking; Snow banks; Cars (and buses sometimes) use as shortcut; Blind spot for drivers; Missing sidewalk links for peds	Develop management plan for this route for bicycles and pedestrians and any traffic - including additional signage*
2b			Mandate removal of snow bank at crossing triangle between Junior & LM*
2c			Install/enhance crosswalk. Install additional signage for drivers (e.g. dual stop signs; ped crossing). Consider crossing guard for this location*
2d			Include as part any drop-off zone redesign. Save trees if any infrastructure work is proposed*
2e			Construct missing sidewalk links*
2f			Evaluate one way flow as part of comprehensive redesign suggested in 1.e above*

Lyseth Elementary & Lyman Moore Middle - School Travel Plan Input & Recommendations (Working Draft)

# Item	Specific Location	Challenges/Safety Issues	Recommendations/Possible Solutions
3a	Access Paths to Both Schools (e.g. PT: PATHS to Auburn St.; PT: Allen to Lyseth playground; informal paths at Med Center, Shaw's, UU Church)	Lack of lighting; Some paths perceived as "sketchy" and/or unsupervised - bullying/crime concerns; Paths not maintained during winter; Some paths close by but not connected	Check on permission to use alternate informal paths from south
3b			Do bike-ped safety education specifically targeting the use of paths*
3c			Offer parent or staff supervision on designated path(s) - and/or create Student Safety Patrol for this area
3d			Maintain paths during winter; Assess whether can/should pave any paths to facilitate winter maintenance.
3e			Prepare students for winter walking - advice on equipment, conduct a warm clothing drive, educate on safe walking practices, etc. *
3f			Assess and build any missing path links to connect existing trails
3g			Build jogging path around playing fields (would be used by all neighborhood members and could generate "eyes on the path") to serve as link to side paths - and as bike path across north side of fields - for students arriving on campus.
4a	Lyseth & Lyman Moore Bike Racks*	Lyseth: Older students don't like having to go through young students playing in courtyard to get to racks; Lyman Moore: Not enough bike parking; Concerns about theft/vandalism	Lyseth: Move one rack to rear (east end) of school for older students; Lyman Moore: Move bike parking to both sides of Moore entryway*
4b			Encourage the use of bike locks; Consider starting a simple bike lock lending/rental library*
4c			Add more bike parking*

Lyseth Elementary & Lyman Moore Middle - School Travel Plan Input & Recommendations (Working Draft)			
#	Specific Location	Challenges/Safety Issues	Recommendations/Possible Solutions
5a	Allen Avenue	Vehicles speeding; No crossing guards; Missing crosswalk at Portland Trails crossing; Missing sidewalk links; Lack of pedestrian & students-crossing signage.	Move one of crossing guards from Lyman Moore entrance to Bramblewood/Virginia & Allen*
5b			Provide annual pedestrian and bicycle safety education*
5c			Use Speed Trailers at least twice a year & practice speed enforcement*
5d			Evaluate lack of pedestrian/students- crossing signage and install signs*
5e			Organize peer walkpool/bike train groups for Lyman Moore students - and adult-led walkpool/bike train groups for hazard-based Lyseth students.
5f			If no room for bike lanes then paint sharrows and/or install Bikes May Use Full lane signs*
5g			Construct missing sidewalk links on southeast side of street*
6a	Allen Ave. & Washington Ave. Intersection	Allen & Washington Intersection large & unfriendly to bikes & peds; Motorists watching traffic signal and not looking for bikes/peds at Allen & Washington intersection - may not know near two schools	Provide annual pedestrian and bicycle safety education for Lyman Moore students regarding this corner *
6b			Organize peer walkpool/bike train groups for Lyman Moore students - and adult-led walkpool/bike train groups for hazard-based Lyseth students. *
6c			Visual Safety Education 2-4 times/yr. (e.g. parents, staff, students with signs) for motorists at this intersection - encouraging them to look for bikes/peds
6d			Install students-crossing signage*
6e			Introduce crossing guard at Allen Ave. & Washington Ave. intersection (for hazard-based Lyseth students)
6f			If no room for bike lanes then paint sharrows and/or install Bikes May Use Full lane signs
6g			Work for complete street/bike-ped friendly/traffic calming improvements at this intersection

Lyseth Elementary & Lyman Moore Middle - School Travel Plan Input & Recommendations (Working Draft)

#	Specific Location	Challenges/Safety Issues	Recommendations/Possible Solutions
7a	Washington Ave. Ext.*	Vehicles speeding; Sidewalks on east side only - and only one crossing guard available for one street crossing from west side; Missing sidewalk link	Provide annual pedestrian and bicycle safety education for students coming from this area*
7b			Install students-crossing signage at additional ped crossings; Consider additional crossing guard*
7c			Use Speed Trailers twice a year & practice speed enforcement*
7d			Organize peer walkpool/bike train groups for Lyman Moore students - and adult-led walkpool/bike train groups for Lyseth students*
7e			Construct missing sidewalk link from Lester to Riverside*
8a	Auburn St.	Vehicles speeding outside school zone; Heavy traffic; Missing sidewalk links; Need for more crosswalks; Bullying/crime concerns; Bike lane but not full length*	Provide annual pedestrian and bicycle safety education*
8b			Use Speed Trailers twice a year & practice speed enforcement*
8c			Assess & sign "Safer Route" to campus*
8d			Organize adult-led walking school bus and/or bike train groups for Lyseth students and peer walkpool and/or bike train groups for Moore students*
8e			If no room for bike lane, at least stripe shoulder from Chapman to Sanborn and/or add sharrows and Bikes May Use Full Lane signs*
8f			Assess and install additional crosswalks*
8g			Construct missing sidewalk links: (1) between Sanborn & Chapman; (2) between Garsoe & Armstrong *

Lyseth Elementary & Lyman Moore Middle - School Travel Plan Input & Recommendations (Working Draft)

Item #	Specific Location	Challenges/Safety Issues	Recommendations/Possible Solutions
9a	Washington Ave. (South of Allen)	Vehicles speeding; Heavy traffic; Bullying/crime concerns*	Provide annual pedestrian and bicycle safety education*
9b			Use Speed Trailers twice a year & practice speed enforcement*
9c			Organize peer walkpool and/or bike train groups for Lyman Moore students - and adult-led walking school bus and/or bike train groups for Lyseth students currently being hazard bused to school*
9d			If no room for bike lanes then paint sharrows and/or install Bikes May Use Full lane signs*
10	Summit St.	Chosen for "Safer Route" designation	Assess & sign "Safer Route" to campus*
11	Pineloch (b/n Summit and Roaring Brook); Ray Street; Virginia St.	Missing sidewalk links; Pineloch: Blind curve(s) dangerous for drivers and students walking; Ray: Recently improved road but missing sidewalk links	Construct missing sidewalk links*

Lyseth Elementary & Lyman Moore Middle - School Travel Plan Input & Recommendations (Working Draft)

# Item	Specific Location	Challenges/Safety Issues	Recommendations/Possible Solutions
12a	At Both Schools	Students w/large gear for after-school have difficulty storing; Building locked during practices so students can't get back to gear Students need additional bike safety education and practice	School admins had ideas about where gear could be stored; Keeping building open to students at after-school activities Host: After-School Bike Club for 6th Graders every spring; Bike Safety Rodeo (with bike & helmet checks, practice on skills course in parking lot, etc.) at Lyseth (could be tied in with Spring Fair) and Lyman Moore. PPD & BCM can help with technical assistance*
12c		A number of students at both schools don't have access to bicycles.	Host: Bike Swap with people from schools and neighborhood donating bikes; or Earn-a-Bike incentive program. Check with PPD about acquiring unclaimed stolen bikes. All Speed Bikes may be able to help tune bikes in their off season.
12d		Lyseth & Lyman Moore staff that live close to school can be good walk & bike role models; estimated that 25-30% of Lyseth & Lyman Moore staff live within 1 mile of the school; Staff report needing to carry large amounts of gear.	Outreach to staff: Presentation by Bike Commuter education program through Go Maine and the Bicycle Coalition; Staff bike mentoring and practice; Offer staff incentives - could include gear like backpacks, rolling carts, & bike trailers to carry staff work materials; Emphasize staff from both schools can use LM shower facilities*
12e		Field trips are an opportunity to learn more about students' sense of place	Organize more walking and biking field trips
12f		Many Lyseth and Lyman Moore students could learn more about walk, bike, public transit, and carpooling options - as well as their benefits	Encourage and provide practice for students to use the METRO bus; Include alternate transportation education as part of Lyseth & Lyman Moore Schools curricula
12g		Walking and biking are fun, but sometimes students need an incentive to get started.	Hold Multi-Week or Year-Long Contest for Walking & Biking*
12h		Funding opportunities can be missed.	Develop list of funding opportunities (PACTS, MaineDOT, Healthy Portland mini-grants, etc.); Assign staff person to monitor and pursue grant opportunities

Lyseth Elementary & Lyman Moore Middle - School Travel Plan Input & Recommendations (Working Draft)			
#	Specific Location	Challenges/Safety Issues	Recommendations/Possible Solutions
13a	All Locations	Younger Children: Parents have to work early; children too young to walk alone; Before age 10 may not possess brain development to make good pedestrian safety decisions; Concerns about delay in verification if child does not make it to school.	Organize adult supervised walkpools/walking school buses that get kids there safely, and allow parents to go about their work day. Consider walk & bike incentive program that also involves electronic tracking of participants (e.g. Freiker Biker program that uses electronic chips in helmets for sign-in). Also check with Portland Police Dept. about availability of bike police and D.A.R.E. officers for patrol of neighborhood streets during a.m and p.m. *
13b		Parents don't know how to connect with other families in their neighborhood for walkpools, bike trains, carpools; Staff have same difficulty	Organize online carpool/walkpool group using an tools like GoLoco.org & Go Maine; Parents can connect with other parents in their neighborhood for regular carpooling - staff could connect with other staff*
13c		Some students under 16 not using bike helmets	Work with PPD to enforce Child Helmet Law; Could include "ticketing for being caught doing good" (reward students caught wearing their helmet or riding according to state laws)
13d		Lack of winter enforcement or cleaning by the City of walkways, paths, and streets	Need to plow sidewalks or do better enforcement*
13e		Lack of connectivity between some streets & cul-de-sacs	Look for neighborhood street connections and potential paths and create these links

LEVEL III SITE PLAN APPLICATION

for the

LYSETH – LYMAN MOORE

CAMPUS CIRCULATION IMPROVEMENTS

PORTLAND, MAINE



CITY OF PORTLAND
Department of Parks, Recreation, and Facilities
212 Canco Road
Portland, Maine 04103

September, 2017

TABLE OF CONTENTS

1. Cover Page, Table of Contents
2. Site Plan Application Form
3. Application Fees
4. Description of Project
5. Evidence of Right, Title and Interest
6. Compliance with Applicable Zoning Requirements
7. Summary of Existing Easements and Covenants
8. Financial and Technical Capacity
9. Construction Management Plan
10. Traffic
11. Significant Natural Features
12. Stormwater Management Plan
13. Consistency with Master Plans
14. Capacity to Serve Indications
15. Solid Waste Generation
16. Fire Department Technical Standards
17. Consistency with City of Portland Design Manual
18. HVAC and Manufacturing Emissions Requirements
19. Compliance with Site Plan Requirements



Level III – Preliminary and Final Site Plans Development Review Application Portland, Maine

Planning and Urban Development Department
Planning Division

Portland's Planning and Urban Development Department coordinates the development review process for site plan, subdivision and other applications under the City's Land Use Code. Attached is the application form for a Level III: Preliminary or Final Site Plan. Please note that Portland has delegated review from the State of Maine for reviews under the Site Location of Development Act, Chapter 500 Stormwater Permits, and Traffic Movement Permits.

Level III: Site Plan Development includes:

- New structures with a total floor area of 10,000 sq. ft. or more except in Industrial Zones.
- New structures with a total floor area of 20,000 sq. ft. or more in Industrial Zones.
- New temporary or permanent parking area(s) or paving of existing unpaved parking areas for more than 75 vehicles.
- Building addition(s) with a total floor area of 10,000 sq. ft. or more (cumulatively within a 3 year period) except in Industrial Zones.
- Building addition(s) with a total floor area of 20,000 sq. ft. or more in Industrial Zones.
- A change in the use of a total floor area of 20,000 sq. ft. or more in any existing building (cumulatively within a 3 year period).
- Multiple family development (3 or more dwelling units) or the addition of any additional dwelling unit if subject to subdivision review.
- Any new major or minor auto business in the B-2 or B-5 Zone, or the construction of any new major or minor auto business greater than 10,000 sq. ft. of building area in any other permitted zone.
- Correctional prerelease facilities.
- Park improvements: New structures greater than 10,000 sq. ft. and/or facilities encompassing 20,000 sq. ft. or more (excludes rehabilitation or replacement of existing facilities); new nighttime outdoor lighting of sports, athletic or recreation facilities not previously illuminated.
- Land disturbance of 3 acres or more (includes stripping, grading, grubbing, filling or excavation).

Portland's development review process and requirements are outlined in the [Land Use Code \(Chapter 14\)](#), [Design Manual](#) and [Technical Manual](#).

Planning Division
Fourth Floor, City Hall
389 Congress Street
(207) 874-8719
planning@portlandmaine.gov

Office Hours
Monday thru Friday
8:00 a.m. – 4:30 p.m.

I. Project Information (Please enter n/a on those fields that are not applicable)

Project Name:	Lyseth Lyman - Moore Campus Improvements
Proposed Development Address:	171 Auburn Street, Portland, ME 04103
Project Description:	Circulation, Access, and Parking Improvements
Chart/Block/Lot:	378/A005, 376/A003, 377/D018, 374/B012, 379/C005
Preliminary Plan	N/A
Final Plan	✓

II. Contact Information (Please enter n/a on those fields that are not applicable)**APPLICANT**

Name:	David Onos
Business Name:	City of Portland
Address:	389 Congress Street
City/State:	Portland, ME
Zip Code:	04101
Work #:	207.808.5404
Home #:	
Cell #:	
Fax #:	
E-mail:	donos@portlandmaine.gov

OWNER

Name:	City of Portland, c/o David Onos
Address:	389 Congress Street
City/State:	Portland, ME
Zip Code:	04101
Work #:	207.808.5404
Home #:	
Cell #:	
Fax #:	
E-mail:	donos@portlandmaine.gov

AGENT/REPRESENTATIVE

Name:	Wright-Pierce, c/o Douglas Rice
Address:	99 Main Street
City/State:	Topsham, ME
Zip Code:	04086
Work #:	207-725-8721
Home #:	
Cell #:	
Fax #:	207-729-8414
E-mail:	douglas.rice@wright-pierce.com

BILLING (to whom invoices will be forwarded to)

Name:	City of Portland, c/o David Onos
Address:	389 Congress Street
City/State:	Portland, ME
Zip Code:	04101
Work #:	207.808.5404
Home #:	
Cell #:	
Fax #:	
E-mail:	donos@portlandmaine.gov

ENGINEER

Name:	Douglas Rice c/o Wright-Pierce
Address:	99 Main Street
City/State:	Topsham, ME
Zip Code:	04086
Work #:	207-725-8721
Home #:	
Cell #:	
Fax #:	207-729-8414
E-mail:	douglas.rice@wright-pierce.com

SURVEYOR

Name:	N/A
Address:	
City/State:	
Zip Code:	
Work #:	
Home #:	
Cell #:	
Fax #:	
E-mail:	

ARCHITECT

Name:	N/A
Address:	
City/State:	
Zip Code:	
Work #:	
Home #:	
Cell #:	
Fax #:	
E-mail:	

ATTORNEY

Name:	N/A
Address:	
City/State:	
Zip Code:	
Work #:	
Home #:	
Cell #:	
Fax #:	
E-mail:	

DESIGNATED PERSON(S) FOR UPLOADING INTO e-PLAN

Name:	Michael Guethle
E-mail:	michael.guethle@wright-pierce.com
Name:	Douglas Rice
E-mail:	douglas.rice@wright-pierce.com
Name:	Christopher Hinkley
E-mail:	christopher.hinkley@wright-pierce.com

III. APPLICATION FEES

LEVEL III DEVELOPMENT (check applicable review)

☐	Less than 50,000 sq. ft.	\$750.00
☐	50,000 – 100,000 sq. ft.	\$1,000.00
☐	100,000 – 200,000 sq. ft.	\$2,000.00
☐	200,000 – 300,000 sq. ft.	\$3,000.00
☐	Over 300,000 sq. ft.	\$5,000.00
☐	Parking lots over 100 spaces	\$1,000.00
☐	After-the-fact Review	\$1,000.00 + applicable application fee above

PLAN AMENDMENTS (check applicable review)

☐	Planning Staff Review	\$250.00
☐	Planning Board Review	\$500.00

OTHER REVIEWS (check applicable review)

☐	Traffic Movement	\$1,500.00
☐	Stormwater Quality	\$250.00
☐	Subdivision	\$500.00 + applicable fee for lots/units below
	# of Subdivision Lots/Units [] x \$25.00 each	\$
☐	Site Location	\$3,500.00 + applicable fee for lots/units below
	# of Site Location Lots/Units [] x \$200.00 each	\$
☐	Change of Use	
☐	Flood Plain	
☐	Shoreland	
☐	Design Review	
☐	Housing Replacement	
☐	Historic Preservation	
TOTAL APPLICATION FEE DUE:		\$

IV. FEES ASSESSED AND INVOICED SEPARATELY

- Notices to abutters (receipt of application, workshop and public hearing meetings) (\$.75 each)
- Legal Ad in the Newspaper (% of total ad)
- Planning Review (\$52.00 hour)
- Legal Review (\$75.00 hour)
- Third Party Review (all outside reviews or analysis, eg. Traffic/Peer Engineer, are the responsibility of the applicant and will be assessed and billed separately)

V. PROJECT DATA (Please enter n/a on those fields that are not applicable)

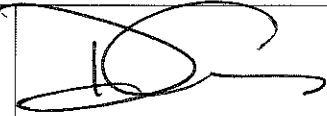
TOTAL AREA OF SITE	25.12 ac / 1,146,475	sq. ft.
PROPOSED DISTURBED AREA OF THE SITE	198,500	sq. ft.
<i>If the proposed disturbance is greater than one acre, then the applicant shall apply for a Maine Construction General Permit (MCGP) with DEP and a Stormwater Management Permit, Chapter 500, with the City of Portland.</i>		
IMPERVIOUS SURFACE AREA		
Impervious Area (Total Existing)	371,935	sq. ft.
Impervious Area (Total Proposed)	2,800	sq. ft.
Building Ground Floor Area and Total Floor		
Building Footprint (Total Existing)	+/- 140,000	sq. ft.
Building Footprint (Total Proposed)	N/A	sq. ft.
Building Floor Area (Total Existing)	+/- 140,000	sq. ft.
Building Floor Area (Total Proposed)	N/A	sq. ft.
ZONING		
Existing	R-2, ROS	
Proposed, if applicable	N/A	
LAND USE		
Existing	School & Athletic Fields	
Proposed	School & Athletic Fields	
RESIDENTIAL, IF APPLICABLE		
# of Residential Units (Total Existing)	N/A	
# of Residential Units (Total Proposed)	N/A	
# of Lots (Total Proposed)	N/A	
# of Affordable Housing Units (Total Proposed)	N/A	
PROPOSED BEDROOM MIX		
# of Efficiency Units (Total Proposed)	N/A	
# of One-Bedroom Units (Total Proposed)	N/A	
# of Two-Bedroom Units (Total Proposed)	N/A	
# of Three-Bedroom Units (Total Proposed)	N/A	
PARKING SPACES		
# of Parking Spaces (Total Existing)	135	
# of Parking Spaces (Total Proposed)	42 (177 Total)	
# of Handicapped Spaces (Total Proposed)	10	
BICYCLE PARKING SPACES		
# of Bicycle Spaces (Total Existing)	0 Conforming Spaces	
# of Bicycle Spaces (Total Proposed)	28	
ESTIMATED COST OF THE PROJECT		
	\$1,540,000	

VI. APPLICANT SIGNATURE

By digitally signing the attached document(s), you are signifying your understanding this is a legal document and your electronic signature is considered a **legal signature** per Maine state law.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Planning Authority and Code Enforcement's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

This application is for a Level III Site Plan review. It is not a permit to begin construction. An approved site plan, a Performance Guarantee, Inspection Fee, Building Permit, and associated fees will be required prior to construction. Other Federal, State or local permits may be required prior to construction, which are the responsibility of the applicant to obtain.

Signature of Applicant:	
Date:	AUGUST 31, 2017

Portland, Maine

David Onos, LEED AP

Director of Project Management
Department of Parks, Recreation & Facilities

donos@portlandmaine.gov
cell: (207) 809-9187
office: (207) 808-5404
portlandmaine.gov



212 Canco Road
Portland, Maine 04103

Yes. Life's good here.

PRELIMINARY PLAN (Optional) - Level III Site Plan			
Applicant Checklist	Planner Checklist	# of Copies	GENERAL WRITTEN SUBMISSIONS CHECKLIST
		1	Completed Application form
		1	Application fees
		1	Written description of project
		1	Evidence of right, title and interest
		1	Evidence of state and/or federal approvals, if applicable
		1	Written assessment of proposed project's compliance with applicable zoning requirements
		1	Summary of existing and/or proposed easement, covenants, public or private rights-of-way, or other burdens on the site
		1	Written requests for waivers from site plan or technical standards, if applicable.
		1	Evidence of financial and technical capacity
		1	Traffic Analysis (may be preliminary, in nature, during the preliminary plan phase)
Applicant Checklist	Planner Checklist	# of Copies	SITE PLAN SUBMISSIONS CHECKLIST
		1	Boundary Survey meeting the requirements of Section 13 of the City of Portland's Technical Manual
		1	Preliminary Site Plan including the following: (information provided may be preliminary in nature during preliminary plan phase)
			Proposed grading and contours;
			Existing structures with distances from property line;
			Proposed site layout and dimensions for all proposed structures (including piers, docks or wharves in Shoreland Zone), paved areas, and pedestrian and vehicle access ways;
			Preliminary design of proposed stormwater management system in accordance with Section 5 of the Technical Manual (note that Portland has a separate applicability section);
			Preliminary infrastructure improvements;
			Preliminary Landscape Plan in accordance with Section 4 of the Technical Manual;
			Location of significant natural features (including wetlands, ponds, watercourses, floodplains, significant wildlife habitats and fisheries or other important natural features) located on the site as defined in Section 14-526 (b) (1);
			Proposed buffers and preservation measures for significant natural features, as defined in Section 14-526 (b) (1);
			Location , dimensions and ownership of easements, public or private rights of way, both existing and proposed;
			Exterior building elevations.

FINAL PLAN - Level III Site Plan			
Applicant Checklist	Planner Checklist	# of Copies	GENERAL WRITTEN SUBMISSIONS CHECKLIST (* If applicant chooses to submit a Preliminary Plan, then the * items were submitted for that phase and only updates are required)
✓		1	* Completed Application form
N/A		1	* Application fees
✓		1	* Written description of project
✓		1	* Evidence of right, title and interest
✓		1	* Evidence of state and/or federal permits
✓		1	* Written assessment of proposed project's specific compliance with applicable Zoning requirements
✓		1	* Summary of existing and/or proposed easements, covenants, public or private rights-of-way, or other burdens on the site
✓		1	* Evidence of financial and technical capacity
✓		1	Construction Management Plan
✓		1	A traffic study and other applicable transportation plans in accordance with Section 1 of the technical Manual, where applicable.
✓		1	Written summary of significant natural features located on the site (Section 14-526 (b) (a))
✓		1	Stormwater management plan and stormwater calculations
✓		1	Written summary of project's consistency with related city master plans
✓		1	Evidence of utility capacity to serve
✓		1	Written summary of solid waste generation and proposed management of solid waste
✓		1	A code summary referencing NFPA 1 and all Fire Department technical standards
✓		1	Where applicable, an assessment of the development's consistency with any applicable design standards contained in Section 14-526 and in City of Portland Design Manual
N/A		1	Manufacturer's verification that all proposed HVAC and manufacturing equipment meets applicable state and federal emissions requirements.

Applicant Checklist	Planner Checklist	# of Copies	SITE PLAN SUBMISSIONS CHECKLIST (* If applicant chooses to submit a Preliminary Plan, then the * items were submitted for that phase and only updates are required)
✓		1	* Boundary Survey meeting the requirements of Section 13 of the City of Portland's Technical Manual
		1	Final Site Plans including the following:
✓			Existing and proposed structures, as applicable, and distance from property line (including location of proposed piers, docks or wharves if in Shoreland Zone);
✓			Existing and proposed structures on parcels abutting site;
✓			All streets and intersections adjacent to the site and any proposed geometric modifications to those streets or intersections;
✓			Location, dimensions and materials of all existing and proposed driveways, vehicle and pedestrian access ways, and bicycle access ways, with corresponding curb lines;
✓			Engineered construction specifications and cross-sectional drawings for all proposed driveways, paved areas, sidewalks;
✓			Location and dimensions of all proposed loading areas including turning templates for applicable design delivery vehicles;
N/A			Existing and proposed public transit infrastructure with applicable dimensions and engineering specifications;
✓			Location of existing and proposed vehicle and bicycle parking spaces with applicable dimensional and engineering information;
✓			Location of all snow storage areas and/or a snow removal plan;
N/A			A traffic control plan as detailed in Section 1 of the Technical Manual;
✓			Proposed buffers and preservation measures for significant natural features, where applicable, as defined in Section 14-526(b)(1);
N/A			Location and proposed alteration to any watercourse;
✓			A delineation of wetlands boundaries prepared by a qualified professional as detailed in Section 8 of the Technical Manual;
✓			Proposed buffers and preservation measures for wetlands;
✓			Existing soil conditions and location of test pits and test borings;
✓			Existing vegetation to be preserved, proposed site landscaping, screening and proposed street trees, as applicable;
✓			A stormwater management and drainage plan, in accordance with Section 5 of the Technical Manual;
✓			Grading plan;
N/A			Ground water protection measures;
✓			Existing and proposed sewer mains and connections;

- Continued on next page -

✓		Location of all existing and proposed fire hydrants and a life safety plan in accordance with Section 3 of the Technical Manual;
✓		Location, sizing, and directional flows of all existing and proposed utilities within the project site and on all abutting streets;
✓		Location and dimensions of off-premises public or publicly accessible infrastructure immediately adjacent to the site;
✓		Location and size of all on site solid waste receptacles, including on site storage containers for recyclable materials for any commercial or industrial property;
✓		Plans showing the location, ground floor area, floor plans and grade elevations for all buildings;
N/A		A shadow analysis as described in Section 11 of the Technical Manual, if applicable;
N/A		A note on the plan identifying the Historic Preservation designation and a copy of the Application for Certificate of Appropriateness, if applicable, as specified in Section Article IX, the Historic Preservation Ordinance;
N/A		Location and dimensions of all existing and proposed HVAC and mechanical equipment and all proposed screening, where applicable;
N/A		An exterior lighting plan in accordance with Section 12 of the Technical Manual;
✓		A signage plan showing the location, dimensions, height and setback of all existing and proposed signs;
✓		Location, dimensions and ownership of easements, public or private rights of way, both existing and proposed.

Section 3: Application Fees

3.0 Application Fees

Whereas this is a City of Portland project, the application fees are anticipated to be waived.

Section 4: Description of Project

4.0 Proposed Project

The proposed project is for the re-development of the existing circulation, and parking facilities at the Lyseth/Lyman-Moore campus. Circulation at the existing site is poor during the beginning and end of the school day, as there are substantial conflicts between cars, pedestrians, and busses circulating the site at the same time. As such, improvements are proposed to improve circulation at the existing site, allowing for one loop of a vehicle drop-off location for passenger cars, a separate loop for bus access, and associated perimeter parking improvements that are anticipated to lessen the impact of staff and faculty attempting to park while students are accessing the facility. The proposed design will also incorporate signage anticipated to provide clarification on where drop-off and parking is allowed, including striping and access for emergency vehicles. Changes in pedestrian access are also proposed to allow more well-defined travel lanes for pedestrians, including improvements to building access.

The proposed work is anticipated to be constructed in two phases, with the parking lot near the middle school, and the drainage at the northeast of the elementary school, being completed as part of the first phase. It is also understood that many of the existing conditions includes for a previously approved drainage and athletics fields improvement project, approved in June 2017. Project phasing has been noted in Figure 4 of the project plans.

Parking upgrades are necessary due to the currently undersized parking facilities at the school and athletics fields locations. It is understood that a substantial number of existing parking spaces are not sized in accordance with the City's technical manual, and that those provided within the proposed design do meet these standard or compact parking space dimensions. The number of parking spaces to be provided is driven by a combination of City codes and anecdotal understanding that the existing parking areas are currently unable to handle the existing demand for parking spaces. Additional discussion on the parking design and development is highlighted in Section 19, Compliance with Site Plan Requirements.

Landscaping is proposed within parking areas and other areas adjacent to proposed improvements. Landscaping includes trees, shrub-like plantings, and grasses. Fencing/screening is proposed adjacent to the new parking area, and trees are incorporated into several islands within the facility to promote shading and beautification of the development.

The existing drainage system will be replaced and upgraded with new underdrains, structures, and pipe. The drainage upgrades will be completed to allow for connections from the adjacent buildings, and are designed at an elevation where roof drainage from future development of the site could be implemented into the proposed system. Two roof connections to the existing sewer are proposed to be relocated to the storm drain as part of the drainage improvements.

Stormwater treatment upgrades will also be completed as a part of the proposed project. Discussion on this information is provided in the Stormwater Management Plan, Section 12 of this permit.

Section 5: Evidence of Right, Title, and Interest

5.0 Existing Deeds

Existing deeds to the parcels for this project have been attached to this section.

A discussion of easements and similar land use information can be found in Section 7 of this permit.

ATTACHMENT 5.1

DEED

427

2037
427
City

deed, before me,

Edward M. Whitaker Notary Public Notarial Seal

My commission expires March 23, 1956

Received March 29, 1951, at 9h A.M., and recorded according to the original

STATE OF MAINE
BUREAU OF TAXATION
CERTIFICATE OF DISCHARGE OF INHERITANCE TAX LIEN

State of
Maine
To
MacCam-
mond
Est.
Disch.

Estate of Elizabeth J. MacCammond
Late of Darien, Connecticut
Date of Death April 11, 1950
Testate -----
Docket No. Cumb. 7713

I, the State Tax Assessor, hereby certify that the real property described below has been and hereby is discharged of any lien for any inheritance and estate tax, with any interest thereon, due because of the death of the above named decedent. This certificate is to be recorded in the Registry of Deeds as provided by Section 17, Chapter 142, R.S. 1944, as amended.

One half interest undivided and in common in and to three certain lots or parcels of land with the camp buildings thereon, situated in Sebago, in the County of Cumberland and State of Maine, and being the same conveyed by Nellie F. Sanborn to Elizabeth J. MacCammond and Marian T. Smith as tenants in common by Warranty Deed dated July 9, 1935, recorded in Cumberland County Registry of Deeds in Book 1555, Page 344.

Date signed Mar 27 1951

Ernest H. Johnson
State Tax Assessor

State of Maine
Kennebec, SS.

Augusta, Mar 27 1951

Personally appeared the above named Ernest H. Johnson and acknowledged the above instrument to be his free act and deed in his said capacity.

Albert L. Huot Notary Public Notarial Seal

Received March 29, 1951, at 10h 55m A.M., and recorded according to the original

WARRANTY DEED

Willey &
To
Portland
City of
War.

KNOW ALL MEN BY THESE PRESENTS,

THAT Maurice E. Willey and Ada E. Willey, both of Portland, County of Cumberland, State of Maine, in consideration of Five Thousand Eight Hundred and Fifty Dollars (\$5,850.00) paid by the City of Portland, a municipal corporation and body politic organized under the laws of the State of Maine, situated in the County of Cumberland and State of Maine, the receipt whereof we do hereby acknowledge, do

hereby give, grant, bargain, sell and convey unto the said City of Portland, its successors and assigns forever, a certain lot or parcel of land together with all buildings, structures and improvements thereon situated in the rear of other land on the easterly side of Auburn Street in said Portland, and bounded and described as follows:

BEGINNING at an iron in the northerly division line of land now or formerly of James C. Oliver and land of Maurice E. Willey and Ada E. Willey; said iron being distant easterly along the said northerly division line 246.31 feet from the easterly street line of Auburn Street; thence easterly along the said northerly division line and following a wire fence and making an included angle with the westerly direction of the last described course of $178^{\circ} 44\frac{1}{2}'$ through the north a distance of 355.32 feet to an iron; thence easterly and following a stone wall wire fence and making an included angle through the north with the westerly direction of the last described course of $181^{\circ} 18\frac{1}{2}'$ a distance of 109.38 feet to an iron in the said stone wall and wire fence; thence southeasterly and following the said stone wall and wire fence and making an included angle through the north with the westerly direction of the last described course of $185^{\circ} 19\frac{1}{2}'$ a distance of 114.15 feet to an iron in said stone wall and wire fence; thence southeasterly and following the said stone wall and wire fence and making an included angle through the north with the westerly direction of the last described course of $180^{\circ} 57'$ a distance of 466.12 feet to an iron set in the westerly line of land now or formerly of Sidney E. Dee et al; thence in a northerly direction and along said line of Dee land and following a fence and stone wall, and making an included angle through the west with the westerly direction of the last described course of $94^{\circ} 22'$ a distance of 188.62 feet to an iron set in said line of said Dee's land; thence westerly along the southerly line of land now or formerly of Maurice E. Willey and making an included angle through the south with the southerly direction of the last described course of $78^{\circ} 20'$ a distance of 1061.55 feet, more or less, to an iron; thence southerly and making an included angle through the southeast with the easterly direction of the last described course of $102^{\circ} 26'$ a distance of 24.61 feet to an iron, said iron being distant 100.00 feet northerly from the first mentioned bound; thence westerly and making an included angle through the northwest with the northerly direction of the last described course of $102^{\circ} 26'$ a distance of 12.0 feet, more or less, to the center of Fall Brook; thence southerly following the course of the center of Fall Brook a distance of 102 feet more or less, to a point in the center of said Brook and land of James C. Oliver; thence easterly

along the northerly line of land of said James C. Oliver a distance of 21.4 feet, more or less, to an iron and the point of beginning. This being a portion (the part situated to the East of the center of Fall Brook) of the premises conveyed by Fred E. Lovejoy to the grantors by deed dated August 2, 1938 and recorded in Cumberland County Registry of Deeds in Book 1556, Page 394.

ALSO a certain lot or parcel of land together with all buildings, structures and improvements thereon, situated in the rear of other land on the easterly side of Auburn Street in said Portland and bounded and described as follows:

BEGINNING at the northeasterly corner of land conveyed by Fred E. Lovejoy to Maurice E. Willey, by deed dated August 2, 1938, recorded in Cumberland County Registry of Deeds, in Book 1556, Page 394, at a point in the line of land now or formerly of Herbert N. Maxfield; thence northerly along the line of said Maxfield to an iron stake which is at a point one hundred sixty-four (164) feet northerly from the northerly line of said land conveyed to said Maurice E. Willey and said line extended easterly in the same direction measured at right angles thereto; thence southwesterly parallel to said northerly line of said land of said Willey and maintaining the distance of one hundred sixty-four feet therefrom measured at right angles thereto to an iron pipe driven in the center line of Fall Brook; thence southerly by the center line of said Fall Brook one hundred ninety (190) feet, more or less, to the northerly line of said land conveyed to said Willey; thence northeasterly by the northerly line of said land of said Willey eight (8) feet, more or less, to an angle in said line; thence northerly by said land of said Willey, twenty-four and sixty-one hundredths (24.61) feet to an iron hub driven at another angle in said line; and thence easterly, making an angle with the last named course of one hundred two degrees twenty-six minutes (102° 26') and along the northerly line of land of said Willey, one thousand sixty-one and fifty-five hundredths (1061.55) feet, more or less, to said land of said Maxfield and the point of beginning; containing four (4) acres, more or less. These premises are the same which were conveyed to the grantors by Joseph E. Willey by deed dated June 18, 1948 and recorded in Cumberland County Registry of Deeds, in Book 1918, Page 211.

ALSO a certain lot or parcel of land together with all buildings, structures and improvements thereon, situated in the rear of other land on the easterly side of Auburn Street in said Portland and bounded and described as follows:

BEGINNING at an iron pipe in the southerly side of land conveyed to Augusta J. Hazlett, et al by said Suburban Homes, Inc., by deed dated April 9, 1942, and recorded in Cumberland County Registry of Deeds, Book 1672, Page 347, which iron pipe is also driven in the center of Fall Brook and is two hundred forty-one and five-tenths (241.5) feet, more or less, from the easterly line of said Auburn Street measured

along said southerly line of said land conveyed to said Augusta J. Hazlett, et al; thence running easterly along the southerly line of said land conveyed to said Augusta J. Hazlett, et al eleven hundred twenty-five (1125) feet, more or less, to a stake in the line of land now or formerly of Herbert N. Maxfield; thence running southerly along the line of land of said Maxfield four hundred (400) feet, more or less, to the northeasterly corner of land conveyed to Joseph E. Willey by said Suburban Homes, Inc., by deed dated April 9, 1942, and recorded in said Registry of Deeds, in Book 1677, Page 313; thence running westerly by the line of said land conveyed to said Joseph E. Willey, one thousand fifty (1050) feet, more or less, to the center line of Fall Brook and the northwesterly corner of said land conveyed to said Joseph E. Willey by said Suburban Homes, Inc.; and thence running northerly by the center line of said Fall Brook, one hundred fifty (150) feet more or less, to the point of beginning; containing six and seven-tenths (6.7) acres of land, more or less. These premises are the same which were conveyed to the grantors by Suburban Homes, Inc., by deed dated December 13, 1943 and recorded in Cumberland County Registry of Deeds in Book 1737, Page 10.

U.S.I.R.
\$6.60
M.E.W.
3/27/51

TO HAVE AND TO HOLD the aforegranted and bargained premises with all the privileges and appurtenances thereof, to the said City of Portland, its successors and assigns, to its and their use and behoof forever.

AND we do COVENANT with the said Grantee, its successors and assigns, that we are lawfully seized in fee of the premises, that they are free of all incumbrances; that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs shall and will WARRANT AND DEFEND the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons.

IN WITNESS WHEREOF, we the said Maurice E. Willey and Ada E. Willey, husband and wife, have hereunto set our hands and seals this twenty-seventh day of March in the year of our Lord one thousand nine hundred and fifty-one.

Signed, Sealed and Delivered

in presence of

Adelbert L. Miles

Maurice E. Willey Seal

to both

Ada E. Willey Seal

STATE OF MAINE CUMBERLAND, SS.

March 27th, 1951.

Personally appeared the above named Maurice E. Willey and acknowledged the foregoing instrument to be his free act and deed.

Before me, Adelbert L. Miles Notary Public Notarial Seal

Received March 29, 1951, at 11h 5m A.M., and recorded according to the original

2

Know all Men by these Presents, That

I, Fred E. Lovejoy of New Smyrna in the County of Volusia and State of Florida, formerly of Portland in the County of Cumberland and State of Maine,

in consideration of one (\$1.00) dollar and other good and valuable consideration paid by Maurice E. Willey and Ada E. Willey, both of said Portland, as joint tenants and not as tenants in common,

the receipt whereof I do hereby acknowledge, do hereby give, grant, bargain, sell and convey unto the said Maurice E. Willey and Ada E. Willey, to them and their heirs and the survivor of them and the heirs and assigns of the survivor of them forever, a certain lot or parcel of land, situated in Portland on the easterly side of Auburn Street and more particularly bounded and described as follows:

Commencing at an iron set in the easterly side of said Auburn Street at the northwesterly corner of land now or formerly of Mary S. Burnham; thence at an angle of one hundred two degrees twenty six minutes (102°26') to Auburn Street and in an easterly direction, along the northerly line of land of said Mary S. Burnham, seven hundred eleven and five hundredths feet (711.05') more or less to a stake; thence at a deflection to the right of six degrees, twenty-one minutes (6°21') five hundred eighty and five hundredths feet (580.05') more or less along the line of land now or formerly of Lyneous J. Smith to an iron set in the westerly line of land now or formerly of Herbert W. Maxfield; thence in a northerly direction and along said line of said Maxfield's land and following a fence and stone wall, one hundred eighty-eight and sixty-two hundredths feet (188.62') to an iron set in said line of said Maxfield's land; thence westerly and at an angle of seventy-eight degrees, twenty minutes (78°20') to said Maxfield land and along the southerly line of land of this grantor, one thousand, sixty-one and fifty-five hundredths feet (1061.55') to an iron; thence southerly and at an angle of one hundred two degrees and twenty-six minutes (102°26') to said last bound, twenty-four and sixty-one hundredths feet (24.61') to an iron, one hundred feet (100') distant from the first mentioned bound; thence westerly and parallel to and one hundred feet (100') from said first mentioned bound, two hundred thirty-three feet (233') to an iron set in the easterly side of Auburn Street; thence southerly by said Auburn Street, one hundred feet (100') to the point of beginning and containing four (4) acres.

1556

394

into Willey

See
Book 3960
Page 217

U.S.I.R.
\$1.00
G.M.L.
8/9/38

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Maurice E. Willey and Ada E. Willey as joint tenants and not as tenants in common to them and their heirs and assigns and the survivor of them and the heirs and assigns of the survivor of them forever, and I do hereby give, grant, bargain, sell and convey unto the said Maurice E. Willey and Ada E. Willey, to them and their heirs and the survivor of them and the heirs and assigns of the survivor of them forever, a certain lot or parcel of land, situated in Portland on the easterly side of Auburn Street and more particularly bounded and described as follows:

that I have good right to sell and convey the same to the said Grantees to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said Grantees, their heirs and assigns and the survivor of them and the heirs and assigns of the survivor of them forever, against the lawful claims and demands of all persons.

In Witness Whereof, I, the said Fred E. Lovejoy and Elizabeth E. Lovejoy, wife of the said Fred E. Lovejoy, joining in this deed as grantor and relinquishing and conveying my right by descent and all other rights in the above described premises

our hand and seal this 2nd day of August in the year of our Lord one thousand nine hundred and thirty-eight.

Signed, Sealed and Delivered in presence of

Herbert F. Fuller

Fred E. Lovejoy

Seal

Elizabeth Webb

Elizabeth E. Lovejoy

Seal

State of Florida, Volusia ss

~~State of Maine, Cumberland ss~~

August 2, 1938

Personally appeared

the above named

Fred E. Lovejoy

and acknowledged the foregoing instrument to be his free act and deed. Before me Herbert F. Fuller, Notary Public, Notarial Seal Notary Public, State of Florida at
Before me, Large My commission expired Feb. 24, 1940

Received August 10, 1938, at 2 o'clock 25 m. P. M., and recorded according to the original.

Know all Men by these Presents, That

125
125

2040
125

We, Augusta J. Hazlett of Portland, County of Cumberland, State of Maine and Paul S. Hazlett of Oakfield, County of Aroostock, State of Maine, mother and son

in consideration of Six Hundred and no/100 Dollars (\$600.00) paid by City of Portland, a municipal corporation and body politic organized under the laws of the State of Maine, situated in the County of Cumberland and State of Maine

the receipt whereof we do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said City of Portland, its successors and assigns, forever, a certain lot or parcel of land together with all buildings, structures and improvements thereon, situated in the rear of other land on the easterly side of Auburn Street in said Portland, and bounded and described as follows:

Beginning at an iron pipe in the center of Fall Brook and the northerly line of land now or formerly of Maurice E. Willey et al, said iron being distant easterly from the easterly street line of Auburn Street, 241.5 feet, more or less; thence making a slight angle to the left and continuing northeasterly on the division line of land between Augusta J. Hazlett et al and now or formerly of Maurice E. Willey et al, a distance of 1125.0 feet, more or less, to a point in the line of land now or formerly of Sidney E. Dee, et al; thence northerly by the division line of land between said Hazlett and said Dee a distance of 165.0 feet to an iron pipe in a stone wall at the northeasterly corner of the land of said Hazlett; thence southwesterly by the division line of land of said Hazlett and land now or formerly of C. Edward Phair and making an included angle through the southwest with southerly direction of the last described course of 77° 53' a distance of 32.26 feet to an iron pipe in a stone wall; thence southwesterly and following the said stone wall and making an included angle through the south with the northeasterly direction of the last described course of 166° 04½' a distance of 199.02 feet to an iron pipe in the said stone wall; thence southwesterly and following the said stone wall and wire fence and making an included angle through the south with the northeasterly direction of the last described course of 183° 05' a distance of 267.34 feet to a stake; thence southwesterly and following a wire fence and making an included angle through the south with the northeasterly direction of the last described course of 178° 03½' a distance of 299.01 feet to a 30 inch maple tree; thence southwesterly and following the said wire fence and making an included angle through the south with the northeasterly direction of the last described course of 183° 11½' a distance of 403.11 feet to an iron in the center of Fall Brook; thence southeasterly following the course of the center of said Fall Brook a distance of 180.0 feet, more or less, to an iron in the center of Fall Brook and the point of beginning.

This being a portion (the part situated to the East of the center of Fall Brook) of the premises conveyed to the grantors herein by warranty deed from Suburban Homes, Inc., dated April 9, 1942 and recorded April 21, 1942 in Cumberland County Registry of Deeds, Book 1672, Page 347. ✓

On Here and in With the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said City of Portland, its successors and assigns, to its and

U.S.I.R.
\$1.10
A.J.H.
3/27/51

their use and behoof forever. And we do covenant with the said Grantee, its successors and assigns,

~~heirs and assigns~~ that we are lawfully seized in fee of the premises; that they are free of all incumbrances;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs, shall and will warrant and defend the same to the said

Grantee, its successors ~~heirs and assigns~~ forever, against the lawful claims and demands of all persons.

In Witness Whereof, we the said Augusta J. Hazlett, a widow, Paul S. Hazlett and Mary E. Hazlett wife of the said Paul S. Hazlett joining in this deed as Grantor, and relinquishing and conveying all right by descent and all other rights in the above described premises,

our hand s and seals this twenty-seventh day of March have hereunto set one thousand nine hundred and fifty-one. in the year of our Lord

Signed, Sealed and Delivered in presence of
Paul S. Hazlett to A.J.H.
Vera D. Moseley to P.S.H.
Clair L. Allen

Augusta J. Hazlett Seal
Paul S. Hazlett Seal
Mary E. Hazlett Seal

State of Maine, CUMBERLAND, SS. March 27th 1951. Personally appeared
the above named Paul S. Hazlett

and acknowledged the foregoing instrument to be his free act and deed.

Before me, Vera D. Moseley Notary Public Notarial Seal

Received April 6, 19 51, at 10 o'clock 31 m. A. M., and recorded according to the original.

347 1672
347

pany, by Albert E. Libby, Trust Officer, have hereunto set our hands and seals this seventeenth day of April A. D. 1942.

Signed, Sealed and Delivered in Presence of

Audrey Osgood—to both

Richard S. Chapman

Seal

CASCO BANK & TRUST COMPANY CORPORATE
SEAL

By Albert E. Libby

Its Trust Officer

Executors of the Will of

Annah F. Chapman

into
Hazlett

State of Maine. Cumberland, ss.

April 17, 1942.

Then personally appeared the above named Richard S. Chapman and acknowledged the foregoing instrument to be his free act and deed. -----

Before me, Caspar F. Cowan Justice of the Peace

Received April 21, 1942, at 3h 20m P. M., and recorded according to the original

For and in consideration of the sum of One dollar to me paid by the New EnglandHanna-
Telephone and Telegraph Company, a corporation duly organized under the laws of the ford
State of New York, and the Cumberland County Power and Light Company, a corporation to
duly organized under the laws of the State of Maine, receipt of which is hereby New Eng.
acknowledged, I hereby grant unto said Companies, their respective successors and T. & T.
assigns, the right to place and maintain a distributing pole with the wires and/or Co. &
cables thereon with the necessary guys, anchors, fixtures, and supports, for the pur- Permit
pose of furnishing telephone and electric company services, upon and over my prem-
ises situated on the easterly side of Ocean House Road, so-called, in the Town of
Cape Elizabeth, County of Cumberland and State of Maine.
with permission to enter upon my property for all the above purposes.

WITNESS my hand and seal this 13th day of March 1942.

Witnesses:

H. Eugene Rideout

Howard C. Hannaford
(Land Owner)

Seal

State of Maine. Cumberland, ss.

March 13, 1942

Then personally appeared the above named Howard C. Hannaford and acknowledged the foregoing instrument to be his free act and deed.

Before me, H. Eugene Rideout Notary Public, Notarial Seal

My Commission expires 1/27/44

Received April 21, 1942, at 3h 30m P. M., and recorded according to the original

KNOW ALL MEN BY THESE PRESENTS, That Suburban Homes, Inc., a Corporation or- Suburban
ganized and existing under the laws of the State of Maine and located at Portland, Homes,
in the County of Cumberland and State of Maine, in consideration of one dollar and Inc.
other valuable consideration, paid by Augusta J. Hazlett and Paul S. Hazlett, to
and son, both of Portland, in the County of Cumberland and State of Maine, the re- Hazlett
&
War,

ceipt whereof it does hereby acknowledge, does hereby give, grant, bargain, sell and convey, unto the said Augusta J. Hazlett and Paul S. Hazlett, as joint tenants and not as tenants in common, and their heirs and assigns, and the survivor of them and the heirs and assigns of the survivor of them, forever,

A certain lot or parcel of land situated on the easterly side of Auburn Street, in said Portland, and bounded and described as follows, namely:

Beginning on the easterly line of said Street at the southwesterly corner of the lot of land conveyed to Alexander A. McIntyre by Fred E. Lovejoy, by deed dated September 16, 1940, recorded in Cumberland County Registry of Deeds, in Book 1619, Page 12; thence southerly by said line of said Auburn Street sixty-five (65) feet to an iron pipe; thence easterly on a line parallel to the southerly line of said land conveyed to Alexander A. McIntyre by Fred E. Lovejoy, two hundred forty-one and five-tenths (241.5) feet, more or less, to an iron pipe driven in the center of Fall Brook; thence turning a slight angle to the left and continuing northeasterly eleven hundred twenty-five (1125) feet, more or less, to a stake in the line of land now or formerly of Herbert N. Maxfield, which stake is at a point one hundred sixty-five (165) feet, measured along the line of land of said Herbert N. Maxfield, southerly from the northeasterly corner of the certain lot or parcel of land conveyed by Fred E. Lovejoy to said Suburban Homes, Inc., by deed dated May 12, 1941, and recorded in said Registry of Deeds, in Book 1639, Page 274; thence northerly along the line of said Maxfield, one hundred sixty-five (165) feet to the northeasterly corner of said land conveyed by said Fred E. Lovejoy to said Suburban Homes, Inc.; thence southwesterly along the line of land formerly of William Jackson and land of one Moody, twelve hundred forty-eight (1248) feet, more or less, to an iron pipe driven in the center of said Fall Brook and the northeasterly corner of said land conveyed by said Fred E. Lovejoy to Alexander A. McIntyre; thence southeasterly following the course of the center of said Brook and the line of said land conveyed to said McIntyre, one hundred ten (110) feet, more or less, to an iron pipe at the southeasterly corner of said land of said McIntyre; and thence westerly along the southerly line of said land of said McIntyre, two hundred (200) feet, more or less, to said Auburn Street and the point of beginning.

Being a portion of the premises conveyed to said Suburban Homes, Inc., by Fred E. Lovejoy by deed dated May 12, 1941 and recorded in said Registry of Deeds, in Book 1639, Page 274.

The portion of said premises lying between said Fall Brook and said Auburn Street is hereby conveyed subject to the following restrictions and limitations, which shall continue in full force and effect for the term of ten years from the first day of April, 1942, namely:-

1. Only one residence shall be erected or maintained on said portion of said premises, which shall cost not less than the sum of twenty-five hundred dollars in addition to the cost of the land.

2. No building or part of building shall be constructed nearer than fifteen

feet to said line of said Auburn Street.

3. No structure for commercial or industrial purposes, and no apartment or flat house, so called, shall be erected or maintained on said portion of said premises.

4. Plans for any structure to be erected or placed on said portion of said premises shall be submitted to said Suburban Homes, Inc., or its architect.

The foregoing restrictions and limitations shall run and enure to the benefit of the grantor, its successors and assigns, and the grantor, its successors or assigns, shall be under no obligation to enforce or to enjoin or restrain any violation thereof.

Said premises are hereby conveyed subject to taxes to the City of Portland for the year 1942, and said Grantees hereby assume and agree to pay said taxes as part of the consideration for this conveyance.

TO HAVE AND TO HOLD the aforegranted and bargained premises with all the privileges and appurtenances thereof, to the said Augusta J. Hazlett and Paul S. Hazlett, as joint tenants and not as tenants in common, and their heirs and assigns and the survivor of them and the heirs and assigns of the survivor of them, to their use and behoof forever.

U.S.I.R.
\$1.10
S.H.
4/9/42

AND the said Grantor Corporation does hereby covenant with the said Grantees, their heirs and assigns, and the survivor of them, and the heirs and assigns of the survivor of them, that it is lawfully seized in fee of the premises, that they are free of all incumbrances; except as aforesaid; that it has good right to sell and convey the same to the said Grantees to hold as aforesaid; and that it and its successors, shall and will warrant and defend the same to the said Grantees, and their heirs and assigns, and the survivor of them and the heirs and assigns of the survivor of them forever, against the lawful claims and demands of all persons, except as aforesaid.

IN WITNESS WHEREOF, the said Suburban Homes, Inc. has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Fred M. Wheelock, its Treasurer, thereunto duly authorized, this ninth day of April, in the year one thousand nine hundred and forty-two.

Signed, Sealed and Delivered in Presence of

SUBURBAN HOMES, INC. CORPORATE
SEAL

Clark D. Chapman

By Fred M. Wheelock
Its Treasurer

State of Maine. Cumberland, ss.

April 9, 1942.

Personally appeared the above named Fred M. Wheelock, Treasurer of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and deed in his said capacity, and the free act and deed of said corporation.

Before me, Clark D. Chapman Justice of the Peace

Received April 21, 1942, at 3h 50m P. M., and recorded according to the original

208
208

Know all Men by these Presents, That

I, Joseph A. Lucariello of Portland, County of Cumberland, State of Maine

2040
208

in consideration of Eight Hundred Fifty and no/100 Dollars (\$850.00) paid by City of Portland, a municipal corporation and body politic organized under the laws of the State of Maine, situated in the County of Cumberland and State of Maine the receipt whereof I do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said

City of Portland, its successors and assigns forever, a certain lot or parcel of land situated on the easterly side of Auburn Street, in said City of Portland, bounded and described as follows:

to City

Beginning at the southeasterly corner of a lot of land conveyed by Cecil C. Davis, et al to Joseph A. Lucariello by deed dated March 6, 1946 and recorded in Cumberland County Registry of Deeds, Book 1808, Page 479; thence westerly along the southerly side line of said lot two hundred seven and eight tenths (207.8) feet to the easterly side line of said Auburn Street; thence northerly along the easterly side line of said Auburn Street eighty-five and eighty-three hundredths (85.83) feet to a point; thence in an easterly direction in a line parallel with the first mentioned course one hundred sixty (160) feet, more or less, to Fall Brook; thence in a southerly direction, following the course of said Fall Brook, to the point of beginning.

Being the southerly portion of the premises conveyed to the Grantor herein by Cecil C. Davis, et al by Warranty Deed dated March 6, 1946 and recorded in Cumberland County Registry of Deeds, Book 1808, page 479. ✓

U.S.I.R.
\$1.10
J.A.L.
4/11/51

On this and in full the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said City of Portland, its successors and assigns, to its and

their use and behoof forever. And I do covenant with the said Grantee, its successors and assigns,

heirs and assigns that I am lawfully seized in fee of the premises; that they are free of all incumbrances;

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said

Grantee, its successors heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, we the said Joseph A. Lucariello and Olive I. Lucariello wife of the said Joseph A. Lucariello joining in this deed as Grantor, and relinquishing and conveying all our right by descent and all other rights in the above described premises,

our hands and seals this thirtieth day of March have hereunto set in the year of our Lord one thousand nine hundred and fifty-one.

Signed, Sealed and Delivered in presence of

F. Burley Smith

Joseph A. Lucariello Seal

to both

Olive I. Lucariello Seal

State of Maine, CUMBERLAND, SS. March 30th 1951. Personally appeared the above named Joseph A. Lucariello, and acknowledged the foregoing instrument to be his free act and deed.

Before me, F. Burley Smith Notary Public Notarial Seal.

Received April 13, 1951, at 12 o'clock 1 m. P. M., and recorded according to the original.

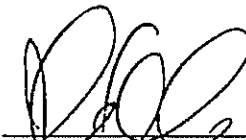
1a

WARRANTY DEED**Maine Statutory Short Form**29085
114**KNOW ALL PERSONS BY THESE PRESENTS, That****John C. Charette and Katye E. Thatcher Charette**

of 183 Auburn Street, Portland, ME 04103

for consideration paid, grant to **Jason M. MacLeod**

of 91 Wellman Road, Augusta, ME 04330

with **warranty covenants**, as joint tenants the land in City of Portland , County of Cumberland, and State of Maine, described on the attached **EXHIBIT A**.e'ly side of
Auburn St.
n'ly of
entrance to
School**WITNESS** our/my hand(s) and seal(s) this 28th day of October, 2011.*Signed, Sealed and Delivered in
presence of: jo beth*
_____

John C. Charette


Katye E. Thatcher Charette

MAINE REAL ESTATE TAX PAID

STATE OF MAINE

October 28, 2011

COUNTY OF CumberlandThen personally appeared the above named John C. Charette and Katye E. Thatcher Charette and acknowledged the foregoing instrument to be his/her/their free act and deed.

Before me,



Notary Public

Printed Name: _____

KELLY A. PECK

NOTARY PUBLIC MAINE

My Commission Expires: MY COMMISSION EXPIRES APRIL 2, 2016

Exhibit A

A certain lot or parcel of land, with the buildings thereon, situated on the easterly side of Auburn Street, in the City of Portland, County of Cumberland and State of Maine, bounded and described as follows:

Beginning on said easterly side of Auburn Street, at the northwesterly corner of land conveyed by Joseph A. Lucariello to the City of Portland; thence northerly by said Auburn Street, a distance of eighty-eight and 17/100 (88.17) feet, more or less, to a stake at the northwesterly corner of land conveyed to Joseph A. Lucariello by Cecil C. Davis, et al, by deed dated March 6, 1946, recorded in the Cumberland County Registry of Deeds in Book 1808, Page 479; thence easterly at right angles with the easterly line of Auburn Street to Fall Brook; thence southeasterly by the center line of said Brook to said City land; thence westerly by said City land a distance of one hundred sixty (160) feet, more or less, to said Auburn Street at the point of beginning.

Reference is hereby made to a Warranty Deed from Jonathan R. Doyle and Kathleen M. FitzGerald to John C. Charette and Katye E. Thatcher, nka Katye E. Thatcher Charette, dated June 12, 2003, and recorded June 18, 2003, in Book 19587, Page 139 in the Cumberland County Registry of Deeds.

Received
Recorded Register of Deeds
Nov 01, 2011 01:40:34P
Cumberland County
Pamela E. Lovley

92²

Know all Men by these Presents, That

I, Joseph A. Lucariello, of Portland, in the County of Cumberland and State of Maine

2103
92

in consideration of One Dollar and other valuable considerations paid by Stanley P. Johnson and Lillian E. Johnson of said Portland

the receipt whereof I do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said

Stanley P. Johnson and Lillian E. Johnson as joint tenants and to the survivor of them, their heirs and assigns and the heirs and assigns of the survivor of them forever, the following described property:

ely side
Auburn
Street
nly of
entrance to
school

A certain lot or parcel of land, with the buildings thereon, situated on the easterly side of Auburn Street, in said City of Portland, bounded and described as follows: Beginning on said easterly side of Auburn Street at the northwesterly corner of land conveyed by Joseph A. Lucariello to The City of Portland; thence northerly by said Auburn Street eighty-eight and seventeen hundredths (88.17) feet, more or less, to a stake at the northwesterly corner of land conveyed to Joseph A. Lucariello by Cecil C. Davis, et al. by deed dated March 6, 1946 and recorded in Cumberland County Registry of Deeds, Book 1808, Page 479; thence easterly at right angles with the easterly line of Auburn Street to Fall Brook; thence southeasterly by the center line of said Brook to said City land; thence westerly by said City land one hundred sixty (160) feet, more or less, to said Auburn Street at the point of beginning.

Being the northerly part of the premises conveyed to me by Cecil C. Davis, et al, as aforesaid.

The above described property is conveyed subject to the taxes for the year 1952 which the Grantees herein assume and agree to pay.

U.S.I.R.
\$7.70
J.A.L.
9/22/52

On this and in full the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Stanley P. Johnson and Lillian E. Johnson, and the survivor of them, their heirs and assigns and the heirs and assigns of the survivor of them, to them and their use and behoof forever. And I do covenant with the said Grantees, and the survivor of them, their Heirs and Assigns, and the heirs and assigns of the survivor of them heirs and assigns, that I am lawfully seized in fee of the premises; that they are free of all incumbrances; except as aforesaid,

that I have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that I and my heirs, shall and will warrant and defend the same to the said

Grantees, and the survivor of them their Heirs and Assigns and the heirs and assigns of the survivor of them heirs and assigns forever, against the lawful claims and demands of all persons. except as aforesaid.

In witness whereof, I the said Joseph A. Lucariello and Olive I. Lucariello wife of the said Joseph A. Lucariello joining in this deed as Grantor, and relinquishing and conveying her rights by descent and all other rights in the above described premises,

our hands and seals this twenty-second day of September have hereunto set one thousand nine hundred and fifty-two. in the year of our Lord

Signed, Sealed and Delivered in presence of

D. W. Philbrick

Joseph A. Lucariello Seal

S. W. Hughes

Olive I. Lucariello Seal

State of Maine, CUMBERLAND, ss.

September 22, 1952.

Personally appeared

the above named Joseph A. Lucariello

and acknowledged the above instrument to be his free act and deed.

Before me, Donald W. Philbrick Justice of the Peace.

Received September 22

1952, at 1 o'clock 20 m. P.M., and recorded according to the original.

a,

Know all Men by these Presents, That

479

1808

479

We, Cecil C. Davis and Alice R. Davis, both of Portland, in the County of Cumberland and State of Maine,

in consideration of one dollar and other valuable considerations paid by Joseph A. Lucariello, of said Portland,

the receipt whereof we do hereby acknowledge, do hereby, give, grant, bargain, sell and convey unto the said Joseph A. Lucariello, his heirs and assigns forever, the following described property:

A certain lot or parcel of land with the buildings thereon, situated on the easterly side of Auburn Street in said City of Portland, bounded and described as follows: Beginning on said easterly side of Auburn Street at the northwesterly corner of land conveyed by Fred E. Lovejoy to Suburban Homes, Inc., and later of one Hazlett; thence northerly by said line of Auburn Street one hundred seventy-four (174) feet to a stake; thence easterly at right angles with said line of Auburn Street to Fall Brook; thence southeasterly by the center line of said Brook to said Hazlett land; thence westerly by said Hazlett land two hundred (200) feet, more or less, to said Auburn Street at the point of beginning.

Being the same premises conveyed to us by Alexander A. McIntyre et al by deed dated May 13, 1943 and recorded in Cumberland County Registry of Deeds, Book 1715, Page 41.

into
Lucariello

On this and in full the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said Joseph A. Lucariello his heirs and assigns, to his and

U.S.I.R.
\$4.40
C.C.D.
3/6/46

their use and behoof forever. And we do covenant with the said Grantee, his heirs and assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances;

that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs, shall and will warrant and defend the same to the said Grantee, his heirs and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, we, the said Cecil C. Davis and Alice R. Davis, being husband and wife, each joining in this deed as Grantor, and each relinquishing and conveying our respective rights by descent and all other rights in the above described premises,

our hands and seals this sixth day of March in the year of our Lord one thousand nine hundred and forty-six.

Signed, Sealed and Delivered in presence of

D. W. Philbrick

Alice R. Davis

Seal

to both

Cecil C. Davis

Seal

State of Maine, CUMBERLAND, ss.

March 6, 1946

Personally appeared

the above named Cecil C. Davis and Alice R. Davis

and acknowledged the above instrument to be their free act and deed.

Before me, Donald W. Philbrick Justice of the Peace

Received March 6,

1946, at 11 o'clock 50 m. A.M., and recorded according to the original.

his said capacity and the free act and deed of said Bank.

Before me, F. Burley Smith

Notary Public Notarial Seal

Received April 6, 1951, at 10h 30m A. M., and recorded according to the original

KNOW ALL MEN BY THESE PRESENTS, That We, Sidney E. Dee and Esther M. Dee, both
of Portland, in the County of Cumberland and State of Maine in consideration of
One Dollar and other valuable considerations paid by CITY OF PORTLAND, a municipal
corporation and body politic organized under the laws of the State of Maine and
having its principal offices in said Portland the receipt whereof we do hereby ac-
knowledge, do hereby give, grant, bargain, sell and convey, unto the said CITY OF
PORTLAND, its Successors and Assigns forever, the following described property:

A certain lot or parcel of land, situated in said City of Portland, bounded
and described as follows: Beginning at an iron in a stone wall in the division line
between land of Sidney E. Dee, et al. and land now or formerly of Elizabeth B. Smith,
said point being distant northwesterly along said division line seven hundred thirty-
six and ninety-four hundredths (736.94) feet from its intersection with the north-
westerly side line of Allen Avenue; thence northwesterly by the stone wall and by
land now or formerly of Thomas R. Perham, et al. a distance of one hundred thirty-
two and thirty hundredths (132.30) feet to an iron; thence northwesterly by the
stone wall and wire fence and by land now or formerly of Charles E. Phair, et al
and making an included angle through the West of 179° 56' with the southerly direct-
ion of the last described course a distance of six hundred thirty-three and forty-
one hundredths (633.41) feet to an iron in a stone wall; thence northwesterly and
making an included angle through the West of 110° 42' with the southerly direction
of the last described course a distance of one hundred twenty-one and seventy-six
hundredths (121.76) feet to an iron; thence southwesterly and making an included
angle through the East of 90° 33' and by land now or formerly of Augusta J. Hazlett,
et al. and land now or formerly of Maurice E. Willey a distance of nine hundred two
and fifty-two hundredths (902.52) feet to an iron in a stone wall and to other land
of Sidney E. Dee, et al.; thence northeasterly by land of Sidney E. Dee, et al. and
making an included angle through the North of 64° 30' a distance of four hundred
forty-two (442) feet, more or less, to the point of beginning.

Again beginning at the first mentioned point in the division line between land
of Sidney E. Dee, et al. and land now or formerly of Elizabeth B. Smith; thence
southeasterly by said division line a distance of seven hundred thirty-six and nine-
ty-four hundredths (736.94) feet to its intersection with the northwesterly side
line of Allen Avenue; thence southwesterly by the said northwesterly side line of
Allen Avenue a distance of seventy-three and sixty-one hundredths (73.61) feet to a
point; thence northwesterly on a line parallel with and seventy (70) feet distant
at right angles with the said division line between land of Sidney E. Dee, et al. and

57 57

2041
57
City

land now or formerly of Elizabeth B. Smith a distance of seven hundred fifty-four and forty-three hundredths (754.43) feet, more or less, to a point in the most southerly boundary line of the first described parcel; thence easterly by the said southerly boundary line of the first described parcel seventy and twenty hundredths (70.20) feet, more or less, to the point of beginning.

Meaning and intending hereby to convey the northerly portion, containing about five (5) acres, of the land conveyed by Mace B. Lufkin, et al. to Sidney E. Dee, et al. August 17, 1945 and recorded in Cumberland County Registry of Deeds, in Book 1789, Page 286, together with a strip of land seventy (70) feet wide extending from Allen Avenue to the first parcel mentioned.

This conveyance is made subject to taxes for 1951 which the Grantee assumes and agrees to pay.

U.S.I.R.

\$1.65

S.E.D. &

3-30-51

TO HAVE AND TO HOLD the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said CITY OF PORTLAND, its Successors and Assigns, to its and their use and behoof forever.

AND we do covenant with the said Grantee, its Successors and Assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; except as aforesaid; that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our heirs, shall and will warrant and defend the same to the said Grantee, its Successors and Assigns forever, against the lawful claims and demands of all persons, except as aforesaid.

IN WITNESS WHEREOF, we, the said Sidney E. Dee and Esther M. Dee, being husband and wife, joining in this deed as Grantors, and relinquishing and conveying our rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this 30th day of March in the year of our Lord one thousand and nine hundred and fifty-one.

Signed, Sealed and Delivered in Presence of

Patricia E. Meally

to both

Sidney E. Dee

Esther M. Dee

Seal

Seal

STATE OF MAINE

Cumberland, ss.

Mar. 30, 1951.

Personally appeared the above named Sidney E. Dee and acknowledged the above instrument to be his free act and deed.

Before me, Patricia E. Meally

Notary Public Notarial Seal

Received April 6, 1951, at 10h 31m A. M., and recorded according to the original

=

Know all Men by these Presents, That

2149

468

PWD

City of Portland a public municipal Corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine

in consideration of One Dollar (\$1.00) and other valuable considerations paid by Portland Water District, a corporation duly organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said Portland Water District, its successors and assigns forever, The right perpetually to enter at any and all times upon a strip of land situated in said Portland being part of the land conveyed to the grantor by Sidney E. Dee, et al., by deed dated March 30, 1951 and recorded in Cumberland County Registry of Deeds in Book 2041, Page 57, to which deed reference is hereby made for a more particular description of said land, said strip being twenty-five (25) feet in width and bounded and described as follows: Beginning at a point in the dividing line between said land conveyed to the grantor by Sidney E. Dee, et al., and other land of the said Sidney E. Dee, et al., said point being distant northerly along said dividing line eighty-three and 09/100ths (83.09) feet from the northerly sideline of Allen Avenue; thence S. 49° 15'E., eighty-two and 25/100ths (82.25) feet, more or less, to said Allen Avenue; thence easterly by said Allen Avenue, twenty-five and 08/100ths (25.08) feet, more or less, to land now or formerly of one Smith; thence northerly by said Smith's land one and 6/10ths (1.6) feet, more or less, to a point; thence N. 49° 15' W. parallel to and distant twenty-five (25) feet from said first described course one hundred twenty-four and 75/100ths (124.75) feet, more or less, to said other land of Sidney E. Dee, et al.; thence Southerly by said Dee's land forty-four and 55/100ths (44.55) feet, more or less, to the point of beginning. The above described courses are magnetic and as the year 1950. And to construct and perpetually maintain through and under said strip conduits or pipe lines for conveying water and to lay, relay, repair, maintain and remove water pipe or pipes through or under said strip with all necessary fixtures and appurtenances, together with the right at all times to make connections with said conduits or pipe lines to land adjoining said strip by means of pipes or services, and to enter upon said strip at any and all times for any of the foregoing purposes; reserving to the grantor, its successors and assigns, the full use and enjoyment of said strip for such purposes as will in no way interfere with the perpetual use thereof by the grantee, its successors and assigns for the purposes above mentioned, provided that no building or any kind of permanent structure shall be erected on said strip by the grantor, its successors and assigns, and that the grantor, its successors and assigns, shall not remove earth from said strip or place fill thereon without the written permission of the grantee.

On Have and in Hold the same, together with all the privileges and appurtenances thereunto belonging, to it the said Portland Water District, its successors and assigns, and Assigns forever.

Corporation does

And the said Grantor covenant with the said Portland Water District, its successors and assigns, that it will warrant and forever defend the premises to it the said Grantee, its successors and assigns, forever

here and assigns that will warrant and defend the premises to the said

here and assigns forever, against the lawful claims and demands of all persons claiming by, through or under it.

In Witness Whereof, the said City of Portland has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Leon W. Kelber its Treasurer thereunto duly authorized,

have hereunto set hand and seal this 5th day of February in the year of our Lord one thousand nine hundred and fifty-four.
Signed, Sealed and Delivered in presence of

Barnett I. Shur

CITY OF PORTLAND
CORPORATE SEAL
By Leon W. Kelber
City Treasurer

State of Maine, CUMBERLAND, ss. February 5th, 1954. Personally appeared the above named Leon W. Kelber, Treasurer of said Grantor Corporation as aforesaid,

and acknowledged the foregoing instrument to be his free act and deed, in his said capacity, and the free act and deed of said corporation. Before me, Barnett I. Shur Justice of the Peace.
Received February 11 1954, at 11 o'clock 15 m. A. M., and recorded according to the original.

274
274
Willey &

To
Portland
Water
Distr
War

KNOW ALL MEN BY THESE PRESENTS, THAT We, MAURICE E. WILLEY and ADA E. WILLEY, both of Portland in the County of Cumberland and State of Maine in consideration of One Dollar (\$1.00) and other valuable considerations paid by PORTLAND WATER DISTRICT, a corporation duly organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said PORTLAND WATER DISTRICT, its successors and Assigns forever, the right perpetually to enter at any and all times upon a strip of land situated on the Easterly side of Auburn Street in said Portland, being a part of the land conveyed to the grantors by Fred E. Lovejoy by deed dated August 2, 1938, recorded in Cumberland County Registry of Deeds in Book 1556, Page 394, to which deed reference is hereby made for a more particular description of said land, said strip being twenty-five (25) feet in width and more particularly bounded and described as follows, viz.: Beginning in the Easterly side line of said Auburn Street at the Southwest-erly corner of said land conveyed to the grantors by Fred E. Lovejoy; thence in an Easterly direction along the dividing line between said grantors' land and land of James C. Oliver, two hundred twenty-four and nine tenths (224.9) feet, more or less, to land conveyed by the grantors to the City of Portland by deed dated March 27, 1951, recorded in said Cumberland County Registry of Deeds in Book 2037, Page 429; thence in a Northerly direction along the dividing line between said land of the grantors and said land of the City of Portland twenty-five (25) feet to a point; thence in a Westerly direction parallel to and twenty-five (25) feet distant from said first described course, two hundred twenty-four and nine tenths (224.9) feet, more or less, to said Easterly side line of Auburn Street; thence in a Southerly direction along said Easterly side line of Auburn Street, twenty-five (25) feet to the point of beginning.

And to construct and perpetually maintain through and across said strip conduits or pipe lines for conveying water and to lay, relay, repair, maintain and remove water pipe or pipes upon or under said strip with all necessary fixtures and appurtenances together with the right at all times to made connections with said conduits or pipe lines to land adjoining said strip by means of pipes or services; to trim, cut down and remove bushes and trees and to remove grass and crops growing on said strip to such extent as in the judgment of the grantee is necessary for any of the above purposes and to enter upon said strip at any and all times for any of the foregoing purposes; reserving to the grantors, their heirs and assigns, the use and enjoyment of said strip for such purposes only as will in no way interfere with the perpetual use thereof by the grantee, its successors and assigns, for the purposes above mentioned, provided that no building or any kind of permanent structure shall be erected on said strip by the grantors, their heirs and assigns, and that the grantors,

2163
274

PWD

275
273

their heirs and assigns, shall not remove earth from said strip or place fill thereon without the written permission of the grantee.

Together with the right, insofar as the grantors have the right to convey the same, perpetually to enter at any and all times for any of the foregoing purposes upon that portion of said Auburn Street adjacent to the above-described premises.

TO HAVE AND TO HOLD the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said PORTLAND WATER DISTRICT, its successors and Assigns, to its and their use and behoof forever. U.S.I.R. \$0.55 M.E.W.

AND we do COVENANT with the said Grantee, its successors and Assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; that we have good right to sell and convey the same to the said Grantee to hold as aforesaid; and that we and our Heirs, shall and will WARRANT AND DEFEND the same to the said Grantee, its successors and Assigns forever, against the lawful claims and demands of all persons. 12/2/53

IN WITNESS WHEREOF, We the said MAURICE E. WILLEY and ADA E. WILLEY, being husband and wife, each joining in this deed as grantor and each relinquishing and conveying our respective rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this 2nd day of December in the year of our Lord one thousand nine hundred and fifty-three.

SIGNED, SEALED AND DELIVERED
IN PRESENCE OF

Edward J. Norris

Ada E. Willey Seal

to both

Maurice E. Willey Seal

STATE OF MAINE

Cumberland ss.

December 2, 1953.

Personally appeared the above named Maurice E. Willey and acknowledged the above instrument to be his free act and deed.

Before me, Edward J. Norris Justice of the Peace Notary Public
Notarial Seal My Commission Expires June 29, 1960

Received December 21, 1953 at 2h. 50m. P.M. and recorded according to the original

a
o

KNOW ALL MEN BY THESE PRESENTS THAT FEDERAL LOAN AND BUILDING ASSOCIATION a Corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine in consideration of One Dollar (\$1.00) and other valuable considerations paid by PORTLAND WATER DISTRICT, a corporation duly organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey, and forever

Fed Ln
& Bldg
Assn
To
Portland
Water
Distr
Q C

Florence H. Bailey	Seal
Dorothy H. Hutchins	Seal
Hazen A. Stuart	Seal
Phillis D. Stuart	Seal

2167
162
P.W.D

State of Maine,)
Cumberland) ss.

December 21, 1953.

Personally appeared the above named Clyde E. Bailey and acknowledged the above instrument to be his free act and deed.

Before me, Edward J. Norris Notary Public Notarial Seal My Commission Expires June 29, 1960.

Received January 25, 1954 at 3h.20m. P.M., and recorded according to the original. m

Dee &
to
Portland
Water
District
War.

KNOW ALL MEN BY THESE PRESENTS, THAT We, Sidney E. Dee and Esther M. Dee, both of Portland, in the County of Cumberland and State of Maine in consideration of One Dollar (\$1.00) and other valuable considerations paid by PORTLAND WATER DISTRICT, a corporation duly organized and existing under the laws of the State of Maine and located at Portland, in the County of Cumberland and State of Maine the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said PORTLAND WATER DISTRICT, its successors and Assigns forever, The right perpetually to enter at any and all times upon two certain strips of land situated in said Portland, being part of the land conveyed to the Grantors by Nace B. Lufkin, et al. by deed dated August 17, 1945 and recorded in Cumberland County Registry of Deeds in Book 1789, Page 286, to which deed reference is hereby made for a more particular description of said land, the first of said strips being thirty (30) feet in width and lying equally on either side of the following described center line, namely, fifteen (15) feet in width on either side of said center line and its projection at both ends:

Beginning at a point in the dividing line between land of the Grantors and land of the City of Portland, said point being twenty-two and ninety-three hundredths (22.93) feet North 52° 28' East along said dividing line from the Northwesterly corner of said land of the Grantors; thence North 89° 47' East three hundred ninety-eight and ninety-six hundredths (398.96) feet, more or less, to a stake set in the ground at a point distant ten (10) feet Southwesterly from the dividing line between said land of the Grantors and other land of said City of Portland;

And the second of said strips being fifteen (15) feet in width and lying ten (10) feet on the Northeasterly side and five (5) feet on the Southwesterly side of the following described center line and its projection at both ends:

Beginning at the above-described stake distant ten (10) feet Southwesterly from the dividing line between land of the Grantors and land of the City of Portland; thence South 33° 12' East parallel to and distant ten (10) feet from said dividing line between land of the Grantors and land of the City of Portland four hundred (400)

at, more or less, to a point: thence South 67° 20' East seventeen and eighty-five hundredths (17.85) feet, more or less, to a point in said dividing line between land of the Grantors and land of the City of Portland, said point being ninety-two and fifty-two hundredths (92.52) feet Northwesterly along said dividing line from the Northwesterly side line of Allen Avenue.

The above-described courses are true courses and are referred to the true meridian. And to construct and perpetually maintain through and across said strips conduits or pipe lines for conveying water and to lay, relay, repair, maintain and remove water pipe or pipes upon or under said strips with all necessary fixtures and appurtenances together with the right at all times to make connections with said conduits or pipe lines to land adjoining said strips by means of pipes or services: to trim, cut down and remove bushes and trees and to remove grass and crops growing on said strips to such extent as in the judgment of the Grantee is necessary for any of the above purposes and to enter upon said strips at any and all times for any of the foregoing purposes; reserving to the Grantors, their heirs and assigns, the use and enjoyment of said strips for such purposes only as will in no way interfere with the perpetual use thereof by the Grantee, its successors and assigns for the purposes above mentioned, provided that no building or any kind of permanent structure shall be erected on said strips by the Grantors, their heirs and assigns, and that the Grantors, their heirs and assigns, shall not remove earth from said strips or place fill thereon without the written permission of the Grantee.

TO HAVE AND TO HOLD the aforegranted and bargained premises, with all privileges and appurtenances thereof to the said PORTLAND WATER DISTRICT, its successors and Assigns, to its and their use and behoof forever.

U.S.I.P.
\$1.10
S.E.D.
1-15-54

AND we do COVENANT with the said Grantee, its successors and Assigns, that we are lawfully seized in fee of the premises: that they are free of all incumbrances; that we have good right to sell and convey the same to the said Grantee to hold as aforesaid: and that we and our Heirs, shall and will WARRANT AND DEFEND the same to the said Grantee, its successors and Assigns forever, against the lawful claims and demands of all persons.

IN WITNESS WHEREOF, we, the said Sidney E. Dee and Esther M. Dee, being husband and wife, joining in this deed as Grantors, and relinquishing and conveying our rights by descent and all other rights in the above described premises, have hereunto set our hands and seals this 15th day of January in the year of our Lord one thousand nine hundred and fifty-four.

Signed, Sealed and Delivered

in presence of

Edward J. Morris

Sidney E. Dee

Seal

to both

Esther M. Dee

Seal

State of Maine, Cumberland ss.

January 15, 1954

Personally appeared the above named Sidney E. Dee and Esther M. Dee and acknowl-

edged the above instrument to be their free act and deed.

Before me, Edward J. Norris Notary Public Notarial Seal. My Commission Expires June 29, 1960.

Received January 25, 1954 at 3h.20m. P.M., and recorded according to the original.

Pg. 3

P W D
cont.

Cole &
to
Portland
Water
District
War.

KNOW ALL MEN BY THESE PRESENTS, THAT We, Clarence S. Cole and Mildred H. Cole, both of Falmouth in the County of Cumberland and State of Maine in consideration of One Dollar (\$1.00) and other valuable considerations paid by PORTLAND WATER DISTRICT, a corporation duly organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell and convey, unto the said PORTLAND WATER DISTRICT, its successors and Assigns forever, The right perpetually to enter at any and all times upon a strip of land situated in said Falmouth on the Northwesterly side of the Middle Road, so-called, being part of the land conveyed to the grantors by Morris H. Dickinson by deed dated March 26, 1953, and recorded in Cumberland County Registry of Deeds in Book 2123, Page 270, to which deed reference is hereby made for a more particular description of said land, said strip being bounded and described as follows:

Beginning on the Northwesterly side of said Middle Road at the Easterly corner of said land of the grantors and the Southerly corner of land of Belle B. Whipple; thence N. 73° 38' W. by said Whipple land, two hundred ninety-eight (298) feet, more or less, to the Southwesterly corner of said Whipple land; thence continuing on the same course N. 73° 38' W., one hundred sixty-seven and 15/100ths (167.15) feet, more or less, to a stake set in the ground; thence S. 48° 04' W., two hundred thirty-nine (239) feet, more or less, to the brook and land of Herbert F. Pillsbury; thence Southeasterly along said brook and by said Pillsbury land, thirty (30) feet, more or less, to a point; thence N. 48° 04' E. parallel to and distant thirty (30) feet from the aforesaid course of S. 48° 04' W. one hundred ninety-nine (199) feet, more or less, to a stake; thence S. 73° 38' E. parallel to and distant fifty (50) feet from the aforesaid course of N. 73° 38' W. four hundred forty-four (444) feet, more or less, to said Middle Road; thence Northeasterly by said Middle Road, fifty-two and 6/10ths (52.6) feet, more or less, to the point of beginning. Containing 29,300 square feet, more or less.

The above described courses are true courses and are referred to the true meridian. And to construct and perpetually maintain through and across said strip conduits or pipe lines for conveying water and to lay, relay, repair, maintain and remove water pipe or pipes upon or under said strip with all necessary fixtures and appurtenances together with the right at all times to make connections with said conduits or pipe lines to land adjoining said strip by means of pipes or services; to trim, cut down and remove bushes and trees and to remove grass and crops growing on said strip to such extent as in the judgment of the grantee is necessary for any of the above pur-

STATE OF MAINE

ANDROSCOGGIN, SS.

Lewiston, Maine

February 5, 1954

Personally appeared the above named CARL L. CURTIS, and acknowledged the foregoing instrument to be his free act and deed.

Before me, Anne E. Daunis Notary Public Notarial Seal

STATE OF MAINE

ANDROSCOGGIN, SS.

Lewiston, Maine

February 5, 1954

Personally appeared the above named GEORGE A. FOGG, President of said Truck Leasing Corporation, and acknowledged the foregoing instrument to be his free act and deed, and the free act and deed of said Corporation.

Before me, Anne E. Daunis Notary Public Notarial Seal

Received February 8, 1954 at 4h. 55m. P.M. and recorded according to the original

a
c

Portland
City of
To
Portland
Water
Distr

Q C

KNOW ALL MEN BY THESE PRESENTS THAT City of Portland, a public municipal corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine in consideration of One Dollar and other valuable considerations paid by Portland Water District, a corporation duly organized and existing under the laws of the State of Maine, and located at Portland, in the County of Cumberland and State of Maine the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said PORTLAND WATER DISTRICT, its successors and assigns forever, the right perpetually to enter at any and all times upon a certain strip of land situated in said Portland, being part of the land conveyed to the Grantor by Maurice E. Willey, et al., by deed dated March 27, 1951 and recorded in Cumberland County Registry of Deeds, in Book 2037, Page 429, to which deed reference is hereby made for a more particular description of said land, said strip being twenty-five (25) feet in width and bounded and described as follows:

Beginning at the southwesterly corner of said land conveyed to the Grantor by Maurice E. Willey, et al.; thence along the southerly line of said land conveyed to the Grantor by Maurice E. Willey, et al., on the following courses: North 85° 22 1/2' East twenty-one and four tenths (21.4) feet, more or less, to an iron pipe, thence North 84° 07' East three hundred fifty-five and thirty-two hundredths (355.32) feet, more or less, to an iron pipe, thence North 85° 25 1/2' East one hundred nine and thirty-eight hundredths (109.38) feet, more or less, to an iron pipe, thence South 89° 15' East one hundred fourteen and fifteen hundredths (114.15) feet, more or less, to an iron pipe, thence South 88° 18' East four hundred sixty-six and twelve hundredths (466.12)

2167

358

P W D

feet, more or less, to an iron pipe and land of Sidney E. Dee, et al.; thence by said Dee's land North 70° 34' East sixty-nine and twenty-nine hundredths (69.29) feet, more or less, to a point; thence in a westerly direction, parallel to and distant twenty-five (25) feet from the aforesaid southerly line of said land conveyed by Maurice E. Willey, et al. to the Grantor, and its projection at both ends, on various courses to a stake set in the westerly line of said land conveyed to the Grantor by Maurice E. Willey, et al.; thence in a southerly direction by other land of said Willey twenty-five (25) feet, more or less, to the point of beginning.

The above-described courses are magnetic and as of the year 1950.

And to construct and perpetually maintain through and under said strip, conduits or pipe lines for conveying water and to lay, relay, repair, maintain and remove water pipe or pipes through or under said strip, with all necessary fixtures and appurtenances, together with the right at all times to make connections with said conduits or pipe lines to land adjoining said strip by means of pipes or services, and to enter upon said strip at any and all times for any of the foregoing purposes; reserving to the Grantor, its successors and assigns, the full use and enjoyment of said strip for such purposes as will in no way interfere with the perpetual use thereof by the Grantee, its successors and assigns, for the purposes above mentioned, provided that no building or any kind of permanent structure shall be erected on said strip by the Grantor, its successors or assigns, and that the Grantor, its successors and assigns, shall not remove earth from said strip or place fill thereon without the written permission of the Grantee.

TO HAVE AND TO HOLD the same, together with all the privileges and appurtenances thereunto belonging, to the said PORTLAND WATER DISTRICT, its successors and Assigns forever. AND the said Grantor Corporation does COVENANT with the said PORTLAND WATER DISTRICT, its successors and Assigns, that it will WARRANT and FOREVER DEFEND the premises to the said Grantee, its successors and Assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

IN WITNESS WHEREOF, the said City of Portland, has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Leon W. Kelber, its Treasurer thereunto duly authorized, this 5th day of February in the year one thousand nine hundred and fifty-four.

SIGNED, SEALED AND DELIVERED
IN PRESENCE OF

Barnett I. Shur

CITY OF PORTLAND CORPORATE SEAL
By Leon W. Kelber
City Treasurer

State of Maine,) ss.
Cumberland)

February 5th, 1954

Personally appeared the above named Leon W. Kelber Treasurer of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and

360
366

deed in his said capacity, and the free act and deed of said corporation.

Before me, Barnett I. Shur Justice of the Peace.

Received February 11, 1954 at 11h. 15m. A.M. and recorded according to the original a

Pine
State
Ln & Bldg
Assn

KNOW ALL MEN BY THESE PRESENTS, THAT PINE STATE LOAN AND BUILDING

ASSOCIATION, a corporation organized and existing according to law and having its place of business at Portland, County of Cumberland and State of Maine, mortgagee & owner of a

To

Peterson

Disch

certain mortgage given by Hilda E. Peterson of Westbrook, County of Cumberland and State of Maine, to PINE STATE LOAN AND BUILDING ASSOCIATION dated March 16, A. D. 1949, and recorded in Cumberland County Registry of Deeds, Book 1948, Page 58, does hereby acknowledge that it has received full payment and satisfaction of the same and of the debt thereby secured, and in consideration thereof it does hereby cancel and discharge said mortgage, and release unto the said Hilda E. Peterson, her heirs and assigns forever the premises therein described.

IN WITNESS WHEREOF, the said PINE STATE LOAN AND BUILDING ASSOCIATION has caused this instrument to be signed in its corporate name and sealed with its corporate seal by Edward B. Perry, its Treasurer, thereunto duly authorized this eleventh day of February in the year one thousand nine hundred and fifty-four.

SIGNED, SEALED AND DELIVERED

IN PRESENCE OF

PINE STATE LOAN AND BUILDING ASSOCIATION
CORPORATE SEAL

Martha E. Downs

By Edward B. Perry
Treasurer

State of Maine

Cumberland ss

February 11, 1954.

Personally appeared the above named Edward B. Perry, Treasurer of said Corporation aforesaid, and acknowledged the foregoing instrument to be his free act and deed, in his said capacity, and the free act and deed of said Corporation.

Before me, Martha E. Downs Notary Public Notarial Seal

Received February 11, 1954 at 4h. 10m. P.M. and recorded according to the original a

Bruns
Sav Instn

Brunswick, Maine
Date: Feb. 15, 1954

To

Pearce &
Disch

The debt secured by the within mortgage having been paid in full, this mortgage is hereby discharged, and the real estate therein described is released to the within mortgagor, he (his) heirs and assigns forever.

IN WITNESS WHEREOF, the said BRUNSWICK SAVINGS INSTITUTION has caused this instrument to be signed in its corporate name and its corporate seal to be hereto attached by F. Burton Whitman, Jr. its Assistant Treasurer, thereunto duly authorized, the day and year first above written.

IN THE PRESENCE OF:
Elizabeth S. Powers
Cumberland, ss.

BRUNSWICK SAVINGS INSTITUTION CORPORATE SEAL
By: F. Burton Whitman Jr. Ass't. Treas.
STATE OF MAINE Dated: Feb. 15, 1954

Personally appeared the above named F. Burton Whitman, Jr. as Assistant Treasurer of said BRUNSWICK SAVINGS INSTITUTION, and acknowledged the foregoing instrument to be the free act and deed of said corporation and his free act and deed in his said capacity.

Before me, Elizabeth S. Powers Notary Public Notarial Seal

Received February 17, 1954 at 9h. A.M. and recorded according to the original

Endorsed on Mortgage Deed as recorded in Book 2082, Page 131. a

Section 6: Compliance with Applicable Zoning Requirements

6.0 Existing Zones

The proposed site exists within a R-2 Zone for the parking, building, and vehicle circulation portions of the project. The site is zoned R-OS for the existing athletic fields locations, and a portion of the proposed parking areas. A Stream Protection Overlay Zone (S-P) exists within and adjacent to the Fall Brook corridor, at the west of the site. The site abuts the R-2 Zone to the north and east, and the R3 Zone to the south and west.

Compliance within these zones is indicated below:

R-OS:

Use: Athletics fields are a permitted use in this zone.

Screening: Screening shall be adequately provided when abutting residential areas. It is understood that the parking lot near the basketball courts is within the R-OS zone. No substantial modifications to the existing site are occurring within 50' of the property boundary for the R-OS zone modifications, and as such we do not anticipate additional screening around the existing athletics fields for the parking and circulation upgrades that are occurring closer to the schools. While not required for screening, trees are proposed along the eastern edge of this parking lot, and a fence is proposed along the basketball court.

Parking: Parking shall be required by Division 20. Whereas parking is required to adequately suit the property, a 2016 e-mail (attached) from Planning has indicated that this use would be considered approved as part of the proposed improvements, as long as parking improvements were substantial enough to incorporate the intent of the Division 20 parking requirements for athletics fields.

Maximum Lot Coverage: Max 25%. No additional buildings are proposed as part of this project.

R-2:

Use: Parks and other active and passive non-commercial recreation spaces are permitted. Municipal uses permitted; schools are conditionally permitted. Whereas the proposed uses are

an improvement upon the existing uses, it is anticipated that there would not be any zoning concerns in this location.

Maximum lot coverage: 20%. No additional buildings are to be constructed.

Screening: Screening shall be adequately provided when abutting residential areas. While informal parking does exist near the northern side of the Middle School, there is currently no screening in this location. A 4' stockade fence has been provided as screening for other properties abutting the northern parcel line, and the proposed project includes for extending this fence along the proposed formal parking area, at a location along the existing edge of plantings.

ATTACHMENT 6.1

CONVERSATION WITH CITY PLANNING

Kathleen O. Sculley

From: Christina Stacey <cstacey@portlandmaine.gov>
Sent: Friday, January 08, 2016 8:15 AM
To: Jennifer Claster
Cc: Barbara Barhydt
Subject: Lyseth - Moore Parking Expansion
Attachments: 20160108075343495.pdf

Hi Jennifer,

Per our discussion on Wednesday, I was able to speak with Ann Machado (zoning administrator) about the parking expansion in the R-OS zone at the Lyseth - Moore school. I am attaching a scan of the off-street parking requirements for the R-OS zone - see item c at the top of the document. It says that parking is allowed in the R-OS zone if it is needed to serve park employees and visitors. If the parking lot expansion can comply with this provision, then Ann thinks the project will be OK under zoning without having to worry about amending the zone boundaries.

Let me know if you have any questions.

Yours,
Chris

Christina Stacey
Zoning Specialist - Inspections Division
City of Portland
389 Congress St.
Portland, ME 04101
(207) 874-8695

cstacey@portlandmaine.gov

>>> <InspectionsCopier@portlandmaine.gov> 1/8/2016 7:53 AM >>>

This E-mail was sent from "RNP1E5ADC" (Aficio MP 4000B).

Scan Date: 01.08.2016 07:53:43 (-0500)

Queries to: InspectionsCopier@portlandmaine.gov

transportation.

- (c) *Recreation open space zone:* Off-street parking adequate to serve projected employee and visitor needs shall be provided. Parking needs projections provided by the applicant or the planning department should be considered in the review.
- (d) *Change of use in the B-2b zone:*
 - 1. A change of use of 10,000 sq. ft. or less of floor area of a building or a portion of a building need not provide parking for non-residential uses, provided that if the number of existing parking spaces serving the site is less than the requirements of this division, that number of parking spaces may not be reduced lower than the required amount prior to the change of use except:
 - a. To the extent necessary to meet the requirements of the Americans with Disability Act; or
 - b. To the extent it is a requirement, or a condition of site plan review; or
 - c. To the extent the change of use requires less parking than the previous use and the total number of parking spaces serving the site exceeds the parking requirements of this division for all uses on the site including the change of use.
 - 2. A newly constructed building, a building addition or a change of the use of a building exceeding 10,000 sq. ft. of floor area, shall provide the parking required by this division.
- (e) *B-3 Zone:* No off-street parking is required for changes of use.
- (f) *I-R1, Island Business Zone:* Off-street parking shall be required at twenty-five (25%) percent of the required 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.

Section 7: Summary of Existing Easements and Covenants

7.0 Existing Easements

Existing easements are identified on the Boundary Survey Plan provided as part of this submission. The easements are attached as follows:

7.1: Portland Water District easement, southern portion of the project.

ATTACHMENT 7.1

PORTLAND WATER DISTRICT EASEMENT

STATE OF MAINE

ANDROSCOGGIN, SS.

Lewiston, Maine

February 5, 1954

Personally appeared the above named CARL L. CURTIS, and acknowledged the foregoing instrument to be his free act and deed.

Before me, Anne E. Daunis Notary Public Notarial Seal

STATE OF MAINE

ANDROSCOGGIN, SS.

Lewiston, Maine

February 5, 1954

Personally appeared the above named GEORGE A. FOGG, President of said Truck Leasing Corporation, and acknowledged the foregoing instrument to be his free act and deed, and the free act and deed of said Corporation.

Before me, Anne E. Daunis Notary Public Notarial Seal

Received February 8, 1954 at 4h. 55m. P.M. and recorded according to the original

a
c

Portland
City of
To
Portland
Water
Distr

Q C

KNOW ALL MEN BY THESE PRESENTS THAT City of Portland, a public municipal corporation organized and existing under the laws of the State of Maine and located at Portland in the County of Cumberland and State of Maine in consideration of One Dollar and other valuable considerations paid by Portland Water District, a corporation duly organized and existing under the laws of the State of Maine, and located at Portland, in the County of Cumberland and State of Maine the receipt whereof it does hereby acknowledge, does hereby remise, release, bargain, sell and convey, and forever quit-claim unto the said PORTLAND WATER DISTRICT, its successors and assigns forever, the right perpetually to enter at any and all times upon a certain strip of land situated in said Portland, being part of the land conveyed to the Grantor by Maurice E. Willey, et al., by deed dated March 27, 1951 and recorded in Cumberland County Registry of Deeds, in Book 2037, Page 429, to which deed reference is hereby made for a more particular description of said land, said strip being twenty-five (25) feet in width and bounded and described as follows:

Beginning at the southwesterly corner of said land conveyed to the Grantor by Maurice E. Willey, et al.; thence along the southerly line of said land conveyed to the Grantor by Maurice E. Willey, et al., on the following courses: North 85° 22 1/2' East twenty-one and four tenths (21.4) feet, more or less, to an iron pipe, thence North 84° 07' East three hundred fifty-five and thirty-two hundredths (355.32) feet, more or less, to an iron pipe, thence North 85° 25 1/2' East one hundred nine and thirty-eight hundredths (109.38) feet, more or less, to an iron pipe, thence South 89° 15' East one hundred fourteen and fifteen hundredths (114.15) feet, more or less, to an iron pipe, thence South 88° 18' East four hundred sixty-six and twelve hundredths (466.12)

feet, more or less, to an iron pipe and land of Sidney E. Dee, et al.; thence by said Dee's land North 70° 34' East sixty-nine and twenty-nine hundredths (69.29) feet, more or less, to a point; thence in a westerly direction, parallel to and distant twenty-five (25) feet from the aforesaid southerly line of said land conveyed by Maurice E. Willey, et al. to the Grantor, and its projection at both ends, on various courses to a stake set in the westerly line of said land conveyed to the Grantor by Maurice E. Willey, et al.; thence in a southerly direction by other land of said Willey twenty-five (25) feet, more or less, to the point of beginning.

The above-described courses are magnetic and as of the year 1950.

And to construct and perpetually maintain through and under said strip, conduits or pipe lines for conveying water and to lay, relay, repair, maintain and remove water pipe or pipes through or under said strip, with all necessary fixtures and appurtenances, together with the right at all times to make connections with said conduits or pipe lines to land adjoining said strip by means of pipes or services, and to enter upon said strip at any and all times for any of the foregoing purposes; reserving to the Grantor, its successors and assigns, the full use and enjoyment of said strip for such purposes as will in no way interfere with the perpetual use thereof by the Grantee, its successors and assigns, for the purposes above mentioned, provided that no building or any kind of permanent structure shall be erected on said strip by the Grantor, its successors or assigns, and that the Grantor, its successors and assigns, shall not remove earth from said strip or place fill thereon without the written permission of the Grantee.

TO HAVE AND TO HOLD the same, together with all the privileges and appurtenances thereunto belonging, to the said PORTLAND WATER DISTRICT, its successors and Assigns forever. AND the said Grantor Corporation does COVENANT with the said PORTLAND WATER DISTRICT, its successors and Assigns, that it will WARRANT and FOREVER DEFEND the premises to the said Grantee, its successors and Assigns forever, against the lawful claims and demands of all persons claiming by, through, or under it.

IN WITNESS WHEREOF, the said City of Portland, has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Leon W. Kelber, its Treasurer thereunto duly authorized, this 5th day of February in the year one thousand nine hundred and fifty-four.

SIGNED, SEALED AND DELIVERED
IN PRESENCE OF

Barnett I. Shur

CITY OF PORTLAND CORPORATE SEAL
By Leon W. Kelber
City Treasurer

State of Maine,)
Cumberland) ss.

February 5th, 1954

Personally appeared the above named Leon W. Kelber Treasurer of said Grantor Corporation as aforesaid, and acknowledged the foregoing instrument to be his free act and

deed in his said capacity, and the free act and deed of said corporation.

Before me, Barnett I. Shur Justice of the Peace.

Received February 11, 1954 at 11h. 15m. A.M. and recorded according to the original

Pine
State
Ln & Bldg
Assn

KNOW ALL MEN BY THESE PRESENTS, THAT PINE STATE LOAN AND BUILDING

ASSOCIATION, a corporation organized and existing according to law and having its place of business at Portland, County of Cumberland and State of Maine, mortgagee & owner of a

To

Peterson
Disch

certain mortgage given by Hilda E. Peterson of Westbrook, County of Cumberland and State of Maine, to PINE STATE LOAN AND BUILDING ASSOCIATION dated March 16, A. D. 1949, and recorded in Cumberland County Registry of Deeds, Book 1948, Page 58, does hereby acknowledge that it has received full payment and satisfaction of the same and of the debt thereby secured, and in consideration thereof it does hereby cancel and discharge said mortgage, and release unto the said Hilda E. Peterson, her heirs and assigns forever the premises therein described.

IN WITNESS WHEREOF, the said PINE STATE LOAN AND BUILDING ASSOCIATION has caused this instrument to be signed in its corporate name and sealed with its corporate seal by Edward B. Perry, its Treasurer, thereunto duly authorized this eleventh day of February in the year one thousand nine hundred and fifty-four.

SIGNED, SEALED AND DELIVERED

IN PRESENCE OF

PINE STATE LOAN AND BUILDING ASSOCIATION
CORPORATE SEAL

Martha E. Downs

By Edward B. Perry
Treasurer

State of Maine

Cumberland ss

February 11, 1954.

Personally appeared the above named Edward B. Perry, Treasurer of said Corporation aforesaid, and acknowledged the foregoing instrument to be his free act and deed, in his said capacity, and the free act and deed of said Corporation.

Before me, Martha E. Downs Notary Public Notarial Seal

Received February 11, 1954 at 4h. 10m. P.M. and recorded according to the original

Bruns
Sav Instn

Brunswick, Maine
Date: Feb. 15, 1954

To

Pearce &
Disch

The debt secured by the within mortgage having been paid in full, this mortgage is hereby discharged, and the real estate therein described is released to the within mortgagor, he (his) heirs and assigns forever.

IN WITNESS WHEREOF, the said BRUNSWICK SAVINGS INSTITUTION has caused this instrument to be signed in its corporate name and its corporate seal to be hereto attached by F. Burton Whitman, Jr. its Assistant Treasurer, thereunto duly authorized, the day and year first above written.

IN THE PRESENCE OF:
Elizabeth S. Powers
Cumberland, ss.

BRUNSWICK SAVINGS INSTITUTION CORPORATE SEAL
By: F. Burton Whitman Jr. Ass't. Treas.
STATE OF MAINE Dated: Feb. 15, 1954

Personally appeared the above named F. Burton Whitman, Jr. as Assistant Treasurer of said BRUNSWICK SAVINGS INSTITUTION, and acknowledged the foregoing instrument to be the free act and deed of said corporation and his free act and deed in his said capacity.

Before me, Elizabeth S. Powers Notary Public Notarial Seal

Received February 17, 1954 at 9h. A.M. and recorded according to the original

Endorsed on Mortgage Deed as recorded in Book 2082, Page 131.

Section 8: Financial and Technical Capacity

8.0 Financial Capacity

The client has demonstrated financial capacity in a letter, attached to this document, that indicates the methods for funding the proposed project.

8.1 Technical Capacity

The client has obtained the services of Wright-Pierce to complete the permitting and design of the proposed improvements. Wright-Pierce is a Maine-based company with an office in Portland. Key staff for the project includes:

Doug Rice, P.E.: Senior project manager with over 35 years of experience in civil engineering and related fields. Mr. Rice has extensive experience in roadway and parking lot design, stormwater treatment, stormwater conveyance, traffic circulation, athletic fields design and client management.

Michael Guethle, P.E.: Project engineer with over 5 years of experience in civil and environmental engineering. Mr. Guethle has previously drafted plans for many other development projects within the City of Portland and is thoroughly familiar with the City's permitting processes and technical standards.

Chris Hinkley: Senior Civil Technician with over 10 years of experience in civil engineering and related fields. Mr. Hinkley has experience drafting plans and completing field work for the City of Portland, and is familiar with the plan standards and other design standards required by the City.

Subconsultants:

Jones Associates: Jones Associates is a firm capable of providing surveying assistance, soils analysis, wetland delineations, and other environmental field services to the project. At this time, they have been retained to assist in soil borings and wetland delineations.

Bill Bray: Bill Bray is a senior engineer with substantial experience in traffic management studies and circulation design. Mr. Bray has been retained to assist in the development of traffic studies for the project.

ATTACHMENT 8.1

FINANCIAL CAPACITY



PORTLAND MAINE

Strengthening a Remarkable City, Building a Community for Life • www.portlandmaine.gov

8/31/17

City of Portland Planning Department:

RE: Financial Capacity – Moore / Lyseth Campus Improvements

Funding for the Moore/Lyseth project began in fiscal year 2017 with a \$400,000 CIP appropriation. This initial outlay was intended to cover engineering costs, borings, surveying, cost estimating and to seed the project. The actual construction costs would then be covered by a subsequent CIP outlay – the amount to be determined following initial engineering work and estimating.

During the spring of 2017, an ad hoc committee was formed to review conditions at (4) Portland elementary schools and to provide recommendations for funding options for needed renovations. During this committee work, it was decided that the Moore/Lyseth campus work would be rolled into the “Buildings For Our Future” effort.

This coming November, there are two competing bond issues on the ballot, both of which will include the funding for this project. In the event that neither referendum bond issue passes, a FY 19 \$2m CIP is expected to fund this project. Either way, the intent is to gain Planning Board approval this winter – thereby making this long overdue project “shovel ready” and available to start construction in the summer of 2018.

Thank You,

David Onos
Director of Project Management
Public Buildings Division
Department of Parks, Recreation & Facilities

ATTACHMENT 8.2

PROJECT RESUMES

DOUGLAS A. RICE, PE

Project Manager

PROJECT ASSIGNMENT:

Project Manager

Education

A.S., Architecture and
Building Construction,
University of Maine,
Augusta

Architecture and Civil
Engineering - Versa CAD,
Central Maine Technical
College

Professional Registration

Maine
New Hampshire

Experience

37 Years

Joined Firm

1986

Professional Affiliations

Construction
Specifications Institute

Professional Development

Training as per 29 CFR
1910.146

EXPERIENCE SUMMARY

Mr. Rice has over 37 years of experience in civil and environmental engineering with 29 years at Wright-Pierce. He has extensive experience in stormwater management plans, street and highway design, site design, sewer separation and other related projects.

RELEVANT PROJECT EXPERIENCE

Industrial Park Planning, Permitting and/or Design

Industrial Park Feasibility Study, Berlin, NH

Text.

Brunswick Industrial Park, Brunswick, ME

Text.

Economic Development Tract, Thomaston, ME

Text.

Van Buren Business Park, Van Buren, ME

Text.

Bowdoin Mill Environmental Permitting, Topsham, ME

Worked with Fore River Company to acquire environmental permits for redevelopment of an historical mill complex.

Site Assessment, Planning and Design

Naval Air Station Infrastructure Inventory, Brunswick, ME

Text.

Naval Air Station Annex Infrastructure inventory, Topsham, ME

Text.

Jordan Avenue Pump Station Site Design, Brunswick, ME

Site design for the Brunswick-Topsham Water District.

River Road Pump Station Site Design, Brunswick, ME

Text.

Downtown Parking Study, Bath, ME

Text.

15-Lot Open Space Subdivision, Freeport, ME

Text.

New Public Library, Topsham, ME

Text.

New Town Office/Police Station Site Work and Permitting, Sabattus, ME

Site Work and Permitting

New Town Office/Police Station, Richmond, ME

Site Work and Permitting

Poland Spring Bottling Facility, Hollis, ME

Site and roadway design, state and local permitting, stormwater management, and erosion control for \$74-million bottling facility.

Thornton Oaks Retirement Community, Brunswick, ME

Site design, permitting (state, local), stormwater management, relocation of existing recreational exercise path

Biosolids Improvement Project, North Andover, MA

For the Greater Lawrence Sanitary District performed site and stormwater management design.

Subdivision Permitting, Bath, ME

Department of Environmental Protection (DEP) permitting for West Chop Point Subdivision.

Subdivision Permitting, Rangeley and Brunswick, ME

DEP permitting for Woodside Subdivision and Maplewood Homes.

Roadside Rest Area, Dyer Brook, ME

Plan preparation for roadside rest area I-95 for the Maine Department of Transportation (MDOT).

Gas Contaminated Soil Clean Up for Marina Site, Bath, ME

Text

Site Design for Thornton Oaks Retirement Community, Brunswick, ME

Environmental audit, local approvals and Army Corps of Engineers permitting.

Site design of Webber Gravel Pit, Topsham, ME

Text

Mid Coast Hospital Site Search, Brunswick/Bath, ME

Text

Parkwood Inn Site Design, Permitting and Stormwater Management, Brunswick, ME

Text

Maine Street Baptist Church, Brunswick, ME

Site design, permitting and stormwater management.

Chans Nursing Facility, Brunswick, ME

Site design, permitting and stormwater management.

Sunfield Apartments, Brunswick, ME

Site design, permitting and stormwater management.

Cinema Site, Brunswick, ME

Site design, permitting and stormwater management.

Gas Distribution, Brunswick, ME

Provided various services to a mid-sized natural gas distribution utility, including infrastructure mapping, construction coordination and monitoring, and natural gas pipeline design.

Stormwater, Flooding and Stabilization

Storm Drainage System Improvements, Richmond, ME

Text.

Various Stormwater Management Plans, Brunswick, ME

Brunswick Naval Air Station, Mere Brook drainage study, Thornton Oaks Retirement Community Woodside Subdivision, Phase II, and Maplewood Homes.

Stormwater Disposal System South Portland, ME

Consisting of 2,000 linear feet of 54-inch diameter pipe with a tidal outfall.

Stormwater Management for Composting Facility, Keene, NH

Text.

Salmon Falls Culvert Replacement, Rochester, NH

Text

Parks and Recreational Facilities

Bowdoin College Squash Court Facilities, Brunswick, ME

Text.

Memorial Park, Old Orchard Beach, ME

Text.

Sherman and Mountain Mills East Boating Facility, Wilmington, VT

Text.

Riverfront Redevelopment, Westbrook, ME

Assisted Orcutt Associates and the City of Westbrook with a multi-year program of redevelopment of the city's riverfront on the Presumpscot River. The work includes significant utility rehabilitation in addition to street reconstruction, reconfiguration of parking, installation of period lighting and other amenities.

Riverfront Redevelopment, Gardiner, ME

Assisted the city with a multi-year program of redevelopment of the city's riverfront on the Kennebec River. The work includes expansion of the existing marina facilities, utility rehabilitation, rehabilitation of sidewalks, reconfiguration of parking, installation of period lighting and other amenities.

Colby College Artificial Turf Field Evaluation, Waterville, ME

Text.

Recreation Field Design, Old Orchard Beach, ME

Preliminary design of multifunction recreation fields, exercise path, field house

with restaurant, and a concession stand with a maintenance area.

Bates College Track and Field Sports Facility Stormwater Management, Lewiston, ME

Site design, stormwater management and permitting.

Sawyer Park Boat Launch, Brunswick, ME

Assisted in the design and permitting of a tidal boat launching facility (Sawyer Park) on the New Meadows River for the Maine Department of Conservation.

Street, Sidewalks and Roadways

Street Reconstruction, Rockland, ME

Prepared final design documents for the reconstruction of 30 city streets in the South End. The project is funded through a variety of federal, and state agencies along with a local share. Participating agencies include, Rural Development, the Department of Economic and Community Development, and the Maine Department of Transportation. The project is expected to be constructed over the next two years.

Street Reconstruction, Van Buren, ME

Full reconstruction of several municipal streets.

Street Rehabilitation, Hampton, NH

Recently assisted the town with development of bidding documents associated with the rehabilitation of portions of eight streets within the community.

Roadway Reconstruction, Lebanon, NH

Full reconstruction of several roadways as part of a federally funded sewer separation project. This project is ongoing.

Road and Bridge Reconstruction, Rochester, NH

Full reconstruction of Lafayette Street, Chamberlain Street and the Salmon Falls bridge.

Reconstruction of Roadway, Sidewalks, Storm Drainage and Sewers on Free Street, Lisbon Falls, ME

Text

Commons Area Street Reconstruction including Storm Drainage System, Rochester, NH

Text.

Sunset Street area Replacement of Sewer Manholes, Water Main and Drainage System, Rochester, NH

Text.

MaineDOT Route 163, St. Agatha, ME

Designed 0.4 miles of Route 163 for the Maine Department of Transportation.

MaineDOT Route 163, Van Buren, ME

Designed 0.6 miles of Route 1 for the Maine Department of Transportation.

Reconstruction of Webster Road, Lisbon, ME

Roadway reconstruction included a new storm drainage system.

Charette Hill Area Improvement Project, Fort Kent, ME

Project included roadway reconstruction, storm drainage and water mains.

Killick Pond Road Reconstruction, Hollis and Lisbon Falls, ME

Reconstruction of 2.25 miles of Killick Pond Road included intersection realignment and sight distance improvements.

Sewer Separation and Street Improvements, Portland, ME

2,000 linear foot arterial extension of Washington Avenue.

Jetport Interchange, Portland and South Portland, ME

For the Maine Turnpike Authority.

Chamberlain Street Reconstruction, Rochester, NH

New sewer, water, and storm drainage systems.

Hillside Avenue Sidewalk Reconstruction, Berlin, NH

Text.

Developed Technical Design Standards for Street Restoration, Berlin, NH

Text.

Riverside Drive Transportation Enhancement, Berlin, NH

Text.

Mason Street Bridge Deck Resurfacing, Berlin, NH

Text.

Streetscape Design, Durham, NH

Text.

Street Rehabilitation, Hampton, NH

Text.

Roadway and Sidewalks Reconstruction, Lebanon, NH

Text.

Sewall Road improvements, Wolfeboro, NH

Text.

Clark Road Improvements, Wolfeboro, NH

Text.

Street Improvements, Thomaston, ME

Text.

Free Street Reconstruction, Lisbon Falls, ME

Text.

Lee Street Reconstruction, Wiscasset, ME

Text.

Bridges

Bridge Reconstruction, Madawaska, ME

Full reconstruction of 11th Avenue bridge.

Replacement of Two Bridges for MDOT/FEMA, Pownal, ME

Text.

Wastewater

Wastewater Treatment Facility, Fort Kent, ME

Text.

Wastewater Treatment Facility, Thomaston, ME

Text.

Route 27 Sewer Extension, Boothbay, ME

Text.

**Sewer System Improvements, Sewer Separation and Street Improvements
Thomaston, ME**

Text.

Sewer Separation and Street Improvements, Corinna, ME

Text.

Sewer System Improvements and Rehabilitation, Hampton, NH

Text.

Sewer Separation and Street Improvements, Squirrel Island, ME

Text.

Sewer Separation, Great Salt Bay, ME

Text.

Sewer Separation for Brunswick Sewer District, Brunswick, ME

Text.

Sewer Separation and Street Improvements, Bar Harbor, ME

Text.

Sewer Separation Project, Bath, ME

Special diversion structure; sanitary sewers, storm drainage, sidewalk and roadway reconstruction for Middle Street neighborhood reconstruction project, and Phase II sewer separation.

**Sewer Separation and Street Improvements for Weston Avenue,
Madison, ME**

Text.

Composting Facility, Stormwater Management, and Site Design, Keene, NH

Text.

Municipal Solid Waste Landfill Closure and Central Office Facility for New Transfer Station, Edgartown, MA

Text.

Site Design and Stormwater Management for Sludge Composting Facility, Fairhaven, MA

Text.

Sewer System Improvements, Presque Isle, ME

Text.

Sewer System Improvements, Fort Kent, ME

Text.

Combined Sewer Overflow (CSO), Lewiston-Auburn, ME

Monitoring sampling for Clean Water Act master plan; 12 sampling locations; 4 river sampling sites.

Combined Sewer Overflow (CSO), Corinna, ME

Monitoring to prioritize separation efforts.

Design of Lagoons, Spray Irrigation System, Force Mains and Pump Stations, Rangeley, ME

Text.

MICHAEL A. GUETHLE, PE

Project Engineer

PROJECT ASSIGNMENT: Project Engineer

Education

B.S., Environmental
Engineering and Civil
Engineering, Clarkson
University

Professional Registration

Maine

Experience

5 Years

Joined Firm

2015

Professional Affiliations

Maine Water Environment
Association (MEWEA)

New England Water
Environment Association
(NEWEA)

Professional Certifications

MaineDOT Local Project
Administration (LAP/LPA)

OSHA 10-Hour Safety

ACI Concrete Field Testing
Technician – Grade 1

EXPERIENCE SUMMARY

Mr. Guethle is project engineer within the Civil and Infrastructure Engineering Practice Group at Wright-Pierce. His background is largely based in stormwater treatment design and maintenance, conveyance utilities, site development, dam design, and construction administration projects, ranging from small residential projects to the largest multi-modal transportation expansions in Maine. His diverse background creates a unique understanding of applicable design and construction knowledge, including experience with design tools such as AutoCAD, ArcGIS, HEC-RAS, and HydroCAD as well as construction tools such as a sub-centimeter GPS systems and contract management software. Below is a partial list of relevant projects throughout Maine and New York that he has been involved with throughout his career.

RELEVANT PROJECT EXPERIENCE

Site Development – Including Stormwater Treatment

Elm Street Sidewalk Construction, Damariscotta, ME

Designing grading, permitting, stormwater design, and parking layout for approx. 1,500 linear feet of new sidewalk within the Elm Street corridor, connecting an existing sidewalk from a residential neighborhood to the more urban downtown area.

Hagar Enterprises, Inc. Laydown Facility Expansion, Damariscotta, ME

Completing site design, stormwater treatment, and Site Law of Development Act (SLODA) permitting for the expansion of a laydown facility for Hagar Enterprises, Inc. in Damariscotta. This includes expanding a 2.6-acre facility to a 5.6-acre facility, expanding the existing stormwater treatment, evaluating stormwater treatment options, HydroCAD modeling, and coordinating with regulatory agencies as well as the contractor.

Inn Along the Way Site Development, Damariscotta, ME

Completing design and permitting for the redevelopment of an existing farm to an assisted living facility in Damariscotta. The work includes development of a MaineDEP stormwater permit, associated design of stormwater BMPs, and the design of roadways, parking facilities, and walking paths to meet permit requirements. Project also includes coordination with the contractor, client, and regulatory agencies.

Maine Wild Blueberry Expansion, Machias, ME

Development of a SLODA permit for the expansion of a blueberry processing facility to 5.7-acres of impervious area in Machias, Maine. The project includes development of the permit, associated design of stormwater BMPs, and the design of roadways and circulation to meet permit requirements while meeting unique client needs and expectations.

Lyseth Lyman-Moore School Site Design, Portland, ME

Designing improvements to traffic circulation, parking, athletic fields layout, walking paths, and stormwater treatment at a combined elementary school and middle school campus. Project includes significant coordination with client and regulatory agencies. Project incorporates use of AutoCAD programs, HydroCAD design for stormwater BMPs, and additional design concerns from being within the watershed of an urban impaired stream.

Whipple Road Sidewalk Design, Kittery, ME

Design of approximately 2,500 LF of sidewalk in a narrow right-of-way along Whipple Road. Project is a Locally Administered Project by the MaineDOT, and as such requires a significant amount of coordination between MaineDOT, the town, regulatory agencies, and project partners. Work for the project includes incorporation of utility pole relocations, development of sidewalk layout, environmental permitting and associated site drainage improvements.

Coastal Bluff Erosion Evaluation, Falmouth, ME

Design of multiple locations of eroding coastal bluff in developed residential neighborhoods in Falmouth. Project includes development of plans in AutoCAD and evaluation of multiple methods of slope stabilization to determine the preferred method of erosion mitigation.

Coastal Maine Botanical Gardens Expansion, Boothbay, ME

Designing grading, permitting, stormwater BMP design, and site layout design of the parking, roadway, landscaped, hardscaped, and building facilities for the multi-phase expansion of the Coastal Maine Botanical Gardens.

Munjoy Heights, Portland, ME*

Civil/site engineering design of a 6-building, 29-unit development on steep slopes of Munjoy Hill in the city. This includes, but is not limited to, the layout and design of sanitary sewers, storm drains, water mains, site driveway, retaining wall locations, building locations, and building drainage structures to be in accordance with the City of Portland technical standards.

89 Anderson Street Redevelopment, Portland, ME*

The project includes the civil/site engineering design of a single-building, 53-unit redevelopment of an existing underutilized lot in the East Bayside neighborhood in the city of Portland.

Knights Pond Improvements, Cumberland, ME*

Designing and permitting the layout, erosion control and potential impacts for the lowering of a dam with multiple subcontractors and interest groups. Project responsibilities included development of necessary permitting, development of plans and details in AutoCAD, and development of a project summary report.

Eagle Road Stormwater Improvements, Acton, ME*

The project included retrofit design of stormwater improvements for 1,200-LF of existing gravel roadway. Project responsibilities included assessing and obtaining information on existing conditions, creating a base plan with ArcGIS v.10 layers,

and development of plans in AutoCAD 2013 and Civil 3D 2013, as well as field visits.

Blue Heron Lane NRPA Permitting, Kennebunkport, ME*

Designed roadway and utility access to a residential development, while minimizing wetland impact and providing NRPA permitting for wetland impacts in municipal shoreland zoning locations. Project responsibilities included development of necessary permitting, development of plans and details in AutoCAD 2013, and development of a project summary report.

Wastewater Treatment Facility Upgrade, Monticello, NY*

Site layout, permitting, stormwater design, and erosion and sediment control design for the expansion of a wastewater facility.

Dam Engineering

Kotler Family/Indian Pond Dam Reconstruction, Greenwood, ME

Design and permitting for the reconstruction of a privately owned dam. Project responsibilities included development of NRPA permits, Army Corps of Engineers permits, dam design, and construction oversight and administration. Additional coordination with regulatory agencies and the client was required due to the additional need for permit extensions due to a delay in construction materials.

Kennebunk Light & Power District Dam Study, Kennebunk, ME

Compiled a cost analysis for multiple alternatives to manage 3 existing dams in accordance with regulations an upcoming re-licensing with FERC deadline. Project consisted of redevelopment of a report, coordination with the client, understanding concerns from special interest groups and abutters, and development of a 40-year cost analysis for each option.

Ladd Dam Fishway, Vassalboro, ME

Completion of a HydroCAD and HecRAS Analysis to design and model a Denil fish passage system around Ladd Dam in North Vassalboro. Responsibilities included hydraulic modeling, development of a design, and coordination with the client.

On-Site Construction Administration – Including Stormwater Treatment and Erosion and Sediment Control

Former FPL Parcel Reconstruction, Biddeford, ME

Site observation for the redevelopment of an underutilized lot owned by the city into a public park. Observation tasks included construction of gravel subgrade, granite block steps, fencing and railing, concrete, pavement, and landscaping.

International Marine Terminal, Portland, ME*

Class III chief inspector for the \$8.6 million IMT rail corridor and existing laydown yard expansion. Work includes 5,000 ft. of new track, 18-acre container storage area, 2,600 CY of concrete loading slab, 1,650 ft. of Commercial Street roadway improvements and replacement of the fender system. Class III chief inspector services included the inspection, measurement, and documentation of all work

performed by the contractor and their subcontracts to document compliance with the project plans & specifications as well as Maine DOT standard details and specifications, and other appurtenant standards.

Rangeley Branch Rail Restoration, Auburn & Poland, ME*

Construction inspector for the \$2.2 million restoration of 9,000 linear feet of railroad and track construction. Work includes earthwork activities, site layout, stream relocation and restoration, planting, and track construction. Class II inspector services included the inspection, measurement, and documentation of all work performed by the contractor and their subcontracts to document compliance with the project plans and specifications as well as Maine DOT standard details and specifications, and MaineDOT Rail Maintenance Standards Handbook and AREMA.

Eldredge Lumber and Hardware Intermodal Site Redevelopment, Portland, ME*

The project included construction oversight of \$800,000 redevelopment of approximately 7.5 acres of existing lumberyard. Work includes significant stormwater infrastructure retrofits and intermodal improvements to facilitate the future transfer of building products from rail for statewide distribution.

Cottage Brook Subdivision, Cape Elizabeth, ME*

2,500-LF of new roadway for a development in Cape Elizabeth. Work included project oversight for civil aspects of project, including but not limited to paving, drainage infrastructure, sewer, road and retaining wall construction, as well as erosion and sediment control inspection.

Stormwater Management and Treatment

Library Park Study, Bath, ME

HydroCAD analysis and report of 2-acre parcel surrounding public monuments and artwork.

MDOT Stormwater Operation and Maintenance Plan, Statewide, ME*

Reviewed the inspection of MaineDOT's stormwater BMPs throughout the state, determining the precise location, as well as the functioning condition and maintenance needs of each BMP. The final deliverables include ArcGIS v.10-generated site specific site plans, an inspection log to record functional information for each BMP at each location, and the operation and maintenance matrix that will offer user-friendly maintenance guidance for each type of BMP.

MDOT Stormwater BMP Specification Development, Statewide, ME*

Development of new bioretention cell and underdrained trench details and specifications for the MaineDOT, as the MaineDOT does not currently have specifications for these BMPs.

Cushing Island Stormwater Improvements, Portland, ME*

The project included design of two stormwater culverts, culvert inlet and outlet protection, and an appurtenant swale based upon considerations observed from previously collected field data. Project responsibilities included development of a

HydroCAD analysis, development of plans and details in AutoCAD 2013, and development of a project summary report.

Sewer Separation and Sanitary Sewer Design

FEMA-Sewer Repair, Bethlehem, NY*

Surveyed approximately 115 sections of trunk sewer and appurtenant manhole structures in order to find sources of inflow and infiltration from hurricane damage. Permitted and designed immediate repairs that were found, and provided a report to our client indicating potential locations of future I/I from hurricane damage.

DASNY Sewer Expansion, Bethlehem, NY*

Development of permitting, plans and specification to reroute approx. 3,000 LF of sewer forcemain and approx. 10,000 LF of gravity sewer to relieve an existing pump station of anticipated future flows from a proposed development district.

CHRISTOPHER HINKLEY

Senior Civil Technician

PROJECT ASSIGNMENT: Survey

Education

B.S., Construction
Management University of
Southern Maine

A.A.S., Architectural and
Civil Engineering
Technology Central Maine
Community College

Experience

12 Years

Joined Firm

2006

Professional Certificate

MaineDOT Local Project
Administrator

EXPERIENCE SUMMARY

Mr. Hinkley is a senior civil technician/survey crew chief in the firm's Civil Practice Group. His experience includes surveying, site design, utility coordination, inspection, and construction administration.

RELEVANT PROJECT EXPERIENCE

Back Cove West CSO Storage Conduit, Portland, ME

Coordinated and performed topographic survey/manhole inspection from Baxter Boulevard Pump Station (along Baxter Boulevard) to the intersection of Forest Avenue, +/- 7000 LF.

Back Cove South CSO Storage Conduit, Portland, ME

Coordinated and performed topographic survey along Marginal Way from NEPS (Northeast Pump Station) to Forest Avenue, +/- 6300 LF. Investigated storm drainage and sewer system to obtain location and invert information. He implemented new preliminary design software (InfraWorks360) to better assist the client in visualizing the overall project. He worked side by side with the project manager/engineer on the design of the CSO storage conduit.

Bridge Streets and Riverview Road Pump Stations Upgrade, Bath, ME

Coordinated and performed topographic survey for two pump station sites.

Sea Street and Mt. Battie Pump Stations Upgrade, Camden, ME

Coordinated and performed topographic survey for two pump station sites.

Rawson Avenue Pump Station Upgrade Camden, ME

Coordinated and performed topographic survey for a pump station site.

North Street, Bath, ME

Coordinated and performed topographic survey along North Street from Lincoln Street to Middle Street, +/-2,500 LF. Investigated storm drainage and sewer system to obtain invert information.

Contracts #1-5 WTP/Water Main Improvements, Bellingham, MA

Coordinated and performed topographic for 2 water treatment plants and 33,500 linear feet of roadway for water main upgrades. Worked side-by-side with the project manager/engineer to design the new water mains.

MDC-Contract-1 Sewer Separation, Hartford, CT

Created and assisted in the design of figures to separate the storm drainage from the sewer system at each residence involved in the project.

MDC-Contract-2 Sewer Separation, Hartford, CT

Created and assisted in the design of figures to separate the storm drainage from the sewer system at each residence involved in the project.

CHRISTOPHER HINKLEY

Senior Civil Technician

I/I Reduction, Dover, NH

Topographic survey of streets throughout the city. Assisted in design of sewer extensions and separation from storm drainage.

Storm Drainage and Water Rehabilitation, Old Orchard Beach, ME

Ocean and Seaview Avenue sewer, storm drainage and water distribution rehabilitation. Topographic survey along both streets. Assisted in the design of new sewer, storm drainage and water rehabilitation.

Sewer Rehabilitation, Old Orchard Beach, ME

West Grand Avenue sewer rehabilitation. Topographic survey of West Grand Avenue. Assisted in the design of new sewer on West Grand and side streets.

Survey, City of South Portland, ME

Topographic survey along Broadway Street - 2000 ft. for a new siphon main.

Sewer Rehabilitation and Separation, Rockland, ME

Topographic survey of streets throughout the city for sewer rehabilitation and separation. Assisted in the design of sewer rehabilitation and separation.

2006, 2007 & 2009 Sewer Separation, Auburn, ME

Topographic survey for an abundance of streets throughout the city of Auburn for sewer separation. Also, assisted in design.

Sewer Rehabilitation and Separation, Richmond, ME

Topographic survey of streets throughout the town for Phase 1 and 2 sewer separation and rehabilitation. Assisted in design of new sewer.

Survey, Milbridge, ME

Topographic survey of various sites for new grease traps, sand filters, chlorination chambers, septic tanks & pump stations. I/I work followed with smoke testing and dye testing. Assisted in the design of these various sewer stations.

Topographic Survey, Hartland, ME

Topographic survey of the secure sludge landfill site, leachate lagoon and groundwater monitoring wells.

Topographic Survey, Newport, ME

Topographic survey of the surrounding site along with helping out in the civil design aspect.

Topographic Survey, Acton, MA

Topographic survey of a site for a proposed water load out facility.

Topographic Map, Acton, MA

Arlington Road, GPS, locating photo control targets to build a topographic map of the area.

Section 9: Construction Management Plan

9.0 Construction Management Plan

Construction of the proposed project will begin in June 2018, pending planning board approval. Work is anticipated to be completed in two seasons, as the work is largely limited to the summer, when students are not in session. Phasing is indicated on Figure 1 of the project plans.

PHASE 1 CONSTRUCTION		
1	Estimated Construction Time	6/18/18 – 8/31/18
2	Erosion Control Measures	June 18 th
3	Excavation/Milling/Clearing, Parking Lot	June 19 th – July 1 st
4	Drainage Improvements	July 2 nd – July 25 th
5	Sidewalk Construction	July 25 th – August 1 st
6	Paving	August 1 st – August 7 th
7	Loam, Seeding, Planting, Punch list	August 7 th – August 31 st

PHASE 2 CONSTRUCTION		
1	Estimated Construction Time	6/17/19 – 8/30/19
2	Erosion Control Measures	June 17 th
3	Excavation/Milling/Clearing, Parking Lot	June 17 th – July 5 th
4	Drainage Improvements	July 2 nd – August 2 nd
5	Relocating Utility Poles	July 15 th – August 2 nd
6	Sidewalk Grading/Construction	July 15 th – August 9 th
7	Stormwater Treatment Construction	July 22 nd – August 9 th
8	Plantings, Fencing	August 12 th – August 16 th
9	Paving	August 12 th – August 16 th
10	Loam, Seeding, Punch list	August 18 th – August 30 th

These dates are subject to change, as the project is to be municipally bid and no contractor has been selected at this point in time.

While the entire site is a public site, the contractor will provide the engineer with a plan that indicates site access constraints, and signage/barriers to access at points of entry to the public prior to any construction. A site access map prepared by the contractor cannot be provided as part of this submission, as the project is to be bid publicly and no contractor has been selected at this time. No utility connections or roadway work is anticipated in the Auburn Street corridor. Only sidewalks/stripping modifications are anticipated at the Junior Street entrance to the proposed project, and this work is proposed within the project's parcel bounds, not within the Junior Street Right-Of-Way.

Section 10: Traffic

10.0 Traffic

From a review of the City of Portland Technical Manual, a Traffic Management Plan is required if a proposed development will result in 100 additional passenger car equivalents, or in the case of locations abutting arterials, 25 passenger car equivalents. Whereas the proposed project is intended to improve upon circulation within the existing site, and no additions to the school are proposed to add any buildings that would result in additional students or use of the facility, it is anticipated that no Traffic Management Plan would be required for the circulation and parking improvements.

Information regarding parking standards has been addressed in Section 17 of this application.

It is required by the technical manual that site circulation be feasible within the constraints of the project parcel. Circulation within the site has been reviewed within the AutoCAD program AutoTURN. Whereas there are standard driving lane dimensions of 12'-width, there were not formal school circulation guidelines proposed within the technical manual, so the ability for access to adequately be obtained in AutoTURN was the method determining the width of the bus aisles. Fire access concerns were evaluated as highlighted in the existing conditions memorandum, attached to this document. For the purposes of this project, the following items have been reviewed in AutoTURN:

- The ability for a car to fit into the most restrictive parking spaces
- The ability for a car to navigate the parent drop-off loop
- The ability for a bus to navigate the bus drop-off loop
- Fire access within the bus loop to the north face of the middle school, and fire access to the north face of the elementary school.

Traffic counts have been performed at the site, at the school entrance to Junior Street, and to Auburn Street. Auburn Street is currently managed by a traffic light, and is State Route 100, an arterial within the City. These traffic counts are attached to this section, as well as preliminary observations of the existing site circulation in the Existing Conditions Memo.

ATTACHMENT 10.1

EXISTING CONDITIONS MEMORANDUM

TO:	Project Team	DATE:	December 22, 2015
FROM:	Jennifer Claster	PROJECT NO.:	13352A
SUBJECT:	Lyseth-Lyman Moore Master Plan - Existing Conditions Memo		

This memo summarizes Wright-Pierce's review of existing conditions, including phone conversations and site observations, prior to commencing design on master plan options for the Lyseth-Lyman Moore Campus.

Statistics from Questionnaires, Observations and David Onos' Future Projections

- Lyseth ES current student enrollment: 483
- Lyseth future student enrollment: 500 students
- Lyman Moore MS current student enrollment: 480
- Lyman Moore future student enrollment: 700
- Lyseth ES current staffing: 60+
- Lyman Moore MS current staffing: 94
- Lyseth ES current buses: 4 (75 kids)
- Lyman Moore MS current buses: 6 (215 kids)
- Lyseth ES current walk/bike: 10-20
- Lyman Moore MS current walk/bike: 260+
- Official Parking Spaces: 135 spaces in large lot and two smaller lots
- Unofficial parking spaces: 26 – 34 spaces in front loop and along Lyseth building in staff parking area

Lyman Moore MS Drop Off Observations 12-18-15 (Drizzle, then Clearing by 7:20)

1. Parents arrive as early as 7:09 a.m. Their arrival is staggered. Arrival peaks at around 7:45, when there appeared to be 6 or 7 cars waiting to drop off and stacked up around the front entrance.
2. The buses start arriving at 7:20 a.m. Their arrival is staggered. Four buses use the front loop and two buses use the east drop-off. There do not appear to be more than two buses in a drop off zone at any one time.
3. There does not currently appear to be a capacity problem for bus or parent drop off.
4. Parents seem inclined to drop children off as close to the front door as possible, resulting in congestion, since this area is not designed as a drop off zone. Much of the drop off

zone is empty while parents are picking up and dropping off. Management would largely resolve the parent-related congestion.

5. Few parents appeared to use the east drop-off, though it was underutilized much of the time. They do use the front loop when buses are not there.
6. Some parents park in the handicapped spaces and let their children off there.
7. Observation ended at 7:55 a.m. – third bell.

Lyseth ES Drop Off Observations 12-18-15 (Drizzle)

1. Parents and kids arrive as early as 8:05 a.m. They arrived on foot and by car in a slow trickle.
2. By 8:18 a.m., parents were stacked up in the parent loop, filling it completely (capacity=8 cars). Two of the cars were empty.
3. The first bus arrived at 8:22 a.m. Up to three buses were observed using the bus drop-off loop at once. There does not appear to be a bus capacity issue. Four buses total arrived during drop off.
4. By 8:23 there were 10 cars in the parent loop (double stacked), some of which had been there for 5 minutes or more. The parents were not dropping their children off and pulling through. Up to 12 cars were observed in the loop at one time.
5. Because there is no sidewalk at the parent drop off loop, children exit into the drive lane with parent assistance, and parents then walk them to the crosswalk and to the front entrance. This causes congestion and slow-down. A sidewalk and assigned crossing guard may help the situation.
6. Parent education would help reduce parents leaving their cars unattended in the drop-off loop for 5+ minutes.
7. Parents also park in the large lot and walk their children through the parent and bus drop-off loops, which also causes congestion, and adds potential for car/pedestrian conflict.
8. Observation ended at 8:40 a.m. – bell.

Lyman Moore MS Pick Up Observations 12-18-15 (Rain)

1. 5 buses were on site by 2:23 p.m. A few parents were waiting in the handicapped spaces.
2. The bell rang at 2:25 p.m. All 6 buses were now on site – 4 at the front loop and 2 at the east area.

3. Parents were parked partly on the grass on the exit drive near Junior Street and kids started loading into those cars. Some parents were also parked on the loop, near the exit drive. There is no official place for them to wait, because the buses fill both the loop and the east area at pick up.
4. At 2:28 p.m., parents started pulling in front of the main entrance and waiting for kids, blocking traffic, since this is not a designated pick up area. There was unused capacity at the east drop off.
5. By 2:30 p.m., the buses at the east area were gone and the 4 buses in the loop were still loading. As buses pulled away from the east drop off area, parents started to use that space.
6. By 2:32 p.m. all buses had left the site. Once the front loop was vacated, parents started pulling in there. Traffic backed up a little as four buses left at once.
7. Educating parents about procedures and providing staff to manage pick up might help with congestion. Would it be possible to restrict parent pick up to after 2:32?
8. Pick up was largely over by 2:36 p.m.

Lyseth ES Pick Up Observations 12-18-15 (Rain)

1. Parents were waiting in the loops as early as 2:44 p.m.
2. By 2:54 p.m., 7 cars were in the parent loop. It appeared that more parents were using the recently vacated middle school staff parking space in the large lot and side lot as staging areas for pick up.
3. By 3:00 p.m. the parent loop was full, with 8 cars. Cars would pull into the loop to see if it was full and then pull through and wait in the parking lot. Parents were standing in front of the school entrance.
4. The first bus pulled into the bus loop at 3:04 p.m.
5. By 3:07 p.m. there were 10 cars in the parent loop (double parked) and lots of people using the front cross walks.
6. At 3:08, the first group of kids appeared from a side door, with adults. It appeared they were waiting for a bus.
7. The bell rang at 3:10 p.m. The first group of kids started loading onto the first bus.
8. At 3:11, the second bus pulled into the bus loop. Kids started walking toward the cars with parents, crossing through the drop off zones.

9. By 3:14 foot traffic had increased. Bus 1 pulled away. There were 11 cars in the parent drop off loop.
10. By 3:18, there was a back up of cars at Junior Street. A parent had parked on the driveway across from Junior Street and their child met them at the crossing. The parent's attempt to walk the child across the street caused the back up.
11. Parent activity appeared to peak at around 3:19 p.m., with parents still pulling through the loop and backed up at Junior Street.
12. The cars were largely gone by 3:21 p.m.
13. The third bus, which appeared to be late, arrived to shouts of joy at 3:22 p.m. No fourth bus was observed.
14. Observation ended at 3:25 p.m.
15. Pick up appears to take place rapidly once the bell rings, with parents idling in parking lots until they can make their way to the parent loop, or walking to the building to get their kids and walking them back to their cars. The lack of a sidewalk at the parent drop off is a problem. It appears there is sufficient queuing space for the buses, but more queuing length for cars would be helpful here.

Conversation with Portland Fire Chief Keith Gautreau, 12-21-15

1. The Fire Department does not need to be able to get a vehicle around the entire perimeter of the elementary school. Providing access at the pinch point is not a concern for them, because they can drive in from the front to access the north side of the building. Access at this school is currently among the best in the system.
2. Access to the rear and sides of the middle school is more challenging.
3. The bus drop off zone can double as a fire lane, because the bus drivers can be instructed to pull away from the building in the case of an emergency.
4. The NFPA Chapter 18 is the Department's guide for fire access to buildings. Though it mentions a minimum 20 foot fire department access road, the Chief said this can be as narrow as 18', and in some cases, 16'. He thought that, if we go with the double parallel drop-off with a fence, 18' would be sufficient for the fire lane (bus parking/pull-over + bus driving lane), from the standpoint of fire access. He thought ground ladders would be used at the schools, because the buildings do not exceed two stories in height.
5. Ultimately, the Fire Department will want to review the plan that goes forward for the school and may have more requests that are specific to this campus.

Conversation with Sarah Cushman SR2S Coordinator and Author of 2011 Study 12-21-15

1. At the time of the 2011 study, the schools opened and closed at the same time. That is no longer the case. The population of both schools was about 500 (each).
2. We reviewed the campus map with areas of issues, concerns and potential solutions from the 2011 report.
3. Remote drop off was proposed on local streets around the schools. That is no longer seen as a viable option due to neighborhood concerns.
4. Educating parents and students about drop-off procedures could make a big difference here.
5. The schools need more bicycle parking that is more visible from the schools' entrances. The MS bike racks are not visible enough in their current location. Sarah later provided the following statistics from a January 2014 study:

Name of School:	Needs Additional or Updated Bicycle Parking (Yes or No)	Amount of Bicycle Parking Needed	Proposed Location
Lyman Moore	Yes	Parking for 8-10 bicycles	To one side or other of front entrance to the school on concrete pad (per 2014 school input and also as a recommendation in the <i>Lyseth-Moore School Travel Plan</i>)
Lyseth	Yes	Parking for 8-10 bicycles	Need to replace damaged racks in the current locations in our alcove areas on the north side of the building.

6. There should be a sidewalk along the staff parking at Lyseth.
7. A combined drop-off for buses was flagged as something to look into the 2011 report, but the location would appear to close off the two smaller staff parking areas.
8. Assigning more staff to manage drop off and pick up might help ease some of the congestion.
9. Sarah asked whether it would be possible to eliminate the parent drop off loop at Lyseth and have the parents drop off in a location that does not require the children to cross through the bus drop off area.

Conversation with Nate Smith Public Services Engineer who Worked on Stormwater 12-21-15

1. Nate sent revised impervious surface calcs from 2013 (attached) that he thinks will be accurate enough for the current master planning effort.
2. He noted that the current site reflects what is referred to as option 2 in the calcs. This option was constructed to try to gain more space for the playing field adjacent to the gravel wetland.
3. Nate sent as-builts dated June 30, 2015 of this area that have been incorporated into the base mapping for the master plan.
4. Nate thought that, conceptually, it should be possible to abandon the SD under the fields and tennis court, and construct a new line through the staff parking areas that outlets into the gravel wetland as discussed at the kick-off meeting. He had concerns about the feasibility of pumping flowable fill into the pipe under the tennis court, because it is crushed there.
5. The gravel wetland is currently treating only 90% of the Maine DEP Water Quality Volume required under Chapter 500.
6. A significant issue at the site is that 71,075 SF of roof at Lyman Moore MS (the newer building) and 41,616 SF of the roof at Lyseth ES do not drain into the gravel wetland. Instead, they flow to the sanitary sewer. Because of the CSO situation, Nate recommended looking for ways to separate the school roofs from the combined sanitary. This would be easier to accomplish at Lyseth. The newer building at Lyman Moore would require interior modifications in order to disconnect the roof drains and would be more difficult to accomplish. Based on the City's 2013 calculations, if the 41,616 SF of the roof at Lyseth ES is directed to the gravel wetland, then the gravel wetland would only be treating 80% of the Maine DEP Water Quality Volume required under Chapter 500.
7. The site is underlain by marine clay and is not a good candidate for low impact design (LID) features that utilize infiltration. To illustrate the site's poor infiltration, Nate mentioned that although the gravel wetland was designed without a liner, its pond is always under water.
8. If the gravel wetland needs to be expanded, or underground stormwater storage added, the adjacent playing field location would be the most obvious location for this. The

Memo: Lyseth-Lyman Moore Project Team
December 22, 2015
Page 7

nearby parking/drop off loop area could be another location for underground storage – it would be designed to slowly release into the gravel wetland.

Project: Bartley to Rustic Sewer Separation
Gravel Wetland Water Quality Calculations
Date: May 6, 2013 (Revised)
Prepared by: Will Haskell, PE

As Built Gravel Wetland Storage Volume (cf)	43,312			
Reduced Gravel Wetland Storage Volume (cf)	40,875 as const. in Fall 2012 - est. from design plans			
Existing Area Trib. To Gravel Wetland (1)	Existing Trib. Area (sf) (2)	Lyman Moore Roof (Note 2) (3)	Lyseth School Roof (Note 3) (4)	Total Area = (2) + (4) (5)
Impervious Area (sf)	316,580	71,075	41,616	387,655
Landscaped Area (sf)	571,975	-	-	571,975
Total Area	888,555	71,075	41,616	1,001,246
Maine DEP WQV - Note 4 (cf)	45,448	5,923	3,468	51,370
% Treatment - As Built Gravel Wetland	95%	--	--	84%
Actual % Treatment - Modified Gravel Wetland	90%	--	--	80%

Notes

- At our meeting on June 18, 2012 we had discussed four alternatives, including:
 - Do nothing;
 - Steepen south embankment from 3:1 to 2:1 to gain 12' to 15' of playing field back.
 - Reduce the gravel wetland storage volume to gain approximately 30' of playing field.
 - Reduce the gravel wetland storage volume so that the southerly embankment approximately matches the old dry pond embankment and add subsurface storage and treatment under existing playing field.

The actual construction was a combination of Options 2 and 3 .

- Lyman Moore MS has approximately 71,075 sf of roof (newer building) that is not tributary to the gravel wetland and flows to the sanitary sewer. It would be difficult to separate this without changes to the internal roof drain collection system, so this roof area is not added in to the total area calculation.
- Lyseth School roof is approximately 51,600 sf. There is about 9,984 sf near the front of the building that is tributary to the existing storm drain system and the new gravel wetland. The remaining 41,616 sf of roof flows to the sanitary sewer system but could be separated external to the building and directed to the gravel wetland.
- Maine DEP Water Quality Volume (WQV) is calculated based on 1" of runoff from impervious areas and 0.4" of runoff from landscaped areas. Maine DEP Chapter 500 General Standards require that runoff from no less than 95% of impervious areas and no less than 80% of developed areas be treated.

ATTACHMENT 10.2

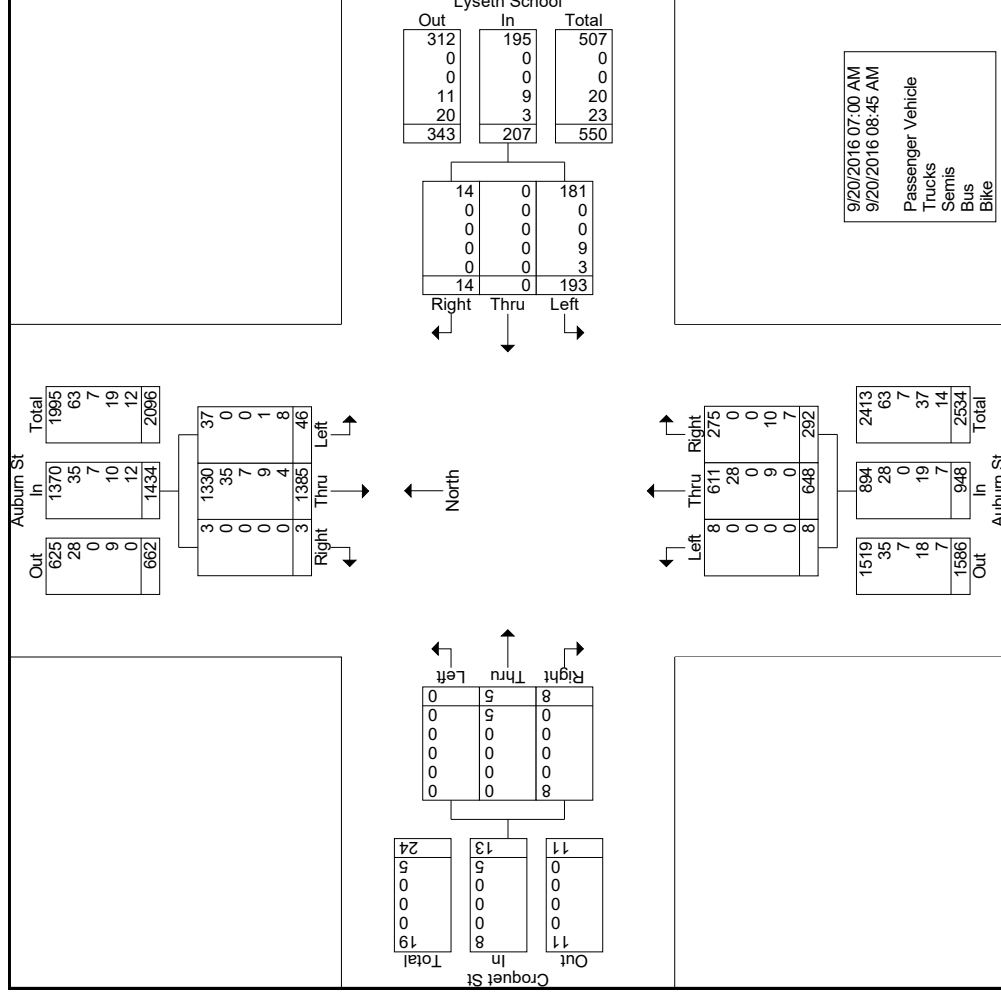
TRAFFIC COUNTS

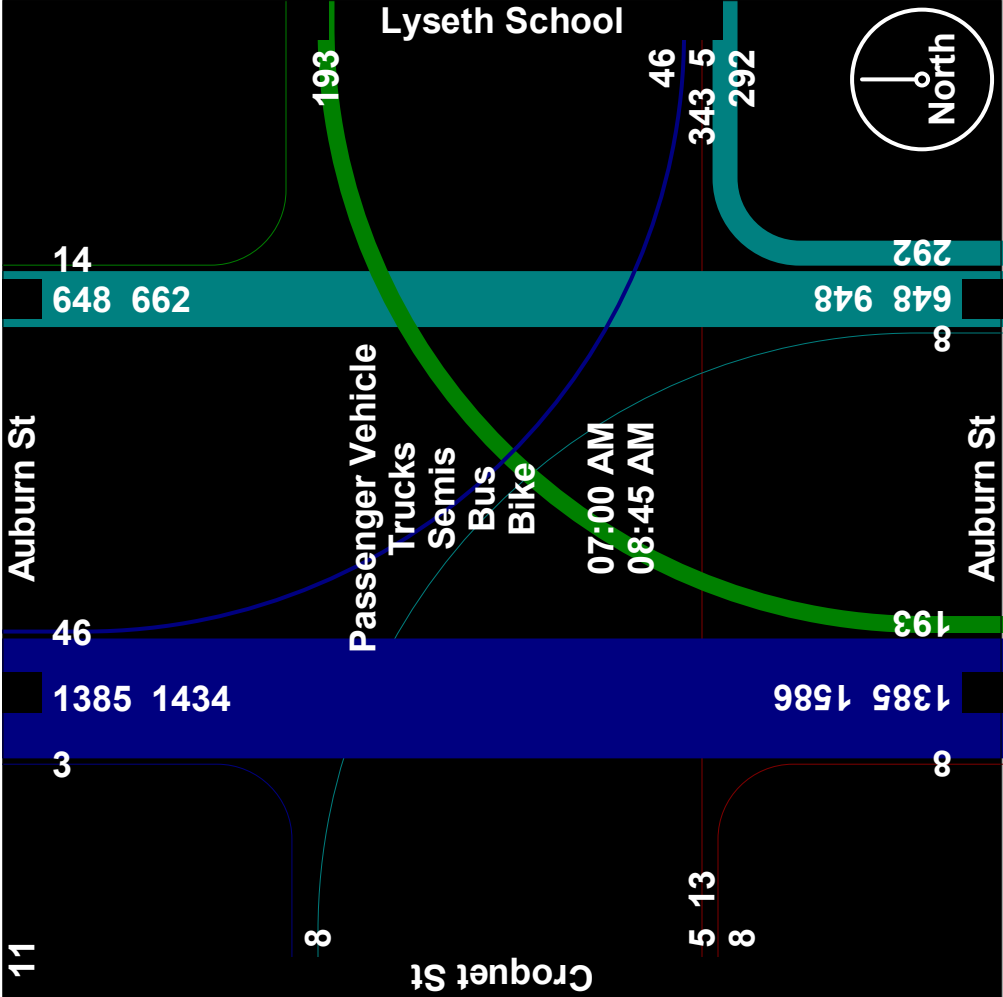
Groups Printed- Passenger Vehicle - Trucks - Semis - Bus - Bike

Start Time	Auburn St From North					Lyseth School From East					Auburn St From South					Croquet St From West				
	Right	Thru	Left	App. Total		Right	Thru	Left	App. Total		Right	Thru	Left	App. Total		Right	Thru	Left	App. Total	Int. Total
07:00 AM	0	144	7	151		0	0	2	2		11	64	1	76		0	0	0	0	229
07:15 AM	0	196	4	200		2	0	18	20		41	60	4	105		1	0	0	1	326
07:30 AM	0	197	3	200		2	0	53	55		86	88	0	174		0	0	0	0	429
07:45 AM	2	194	7	203		1	0	36	37		48	90	1	139		1	0	0	1	380
Total	2	731	21	754		5	0	109	114		186	302	6	494		2	0	0	2	1364
08:00 AM	0	142	4	146		2	0	17	19		21	104	1	126		0	0	0	0	291
08:15 AM	0	176	3	179		1	0	11	12		20	93	1	114		1	1	0	2	307
08:30 AM	0	169	6	175		1	0	12	13		17	80	0	97		1	2	0	3	288
08:45 AM	1	167	12	180		5	0	44	49		48	69	0	117		4	2	0	6	352
Total	1	654	25	680		9	0	84	93		106	346	2	454		6	5	0	11	1238

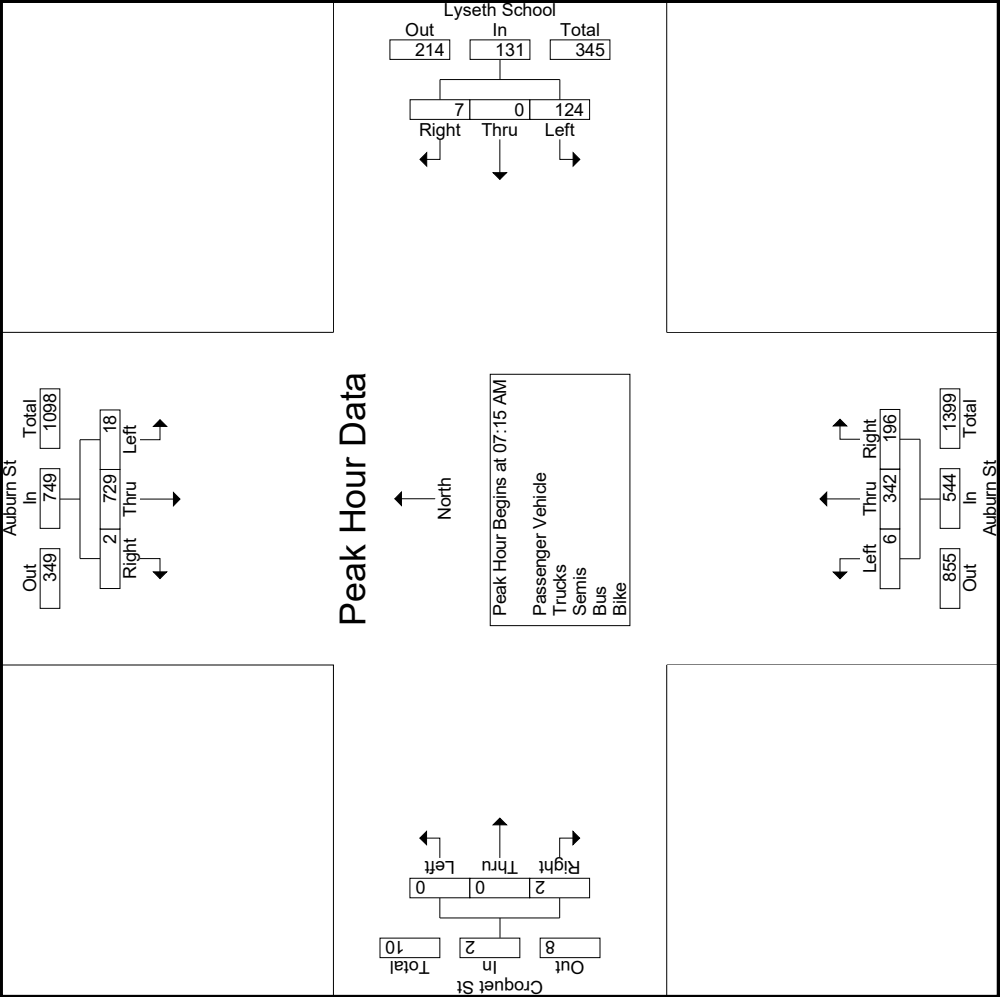
Groups Printed- Passenger Vehicle - Trucks - Semis - Bus - Bike

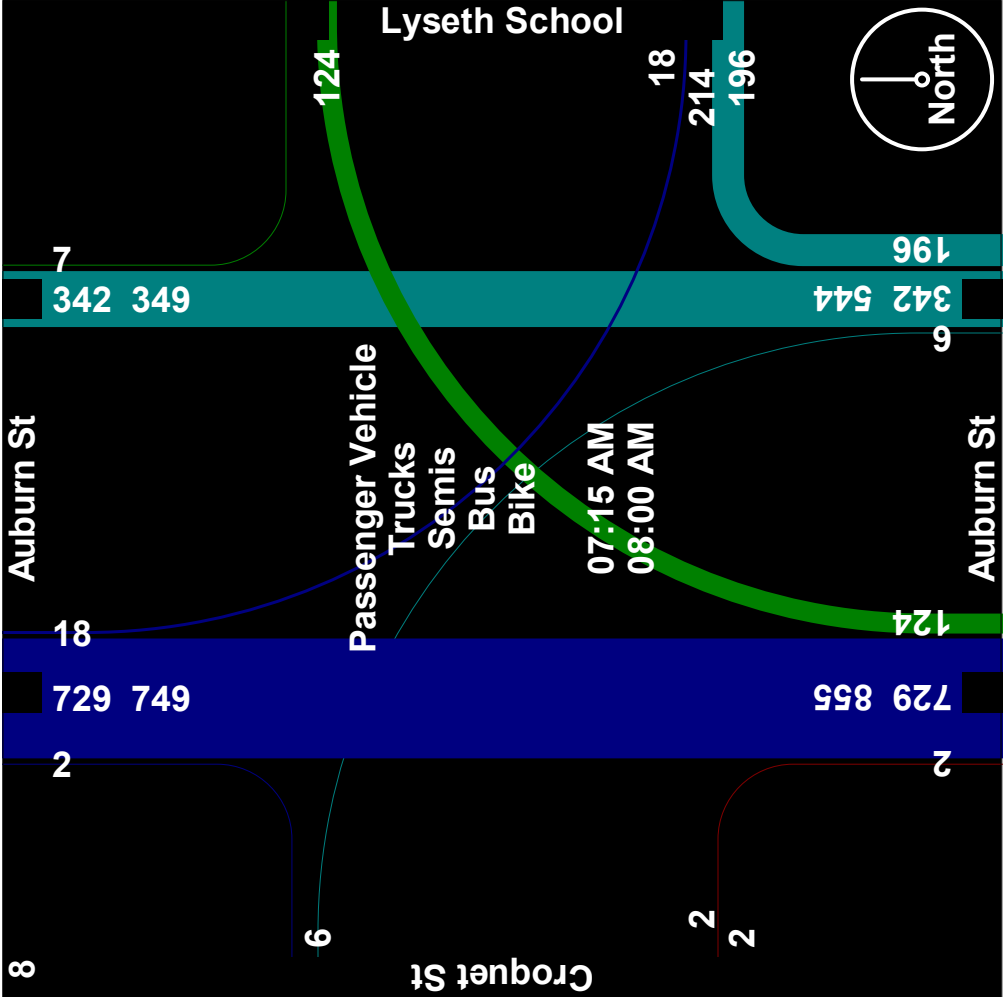
	Auburn St					Lyseth School					Auburn St					Croquet St				
	Right	Thru	Left	App. Total		Right	Thru	Left	App. Total		Right	Thru	Left	App. Total		Right	Thru	Left	App. Total	Int. Total
Grand Total	3	1385	46	1434		14	0	193	207		292	648	8	948		8	5	0	13	2602
Apprch %	0.2	96.6	3.2			6.8	0	93.2			30.8	68.4	0.8			61.5	38.5	0		
Total %	0.1	53.2	1.8	55.1		0.5	0	7.4	8		11.2	24.9	0.3	36.4		0.3	0.2	0	0.5	
Passenger Vehicle	3	1330	37	1370		14	0	181	195		275	611	8	894		8	0	0	8	2467
% Passenger Vehicle	100	96	80.4	95.5		100	0	93.8	94.2		94.2	94.3	100	94.3		100	0	0	61.5	94.8
Trucks	0	35	0	35		0	0	0	0		0	28	0	28		0	0	0	0	63
% Trucks	0	2.5	0	2.4		0	0	0	0		0	4.3	0	3		0	0	0	0	2.4
Semis	0	7	0	7		0	0	0	0		0	0	0	0		0	0	0	0	7
% Semis	0	0.5	0	0.5		0	0	0	0		0	0	0	0		0	0	0	0	0.3
Bus	0	9	1	10		0	0	9	9		10	9	0	19		0	0	0	0	38
% Bus	0	0.6	2.2	0.7		0	0	4.7	4.3		3.4	1.4	0	2		0	0	0	0	1.5
Bike	0	4	8	12		0	0	3	3		7	0	0	7		0	5	0	5	27
% Bike	0	0.3	17.4	0.8		0	0	1.6	1.4		2.4	0	0	0.7		0	100	0	38.5	1

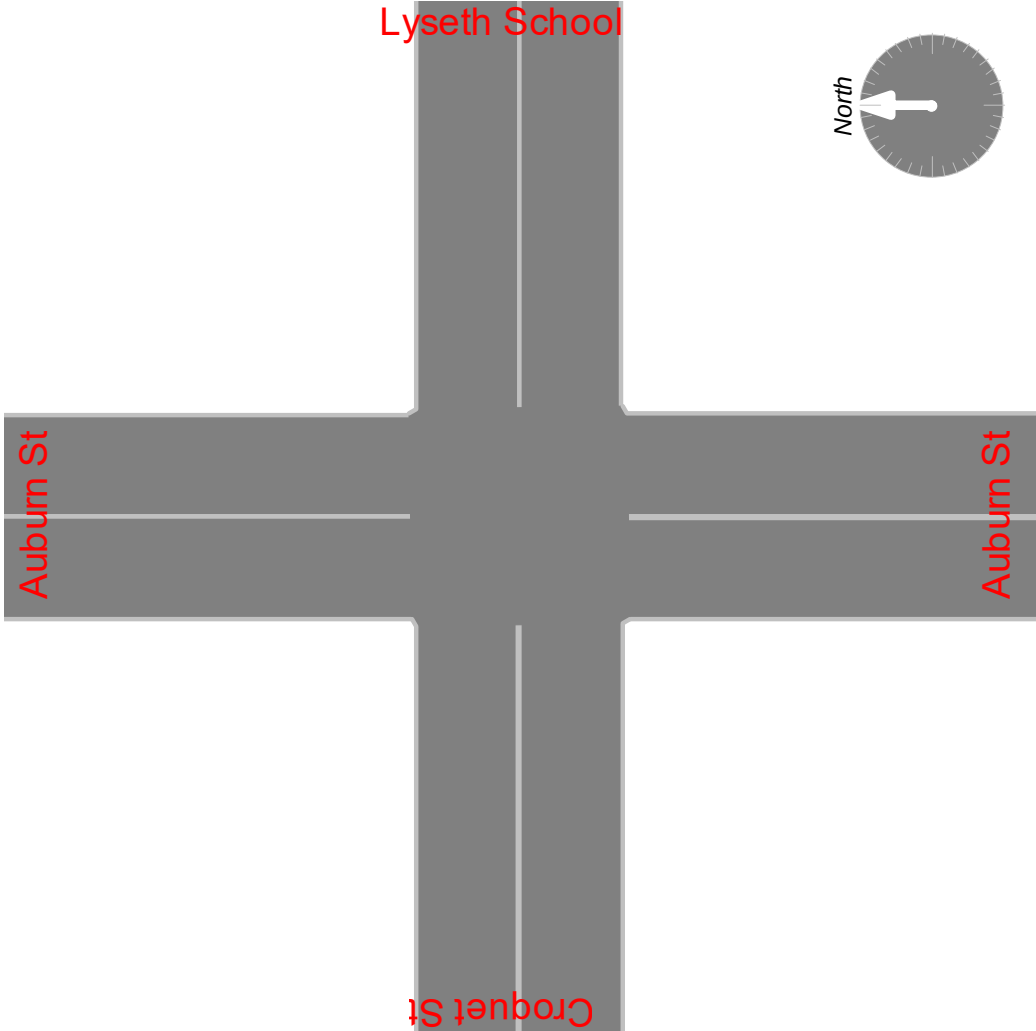




	Auburn St From North				Lyseth School From East				Auburn St From South				Croquet St From West			
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 07:15 AM																
07:15 AM	0	196	4	200	2	0	18	20	41	60	4	105	1	0	0	1
07:30 AM	0	197	3	200	2	0	53	55	86	88	0	174	0	0	0	429
07:45 AM	2	194	7	203	1	0	36	37	48	90	1	139	1	0	0	380
08:00 AM	0	142	4	146	2	0	17	19	21	104	1	126	0	0	0	291
Total Volume	2	729	18	749	7	0	124	131	196	342	6	544	2	0	0	1426
% App. Total	0.3	97.3	2.4		5.3	0	94.7		36	62.9	1.1		100	0	0	
PHF	.250	.925	.643	.922	.875	.000	.585	.595	.570	.822	.375	.782	.500	.000	.000	.831





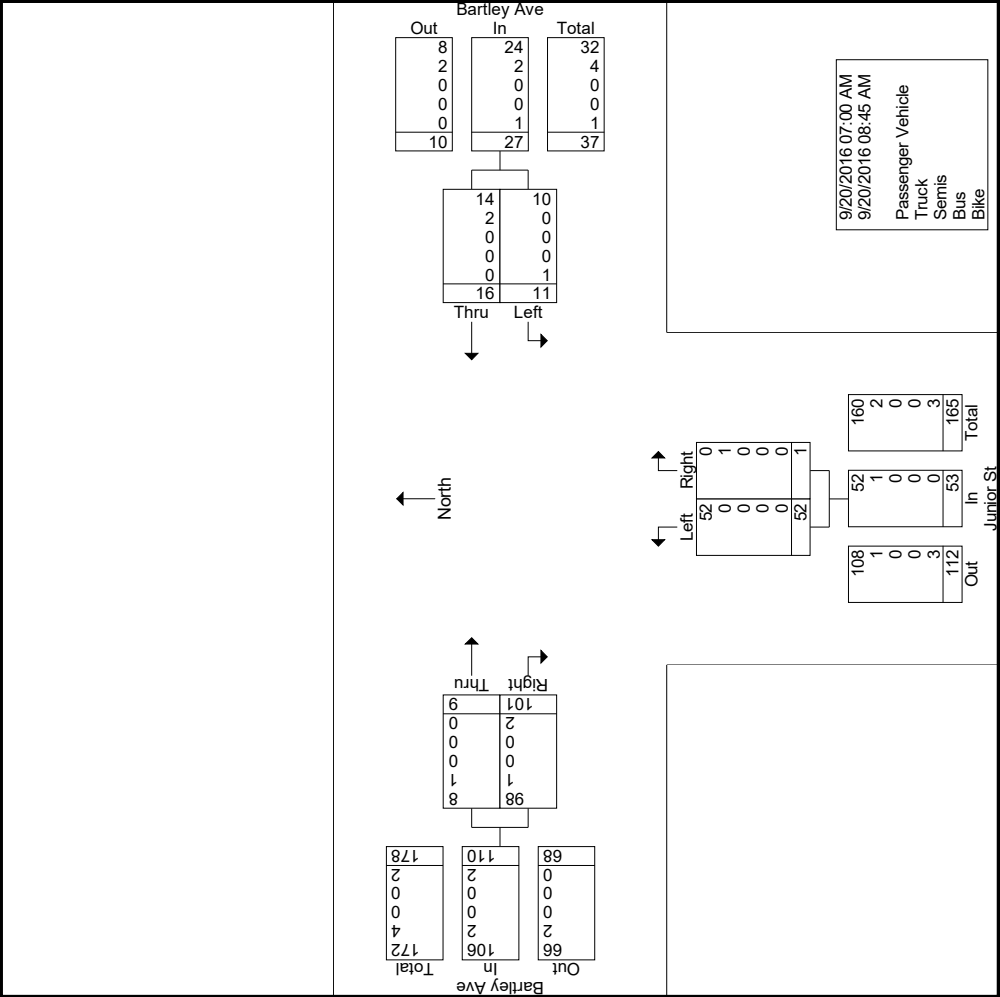


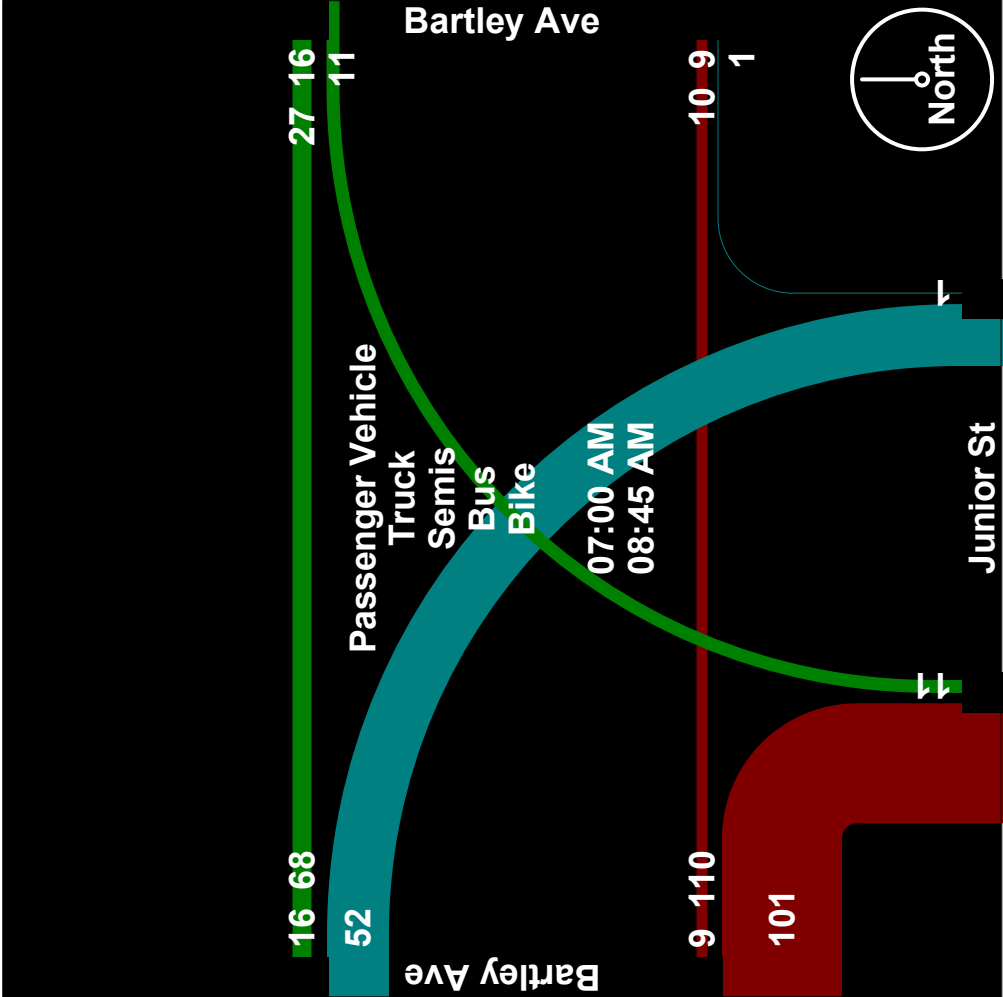
Groups Printed- Passenger Vehicle - Truck - Semis - Bus - Bike

Start Time	Bartley Ave From East			Junior St From South			Bartley Ave From West			Int. Total
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	
07:00 AM	1	0	1	0	1	1	3	1	4	6
07:15 AM	1	0	1	1	3	4	17	0	17	22
07:30 AM	3	4	7	0	16	16	23	1	24	47
07:45 AM	3	1	4	0	8	8	12	0	12	24
Total	8	5	13	1	28	29	55	2	57	99
08:00 AM	1	1	2	0	2	2	7	2	9	13
08:15 AM	2	1	3	0	3	3	6	0	6	12
08:30 AM	3	3	6	0	2	2	14	4	18	26
08:45 AM	2	1	3	0	17	17	19	1	20	40
Total	8	6	14	0	24	24	46	7	53	91

File Name : Portland Junior & Bartley AM 092116
Site Code : 00092079
Start Date : 9/20/2016
Page No : 2

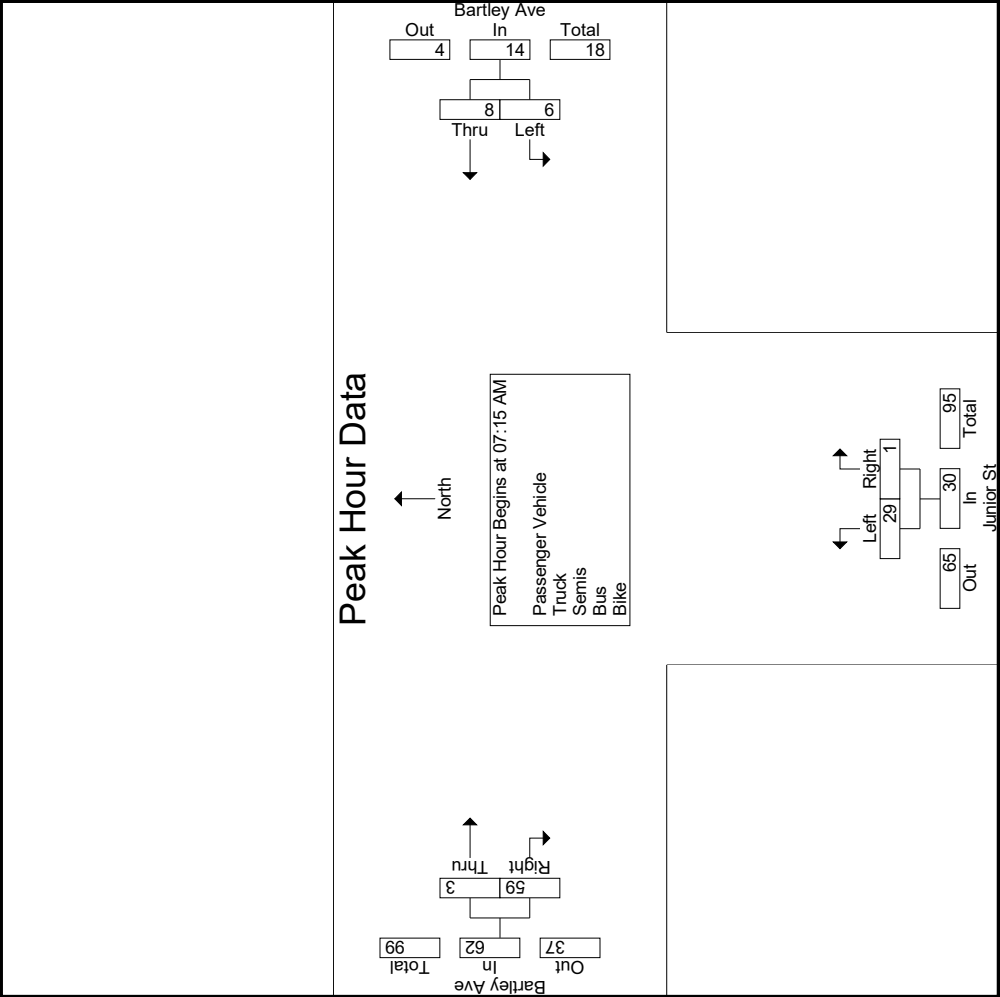
Groups Printed- Passenger Vehicle - Truck - Semis - Bus - Bike											
	Bartley Ave From East				Junior St From South				Bartley Ave From West		
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total	
Grand Total	16	11	27	1	52	53	101	9	110	190	
Apprch %	59.3	40.7		1.9	98.1		91.8	8.2			
Total %	8.4	5.8	14.2	0.5	27.4	27.9	53.2	4.7	57.9		
Passenger Vehicle	14	10	24	0	52	52	98	8	106	182	
% Passenger Vehicle	87.5	90.9	88.9	0	100	98.1	97	88.9	96.4	95.8	
Truck	2	0	2	1	0	1	1	1	2	5	
% Truck	12.5	0	7.4	100	0	1.9	1	11.1	1.8	2.6	
Semis	0	0	0	0	0	0	0	0	0	0	
% Semis	0	0	0	0	0	0	0	0	0	0	
Bus	0	0	0	0	0	0	0	0	0	0	
% Bus	0	0	0	0	0	0	0	0	0	0	
Bike	0	1	1	0	0	0	2	0	2	3	
% Bike	0	9.1	3.7	0	0	0	2	0	1.8	1.6	

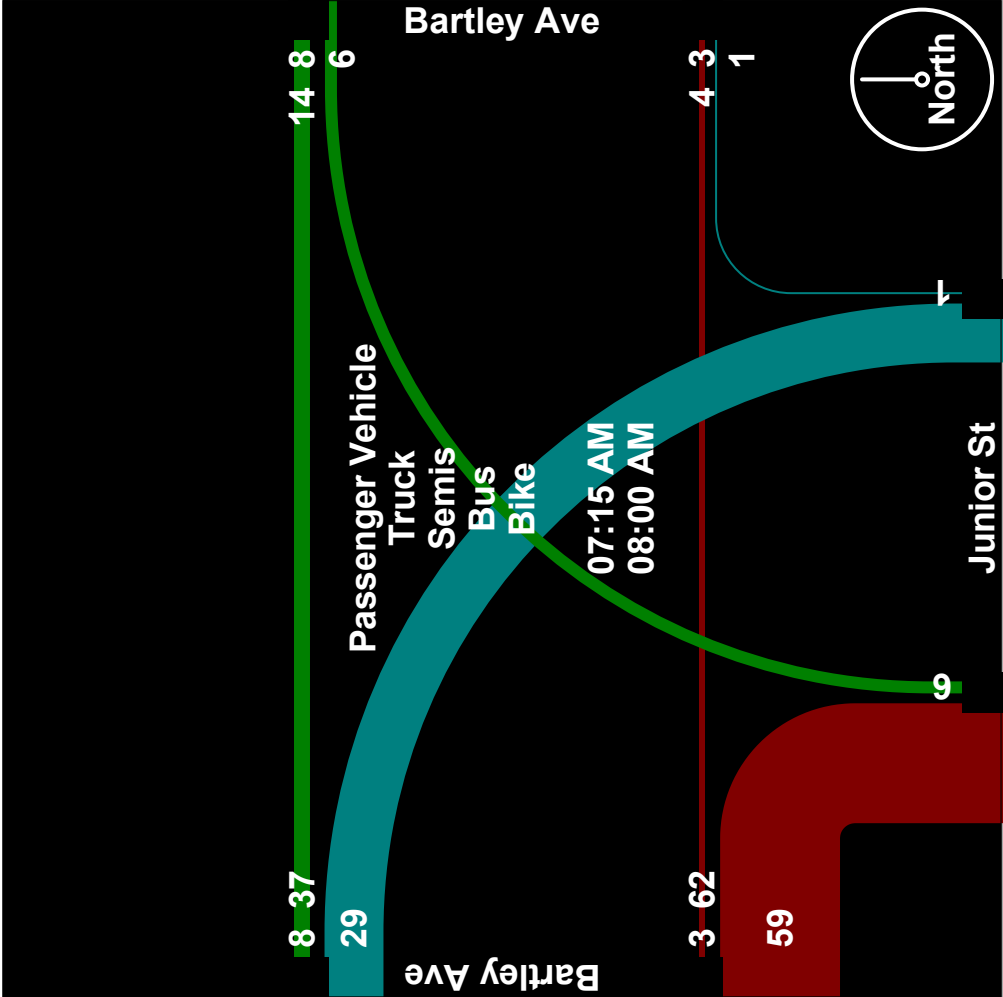


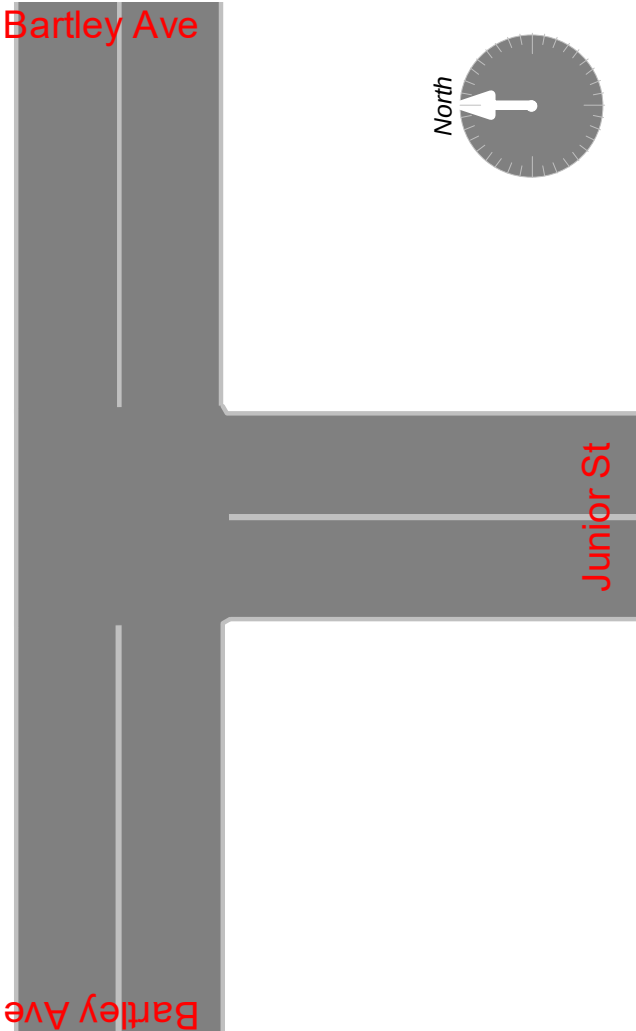


File Name : Portland Junior & Bartley AM 092116
Site Code : 00092079
Start Date : 9/20/2016
Page No : 5

Start Time	Bartley Ave From East			Junior St From South			Bartley Ave From West			
	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	1	0	1	1	3	4	17	0	17	22
07:30 AM	3	4	7	0	16	16	23	1	24	47
07:45 AM	3	1	4	0	8	8	12	0	12	24
08:00 AM	1	1	2	0	2	2	7	2	9	13
Total Volume	8	6	14	1	29	30	59	3	62	106
% App. Total	57.1	42.9		3.3	96.7		95.2	4.8		
PHF	.667	.375	.500	.250	.453	.469	.641	.375	.646	.564







Section 11: Significant Natural Features

11.1 Coordination with Regulatory

Conversations with regulatory requiring applicability for SLODA and stormwater treatment measures have been included as attachments for this section.

11.2 Natural Features Study

A natural resources study completed by Jones Associates is also included as an attachment to this section.

11.3 Soils

Information regarding existing soils is included as an attachment to this section, and is further reported in Section 12: Stormwater Treatment

ATTACHMENT 11.1

CONVERSATIONS WITH REGULATORY AGENCIES

Kathleen O. Sculley

From: Peter McCormack <MCCORP@portlandschools.org>
Sent: Thursday, January 07, 2016 2:30 PM
To: Ethan Owens; Lenore Williams; Jennifer Claster
Cc: David Onos
Subject: RE: Lyseth-Lyman Moore Schools - Portland, Maine

Hi All:

The original Lyseth, according to the plaque in our entrance, was built in 1959 - 60. Your photo only shows two wings, so I suspect the 1965 alteration was the addition of the third wing.

Thanks, Peter

>>> Ethan Owens 1/7/2016 11:43 AM >>>

I can't confirm this but I was told this photo was from 1962. Maybe Lenore or Peter might know when the schools were built.

Ethan Owens
Certified Playground Safety Inspector
Athletic Facilities, Playground & Courts Manager Recreation Dept. ~ City of Portland
134 Congress St
Portland, Maine 04103 ~ USA
207-756-8275/Fax 207-756-8279
eowens@portlandmaine.gov

>>> Jennifer Claster <jennifer.claster@wright-pierce.com> 1/7/2016
10:54 AM >>>

Hi Marybeth,

I am not sure when the schools were originally built, but I have plans that document the following:

- The Lyseth building was altered in 1965.
- The Lyman-Moore building was altered in 1994.

If that is not enough information, I can dig further.

We think there will be a decrease in impervious * our preliminary calculations indicate a 8,500 SF decrease.

It looks like there will be about 5 acres of disturbance, not including the athletic field renovation. All of the proposed disturbance is most likely on ground that has been previously disturbed as part of the site's development.

Thanks!

Jennifer

From: Richardson, Marybeth [mailto:Marybeth.Richardson@maine.gov]
Sent: Thursday, January 07, 2016 10:43 AM
To: Jennifer Claster
Cc: David Onos (onosda@portlandschools.org); Ethan Owens (eowens@portlandmaine.gov)
Subject: RE: Lyseth-Lyman Moore Schools - Portland, Maine

I searched our database using the keyword *school* in Portland and found no records of any Site Law, stormwater or NRPA permits for this school. This could be because the school pre-dated those laws and would be grandfathered. Do you know when the school was built?

Can you quantify the proposed improvements in terms of new impervious/developed areas?

Marybeth Richardson, Regional Licensing and Compliance Manager DEP Southern Maine Regional Office, Bureau of Land Resources
312 Canco Road
Portland, ME 04103
(p) 207-592-1692
Marybeth.richardson@maine.gov

From: Jennifer Claster [mailto:jennifer.claster@wright-pierce.com]
Sent: Thursday, January 07, 2016 9:45 AM
To: Richardson, Marybeth
Cc: David Onos (onosda@portlandschools.org); Ethan Owens (eowens@portlandmaine.gov)
Subject: Lyseth-Lyman Moore Schools - Portland, Maine

Dear Marybeth,

We are assisting the City of Portland's Schools and Recreation Departments with a master plan for improvements to drainage, vehicular circulation, parking, and pedestrian circulation, as well as drainage and layout changes to the athletic fields at the Lyseth Elementary and Lyman-Moore Middle School campus at 171 Auburn Street in Portland (see orthophoto below). The chart, block and lot information are: 274 B012001. The property is approximately 25 acres. A draft preliminary master plan and existing conditions plan are attached for your reference.

The purpose of our current project is to develop a plan for phased improvements that would be constructed over three years. Once the master plan is finalized, funds would be sought for design, permitting and construction of the phased improvements. As part of this master planning process, we are identifying permits that would be needed, as well as the costs and engineering effort associated with those permits.

In a pre-application meeting with the City of Portland yesterday, it was suggested that we contact DEP to see whether there are any existing permits on file with DEP for the property, and whether any additional permits might be needed from the Department. Is that something you can help is with?

Thank you for your assistance, and I look forward to hearing from you.

Regards,

Jennifer Claster

Jennifer Z. Claster, RLA | Maine Licensed Landscape Architect

75 Washington Avenue | Suite 202 | Portland, ME 04101
Office: 207.761.2991 | Direct: 207.319.1506

WRIGHT-PIERCE (<http://www.wright-pierce.com/>) Water | Wastewater
| Infrastructure

Facebook (<https://www.facebook.com/WrightPierceEngineers>) .. LinkedIn (<https://www.linkedin.com/company/wright-pierce>) .. Twitter (https://twitter.com/Wright_Pierce) .. Blog (<http://blog.wright-pierce.com/>) .. Flickr (<https://www.flickr.com/photos/wright-pierce/sets>)

*** Please Note: ***

This email and its attachments may be confidential and are intended solely for the use of the individual to whom it was addressed. Any views or opinions expressed are solely those of the author and do not necessarily represent those of the Portland Public Schools.

Michael A. Guethle

From: Richardson, Marybeth <Marybeth.Richardson@maine.gov>
Sent: Tuesday, January 12, 2016 7:29 AM
To: Jennifer Claster
Subject: RE: Lyseth-Lyman Moore Schools - Portland, Maine

I don't think this changes anything with respect to review under the Site Law. I don't believe that the proposed changes would trigger a review under the statute, so the City wouldn't technically need to apply Site Law standards or submit a notification to this agency. Only the local municipal site plan review standards would apply.

The project may or may not trigger the stormwater law, but even if it does, the project would be exempt because the City has stormwater capacity. FYI, the City was recently sent a letter detailing the recent changes to Chapter 500 and notifying it that the local stormwater ordinance will need to be updated to reflect those changes in order to retain the City's capacity designation.

Let me know if you have any other questions or if you think I've missed something.

Marybeth Richardson, Regional Licensing and Compliance Manager
DEP Southern Maine Regional Office, Bureau of Land Resources
312 Canco Road
Portland, ME 04103
(p) 207-592-1692
Marybeth.richardson@maine.gov

From: Jennifer Claster [mailto:jennifer.claster@wright-pierce.com]
Sent: Monday, January 11, 2016 2:51 PM
To: Richardson, Marybeth
Subject: RE: Lyseth-Lyman Moore Schools - Portland, Maine

Hi Marybeth,

Just closing the loop on our discussion last week. I have some new information, and I am not sure whether it changes the requirement for a SLODA permit. What I thought you said on the phone last week was that this project would not require a SLODA permit because it would not create more than 3 Acres of new disturbance in areas that had not previously been disturbed. Also, because the schools had been constructed prior to 1970 and the project was grandfathered.

I understand that Portland has "delegated authority" for the Site Location of Development Act (SLODA), which means that the site plan will be reviewed by the City, who would request permission from DEP to review it under site location. Here's the new information:

- The Lyseth building was originally built in 1959 – 60 and altered in 1965 to add a wing.
- The Lyman-Moore building appears to have been in place before 1962, and an addition was put on the building in 1994.
- There will most likely be a small **increase** in impervious, probably somewhere between 2,500 SF and 11,000 SF.
- It looks like there will be about 5.5 acres of disturbance, not including the athletic field renovation. The athletic field renovation would involve another 6.5 Acres of disturbance. The vast majority (all but maybe 8,000 SF) of

the proposed disturbance is most likely going to be on ground that has been previously disturbed as part of the site's development. We have been told, but cannot confirm, that the attached photo is from 1962.

Thanks!

Jennifer

Jennifer Z. Claster, RLA | Maine Licensed Landscape Architect

75 Washington Avenue | Suite 202 | Portland, ME 04101

Office: 207.761.2991 | **Direct:** 207.319.1506

WRIGHT-PIERCE | **Water | Wastewater | Infrastructure**
[Facebook](#) .. [Linkedin](#) .. [Twitter](#) .. [Blog](#) .. [Flickr](#)

From: Jennifer Claster

Sent: Thursday, January 07, 2016 9:44 AM

To: Richardson, Marybeth (Marybeth.Richardson@maine.gov)

Cc: David Onos (onosda@portlandschools.org); Ethan Owens (eowens@portlandmaine.gov)

Subject: Lyseth-Lyman Moore Schools - Portland, Maine

Dear Marybeth,

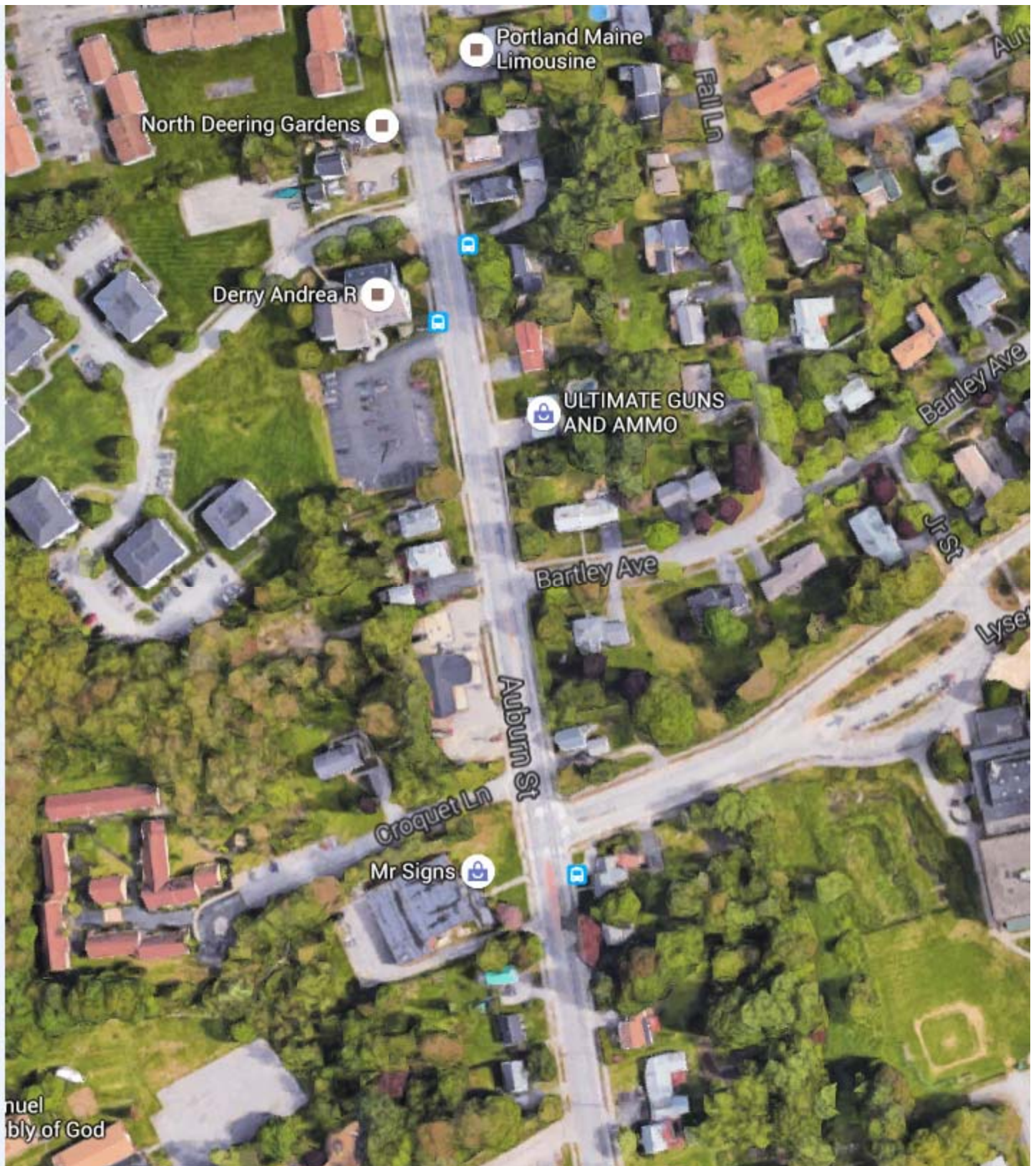
We are assisting the City of Portland's Schools and Recreation Departments with a master plan for improvements to drainage, vehicular circulation, parking, and pedestrian circulation, as well as drainage and layout changes to the athletic fields at the Lyseth Elementary and Lyman-Moore Middle School campus at 171 Auburn Street in Portland (see orthophoto below). The chart, block and lot information are: 274 B012001. The property is approximately 25 acres. A draft preliminary master plan and existing conditions plan are attached for your reference.

The purpose of our current project is to develop a plan for phased improvements that would be constructed over three years. Once the master plan is finalized, funds would be sought for design, permitting and construction of the phased improvements. As part of this master planning process, we are identifying permits that would be needed, as well as the costs and engineering effort associated with those permits. In a pre-application meeting with the City of Portland yesterday, it was suggested that we contact DEP to see whether there are any existing permits on file with DEP for the property, and whether any additional permits might be needed from the Department. Is that something you can help is with?

Thank you for your assistance, and I look forward to hearing from you.

Regards,

Jennifer Claster



Jennifer Z. Claster, RLA | Maine Licensed Landscape Architect

75 Washington Avenue | Suite 202 | Portland, ME 04101
Office: 207.761.2991 | Direct: 207.319.1506

ATTACHMENT 11.2

WETLANDS REPORT AND DELINEATION

JONES ASSOCIATES

Foresters, Surveyors and
Environmental Consultants



WETLAND REPORT

Lyseth Elementary School

Lyman Moore Middle School

Portland, Maine

Prepared for:

Wright-Pierce

75 Washington Avenue Suite 202
Portland, ME 04101

Prepared by:

Jones Associates, Inc.
280 Poland Spring Road
Auburn, Maine 04210
(207) 241-0235

JAI#16-069PD
September 2016

TABLE OF CONTENTS

INTRODUCTION.....	2
GENERAL EXISTING CONDITIONS	2
SOILS.....	3
WETLAND CHARACTERISTICS	5
RARE OR UNUSUAL FEATURES.....	7
WETLAND DELINEATION CHECKLIST.....	8
WETLAND RULES AND INFORMATION	11
REFERENCES.....	17
WETLAND DETERMINATION DATA FORMS.....	18
NRCS CUSTOM SOIL RESOURCE REPORT.....	19

INTRODUCTION

Jones Associates, Inc. was contracted to provide wetland delineation, potential vernal pool identification, and stream bank locations for the Lyseth Elementary School and Lyman-Moore Middle School properties owned by the City of Portland and located in Portland, Maine. The focal area, according to parcel data obtained through the Maine Office of GIS consists of a 23+/- acres. All are located within the City of Portland, Cumberland County, in southern coastal Maine. The following report summarizes site conditions observed during site visits in September of 2016.

Wetland/upland boundaries were identified and delineated according to *U.S. Army Corps of Engineers (ACOE) Wetlands Delineation Manual (Environmental Laboratory 1987)* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, January 2012*. Wetlands were identified based on the presence of hydric soil (inundated or saturated soil conditions resulting from permanent or periodic inundation by ground water or surface water), hydrology (movement and distribution of water), and predominance of hydrophytic species (Hydrophytes: vegetation typically adapted for life in saturated soil conditions).

Wetland delineation consists of transecting the property, examining periodic soil samples, observing any evidence of hydrology, and assessing each stratum of vegetation for its percentage of hydrophytic species. If all three factors were evident, the study plot was considered wetland habitat. Transitions between upland and wetland were clearly marked with blue sub-zero flagging every 30-40 feet, and labeled with alphanumeric codes to identify individual systems (A1, A2, A3....).

Wetland flags were located using Trimble Global Positioning System (GPS) technology with expected average accuracy of sub-meter. This method is recognized by both state and federal agencies. This being stated, Jones Associates, Inc. recommends that the wetland boundary be surveyed using a more precise method of location if any fill or regulated activities are to be performed within 20 feet of the GPS locations.

River, Stream, and Brook delineation is based on identification of physical indicators and follows definitions from MSRA Title 38 § 480-B. Stream banks were clearly marked with orange sub-zero flagging every 30-40 feet or at abrupt flow path changes and labeled with alphanumeric codes to identify individual systems with the prefix "S"(S A1, S A2, S A3....).

GENERAL EXISTING CONDITIONS

The site contains the Lyseth Elementary School, Lyman-Moore Middle School, paved parking areas, concrete sidewalks, athletic fields, basketball courts, tennis courts, storm water management systems, and associated buildings. Private residential lots surround the majority of the observed area with vehicular access from Jr Street to the north and Washington Avenue to the west. Established dirt paths provide non-vehicular access to the observed area from several directions. The existing land use area is highly impacted by development and urbanization.

The observed area is <10% forested with pole sized to mature timber creating 80-100% canopy closure. Natural canopy openings were not observed while field investigations were

being conducted. Manmade openings within the site are developed and maintained. Wetlands found on the property primarily occur in association with the drainage area along the western edge of the existing land use area.

SOILS

According to U.S. Department of Agriculture, Natural Resources Conservation Service, the primary soils series typed on the parcel are Buxton Silt Loam (20%); Deerfield Loamy Sand (45%), Hollis Fine Sand (15%), Scantic Silt Loam (<1%), and Windsor Loamy Sand (5%) characteristics of each series are described in the soil report according to: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture, Official Soil Series Descriptions, <https://soilseries.sc.egov.usda.gov/osdname.asp>

The Buxton series consists of very deep, moderately well drained soils that formed in glaciolacustrine or glaciomarine deposits on coastal lowlands and river valleys. Slope ranges from 3 to 50 percent. Permeability is moderate or moderately slow in the surface horizon, moderately slow or slow in the upper part of the subsoil, and slow or very slow in the lower part of the subsoil and in the substratum. Mean annual temperature is about 7 degrees C, and mean annual precipitation is about 1118 mm at the type location. **GEOGRAPHIC SETTING:** Buxton soils are on coastal lowlands and river valleys. Slope ranges from 3 to 50 percent. The soils formed in medium, moderately fine, and fine textured glaciolacustrine or glaciomarine deposits. The climate is humid and cool temperate. Mean annual precipitation ranges from 860 to 1220 mm, and mean annual temperature ranges from 6 to 8 degrees C. The frost-free season ranges from 90 to 160 days. Elevation ranges from 2 to 274 meters above mean sea level. **DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY:** Moderately well drained. Surface runoff is medium or rapid depending on slope. Saturated Hydraulic Conductivity is moderately high in the surface horizon and the upper part of the subsoil, and low to moderately low in the lower part of the subsoil and in the substratum. **USE AND VEGETATION:** Cleared areas are used mainly for hay, forage crops, or pasture. Some areas are used for silage corn or vegetables. The remaining areas are forested. Common tree species include eastern white pine, balsam fir, paper birch, white spruce, eastern hemlock, and northern red oak.

The Deerfield series consists of very deep, moderately well drained soils formed in glaciofluvial deposits. They are nearly level to strongly sloping soils on terraces, deltas, and outwash plains. Slope ranges from 0 to 15 percent. Saturated hydraulic conductivity is high or very high. Mean annual temperature is about 49 degrees F. and mean annual precipitation is about 47 inches. **GEOGRAPHIC SETTING:** Deerfield soils are level to strongly sloping soils on terraces, deltas, and outwash plains. Slope gradients are commonly 0 to 3 percent, but range to 15 percent. The soils formed in thick deposits of sand derived mainly from granite, gneiss and quartzite, but in places containing materials from schist and sandstone. The sand is poorly graded; medium sand is generally dominant and typically contains little or no gravel. Mean annual temperature ranges from 45 to 52 degrees F. and the mean annual precipitation typically ranges from 38 to 55 inches but the range includes as low as 26 inches in some places east of Adirondack Mountains in the Champlain Valley of New York. The mean growing season ranges from 120 to 200 days.

The Hollis series consists of well drained and somewhat excessively drained soils formed in a thin mantle of till. They are shallow to bedrock. They are nearly level to very steep upland

soils on bedrock-controlled hills and ridges. Slope ranges from 0 through 60 percent. Saturated hydraulic conductivity is moderately high or high. Depth to hard bedrock ranges from 25 to 50 cm. Mean annual temperature is about 9 degrees C, and mean annual precipitation is about 1205 mm. GEOGRAPHIC SETTING: Hollis soils are nearly level to very steep soils on bedrock controlled hills, modified by glacial processes. Slope ranges from 0 to 60 percent. The soils formed in a thin mantle of till derived from local bedrock of schist, granite, and gneiss. Mean annual temperature ranges from 7 to 13 degrees C and mean annual precipitation ranges from 910 to 1295 mm, but the range includes as low as 660 mm in some places east of Adirondack Mountains in the Champlain Valley of New York. The growing season ranges from 115 through 185 days. DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained and somewhat excessively drained. Surface runoff is negligible to very high. Saturated hydraulic conductivity is moderately high or high. USE AND VEGETATION: Mostly forested. Small areas with few rock outcrops are cleared of stones and used for cultivated crops, but most cleared areas are in hay or pasture. Scattered areas are used for community development. Common trees are northern red, white, black, and chestnut oak, hickory, eastern white pine, eastern hemlock, and gray and black birch.

The Scantic series consists of very deep, poorly drained soils formed in glaciomarine or glaciolacustrine deposits on coastal lowlands and river valleys. Slope ranges from 0 to 8 percent. Saturated hydraulic conductivity of the surface and subsurface horizons is moderately high or high and low or moderately slow in the subsoil and substratum. Mean annual temperature is about 7 degrees C, and mean annual precipitation is about 1168 mm inches at the type location. GEOGRAPHIC SETTING: Scantic soils are on coastal lowlands and river valleys. Slope ranges from 0 to 8 percent. The soils formed in medium, moderately fine and fine textured glaciomarine or glaciolacustrine deposits. The climate is humid and cool temperate. Mean annual temperature ranges from about 6 to almost 8 degrees C, and mean annual precipitation ranges from 863 to 1219 mm. The frost-free season ranges from 90 to 160 days. Elevation ranges from about 2 to 275 m above mean sea level. DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Poorly drained. Surface runoff is slow. Saturated hydraulic conductivity of the surface and subsurface horizons is moderately high or high and low or moderately slow in the subsoil and substratum. USE AND VEGETATION: Mostly idle or woodland, some areas are used for growing hay and pasture. Common tree species include red maple, elm, gray birch, white ash, balsam fir, red and white spruce, tamarack, and some eastern white pine.

The Windsor series consists of very deep, excessively drained soils formed in sandy outwash or eolian deposits. They are nearly level through very steep soils on glaciofluvial landforms. Slope ranges from 0 through 60 percent. Saturated hydraulic conductivity is high or very high. Mean annual temperature is about 10 degrees C and mean annual precipitation is about 1092 mm. GEOGRAPHIC SETTING: Windsor soils are nearly level through very steep soils typically on glaciofluvial landforms but include late-Wisconsin-aged dunes. The steeper slopes are typically on terrace escarpments. Slope ranges from 0 to 60 percent. The soils formed in outwash or eolian deposits of poorly graded sands and loamy sands derived mainly from crystalline rocks. Mean annual temperature ranges from 7 to 12 degrees C, and the mean annual precipitation typically ranges from 965 to 1270 mm, but the range includes as low as 660 mm in some places east of Adirondack Mountains in the Champlain Valley of New York. The growing season ranges from 120 to 190 days. DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Excessively drained. Surface runoff is negligible to medium. Saturated

hydraulic conductivity is high or very high. **USE AND VEGETATION:** Most areas are forested or in low growing brushy vegetation. Some areas are used for silage corn, hay, and pasture. Small areas, mostly irrigated, are used for shade tobacco, vegetables and nursery stock. Some areas are in community development. Common trees are white, black, and northern red oak, eastern white pine, pitch pine, gray birch, poplar, red maple, and sugar maple.

WETLAND CHARACTERISTICS

The term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

--Corps of Engineers Wetlands Delineation Manual (U.S. Army Corps of Engineers 1987)

All wetlands were identified using the Cowardin classification system (Cowardin et al. 1979). Wetlands within the Focal Area includes classification Palustrine; meaning all inland, nontidal wetlands characterized by the presence of trees, shrubs, and emergent vegetation. Observed within the Focal Area are considered PFO (Palustrine forested), with micro classifications of PSS (Palustrine scrub/shrub) within a forested setting.

Forested wetlands are located in the low lying areas directly associated with Fall Brook and its watershed. At a landscape scale the portion of the Focal Area containing Fall Brook and the associated wetlands can be classified as a broad swale within an urban setting. Topography in this area can be classified as flat to sloping, typical of urban impaired streams. Microtopography within the area ranges from pit and mound, to broader concave depressions. Drainage patterns were observed throughout and are created by the movement of surface water from up gradient areas as well as from several drainage pipes outlets. Drift deposits were observed adjacent to the stream channel along with sediment deposits which was also found within the stream channel. Small scrub shrub wetlands can be found within the forested wetlands and due to their size have been lumped into the forested wetland classification.

Hydrology for the wetlands is typically supplied from the surrounding uplands and stormwater run-off. Predominantly, delineated wetlands are PFO (palustrine forested); dominated by Norway maple (*Acer platanoides*); the scrub-shrub layer is largely made up of American red raspberry (*Rubus idaeus*), and Smilax spp. Due to the high erodibility of the soils surface layer much of the wetlands are lacking a heavily vegetated scrub shrub layer. Herbaceous species found within the wetland are a mix of annuals and vegetative reproducing perennials. This includes sensitive fern (*Onoclea sensibilis*), cinnamon fern (*Osmundastrum cinnamomeum*), *Carex* spp. and *Scirpus* spp. The soils observed have instances of mucky modified sand, saturation, and cracked surfaces. Many of the facultative trees within the wetland boundary have grown with hydromorphic adaptations.

Fall Brook flows from north to south along the western edge of the focal area and is identified as an Urban Impaired Stream. Maine DEP Chapter 502 defines an Urban Impaired Stream as "A stream is considered impaired if it fails to meet water quality standards because of

effects of stormwater runoff from developed land. Additional stormwater treatment controls are necessary in urban watersheds of impaired streams because proposed stormwater sources in urban and urbanizing areas contribute to the further degradation of stream water quality. Impaired streams are listed in Appendix B of this rule and include all streams listed under Category 4-A or Category 5-A in the 2004 Integrated Water Quality Monitoring and Assessment Report that have urban non-point source (NPS) indicated as a potential source.” During field investigations Fall Brook was not running water and appeared to not have any significant running water for a period of several months.

VERNAL POOLS

As defined by Maine’s Department of Environmental Protection (MDEP): A vernal pool, also referred to as a seasonal forest pool, is a natural, temporary to semi-permanent body of water occurring in a shallow depression that typically fills during the spring or fall and may dry during the summer. Vernal pools have no permanent inlet and no viable populations of predatory fish. A vernal pool may provide the primary breeding habitat for wood frogs (*Rana sylvatica*), spotted salamanders (*Ambystoma maculatum*), blue-spotted salamanders (*Ambystoma laterale*), and fairy shrimp (*Eubrachipus spp.*), as well as valuable habitat for other plants and wildlife, including several rare, threatened, and endangered species. A vernal pool intentionally created for the purposes of compensatory mitigation is included in this definition.

As of September 1, 2007, “Significant Vernal Pools” are defined by MDEP as “Significant Wildlife Habitat.” As read in MDEP’s Chapter 335 -- Significant Wildlife Habitat Rules, “Whether a vernal pool is a significant vernal pool is determined by the number and type of pool-breeding amphibian egg masses in a pool, or the presence of fairy shrimp, or use by threatened or endangered species as specified in Section 9(B). Significant vernal pool habitat consists of a vernal pool depression and a portion of the critical terrestrial habitat within a 250 foot radius of the spring or fall high water mark of the depression. An activity that takes place in, on, over, or adjacent to a significant vernal pool habitat must meet the standards of this chapter.”

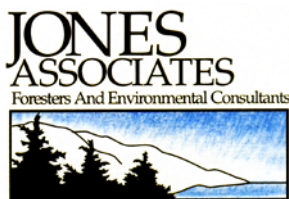
Species and abundance criteria required for Significant Vernal Pools.

Species	Abundance Criteria
Fairy shrimp	Presence in any life stage.
Blue spotted salamanders	Presence of 10 or more egg masses.
Spotted salamanders	Presence of 20 or more egg masses.
Wood frogs	Presence of 40 or more egg masses.

No areas were identified during field investigations as potential vernal pools.

RARE OR UNUSUAL FEATURES

During our investigations of the above site, Jones Associates, Inc. did not observe any rare or unusual plant or animal species within the mapped wetland area. Portions of the area described in this report had been previously altered through development, clearing, and excavation activities. Southern Maine where the site is located is in a severe drought, causing water tables lower than average.



WETLAND DELINEATION CHECKLIST

Job #:	16-069PD
Client:	Wright Pierce
Site Address:	171 Auburn Street, Portland Maine 04103

Wetland Scientist:	Garin Peck
Date of Office Review:	9/15/2016
Date(s) of Field Delineation:	9/8/2016

Wetlands of Special Significance

Yes	No	
	X	Does the on site or immediately adjacent wetland contain a mapped and numbered DWA?
	X	Does the on site or immediately adjacent wetland contain an Inland Waterfowl Wading Bird Habitat?
	X	Does the on site or immediately adjacent wetland contain a potential significant vernal pool?
	X	Does the recent aerial photos of the on site or immediately adjacent wetland show or are there any open water or emergent wetlands with areas greater than 20,000 sq. ft.?
X		Does the on site or immediately adjacent wetland contain a 100 year flood plain?
	X	Does the on site or immediately adjacent wetland contain a S1 or S2 community?
X		Does the on site or immediately adjacent wetland contain a significant wildlife habitat?
	X	Is the on site wetland within 250' of a coastal wetland?
	X	Is the on site wetland within 250' of a great pond?
X		Does the site contain peatlands?

Stormwater Qualifications

X		Is the site in the watershed of a Great Pond or Impaired stream?
	X	Is the site in a lake watershed?
	X	Is the site in a watershed most at risk?

FEMA flood zone FIRM: Panel 2300510002C

Watershed:

HUC 8: 01060001	Presumpscot River
HUC 10: 0106000106	Casco Bay
HUC 10: 0106000103	Presumpscot River
HUC 12: 010600010602	Casco Bay Frontal Drainages
HUC 12: 010600010306	Highland Lake-Lower Presumpscot River

February, 2011

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION



System	L - Lacustrine					
Subsystem	1 - Limnetic			2 - Littoral		
Class	RB – Rock Bottom	UB – Unconsolidated Bottom	AB – Aquatic Bed	RB – Rock Bottom	RS – Rocky Shore	US – Unconsolidated EM – Emergent Shore
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular	1 Bedrock 2 Rubble	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated

Class	RB – Rock Bottom	UB – Unconsolidated Bottom	AB – Aquatic Bed	US – Unconsolidated Shore	ML – Moss-Lichen	EM – Emergent	SS – Scrub-Shrub	FO – Forested
Subclass	1 Bedrock 2 Rubble	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent 3 <i>Phragmites australis</i> 4 Needle-Leaved Evergreen 5 Dead	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen	1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen

MODIFIERS									
In order to more adequately describe the wetland and deepwater habitats, one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.									
Water Regime		Special Modifiers	Water Chemistry		Soil				
Nontidal		Freshwater Tidal	Coastal Halinity		Inland Salinity	pH	Modifiers for all Fresh Water		
A	Temporarily Flooded	L Subtidal	S	Temporarily Flooded-Tidal	b	Beaver			g Organic
B	Saturated	M Irregularly Exposed	R	Seasonally Flooded-Tidal	d	Partly Drained/Ditched		1 Hyperhaline	n Mineral
C	Seasonally Flooded	N Regularly Flooded	T	Semipermanently Flooded-Tidal	f	Farmed		2 Euthaline	
E	Seasonally Flooded/ Saturated	P Irregularly Flooded	V	Permanently Flooded-Tidal	h	Diked/Impounded		3 Mixohaline (Brackish)	
F	Semipermanently Flooded				r	Artificial		9 Mixosaline	
G	Intermittently Exposed				s	Spoil		0 Fresh	
H	Permanently Flooded				x	Excavated		5 Mesohaline	
J	Intermittently Flooded							8 Oligohaline	
								0 Fresh	

WETLAND RULES AND INFORMATION

WETLANDS OF SPECIAL SIGNIFICANCE

Maine's Department of Environmental Protection considers some wetlands to be of higher significance than others. These wetlands are referred to as **Wetlands of Special Significance** (WSS). In order to be considered a WSS they must have one or more of the following characteristics:

- (1) Critically imperiled or imperiled community. The freshwater wetland contains a natural community that is critically imperiled (S1) or imperiled (S2) as defined by the Natural Areas Program.
- (2) Significant wildlife habitat. The freshwater wetland contains significant wildlife habitat as defined by 38 M.R.S.A. § 480-B (10).
- (3) Location near coastal wetland. The freshwater wetland area is located within 250 feet of a coastal wetland.
- (4) Location near GPA great pond. The freshwater wetland area is located within 250 feet of the normal high water line, and within the same watershed, of any lake or pond classified as GPA under 38 M.R.S.A. § 465-A.
- (5) Aquatic vegetation, emergent marsh vegetation or open water. The freshwater wetland contains, under normal circumstances, at least 20,000 square feet of aquatic vegetation, emergent marsh vegetation or open water, unless the 20,000 or more square foot area is the result of an artificial pond or impoundment.
- (6) Wetlands subject to flooding. The freshwater wetland area is inundated with floodwater during a 100-year flood event based on flood insurance maps produced by the Federal Emergency Management Agency or other site-specific information.
- (7) Peatlands. The freshwater wetland is or contains peatlands, except that the department may determine that a previously mined peatland, or portion thereof, is not a wetland of special significance.
- (8) River, stream or brook. The freshwater wetland area is located within 25 feet of a river, stream or brook.

STREAM CHANNELS

According to Maine's Natural Resource Protection Act, Title 38, Article 5-A, Protection of Natural Resources, §480-B Definitions:

"River, stream or brook" means a channel between defined banks. A channel is created by the action of surface water and has two or more of the following characteristics:

- (1) It is depicted as a solid or broken blue line on the most recent edition of the U.S. Geological Survey 7.5-minute series topographic map or, if that is not available, a 15-minute series topographic map.

- (2) It contains or is known to contain flowing water continuously for a period of at least 6 months of the year in most years.
- (3) The channel bed is primarily composed of mineral material such as sand and gravel, parent material or bedrock that has been deposited or scoured by water.
- (4) The channel contains aquatic animals such as fish, aquatic insects or mollusks in the water or, if no surface water is present, within the stream bed.
- (5) The channel contains aquatic vegetation and is essentially devoid of upland vegetation.

"River, stream or brook" does not mean a ditch or other drainage way constructed, or constructed and maintained, solely for the purpose of draining storm water or a grassy swale.

VERNAL POOLS

MDEP habitat management standards for significant vernal pools: To the greatest extent practicable, the following management practices must be followed within significant vernal pool habitat.

- (1) No disturbance within the vernal pool depression;
- (2) Maintain a minimum of 75% of the critical terrestrial habitat as unfragmented forest with at least a partly-closed canopy of overstory trees to provide shade, deep litter and woody debris.
- (3) Maintain or restore forest corridors connecting wetlands and significant vernal pools;
- (4) Minimize forest floor disturbance; and
- (5) Maintain native understory vegetation and downed woody debris.

If more than 25% of the critical terrestrial habitat has been previously developed, restoring a portion of that area through supplemental planting or regrowth of native forest species may be considered toward meeting these standards, or towards standards for avoidance, minimization, or compensation. For purposes of Chapter 355, developed area includes disturbed areas excluding areas that are returned to a condition with the same drainage patterns and the same or improved cover type that existed prior to the disturbance;

Currently, Army Corps of Engineers (ACOE) regulate vernal pools but do not have specific characteristics that define a vernal pool, or a definition of which vernal pools require protection or buffering. They review each site on a case by case basis. ACOE's jurisdiction does not begin until the waters of the United States are impacted.

NATURAL RESOURCES PROTECTION ACT

Jones Associates, Inc. has many years of experience working with and interpreting Maine's environmental laws; however MDEP has several unwritten policies that may change without public notice, therefore, certain project specific questions may need review by MDEP staff.

The Natural Resources Protection Act (NRPA) became effective on August 4, 1988. The law is focused on "protected natural resources". A permit is required when an "activity" will be:

- (1) Located in, on or over any protected natural resource, or
- (2) Located adjacent to (A) a coastal wetland, great pond, river, stream or brook or significant wildlife habitat contained within a freshwater wetland, or (B) certain freshwater wetlands.

An "activity" is (A) dredging, bulldozing, removing or displacing soil, sand, vegetation or other materials; (B) draining or otherwise dewatering; (C) filling, including adding sand or other material to a sand dune; or (D) any construction, repair or alteration of any permanent structure.

The Maine Department of Environmental Protection (MDEP) does not have to be contacted for projects involving minor wetland impacts. Single, complete activities that impact less than 4,300 square feet of freshwater wetland and do NOT occur within: another type of protected natural resource; 25 feet of another protected natural resource and erosion controls are used; a municipal shoreland zone; a wetland normally containing at least 20,000 sq. ft. of open water, aquatic or emergent marsh vegetation; or a peatland are exempt under the Natural Resources Protection Act, 38 M.R.S.A. Section 480-Q(17).

NRPA - PERMIT BY RULE

A "permit by rule" or "PBR", when approved by MDEP, is an approval for an activity that requires a permit under the Natural Resources Protection Act (NRPA). Only those activities described in Chapter 305 may proceed under the PBR process. A PBR activity will not significantly affect the environment if carried out in accordance with this chapter, and generally has less of an impact on the environment than an activity requiring an individual permit. A PBR satisfies the NRPA permit requirement and Water Quality Certification requirement. The following projects may be eligible as PBR activities:

Section (2) Activity Adjacent to Protected Natural Resource

(An activity adjacent to (any land area within 75 feet, measured horizontally, of the normal high water line), but not in: a coastal wetland, great pond, river, stream or brook or significant wildlife habitat contained within a freshwater wetland; or freshwater wetlands consisting of or containing: under normal circumstances, at least 20,000 square feet of aquatic vegetation, emergent marsh vegetation or open water, except for artificial ponds or impoundments; or peatlands dominated by shrubs, sedges and sphagnum moss.

Section (3) Placement of permanent intake pipes and water monitoring devices (including drilled wells)

Section (4) Replacement of Structures

Section (6) Movement of Rocks or Vegetation

Section (7) Placement of outfall pipes (including ditches and drain tiles)

Section (8) Shoreline stabilization using vegetation or riprap

Section (9) Construction of crossings (utility lines, pipes and cables)

Section (10) Construction of stream crossings (bridges, culverts and fords)

Section (11) State Transportation Facilities

Section (12) Restoration of natural areas (i.e., "undoing" human alteration)

Section (13) Fisheries & wildlife habitat creation or enhancement and water quality improvement projects

Section (15) Public Boat Ramps

Section (16) Selected activities in coastal sand dunes

Section (17) Transfers and Permit Extensions

Section (18) One-time renewals of maintenance dredging permits

Section (19) Activities in/on/over significant vernal pool habitat

Section (20) Activities located in/on/over high or moderate value inland waterfowl & wading bird habitat or shorebird nesting, feeding & roosting areas

NRPA - TIER REVIEW PROCESS

NRPA's Tier Review process constitutes a joint application to both the Maine Department of Environmental Protection (MDEP) and the U.S. Army Corps of Engineers (USACOE) for a proposed alteration to a freshwater wetland that qualifies for Tier 1, 2 or 3 review. The square footage of impact is based on the alteration or impact of the whole activity in the wetland. If any part of the overall activity requires a higher tier review, then the whole activity will be reviewed under that higher tier.

The Tier Review process is required for impacts larger than 4,300 square feet, and for requesting a permit for activities in, on, or over a protected natural resource. It is also used for activities adjacent to certain protected natural resources (38 MRSA 480-C(1)). The Tier Review process is required when the activity is not eligible for a PBR.

According to 38 M.R.S.A. Section 480-X(2), an application for a permit to undertake activities altering freshwater wetlands must be reviewed in accordance with the following:

- (1) A Tier 1 review process applies to any activity that involves a freshwater wetland alteration up to 15,000 square feet and does not involve the alteration of freshwater wetlands listed in 38 M.R.S.A. Section 480-X(4);
- (2) A Tier 2 review process applies to any activity that involves a freshwater wetland alteration of 15,000 square feet up to one acre and does not involve the alteration of freshwater wetlands listed in 38 M.R.S.A. Section 480-X (4 or 5);
- (3) A Tier 3 review process applies to any activity that does involve a freshwater wetland alteration greater than one acre, or an alteration of a freshwater wetland listed in 38 M.R.S.A. Section 480-X (4 or 5).

According to 38 M.R.S.A. Section 480-X(4), the following activities are not eligible for Tier 1 or Tier 2 review unless MDEP determines that the activity will not negatively affect the freshwater wetlands and other protected natural resources present.

- (1) Activities located within 250 feet of a coastal wetland;
- (2) Activities located within 250 feet of the normal high-water line, and within the same watershed, of any lake or pond classified as GPA under section 465-A;
- (3) Activities occurring in freshwater wetlands, other than artificial ponds or impoundments, containing under normal circumstances at least 20,000 square feet of aquatic vegetation, emergent marsh vegetation or open water;
- (4) Activities occurring in freshwater wetlands that are inundated with floodwater during a 100-year flood event based on flood insurance maps produced by the Federal Emergency Management Agency or other site-specific information;
- (5) Activities occurring in freshwater wetlands containing significant wildlife habitat that has been mapped, identified or defined, as required pursuant to section 480-B(10), at the time of the filing by the applicant;

- (6) Activities occurring in peatlands dominated by shrubs, sedges and sphagnum moss, except that applications proposing work in previously mined peatlands may be considered by the department for Tier 1 or Tier 2 review, as applicable;
- (7) Activities occurring within 25 feet of a river, stream or brook.

According to 38 M.R.S.A. Section 480-X(5), an activity in freshwater wetlands containing a natural community that is imperiled (S2) or critically imperiled (S1), as defined by the Natural Areas Program pursuant to Title 12, Section 544 is not eligible for Tier 2 review unless the department determines that the activity will not negatively affect the freshwater wetlands and other protected natural resources present.

NRPA General Requirements for both the Tier 1 and Tier 2 review process require that the proposed freshwater wetland alteration must be avoided, if feasible, after considering cost, logistics, technology and the overall purpose of the project. However, if unavoidable, the alteration must be limited to the minimum amount necessary to complete the project. The project must utilize both temporary and permanent erosion control measures to prevent sedimentation of any protected natural resource. In addition, the alteration site must maintain an undisturbed 25 foot buffer strip between the activity and any river, stream or brook and must not violate any state water quality law, including those governing the classification of the State's waters.

REFERENCES

- Britton, Nathaniel Lord and Hon. Addison Brown. 1970. *An illustrated flora of the northern United States and Canada*. 2nd ed. New York: Dover Publications, Inc.
- Cobb, Boughton. 1956. *The Person Field Guide Series: A field guide to the ferns*. Cambridge, Massachusetts: The Riverside Press.
- Environmental Laboratory. 1987. *Corps of Engineers wetlands delineation manual*. Technical Report Y-87-1. Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.
- Environmental Laboratory. 2012. *Regional Supplement to the Corps of Engineers wetland delineation manual: Northcentral and Northeast Region (Version 2.0)*. Report ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- Kenney, Leo P. and Matthew R. Burne. 2001. *A field guide to the animals of vernal pools*. Westborough, Massachusetts: Massachusetts Division of Fisheries & Wildlife Natural Heritage & Endangered Species Program.
- Lellinger, David B. 1985. *A field manual of the ferns & fern-allies of the United States & Canada*. Washington, D.C.: Smithsonian Institution Press.
- Lyon, John Grimson. 1993. *Practical handbook for wetland identification and delineation*. Boca Raton, Florida: Lewis Publishers.
- Magee, Dennis W. 1981. *Freshwater wetlands: a guide to common indicator plants of the northeast*. Amherst: The University of Massachusetts Press.
- Symonds, George W. 1958. *The tree identification book*. New York: Quill (William Morrow & Co.)
- Symonds, George W. 1963. *The shrub identification book*. New York: Morrow Quill Paperbacks (William Morrow & Co.)
- USDA Natural Resources Conservation Service. 2010. *Field indicators of hydric soils in the United States, Version 7.0*. ed. L. M. Vasilas, G.W. Hurt and C.V. Noble. Washington, DC: USDA NRCS in cooperation with the National Technical Committee for Hydric Soils.

Websites:

- Maine Department of Environmental Protection: www.maine.gov/dep/land/nrpa/index.html
- United States Fish and Wildlife Service, National Wetlands inventory: www.fws.gov/wetlands/
- United States Army Corps of Engineers, New England District:
www.nae.usace.army.mil/Missions/Regulatory.aspx
- United States Natural Resources Conservation Service, United States Department of Agriculture, Official Soil Series Descriptions: soils.usda.gov/technical/classification/osd/index.html.

WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Lyman Moore Middle School City/County: Portland/Cumberland Sampling Date: 09/08/2016
Applicant/Owner: Wright-Pierce State: ME Sampling Point: GMP1
Investigator(s): GMP Section, Township, Range: _____
Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 1
Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 43-42-19 Long: 70-17-19 Datum: _____
Soil Map Unit Name: Cumberland County NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
Are Vegetation Y, Soil N, or Hydrology Y naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.) 2016 has been a fairly dry year, the site has undergone disturbance and has significant surrounding urbaization. foNon-Native vegetation was obserbed within the focal area and Fall Brook is classified as an urban impaired stream.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☐ Surface Water (A1) ☐ Water-Stained Leaves (B9) ☐ High Water Table (A2) ☐ Aquatic Fauna (B13) ☐ Saturation (A3) ☐ Marl Deposits (B15) ☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1) ☐ Sediment Deposits (B2) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Drift Deposits (B3) ☐ Presence of Reduced Iron (C4) ☐ Algal Mat or Crust (B4) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Iron Deposits (B5) ☐ Thin Muck Surface (C7) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Other (Explain in Remarks) ☐ Sparsely Vegetated Concave Surface (B8)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>x</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>x</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>x</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

Sampling Point: GMP1

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: GMP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 3/3						Loamy/Clayey	
2-6	10YR 4/4						Loamy/Clayey	
6-8	7.5YR 4/3						Loamy/Clayey	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
☐ Histosol (A1)	☐ Polyvalue Below Surface (S8) (LRR R,	☐ 2 cm Muck (A10) (LRR K, L, MLRA 149B)			
☐ Histic Epipedon (A2)	MLRA 149B)	☐ Coast Prairie Redox (A16) (LRR K, L, R)			
☐ Black Histic (A3)	☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)	☐ 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)			
☐ Hydrogen Sulfide (A4)	☐ High Chroma Sands (S11) (LRR K, L)	☐ Polyvalue Below Surface (S8) (LRR K, L)			
☐ Stratified Layers (A5)	☐ Loamy Mucky Mineral (F1) (LRR K, L)	☐ Thin Dark Surface (S9) (LRR K, L)			
☐ Depleted Below Dark Surface (A11)	☐ Loamy Gleyed Matrix (F2)	☐ Iron-Manganese Masses (F12) (LRR K, L, R)			
☐ Thick Dark Surface (A12)	☐ Depleted Matrix (F3)	☐ Piedmont Floodplain Soils (F19) (MLRA 149B)			
☐ Sandy Mucky Mineral (S1)	☐ Redox Dark Surface (F6)	☐ Mesic Spodic (TA6) (MLRA 144A, 145, 149B)			
☐ Sandy Gleyed Matrix (S4)	☐ Depleted Dark Surface (F7)	☐ Red Parent Material (F21)			
☐ Sandy Redox (S5)	☐ Redox Depressions (F8)	☐ Very Shallow Dark Surface (TF12)			
☐ Stripped Matrix (S6)	☐ Marl (F10) (LRR K, L)	☐ Other (Explain in Remarks)			
☐ Dark Surface (S7)					

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):			
Type: _____			
Depth (inches): _____		Hydric Soil Present?	Yes ____ No __X__

Remarks:
This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to reflect the NRCS Field Indicators of Hydric Soils version 7.0 March 2013 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Lyman Moore Middle School City/County: Portland/Cumberland Sampling Date: 09/08/2016
 Applicant/Owner: Wright-Pierce State: ME Sampling Point: GMP1
 Investigator(s): GMP Section, Township, Range: _____
 Landform (hillside, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 1
 Subregion (LRR or MLRA): LRR R, MLRA 144B Lat: 43-42-18 Long: 70-17-19 Datum: _____
 Soil Map Unit Name: Cumberland County NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)
 Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 Are Vegetation Y, Soil N, or Hydrology Y naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>Y</u> No _____ If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes <u>X</u> No _____	
Wetland Hydrology Present?	Yes <u>X</u> No _____	
Remarks: (Explain alternative procedures here or in a separate report.) 2016 has been a fairly dry year, the site has undergone disturbance and has significant surrounding urbaization. Non-Native vegetation was obserbed within the focal area and Fall Brook is classified as an urban impaired stream.		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) <u>X</u> Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) <u>X</u> Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)		<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) <u>X</u> Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <u>X</u> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <u>x</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION – Use scientific names of plants.

 Sampling Point: GMP1

<u>Tree Stratum</u> (Plot size: <u>30 Feet</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer platanoides</u>	20	Yes	UPL	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.7%</u> (A/B)																
2. <u>Fraxinus pennsylvanica</u>	5	No	FACW																	
3. <u>Acer rubrum</u>	5	No	FAC																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
	30	=Total Cover		Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="text-align: left;">Total % Cover of:</th> <th style="text-align: left;">Multiply by:</th> </tr> <tr> <td>OBL species <u>10</u></td> <td>x 1 = <u>10</u></td> </tr> <tr> <td>FACW species <u>20</u></td> <td>x 2 = <u>40</u></td> </tr> <tr> <td>FAC species <u>5</u></td> <td>x 3 = <u>15</u></td> </tr> <tr> <td>FACU species <u>2</u></td> <td>x 4 = <u>8</u></td> </tr> <tr> <td>UPL species <u>20</u></td> <td>x 5 = <u>100</u></td> </tr> <tr> <td>Column Totals: <u>57</u></td> <td>(A) <u>173</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>3.04</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>10</u>	x 1 = <u>10</u>	FACW species <u>20</u>	x 2 = <u>40</u>	FAC species <u>5</u>	x 3 = <u>15</u>	FACU species <u>2</u>	x 4 = <u>8</u>	UPL species <u>20</u>	x 5 = <u>100</u>	Column Totals: <u>57</u>	(A) <u>173</u> (B)	Prevalence Index = B/A = <u>3.04</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>10</u>	x 1 = <u>10</u>																			
FACW species <u>20</u>	x 2 = <u>40</u>																			
FAC species <u>5</u>	x 3 = <u>15</u>																			
FACU species <u>2</u>	x 4 = <u>8</u>																			
UPL species <u>20</u>	x 5 = <u>100</u>																			
Column Totals: <u>57</u>	(A) <u>173</u> (B)																			
Prevalence Index = B/A = <u>3.04</u>																				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15 Feet</u>)																				
1. <u>Lonicera japonica</u>	2	No	FACU																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
	2	=Total Cover		Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u>X</u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
<u>Herb Stratum</u> (Plot size: <u>5'</u>)																				
1. <u>Onoclea sensibilis</u>	15	Yes	FACW																	
2. <u>Scirpus cyperinus</u>	10	Yes	OBL																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
	25	=Total Cover		Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height.																
<u>Woody Vine Stratum</u> (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
	_____	=Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____																

SOIL

Sampling Point: GMP1

[illegible]

NRCS CUSTOM SOIL RESOURCE REPORT



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Cumberland County and Part of Oxford County, Maine

Lyman-Moore Middle School



September 15, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	7
Soil Map.....	8
Legend.....	9
Map Unit Legend.....	10
Map Unit Descriptions.....	10
Cumberland County and Part of Oxford County, Maine.....	12
BuB—Buxton silt loam, 3 to 8 percent slopes.....	12
DeB—Deerfield loamy sand, 3 to 8 percent slopes.....	13
HrB—Hollis fine sandy loam, 3 to 8 percent slopes.....	14
Sn—Scantic silt loam, 0 to 3 percent slopes.....	14
WmB—Windsor loamy sand, 0 to 8 percent slopes.....	15
References	17

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Streams and Canals

Water Features

Rills

Interstate Highways

US Routes

Major Roads

Local Roads

Transportation

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 11, Sep 17, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 31, 2013—Aug 11, 2013

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Cumberland County and Part of Oxford County, Maine (ME005)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BuB	Buxton silt loam, 3 to 8 percent slopes	4.5	19.6%
DeB	Deerfield loamy sand, 3 to 8 percent slopes	10.3	45.3%
HrB	Hollis fine sandy loam, 3 to 8 percent slopes	3.3	14.5%
Sn	Scantic silt loam, 0 to 3 percent slopes	0.0	0.0%
WmB	Windsor loamy sand, 0 to 8 percent slopes	4.7	20.6%
Totals for Area of Interest		22.8	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Cumberland County and Part of Oxford County, Maine

BuB—Buxton silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: blgw

Elevation: 10 to 900 feet

Mean annual precipitation: 34 to 48 inches

Mean annual air temperature: 43 to 46 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Buxton and similar soils: 87 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Buxton

Setting

Landform: Coastal plains

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Glaciolacustrine deposits derived from siltstone and/or fine-silty marine deposits

Typical profile

H1 - 0 to 9 inches: silt loam

H2 - 9 to 16 inches: silty clay loam

H3 - 16 to 38 inches: silty clay loam

H4 - 38 to 65 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 9.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: D

Hydric soil rating: No

DeB—Deerfield loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: blh6

Elevation: 150 to 1,200 feet

Mean annual precipitation: 30 to 50 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Deerfield and similar soils: 87 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Outwash terraces

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 10 inches: loamy sand

H2 - 10 to 24 inches: loamy sand

H3 - 24 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: About 18 to 36 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: A

Hydric soil rating: No

HrB—Hollis fine sandy loam, 3 to 8 percent slopes

Map Unit Composition

Hollis and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Landform: Hills

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Interfluvium, crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Coarse-loamy supraglacial meltout till derived from mica schist

Typical profile

H1 - 0 to 6 inches: fine sandy loam

H2 - 6 to 18 inches: fine sandy loam

R - 18 to 22 inches: bedrock

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: D

Hydric soil rating: No

Sn—Scantic silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2slv3

Elevation: 10 to 900 feet

Mean annual precipitation: 33 to 60 inches

Mean annual air temperature: 39 to 45 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Not prime farmland

Map Unit Composition

Scantic and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scantic

Setting

Landform: Marine terraces, river valleys

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Glaciomarine deposits

Typical profile

Ap - 0 to 9 inches: silt loam

Bg1 - 9 to 16 inches: silty clay loam

Bg2 - 16 to 29 inches: silty clay

Cg - 29 to 65 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: About 0 to 12 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: D

Hydric soil rating: Yes

WmB—Windsor loamy sand, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w2x2

Elevation: 0 to 1,410 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor

Setting

Landform: Deltas, dunes, outwash plains, outwash terraces

Landform position (three-dimensional): Riser, tread

Down-slope shape: Linear, convex

Across-slope shape: Linear, convex

Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: loamy sand

Bw - 3 to 25 inches: loamy sand

C - 25 to 65 inches: sand

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

ATTACHMENT 11.3

SOIL BORINGS

Northern Test Boring, Inc. Boring Log

Client: City of Portland	Project Name: Lyseth-Lyman Moore Ballfields
Location: Portland, Maine	Driller: Michael Nadeau

	Casing	Sample	Core	Ground Water Observation	
Type	HSA	SS		11'	
Size	2 1/4"	1 3/8"		Start Date:	Finish Date:
Hammer Wt.		140		7/20/16	7/20/16
Hammer Fall		30"			

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24"	20"	0'-2'	5	7	7	9		3" Brown Sandy Topsoil
									Brown Fine-Medium Sand Some Silt
S-2	24"	24"	5'-7'	7	9	9	9	5'	
									Brown/Grey Clayey Silt Trace Fine Sand
S-3	24"	24"	10'-12'	8	3	4	6	10'	
									Grey Silty Fine Sand Some Clay
S-4	9"	6"	15'-17'	27	50/3"			15'	
									Refusal @ 16.5' Probable Bedrock Surface/Possible Boulder
								20'	
								25'	
								30'	

Northern Test Boring, Inc. Boring Log

Client: City of Portland	Project Name: Lyseth-Lyman Moore Ballfields
Location: Portland, Maine	Driller: Michael Nadeau

	Casing	Sample	Core	Ground Water Observation	
Type	HSA	SS		14.7'	
Size	2 1/4"	1 3/8"		Start Date:	Finish Date:
Hammer Wt.		140		7/20/16	7/20/16
Hammer Fall		30"			

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24"	14"	0'-2'	5	7	7	9		4" Brown Sandy Topsoil
									Brown Fine-Medium Sand Some Silt
S-2	24"	24"	5'-7'	6	9	8	10	5'	
									Brown/Grey Clayey Silt Some Fine Sand
S-3	24"	24"	10'-12'	3	5	7	7	10'	
S-4	24"	24"	15'-17'	2	2	2	4	15'	
									Grey Silty Fine Sand
								20'	
									Refusal @ 19.1' Probable Bedrock Surface/Possible Boulder
								25'	
								30'	

Northern Test Boring, Inc. Boring Log

Client: City of Portland	Project Name: Lyseth-Lyman Moore Ballfields
Location: Portland, Maine	Driller: Michael Nadeau

	Casing	Sample	Core	Ground Water Observation	
Type	HSA	SS		14.1'	
Size	2 1/4"	1 3/8"		Start Date:	Finish Date:
Hammer Wt.		140		7/20/16	7/20/16
Hammer Fall		30"			

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24"	21"	0'-2'	6	7	7	9		4" Brown Sandy Topsoil
									Brown Fine-Medium Sand Some Silt
S-2	24"	24"	5'-7'	3	4	6	5	5'	
									Brown/Grey Clayey Silt Some Fine Sand
S-3	24"	24"	10'-12'	4	3	5	5	10'	
S-4	24"	24"	15'-17'	1	1	1	2	15'	
									Grey Clayey Silty Sand
									Grey Silty Fine Sand
S-5	24"	22"	20'-22'	9	10	11	10	20'	
									No Refusal @ 22'
								25'	
								30'	

Northern Test Boring, Inc. Boring Log

Client: City of Portland	Project Name: Lyseth-Lyman Moore Ballfields
Location: Portland, Maine	Driller: Michael Nadeau

	Casing	Sample	Core	Ground Water Observation	
Type	HSA	SS		11.5'	
Size	2 1/4"	1 3/8"		Start Date:	Finish Date:
Hammer Wt.		140		7/20/16	7/20/16
Hammer Fall		30"			

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24"	14"	0'-2'	5	6	6	7		3" Brown Sandy Topsoil
									Brown Fine-Medium Sand Some Silt
S-2	24"	24"	5'-7'	2	6	7	8	5'	
									Brown/Grey Clayey Silt Trace Fine Sand
S-3	24"	24"	10'-12'	5	8	9	15	10'	
									Brown Fine Sand Some Gravel and Silt
								15'	
									Refusal @ 14.7' Probable Bedrock Surface/Possible Boulder
								20'	
								25'	
								30'	

Northern Test Boring, Inc. Boring Log

Client: City of Portland	Project Name: Lyseth-Lyman Moore Ballfields
Location: Portland, Maine	Driller: Michael Nadeau

	Casing	Sample	Core	Ground Water Observation	
Type	HSA	SS		No Free Water Observed	
Size	2 1/4"	1 3/8"		Start Date:	Finish Date:
Hammer Wt.		140		7/20/16	7/20/16
Hammer Fall		30"			

[illegible]

Northern Test Boring, Inc. Boring Log

Client: City of Portland	Project Name: Lyseth-Lyman Moore Ballfields
Location: Portland, Maine	Driller: Michael Nadeau

	Casing	Sample	Core	Ground Water Observation 5.3'	
Type	HSA	SS			
Size	2 1/4"	1 3/8"		Start Date: 7/20/16	Finish Date: 7/20/16
Hammer Wt.		140			
Hammer Fall		30"			

[illegible]

Northern Test Boring, Inc. Boring Log

Client: City of Portland	Project Name: Lyseth-Lyman Moore Ballfields
Location: Portland, Maine	Driller: Michael Nadeau

	Casing	Sample	Core	Ground Water Observation	
Type	HSA	SS		No Free Water Observed	
Size	2 1/4"	1 3/8"		Start Date:	Finish Date:
Hammer Wt.		140		7/20/16	7/20/16
Hammer Fall		30"			

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24"	20"	0'-2'	4	6	5	6		4" Brown Sandy Topsoil
									Brown Fine-Medium Sand Some Silt
S-2	24"	24"	5'-7'	3	7	9	11	5'	
									Brown/Grey Clayey Silt Trace Fine Sand
S-3	24"	24"	10'-12'	5	6	8	7	10'	
S-4	7"	5"	15'-17'	5	50/1"			15'	Brown Fine Sand Some Gravel and Silt
									Refusal @ 15.8' Probable Bedrock Surface/Possible Boulder
								20'	
								25'	
								30'	

Northern Test Boring, Inc. Boring Log

Client: City of Portland	Project Name: Lyseth-Lyman Moore Ballfields
Location: Portland, Maine	Driller: Michael Nadeau

	Casing	Sample	Core	Ground Water Observation	
Type	HSA	SS		No Free Water Observed	
Size	2 1/4"	1 3/8"		Start Date:	Finish Date:
Hammer Wt.		140		7/20/16	7/20/16
Hammer Fall		30"			

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	19"	12"	0'-2'	5	5	5	50/1		3" Brown Sandy Topsoil Brown Fine-Medium Sand Some Silt
								5'	
								10'	
								15'	
								20'	
								25'	
								30'	

Refusal @ 2.1' Probable Bedrock Surface/Possible Boulder

Northern Test Boring, Inc. Boring Log

Client: City of Portland	Project Name: Lyseth-Lyman Moore Ballfields
Location: Portland, Maine	Driller: Michael Nadeau

	Casing	Sample	Core	Ground Water Observation	
Type	HSA	SS		10.5'	
Size	2 1/4"	1 3/8"		Start Date:	Finish Date:
Hammer Wt.		140		7/20/16	7/20/16
Hammer Fall		30"			

[illegible]

Northern Test Boring, Inc. Boring Log

Client: City of Portland	Project Name: Lyseth-Lyman Moore Ballfields
Location: Portland, Maine	Driller: Michael Nadeau

	Casing	Sample	Core	Ground Water Observation	
Type	HSA	SS		5.7'	
Size	2 1/4"	1 3/8"		Start Date:	Finish Date:
Hammer Wt.		140		7/20/16	7/20/16
Hammer Fall		30"			

No.	Pen	Rec	Sample Depth	Sample Blow Counts				Depth	Stratum Description
S-1	24"	21"	0'-2'	3	3	4	4		3" Brown Sandy Topsoil
									Brown Fine-Medium Sand Some Silt
S-2	24"	24"	5'-7'	4	8	12	8	5'	
									Brown Silty Fine-Medium Sand
								10'	
									Refusal @ 9.8' Probable Bedrock Surface/Possible Boulder
								15'	
								20'	
								25'	
								30'	



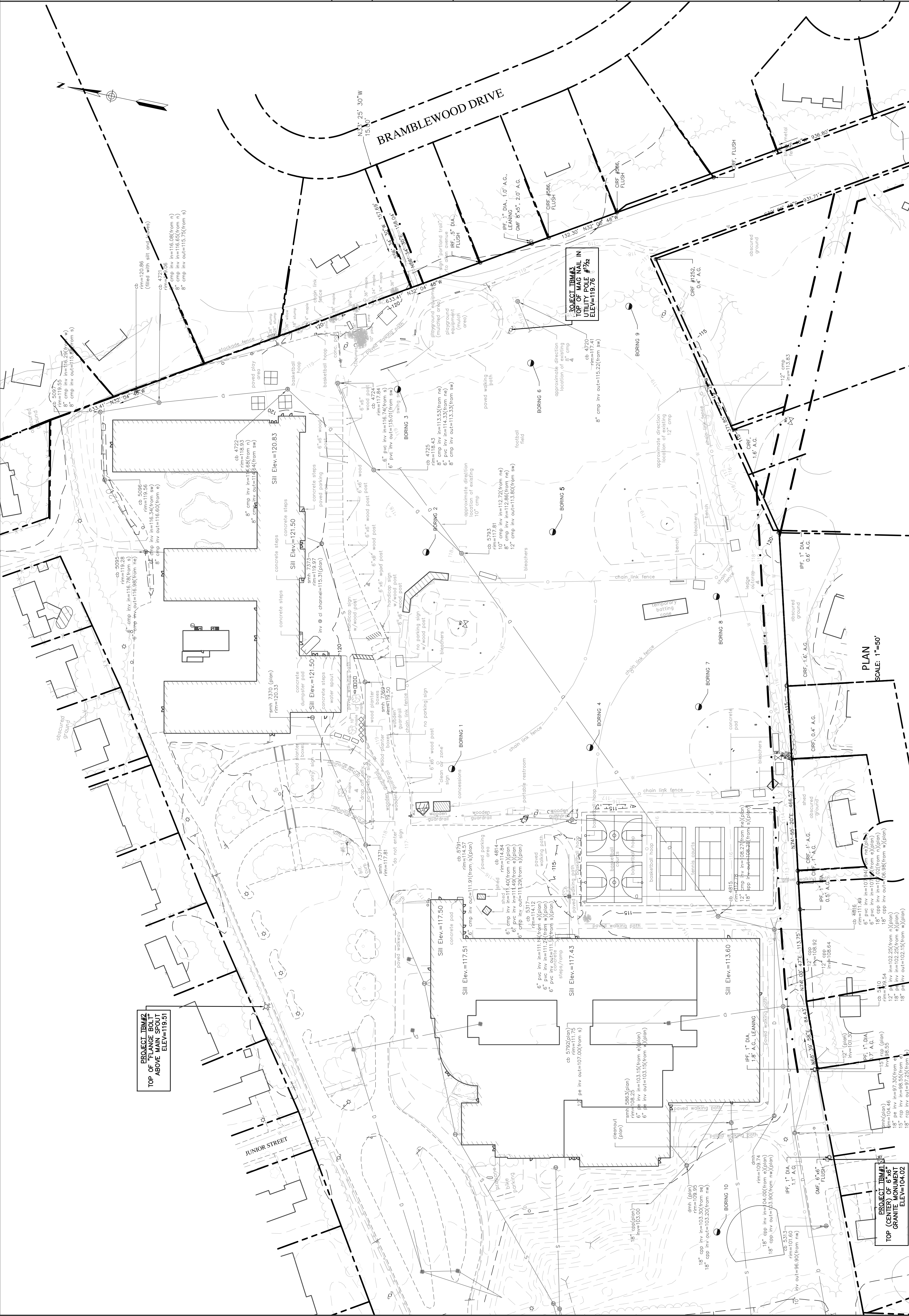
CITY OF PORTLAND, MAINE
PUBLIC SERVICES DEPARTMENT
ENGINEERING DIVISION

LYSETH-LYMAN MOORE
EXISTING CONDITIONS PLAN
BORING LOCATION PLAN

SURVEY CREW:	CGH
DATE:	CGH
SCALE:	CGH
RTW/BCC:	CGH
CHECKED BY:	CGH
DATE:	CGH
DATE:	CGH

Civil 3D 2015 Drawing Name:
Lyseth-Lyman School, 20161.dwg
133528

REFERENCES:



PROJECT ITEM#1
TOP (CENTER) OF 6"x6"
GRANITE MONUMENT
ELEV.=104.02

PROJECT ITEM#2
TOP OF FLANGE BOLT
ABOVE MAIN SPOUT
ELEV.=119.51

PROJECT ITEM#3
TOP OF MAG NAIL IN
UTILITY POLE #12
ELEV.=119.76

PLAN
SCALE: 1"=50'

Section 12: Stormwater Management Plan

12.0 Stormwater Management Plan

Stormwater management plan for the proposed project is attached within this section.

12.1 Coordination with Regulatory

Coordination efforts with regulatory for the proposed project is included within Section 11 of this permit.

12.2 General Standard, Flooding Standard, Urban Impaired Stream Standard

Per City of Portland statute, the General Standard, Flooding Standard, and Urban Impaired Stream Standard will apply for the proposed project. This information is incorporated within the attached Stormwater Management Plan.

ATTACHMENT 12.1

STORMWATER MANAGEMENT REPORT

STORMWATER MANAGEMENT PLAN

for the

LYSETH – LYMAN MOORE

CAMPUS CIRCULATION IMPROVEMENTS

PORTLAND, MAINE



CITY OF PORTLAND
Department of Parks, Recreation, and Facilities
212 Canco Road
Portland, Maine 04103

September, 2017

STORMWATER MANAGEMENT PLAN
LYSETH-LYMAN MOORE CAMPUS
CIRCULATION AND PARKING IMPROVEMENTS
PORTLAND, MAINE

INTRODUCTION

The proposed project is for the re-development of the existing parking and circulation areas and the Lyseth/Lyman-Moore campus. The proposed infrastructure improvements will be within the exiting developed areas of the site.

Work within the existing athletic fields includes the following activities:

- Reconstructing deteriorated drainage system
- Relocation of roof leaders from sewer to storm drain
- Improving site pedestrian, bus, and passenger vehicle circulation
- Parking lot improvements
- Erosion and sedimentation control
- Site landscaping
- Appurtenant Stormwater treatment facilities

The major impetus of the proposed project is redevelopment of the existing parking and circulation infrastructure, which is largely undersized and is no longer properly conveying bus and passenger vehicle traffic. As this area is expanded, pedestrian traffic will also be improved upon. Site landscaping is incorporated into this design, as is stormwater treatment measures.

It is understood that the existing roof drains from the elementary school, and one of the roof drains from the middle school, currently convey flows to the sanitary sewer. It is preferred, but not required by City code for this project, that these roof drains be incorporated into the stormwater treatment system as part of the proposed project. Through conversations between the applicant and with the Department of Public Works, a design that incorporates removal of roof drains from the elementary building has been developed and is incorporated as a major working piece of this Stormwater Management Plan and Report. Meeting minutes from the conversation between the applicant and the Department of Public Works, including the preferred path forward and an understanding of the pollutants, has been incorporated as an attachment to this report. Please note that certain values for project impervious areas or runoff rates may have slightly changed between this conversation and the proposed project, and that the meeting minutes

are incorporated to include preferred path forward, development of project goals for stormwater treatment, and for the reasoning behind use of the proposed and existing stormwater treatment measures.

EXISTING DRAINAGE CONDITIONS

The existing site includes school buildings, parking and roadway infrastructure, plantings and trees within parking islands, and a stormwater treatment gravel wetland. The site is located along a ridge, and generally slopes from higher areas in the eastern portions of the site towards the west. The majority of surface runoff flows from the eastern edge of the property, generally in an east-west direction, and eventually is conveyed through a series of damaged drainage pipes into an existing undersized gravel wetland, and then ultimately into Fall Brook. These surface flows then ultimately discharge into the Atlantic Ocean at Back Cove in Portland.

Soils mapping and characteristics were obtained from the Medium Intensity Soil Survey for Cumberland County. As indicated on the attached soils map the primary hydrological soils group covering the site is either A or D. Further analysis of the site borings, as well as anecdotal evidence of substantial ponding on-site, indicate that the site is primarily clay soils.

PROPOSED DRAINAGE CONDITIONS

The proposed conditions will not substantially modify the existing drainage patterns within the parking areas, but will incorporate the removal of 2 roof leaders from the sewer to the storm drain system. New drainage pipe will be installed as part of the proposed modifications, which will ultimately convey flows into the existing gravel wetland and into Fall Brook. Additionally, stormwater treatment measures will be included in the western-most parking area.

REGULATORY REQUIREMENTS

City of Portland, Maine

The proposed project will require adherence to the Stormwater Runoff policies within the City of Portland Technical Manual. According to the Section 5, "PORTLAND STORMWATER MANAGEMENT STANDARDS AND MAINE DEP CHAPTER 500 STORMWATER MANAGEMENT", *"Stormwater Management Plans for New Development: 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: Level I: Site Alteration, which will result in the creation of more than 1,000 square-feet of new impervious area or 10,000 square-feet of new non-impervious developed area, as defined under Developed Area and listed under Definitions of Chapter 500”.

Therefore, while the project itself is below the state thresholds for many of Chapter 500 and 502 regulations, the City of Portland’s local regulations will require adherence to stormwater management requirements outlined within these state regulations. MDEP Rule Chapters 500 and 502 describe stormwater management requirements for new development projects. These rules describe performance standards divided into five major categories: Basic Standards, General Standards, Phosphorous Standards, Urban Impaired Stream Standards, and Flooding Standards. The following sections describe how this project will address these stormwater management performance standards.

Basic Standards: A project must meet basic standards if it disturbs an area greater than one (1) acre. The proposed project will disturb greater than one acre of land, and therefore state and local regulations require adherence to this standard. These standards include various erosion and sedimentation controls, inspection and maintenance procedures, and general housekeeping requirements. These performance standards have been addressed in two separate reports entitled “Erosion and Sedimentation Control Plan” and “Inspection, Maintenance, and Housekeeping Plan” (Attachments to this report).

General Standards: A project is subject to the general standards if it results in the creation of one (1) or more acres of impervious area or developed areas greater than five (5) acres; while this project does not exceed this threshold, local regulations require adherence to this standard. This project has been designed to meet the general standards. These standards require that a minimum of 95% of all impervious areas (75% of impervious areas for the linear portion of the project) and at least 80% of all developed areas (50% of impervious areas for the linear portion of the project) are designed to be tributary to stormwater BMPs. Standard BMPs have been defined by the MDEP and are described thoroughly in their publication Stormwater Management for Maine: Best Management Practices manual, as most recently revised. Section VI-Stormwater Management BMPs of this Stormwater Management Plan describes the BMPs to be utilized on this project and specific design information for each BMP.

Phosphorus Standards: A project is subject to the phosphorous standards when it is in the watershed of a lake most at risk as identified in Chapter 502. This project is not located in the watershed of a lake that is identified as being Most at Risk in Chapter 502 and therefore the project is not subject to the Phosphorous Standards.

Urban Impaired Stream Standards: Stormwater from this is tributary to Fall Brook, an “Urban Impaired Stream” as defined by MDEP Chapter 502 and, therefore, is subject to the urban impaired stream standards. Mitigation credits in accordance with Chapter 501 are being applied for as part of this project.

Flooding Standards: The MDEP requires that projects creating impervious areas greater than three (3) acres, or developed areas greater than twenty (20) acres, address various flooding standards; while this project does not exceed this threshold, local regulations require adherence to this standard, and the project has analyzed the post-development flows for the 2-, 10-, and 25-year interval storms and their comparison to the pre-development conditions.

WATER QUALITY TREATMENT

As previously mentioned, the proposed development will generate 2,800 SF of new impervious surfaces in the form of additional parking and roadway infrastructure, and will incorporate removal of 30,419 SF of roof drains from the sanitary sewer to the storm drain. MaineDEP Chapter 500 water quality standards requires that for each square foot of impervious surface, one inch of treatment is to be provided. From the new impervious surfaces created, 2,768 Cubic Feet of stormwater runoff will be required to be treated. It is understood that the impervious surfaces developed on-site were created in the 1960s or earlier, and therefore is not subject to site law requirements.

A Grassed Underdrained Soil Filter (GUSF) was designed to accommodate this volume as part of a traffic island feature. Curb cuts and drainage infrastructure have been designed to allow for drainage from a designed subcatchment to convey flows to the proposed location.

In order to meet adjacent grades, a top-of-basin elevation of 110.50’ was chosen, with 112.00’ serving as the overflow and inlet elevation. Curb cut inlets were designed to be at elevation 112.30’, as to not be exceeded during the 25-year storm event, with a design media draining at

18"/48 hours, or 0.375 in/hr. Given the high water table, an impermeable liner has been incorporated as part of the proposed design.

Sediment forebays have also been designed to incorporate 10 storms per year, at 500 lbs/acre for each storm, with a sand density of 90 pcf. Given the 0.67 acres of sanded surfaces (impervious surfaces), this yields 37.2 cf of sand annually. Using a porosity of 0.4 for 6" riprap, 93 CF of riprap would be required. Riprap will be placed at 18" depth, and therefore 62 SF of riprap is required. 75 SF of riprap has been provided at the outlet locations, and therefore the project exceeds this standard.

Additional information requiring the design of the GUSF has been incorporated within the project plans, particularly noting the layers of the proposed filter.

Lyseth-Lyman Moore School Campus Upgrades					
Calculations:		Underdrained Soil Filter			
<u>Underdrained Soil Filter 1</u>					
<u>Subcatchment Review</u>					
Total Impervious Surfaces		29102	sf	0.67	acres
Total Non-Impervious Developed Surfaces		10356	sf	0.24	acres
Total Drainage Area		39458	sf	0.91	acres
<u>Basin Design</u>					
		<u>Treatment</u>	<u>Total acres</u>	<u>Multiplier</u>	<u>Volume</u>
		Impervious Area	0.668	1.0	2,425
		Developed Area	0.238	0.4	345
		Treatment Volume Required		2,770	cf
		Treatment Volume Provided		2,925	cf
Surface Area at Filter Elevation		1950	s.f.		
Water Quaility Volume (18-inch Ponding)		2925	cf		
		<u>Surface Area Check</u>			
		Impervious	29102	5%	1,455
Non-Impervious Developed Area		10356	2%	207	
		Total Surface Area Required, min.		1,662	sf

Lyseth-Lyman Moore School Campus Upgrades Stormwater Treatment Summary Table											
Summary Treatment Table											
Sub Catchment	Total Area	Impervious Area	Impervious Treated	% Impervious Treated	Landscaped Area	Landscaped Treated	% Landscaped Treated	Developed Area	Developed Treated	% Developed Treated	BMP
GUSF-1	39,458	29,102	29,102	100%	10,356.00	10,356.00	100%	39,458	39,458	100%	UGSF
TOTAL	39,458	29,102	29,102	100%	10,356.00	10,356.00	100%	39,458	39,458	100%	-
0.91 acres		See Project Plans for Subcatchments as indicated above									
		Impervious Area + Landscaped Area = Developed Area									
		If the BMP is underdrained filter the area of the filter must be at a minimum of 5% the impervious area + 2% of the landscaped area.									

The general standards require that 95% of the new impervious surface be treated. The existing athletics fields, parking areas, buildings, and appurtenant developed areas predate the SLODA requirements for stormwater treatment, and therefore are not subject to stormwater treatment. The proposed project is generating 2,768 cubic feet of stormwater, and is treating a total volume of 2,770 cubic feet of proposed surfaces from the designed subcatchment area. The proposed treatment facility is sized to accommodate 2,925 cubic feet of surface area. Therefore, greater than 100% of new surfaces are being treated as part of the proposed project. No new non-impervious developed area is created by the proposed project, as the site was previously developed as lawn/planted areas or parking areas and predate SLODA requirements.

URBAN IMPAIRED STREAM STANDARD

The proposed project is located within the Fall Brook watershed and, as such, is subject to the Urban Impaired Stream Standard by virtue of creating 2,800 SF of new impervious surfaces, which is greater than the 1,000 SF limit of additional impervious surface within this watershed. An additional 30,419 SF of rooftop area will be relocated from the storm sewer to the Fall Brook watershed, and as such this value has also been incorporated

In order to meet the Urban Impaired Stream Standard, the proposed project must provide additional stormwater treatment in order to offset the amount of developed surfaces created. The values utilized in the tables below are from MaineDEP Chapter 501, which establishes standards for applicants paying a compensation fee or undertaking mitigation to meet the requirements of the *Stormwater Management Law*, 38 M.R.S. §420-D(11) and Department rules.

Proposed New Impervious Area				
Location	Total Impervious (sf)	Total Impervious (acre)	Credits Per Acre	Credits Required
Roof Area	30,419	0.70	0.20	0.140
Additional Impervious	2,800	0.06	0.50	0.032
Total				0.172

Total Treated Amount							
System ID	Total Area draining to system		Credits Per Acre		Impervious Credits	Landscaped Credits	TOTAL CREDITS PROVIDED
	Treated Impervious (sf)	Treated Landscaped Area (sf)	Impervious Treated	Landscaped Treated			
UGSF-1	0.668	0.238	1.2	0.3	0.802	0.071	0.873

As noted in the tables above, the proposed Grassed Underdrained Soil Filter is located down-slope of a tributary area that contains mostly new medium-intensity parking areas, where the new areas discharging stormwater to Fall Brook are mostly made up of roof areas, which have a substantially lower pollutant load. The GUSF was designed to incorporate flows from the entire tributary area to Chapter 500 standards.

As indicated above, the treated credits account for a value of 0.873, and 0.172 credits were used to already meet the water quality standards. As such, 0.701 credits are available for the Urban Stream Standard. Whereas the proposed parking lot and proposed roof connections require only 0.172 credits, the proposed stormwater treatment measures provide more credits than required for new development.

From prior conversations with Portland Department of Public Works (meeting minutes from 12/20/16 meeting attached), it is understood that the roof drains are not required to be relocated, but removal of the roof drains is preferred if it is a possibility and does not result in substantially higher flows from the down-slope gravel wetpond. With the existing gravel wetpond not being sized in accordance with Chapter 500 for flows that are currently conveyed to it, we are not able to indicate that the pond removes all the pollutants directed towards it as a second, additional BMP to the proposed for the Urban Impaired Stream Standard requirements. However, from the calculations above, it is understood that the provided grassed underdrain soil filter has a capacity to remove a pollutant load 5x what is required, and would meet the proposed standards if a second BMP were on-site and functioning as required by Chapter 500 guidelines.

As such, the applicant is requesting a waiver for the Urban Impaired Stream Standard.

WATER QUANTITY TREATMENT

The site has been analyzed for pre-development and post-development runoff corresponding to the 2, 10 and 25 year storms. The Soil Conservation Service (SCS) TR-20 methodology was selected to determine the flow rates for this hydrologic analysis and HydroCAD (release 10.00) computer modeling software was utilized to perform the computations. This method relies heavily upon detailed watershed

characteristics and historical rainfall data to model estimated peak discharges at selected recurrence intervals. Printed results of the existing conditions HydroCAD modeling and hydrologic computations for the 2, 10 and 25-year recurrence interval are attached to the end of this report.

In recent years, many organizations in the environmental science community have noticed an upward trend in total rainfall for the northeastern United States. In response, the National Resource Conservation Service (formerly SCS) has partnered with Cornell University and the Northeast Regional Climate Center (NRCC) to prepare updated statistical rainfall information (see www.precip.net). The NRCC has published a new statistical analysis of rainfall information in the northeast. The NRCC 24-hour duration rainfall data specific to Portland for various recurrences intervals have been used in these calculations.

Site specific watershed details, including drainage area, land use cover, and time of concentration have been calculated. One pre-construction subcatchment and one post-construction subcatchments were developed with one appurtenant Study Point in order to determine where stormwater exits the property in the pre- and post-developed condition. Whereas this project has been originally developed, the model is considering the “pre-developed” condition to be that of which exists prior to the athletics fields construction. The results for runoff existing the site at these Study Points are summarized in the table below:

STUDY POINT ANALYSIS (PEAK FLOW RATES: CFS)						
<i>Study Point</i>	<i>Pre 2-yr</i>	<i>Post 2-yr</i>	<i>Pre 10- yr</i>	<i>Post 10-yr</i>	<i>Pre 25-yr</i>	<i>Post 25-yr</i>
SP-1	6.63	7.23	32.41	30.54	47.92	43.45

As indicated in the above table, the discharge in the proposed condition is less than the existing developed condition for the 10-year and 25-year conditions, therefore meeting the water quantity standard. The conditions are not met for the 2-year storm, and the difference is a relatively small 0.60 CFS. From the attached HyrdroCAD report, it is understood that a substantial difference in smaller interval storms is the low time of concentration from the rooftops which are being separated from the sanitary sewer, and their associated large flows when compared to other subcatchments which have either ponding infrastructure or larger subcatchments with larger time of concentration values. As such, the applicant is requesting a waiver from the water quantity standard for the 2-year storm.

CONCLUSION

By incorporating various treatment methods and measures, surface runoff from the proposed development will receive treatment that meets the Basic and General Standards. Requests for waivers for the Flooding

Standard, and Urban Impaired Stream Standard, have been included as part of the submission with information supporting the requests for those waivers.

ATTACHMENT 12.2

STORMWATER MEETING WITH DPW MINUTES

**CITY OF PORTLAND, MAINE
LYSETH-MOORE MASTER PLAN IMPLEMENTATION
STATUS MEETING
MINUTES**

December 20, 2016 – 1:00 P.M., 212 Canco Road

Attendance

City of Portland:	Aaron Shields – Project Manager Chris Branch – Department of Public Works Nancy Gallinaro – Department of Public Works Justin Pellerin – Department of Public Works
Wright-Pierce:	Jennifer Claster, RLA – Project Manager Michael Guethle, PE – Project Engineer Doug Rice, PE – Project Manager
Absent:	Sally Deluca –Director, Department of Parks, Recreation & Facilities David Onos – Director of Building Trades Ethan Owens – Department of Parks and Recreation Nathaniel Smith – Department of Public Works

Items for Discussion

1. Project Update

- Wright-Pierce design and review of proposed project
 - A scope of work was previously defined for the athletic fields, limited to drainage reconstruction, maintenance of turf and baseball/softball infields, irrigation, and drainage.
 - Associated phasing of project:
 - Proceeding with Athletic Fields as A Separate Project
 - The work will consist of drainage reconstruction, maintenance of turf and baseball/softball infields, irrigation, and underdrains, as well as the walking path and associated stormwater treatment. It will not include the roof disconnections or renovation of the adjacent parking lots.
 - The walking path will need treatment for stormwater. Wright-Pierce to evaluate additional options for treatment.
 - Phased Site Plan for the remainder of the work.
 - Stormwater treatment methods would likely need to be constructed in first phase/summer of construction.

2. Stormwater Recommendations

- Drainage within Athletic Fields System was discussed. The existing conveyance system is in need of repair/maintenance. Drainage repair will be completed in accordance with any work within the drainage fields.

- Drainage from Roof Areas:
 - Lyman-Moore: Approximately half of the stormwater flows from the Middle School roof are currently conveyed to the gravel wetland. The northern portion of the building has roof drainage connected to the combined sewer; removing roof drains from sewer in this location would likely require reconfiguring plumbing within the building prior to outletting to a new separate storm and sanitary sewer system.
 - Lyseth School: The eastern roof drainage can be conveyed to the athletic fields drainage system due to the proximity of the proposed stormwater infrastructure. The western roof drainage can be conveyed from the combined sewer to the circulation area drainage system. Both structures will require reconstruction or partial reconstruction in order to remove stormwater flows from the sanitary sewer.
- Stormwater treatment: Proposed impervious: Currently, the proposed site improvements will only create 12,200 SF of additional impervious surfaces from currently developed surfaces. This number will likely change as we modify the site into additional design phases. Removing the Lyseth School's roof drain connections from the sanitary sewer is a feasible option, and it is currently anticipated that these flows will be re-routed to the gravel wetland. As such, the gravel wetland either needs to be expanded to accommodate these flows, a scenario described by the calculations below, or to have treatment provided on-site through other stormwater treatment methods:

Additional Impervious Flows Generated From Design			
Location	SF	Treatment Multiplier (in)	Volume (CF)
From Lyseth Roof	50,775	1	4,231.25
Add'l Impervious	12,200	1	1,016.67
			5,247.92

- Ultimately, the City's stormwater policies only require the site to treat the additional 1,017 CF of stormwater generated by the redevelopment (through 12,200 SF of additional impervious surfaces).
- Currently, all surface drainage for the project area either is conveyed to the gravel wetland or to the sanitary sewer system. If the entire project area were to be treated by the gravel wetland, the following capacity would be necessary:

Treatment Necessary for Entire Site				
Item	Area (SF)	Area (Acres)	Treatment (in)	Volume (CF)
TOTAL IMP	422791	9.71	1	35,232.58
TOTAL DEV	426274	9.79	0.4	14,209.13
				49,441.71

- A review of current MaineDEP regulations indicated that gravel wetlands can only claim water quality treatment for up to 18" of ponding. As such, it is understood that the existing gravel wetland is undersized to current DEP standards, although it may have been designed appropriately for DEP standards developed prior to 2016. However, if improvements are made to the gravel wetland, we may be required to increase the pond to its full required size for the entire lot to be in accordance with Chapter 500 regulations.
 - Public works may complete an after-the-fact green infrastructure project that involves increasing the size of the gravel wetland, unrelated to the proposed project.
- No EPA requirements that would require separation were noted.

- Since roof runoff is much less polluted than other sources of urban runoff, it was suggested by DPW that the roof connections could simply be placed into gravel wetland, with the understanding that the gravel wetland is undersized. If the elementary school roof drains can be easily connected to the storm drain, then great; but it is not required by City code.
 - At this time, there are many additional projects on the DPW priority list that would require funding prior to this sewer separation project. This, associated with the need for the DPW to follow certain protocols with funding, would make it very cumbersome for DPW to assist in any stormwater conveyance/treatment at this time.
 - Connecting the roof drains to the existing stormwater drain may require the existing pipes to be upsized.
 - It is understood that the existing gravel wetland is undersized, but would provide some level of treatment for temperature and detention concerns within Fall Brook.
 - Outlet and emergency spillway will need to be re-evaluated for 25/50/100-year storms should additional flows be directed to the gravel wetland.
 - A brief HydroCAD model will be created by Wright-Pierce. As part of this process, Wright-Pierce will review whether or not the proposed project has different peak flows for different areas of the project, and when those flows would arrive at the gravel wetland.
- Chris Branch can review if a gravel wetland/green infrastructure grant would even be an option for this project, should that route be chosen as an option.
 - Should this option be chosen, it is understood that the existing tee-ball field may be encroached on to expand stormwater treatment facilities.
 - Due to the limited ponding allowed for water quality volume with gravel wetlands, other stormwater treatment best management practices may want to be vetted by the DPW should they proceed with this option.
 - Schools is currently paying into stormwater fee credit, but there would not be any credit for reduction to CSO flows removal at this time.
 - While there is an opportunity to make the wetland an educational option, that is not a priority for limited funds.
- Any work for roof drain connection to the storm sewer should be done as part of the facilities project phases. The athletic fields should remain a separate project in order to be treated as a maintenance project.

3. Schedule and Next Steps

- Meet with Planning to review stormwater and phasing approaches
- Utility Coordination
- Preliminary Design
- Borings

ATTACHMENT 12.3

MEDIUM-INTENSITIES SOILS REPORT



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Cumberland County and Part of Oxford County, Maine



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	12
Map Unit Descriptions.....	12
Cumberland County and Part of Oxford County, Maine.....	14
BuB—Lamoine silt loam, 3 to 8 percent slopes.....	14
DeB—Deerfield loamy sand, 3 to 8 percent slopes.....	15
HrB—Hollis fine sandy loam, 3 to 8 percent slopes.....	16
References	17

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

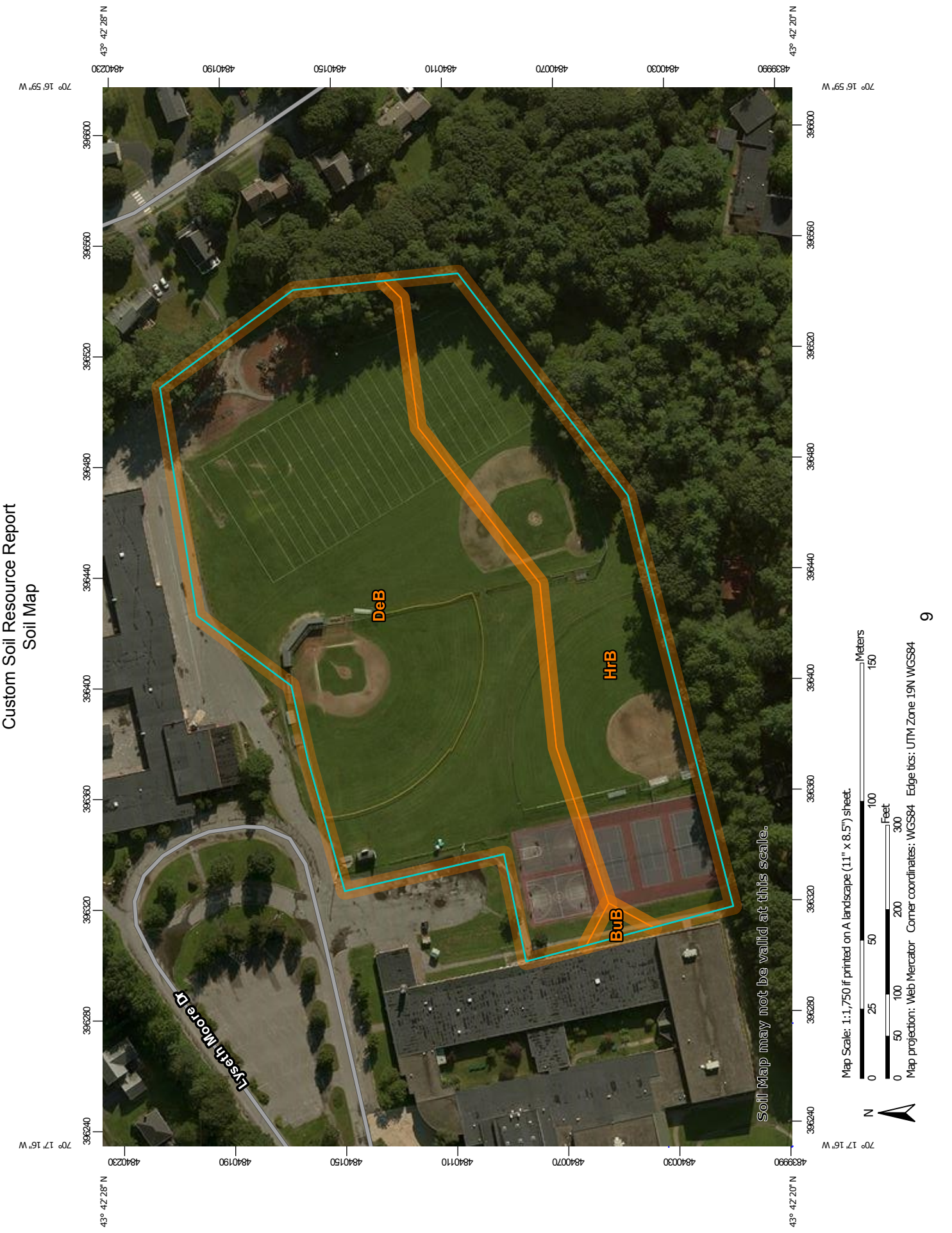
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,750 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 12, Sep 15, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 31, 2013—Aug 11, 2013

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Cumberland County and Part of Oxford County, Maine (ME005)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BuB	Lamoine silt loam, 3 to 8 percent slopes	0.0	0.5%
DeB	Deerfield loamy sand, 3 to 8 percent slopes	5.2	66.2%
HrB	Hollis fine sandy loam, 3 to 8 percent slopes	2.6	33.3%
Totals for Area of Interest		7.9	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Cumberland County and Part of Oxford County, Maine

BuB—Lamoine silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t0kc

Elevation: 10 to 490 feet

Mean annual precipitation: 33 to 60 inches

Mean annual air temperature: 36 to 52 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Lamoine and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lamoine

Setting

Landform: Marine terraces, river valleys

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Fine glaciomarine deposits

Typical profile

Ap - 0 to 7 inches: silt loam

Bw - 7 to 13 inches: silt loam

Bg - 13 to 24 inches: silty clay loam

Cg - 24 to 65 inches: silty clay

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: About 6 to 17 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: C/D

Hydric soil rating: No

DeB—Deerfield loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: blh6

Elevation: 150 to 1,200 feet

Mean annual precipitation: 30 to 50 inches

Mean annual air temperature: 37 to 45 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Deerfield and similar soils: 87 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Outwash terraces

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Sandy glaciofluvial deposits derived from granite and gneiss

Typical profile

H1 - 0 to 10 inches: loamy sand

H2 - 10 to 24 inches: loamy sand

H3 - 24 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)

Depth to water table: About 18 to 36 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: A

Hydric soil rating: No

HrB—Hollis fine sandy loam, 3 to 8 percent slopes

Map Unit Composition

Hollis and similar soils: 85 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hollis

Setting

Landform: Hills

Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Interfluvium, crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Coarse-loamy supraglacial meltout till derived from mica schist

Typical profile

H1 - 0 to 6 inches: fine sandy loam

H2 - 6 to 18 inches: fine sandy loam

R - 18 to 22 inches: bedrock

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Natural drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: D

Hydric soil rating: No

References

- American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.
- American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.
- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
- Federal Register. September 18, 2002. Hydric soils of the United States.
- Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.
- National Research Council. 1995. Wetlands: Characteristics and boundaries.
- Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262
- Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577
- Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580
- Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.
- United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374
- United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

ATTACHMENT 12.4

INSPECTION, MAINTENANCE,
AND HOUSEKEEPING PLAN

INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

City of Portland: Parks, Recreation and Facilities Management Department Lyseth-Lyman Moore Parking and Circulation Improvements Portland, Maine

Introduction

The following plan outlines the anticipated inspection, maintenance and housekeeping 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).

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, material 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.

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 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. 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.

C. 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.
- Barriers shall be removed upon permanent stabilization of the tributary area.
- Upon removal of the barrier, all accumulated sediments downstream of the structure shall be cleaned from the storm drain system.

D. 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).

E. 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.

F. 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.

G. Stormwater Best Management Practices:

- Some Stormwater Best Management Practices may require inspection during construction. Each Stormwater Best Management Practice shall be inspected in accordance with its associated detail as indicated on the site plan.
- For all Stormwater Best Management Practices, contractor shall ensure that all areas tributary to each Stormwater Best Management Practice are stabilized prior to construction.

After Construction

1. **Inspection:** After construction, it is the responsibility of the owner or assigned heirs 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. 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).

C. 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.
- Ensure that no winter sanding is done in Porous Pavement locations.

D. Grassed Underdrained Soil Filters

- Fertilization to establish vegetation within the soil filter should be avoided.
- Snow storage shall not occur in the soil filter.
- Check for accumulated sediments in the bottom of the soil filters. Remove sediments when they occupy 10 percent of the filter or sediment forebay bottom; if trenches fail to drain after surface sediment accumulations are removed, the filter medium must be replaced, using the same design, installation measures, and permeability testing procedures described in this application and related documents.
- Check for the dissipation of water after large storm events. The soil filter

should be completely drained 72 hours after filling from the storm event.

- Check road shoulders for grass cover and erosion. The shoulders should have a complete stand of grass cover and be free of erosion rills or washouts. Repair any washouts and re-loam and seed to re-establish grade and grass cover.

3. **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.

Housekeeping

The following general performance standards apply to the proposed project both during and after construction.

- A. Spill prevention: Controls must be used to prevent pollutants from being discharged from materials and equipment 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 ensure 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, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately and no less than once a week and prior to significant storm events. Operations during dry months, that experience fugitive dust problems, should wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.
- D. Debris and other materials: Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials to precipitation and stormwater runoff. These materials 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.
- F. Excavation de-watering: Excavation de-watering is the removal of water from trenches, foundations, coffer dams, 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 removed from the ponded area, either through gravity or pumping, 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 by the department.
- G. Authorized non-stormwater discharges: Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:
- (a) discharges from firefighting activity;
 - (b) fire hydrant flushings;
 - (c) vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
 - (d) dust control runoff in accordance with permit conditions and appendix (c)(3);
 - (e) routine external building washdown, not including surface paint removal, that does not involve detergents;
 - (f) pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
 - (g) uncontaminated air conditioning or compressor condensate;

- (h) uncontaminated groundwater or spring water;
 - (i) foundation or footer drain-water where flows are not contaminated;
 - (j) uncontaminated excavation dewatering (see requirements in appendix c(5));
 - (k) potable water sources including waterline flushings; and
 - (l) landscape irrigation.
- H. Unauthorized non-stormwater discharges: The department's approval under this chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with appendix c (6). Specifically, the department's approval does not authorize discharges of the following:
- (a) wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
 - (b) fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
 - (c) soaps, solvents, or detergents used in vehicle and equipment washing; and
 - (d) toxic or hazardous substances from a spill or other release.
- I. Staging of Operations: All stockpiling of materials and staging of construction equipment shall be completed in the outlined limit of work, or at the contractor's facilities off-site. All stockpiles shall be stabilized in the manner described in the Erosion and Sedimentation Control Plan and narrative.
- J. Additional requirements. Additional requirements may be applied on a site-specific basis.

Stormwater Inspection and Maintenance Form

City of Portland, Maine
Parks, Recreation and Facilities Management Department

Lyseth-Lyman Moore School Circulation and Parking

Inspector: _____

Date: _____

Maintenance Personnel: _____

	Inspection		Maintenance	
<u>SITE AREA</u>	Date	Comments	Date	Corrective Action
GUSF Vegetation and Mulch				
GUSF Media				
GUSF Sediment Riprap				
GUSF Misc				
General: Overflow Structures				
General: Vegetated areas adjacent to pavement runoff				
General: Lawn Vegetation				
General: Slope Vegetation				
General: Entrance Road Sweeping				
General: Swale and drainage way erosion				
General: Catch Basins				

Sediment/Debris Disposal

Location of Sediment/Debris Accumulation	Location of Sediment/Debris Disposal	Date of Disposal

Stormwater Inspection and Maintenance Form

City of Portland, Maine
Parks, Recreation and Facilities Management Department

--	--	--

ATTACHMENT 12.5

EROSION AND SEDIMENTATION CONTROL PLAN

EROSION AND SEDIMENTATION CONTROL PLAN

City of Portland: Parks, Recreation and Facilities Management Department Lyseth-Lyman Moore Parking and Circulation Improvements Portland, Maine

INTRODUCTION

This Erosion and Sedimentation Control Plan (E&S Plan) has been developed to provide a strategy to prevent unreasonable erosion of soil and sediment transport beyond the project site or into a protected natural resource. These strategies apply to the proposed development immediately prior to soil disturbing activities on the site and shall remain in place until the site is permanently stabilized.

The information presented in this E&S Plan is provided as an overview of the anticipated measures to be used on this site. In some instances, additional measures may be required due to unexpected conditions that arise during construction. Also, specific detail on the application of a recommended practice for an unexpected instance may not be covered in this E&S Plan. For additional detail on any of the erosion and sedimentation control measures discussed in this E&S Plan or for further recommendations of applicable practices, refer to the “Maine Erosion and Sedimentation Control BMP” manual published by the Maine Department of Environmental Protection (MDEP) dated March 2003, as revised.

1.0 PLAN IMPLEMENTATION PHASES

Generally, the implementation of this plan occurs in three distinct phases as described below:

1.1 Pre-construction Phase

Prior to the beginning of any construction, perimeter sediment barriers (i.e. silt fence, erosion control mix berm, etc...) shall be installed at, or just below, the limits of clearing or grubbing, and/or just above any adjacent property line or protected natural resource. Prior to any clearing or grubbing, a construction entrance shall be constructed at the intersection with the proposed access drive and the existing roadway to avoid tracking of mud, dust and debris from the site.

1.2 Construction Phase

Areas undergoing actual construction shall only expose that amount of mineral soil necessary for progressive and efficient site construction. Any area that has been disturbed and is not “permanently stabilized” (as described by this E&S Plan) shall be considered “open.” Open areas shall be protected and stabilized with temporary erosion and sedimentation control measures as shown on the project plans and as described within this E&S Plan.

Preparation for winter stabilization applies to some disturbed areas that are open on or after September 15th of the construction season (refer to the Winter Construction Section of this E&S Plan, Paragraph B – Overwinter Stabilization Timeframe). Any areas that remain open after November 1 or new soil disturbance that occurs after November 1, but before April 15, must be protected by additional measures as described in the Winter Construction section of this E&S Plan. The recommendations outlined in the Winter Construction section of this E&S Plan shall supersede other conflicting recommendations.

1.3 Post-construction phase

Once the site has reached permanent stabilization, remove any temporary sediment control measures, such as silt fence, within 30 days. All accumulated sediment/debris in the permanent stormwater management system, ditches, swales, paved surfaces, and/or any other location that has accumulated sediment/debris during construction shall be removed and disposed of in an approved manner.

2.0 PERMANENT STABILIZATION

The strategies outlined in this E&S Plan shall be in effect until the site reaches permanent stabilization. Newly seeded or sodded areas must be protected from vehicle traffic, excessive pedestrian traffic, and concentrated runoff until the vegetation is well established. If necessary, areas must be seeded and mulched again if germination is sparse, plant coverage is spotty, or topsoil erosion is evident. The following list defines permanent stabilization for applicable situations.

- 2.1 **Seeded Areas:** For seeded areas, permanent stabilization means a 90% cover of vigorous perennial growth with no evidence of washing or rilling of the topsoil.
- 2.2 **Sodded Areas:** For sodded areas, permanent stabilization means the complete binding of the sod roots into the underlying soil with no slumping of the sod or die-off.
- 2.3 **Permanent Mulch:** For mulched areas, permanent mulching means total coverage of the exposed area with an approved mulch material. Erosion control mix may be used as mulch for permanent stabilization according to approved application rates and limitations.
- 2.4 **Riprap:** For areas stabilized with riprap, permanent stabilization means that slopes stabilized with riprap have an appropriate backing of well-graded gravel or approved geotextile to prevent soil movement from behind the riprap.
- 2.5 **Paved Areas:** For paved areas, permanent stabilization means the placement of compacted gravel subbase is completed.
- 2.6 **Ditches, channels, and swales:** For open channels, permanent stabilization means the channel is stabilized with a 90% cover of vigorous perennial growth, a well-graded riprap lining, or with another non-erosive lining such as specified. There must be no evidence of slumping of the channel lining, undercutting of the channel banks, or down-cutting of the channel.

3.0 TEMPORARY EROSION AND SEDIMENTATION CONTROL BMPS

The placement/use of the following erosion and sedimentation control measures shall be in accordance with the "Maine Erosion and Sedimentation Control BMP" manual published by the Maine Department of Environmental Protection (MDEP) dated March 2003, as revised.

- 3.1 **Sediment Barriers:** Prior to the beginning of any construction, sediment barriers (i.e. silt fence, erosion control mix berms, etc...) shall be installed across the slope(s), on the contour, at or just below the limits of clearing or grubbing, and/or just above any adjacent property line or watercourse to protect against construction related erosion. Sediment barriers shall be maintained until all tributary open areas have been permanently stabilized. The following are recommended perimeter sediment barriers:

- **Silt fence:** Shall be installed per the detail on the plans. The effective height of the fence shall not exceed 36 inches. It is recommended that silt fence be removed by cutting the fence materials at ground level so as to avoid additional soil disturbance.
- **Staked hay bales:** Shall be installed per the detail on the plans. Bales shall be wire-bound or string-tied and these bindings must remain parallel with the ground surface during installation to prevent deterioration of the bindings. Bales shall be installed within a minimum four (4) inch deep trench line with ends of adjacent bales tightly abutting another.
- **Erosion control mix berm:** Shall be installed per the detail on the plans. The mix shall consist primarily of organic material and contain a well-graded mixture of particle sizes. The mix must meet the most recent composition specifications published by the MDEP. No trenching is required for installation of this barrier.

3.2 Surface Stabilization: All disturbed areas that will not be worked for more than 7 days shall be protected and stabilized with mulch or other non-erodable cover. Areas located within 75 feet of a wetland or waterbody must be protected and stabilized within 48 hours of the initial disturbance of the soil or prior to any storm event, whichever comes first. Areas that have been seeded (temporary or permanent) shall be stabilized immediately. The following are recommended practices for surface stabilization:

- **Hay or straw Mulch:** Organic mulches including hay and straw need to be air-dried, free of undesirable seeds and coarse materials. Application rate shall be 2 bales (70-90 lbs) per 1000 square feet or 1.5 to 2 tons (90-100 bales) per acre. This type of mulch must be anchored with a tackifier amendment and/or via physical means (i.e. vehicle tracking, jute netting, etc...) to avoid displacement by wind or water.
- **Erosion control mix:** Erosion Control Mix can be manufactured on or off the site. It is composed primarily of shredded bark, stump grindings, composted bark, or other acceptable products based on a similar raw source. The mix must meet the most recent composition specifications published by the MDEP. The mix shall be placed evenly and must provide 100% soil coverage. Erosion control mix shall be applied such that the thickness on slopes 3:1 or less is 2 inches plus ½ inch per 20 feet of slope up to 100 feet. The thickness on slopes between 3:1 and 2:1 is 4 inches plus ½ inch per 20 feet of slope up to 100 feet. This shall not be used on slopes greater than 2:1.
- **Erosion control blankets:** Erosion Control Blankets are used on steep slopes (greater than 3H:1V) and also areas that will receive concentrated stormwater flows. Blankets aid in controlling erosion on disturbed soils and critical areas during the establishment period of vegetation. Various forms of erosion control blankets are commercially available, each with different advantages for different applications. The type of blanket to be used for individual applications shall be as indicated on the development plan set or via the use of an approved equivalent blanket. In all applications, the blanket manufacturer's specifications and installation methods shall be referenced and adhered to.

3.3 Soil Stockpiles: All topsoil shall be stockpiled for future use on the project at a stable location on-site. Structural measures, such as sediment barriers, may be warranted for additional sediment control of the stockpile areas. Stockpiles of soil or subsoil shall be mulched with hay or straw or with erosion control mix. This must be done within 24 hours of stocking and re-established prior to any rainfall. Any soil stockpile will not be placed (even covered with hay or straw) within 75 feet from any protected natural resources.

3.4 Stabilized Construction Entrance/Exit: Prior to any clearing or grubbing, a stabilized construction entrance/exit shall be constructed wherever traffic will exit the construction site onto

a paved roadway in order to minimize the tracking of sediment and debris from the construction site onto public roadways. The entrances and adjacent roadway areas shall be periodically swept or washed to further minimize the tracking of mud, dust or debris from the construction area. When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment trapping device. Stabilized construction exits shall be constructed in areas as specified and detailed on the plans.

- 3.5 Stone Check Dams:** Stone check dams are generally temporary devices, which are constructed across a swale or drainage ditch. Their purpose is to reduce the velocity of concentrated stormwater flows, thereby reducing erosion of the swale or ditch. These devices will also trap small amounts of sediment generated in the ditch itself, however, they are not an effective sediment trapping device and should not be used as such. Stone check dams are typically constructed of 2"-3" crushed stone and stand 24 inches in height.
- 3.6 Storm Drain Inlet Protection:** Storm drains are typically operational prior to permanent stabilization of tributary areas. In these instances, hay bales, crushed stone barriers, and/or silt sacks shall be used within a catch basin or prior to a pipe entrance. This temporary protection will assist in the removal of sediment prior to entrance into a storm drainage system and the prevention of clogging and/or loss of capacity. These devices alone will not prevent all sediment from entering the stormwater system and should be used in conjunction with other devices to achieve desired sediment removal levels.
- 3.7 Dewatering:** Water from construction dewatering will pass first through a filter bag or secondary containment structure (e.g. hay bale lined pool) prior to discharge. The discharge site shall be selected to avoid flooding, icing and sediment discharges to a protected natural resource. Discharge is permitted within the filter basin locations prior to the installation of the filter media.
- 3.8 Dust Control:** Dust control during construction shall be achieved by the use of a watering truck to periodically sprinkle the exposed roadway areas as necessary to reduce dust during the dry months. Applying other dust control products such as calcium chloride or other manufactured products are allowed if authorized by the proper local, state and/or federal regulating agencies. However, it is the contractor's ultimate responsibility to mitigate dust and soil loss from the site.
- 3.9 Concrete Washout:** Concrete washout(s) shall be made available on-site during times when cast-in-place concrete structures are being poured. Concrete washout shall be large enough to wash out trucks, inspection equipment, and working tools as necessary. No concrete washwater shall be directly discharged to any stormwater infrastructure or to any protected natural resources. Once dried, concrete shall be disposed in accordance with proper local, state, and/or federal regulating agencies. Concrete washout shall be constructed in accordance with Dewatering Filter Detail, or other method as approved by engineer.
- 4.0 VEGETATIVE MEASURES**
- 4.1 Temporary Vegetation:** If any disturbed area of soil will be left bare for more than 7 days, or if construction is to be completed in phases over an extended duration, temporary seeding and mulching shall commence immediately following initial fine grading of the site. In sensitive areas (within 75 feet of protected natural resources) temporary mulch must be applied within 48 hours or prior to any storm event on all disturbed surfaces. It shall be maintained and reseeded, as necessary, to ensure good vegetative cover for the entire duration of construction. Seed will be selected from the following table (Table 1 - Temporary Seed Mixture) according to the time of year or via an approved equivalent method.

**TABLE 1
TEMPORARY SEED MIXTURE**

Seed	Lbs./Acre	Lbs./1000s.f.	Recommended Seeding Date
Winter Rye	112	2.6	8/15 thru 10/1
Oats	80	1.8	4/1 thru 7/1 8/15 thru 9/15
Annual Ryegrass	40	0.9	4/1 thru 7/1
Sudangrass	40	0.9	5/15 thru 8/15
Perennial	40	0.9	8/15 thru 9/15

Note:

Some tree and shrub species may be desirable for sites primarily covered with sand and gravel. These methods shall be approved by the appropriate regulatory authority prior to use.

- 4.2 Permanent Vegetation:** Revegetation measures shall commence immediately upon completion of final grading of areas to be loamed and seeded. Revegetation measures shall consist of the following:

4.2.1 Seedbed Preparation

- Four (4) inches of loam will be spread over disturbed areas and smoothed to a uniform surface. Loam shall be free of subsoil, clay lumps, stones and other objects over 2" in any dimension, and without weeds, roots or other objectionable material.
- Soil tests shall be taken at the time of soil stripping to determine fertilization requirements. Soil tests shall be taken promptly as to not interfere with the 7-day limit on soil exposure (48-hours adjacent to a protected natural resource). Based upon test results, soil amendments shall be incorporated into the soil prior to final seeding. In lieu of soil tests, soil amendments may be applied as shown below in Table 2:

**TABLE 2
RECOMMENDED SOIL AMENDMENTS**

Item	Application Rate
10-20-20 Fertilizer (N-P205-K20 or equal)	18.4lbs./1,000 s.f.
Ground Limestone (50% calcium and magnesium oxide)	138-lbs./1,000 s.f.

- Work lime and fertilizer into the soil as nearly as practical to a depth of four (4) inches with proper equipment. Roll the area to firm the seedbed except on clay, silty soils or coarse sand.

4.2.2 Application of Seed

- **Seeding:** The seed mixture shown below in Table 3 shall be utilized for permanent seeding for the majority of the project:

**TABLE 3
PERMANENT SEED MIXTURE**

Seed Type	Application Rate
Creeping Red Fescue	0.46 lbs/1,000 s.f. (20 lbs/acre)
Red Top	0.05 lbs/1,000 s.f. (2 lbs/acre)
Tall Fescue	0.46 lbs/1,000 s.f. (20 lbs/acre)
Total:	0.97 lbs/1,000 s.f. (42 lbs/acre)

- **Seeding:** The seed mixture shown below in Table 4 shall be utilized for permanent seeding for modifications adjacent to the athletics fields:

**TABLE 4
PERMANENT SEED MIXTURE**

Seed Type	Application Rate
Kentucky Bluegrass	2.5 lbs/1,000 s.f. (110 lbs/acre)

- **Hydroseeding:** Shall be conducted on prepared areas as described above. Hydroseeding shall not be done on slopes steeper than 2H:1V. Lime and fertilizer may be applied simultaneously with the seed. Recommended seeding rates must be increased by 10% when hydroseeding.
- **Surface Stabilization:** Mulching or other approved surface stabilization methods shall commence immediately after seed is applied. Refer to the surface stabilization section of this plan for more information.

4.2.3. Sodding

Following seedbed preparation, sod can be applied in lieu of seeding in areas where immediate vegetation is most beneficial such as ditches, around stormwater drop inlets and areas of aesthetic value. Sod should be laid at right angles to the direction of flow starting at the lowest elevation. Sod should be rolled or tamped down to even out the joints once laid down. Where flow is prevalent the sod must be properly anchored down. Irrigate the sod immediately after installation. In most cases, sod can be best established between April 1 and November 15 of the construction year.

5.0 WINTER CONSTRUCTION

The winter construction period is from November 1 through April 15. If the construction site is not permanently stabilized by November 15 then the site needs to be protected with over-winter stabilization.

Winter excavation and earthwork shall be completed such that no more than 1 acre of the site is without stabilization at any one time. Limit the exposed area to those areas in which work is expected to be under taken during the proceeding 15 days and that can be mulched in one day prior to any snow event. All

areas shall be considered to be denuded until the subbase gravel is installed in roadway areas or the areas of future loam and seed have been loamed, seeded and mulched.

Any added measures, which may be necessary to control erosion/sedimentation from the site dependent upon the actual site and weather conditions, must be installed. Continuation of earthwork operations on additional areas shall not begin until the exposed soil surface on the area being worked has been stabilized, in order to minimize areas without erosion control protection.

5.1 Winter Construction BMP Adjustments

- 1) **Sediments Barriers:** During frozen conditions, sediment barriers shall consist of erosion control mix berms as frozen soil prevents the proper installation of hay bales and silt fences.
- 2) **Mulching:** Between the dates of November 1 and April 15, all mulch shall be anchored by either mulch netting, asphalt emulsion chemical, track or weed cellulose fiber. When the ground surface is not visible through the mulch then cover is sufficient. After November 1st, mulch and anchoring of all exposed soil shall occur at the end of each final grading workday.
 - **Open Surfaces (flatter than 8%):** Hay and straw mulch shall be applied at a rate of 150 lb. per 1,000 square feet or 3 tons/acre (twice the normal accepted rate of 75-lbs./1,000 square feet or 1.5 tons/acre) and shall be properly anchored. Mulch shall not be spread on top of snow. The snow will be removed down to one-inch depth or less prior to application. After each day of final grading, the area will be properly stabilized with anchored hay or straw or erosion control matting. An area shall be considered to have been stabilized when exposed surfaces have been either mulched with straw or hay at a rate of 150 lb. per 1,000 square feet (3 tons/acre) and adequately anchored that ground surface is not visible through the mulch.
 - **Open Slopes (8% or steeper) and Drainage Ways:** Slopes shall not be left exposed for any extended time of work suspension unless fully mulched and anchored with netting or erosion control blankets. Mulching shall be applied at a rate of 230-lbs/1,000 square feet on all slopes steeper than 8%. Mulch netting shall be used to anchor mulch in all drainage ways with a slope steeper than 3% for slopes exposed to direct winds and for all other slopes steeper than 8%. Erosion control blankets shall be used in lieu of mulch in all drainage ways. Erosion control mix can be used to substitute erosion control blankets on slopes that do not exceed 2H:1V. In this case, the erosion control mix shall be spread out, not placed in a berm as it is installed as a sedimentation barrier.
- 3) **Soil Stockpiles:** Stockpiles of soil or subsoil shall be mulched for over winter protection with hay or straw at twice the normal rate or at 150-lbs/1,000 square feet (3 tons per acre) or with a four-inch layer of wood waste erosion control mix. This will be done within 24 hours of stocking and re-established prior to any rainfall or snowfall. Any soil stockpile will not be placed (even covered with hay or straw) within 100 feet from any natural resources.

- 4) **Natural Resources Protection:** Any areas within 100 feet from any protected natural resources, if not stabilized with a minimum of 90% mature vegetation catch, shall be mulched by December 1 and anchored with plastic netting or protected with erosion control mats. During winter construction, a double line of sediment barriers (i.e. silt fence backed with hay bales or erosion control mix) will be placed between any natural resource and the disturbed area. Projects crossing the natural resource shall be protected a minimum distance of 100 feet on either side from the resource. Existing projects not stabilized by December 1 shall be protected with the second line of sediment barrier to ensure functionality during the spring thaw and rains.
- 5) **Seeding:** Between the dates of October 15 and April 1st, loam or seed will not be required. During periods of above freezing temperatures finished areas shall be fine graded and either protected with mulch or temporarily seeded and mulched until such time as the final treatment can be applied. If the date is after November 1st and if the exposed area has been loamed, final graded with a uniform surface, then the area may be dormant seeded at a rate of 3 times higher than specified for permanent seed and then mulched.

Dormant seeding may be selected to be placed prior to the placement of mulch and 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-lbs/1000 square feet. All areas seeded during the winter 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.

5.2 Overwinter Stabilization Timeframe

- 1) **Ditches and Channels:** All stone-lined ditches and channels must be constructed and stabilized on the site by November 15. All grass-lined ditches and channels must be constructed and stabilized by September 15. If a ditch or channel is not grass-lined by September 15, then one of the following actions must be taken to stabilize the ditch for late fall and winter.
- **Install a sod lining in the ditch:** A ditch must be lined 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, 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:** A ditch must be lined with stone riprap by November 15. A registered professional engineer must be hired to determine the stone size and lining thickness needed to withstand the anticipated flow velocities and flow depths within the ditch. If necessary, the ditch must be regraded prior to placing the stone lining to prevent the stone lining from reducing the ditch's cross-sectional area.
- 2) **Disturbed Slopes:** All stone-covered slopes must be constructed and stabilized by November 15. All slopes to be vegetated must be seeded by September 15. The MDEP

will consider any area having a grade greater than 15% (10H:1V) to be a slope. If a slope to be vegetated is not stabilized by September 1, then one of the following actions must be taken to stabilize the slope for late fall and winter.

- **Stabilize the soil with temporary vegetation and erosion control blankets:** By October 1 the disturbed slope must be seeded with winter rye at a seeding rate of 3 pounds per 1,000 square feet and apply erosion control blankets over the mulched slope. If the rye fails to grow at least three inches or cover at least 90% of the disturbed slope by November 1, the slope will be covered with a layer of erosion control mix or stone riprap as described in the following standards.
- **Stabilize the slope with sod:** The disturbed slope must be stabilized with properly installed sod by October 1. Proper installation includes 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. Slopes steeper than 33% (3H:1V) or having groundwater seeps on the slope face, may not use late-season sod installation for stabilization.
- **Stabilize the slope with erosion control mix:** A six-inch layer of erosion control mix must be spread over the slope by November 15. Prior to placing the erosion control mix, any snow accumulation on the disturbed slope must be removed. Slopes steeper than 50% (2H:1V) or having groundwater seeps on the slope face can not use erosion control mix to stabilize slopes.
- **Stabilize the slope with stone riprap:** A layer of stone riprap can be placed on the slope by November 15. A registered professional engineer must be hired to determine the stone size needed for stability and to design a filter layer for underneath the riprap.

3) **Other Disturbed Soils:** By September 15, all disturbed soils on areas having a slope flatter than 15% (15H:1V) must receive seed and mulch. If disturbed areas are not stabilized by this date, then one of the following actions must be taken to stabilize the soil for late fall and winter.

- **Stabilize the soil with temporary vegetation:** By October 1, 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 1000 square feet, and anchor the mulch with plastic netting. Monitor growth of the rye over the next 30 days. If the rye fails to grow at least three inches or cover at least 90% of the disturbed soil before November 1, then mulch the area for over-winter protection as described in the following “Stabilize the soil with mulch” standard.
- **Stabilize the soil with sod:** Stabilize the disturbed soil with properly installed sod by October 1. Proper installation includes 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, mulch the disturbed soil by spreading hay or straw at a rate of at least 150 pounds per 1000 square feet on the area so that no soil is visible through the mulch. Prior to applying the mulch, any snow accumulation on the disturbed area must be removed. Immediately after

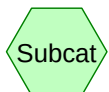
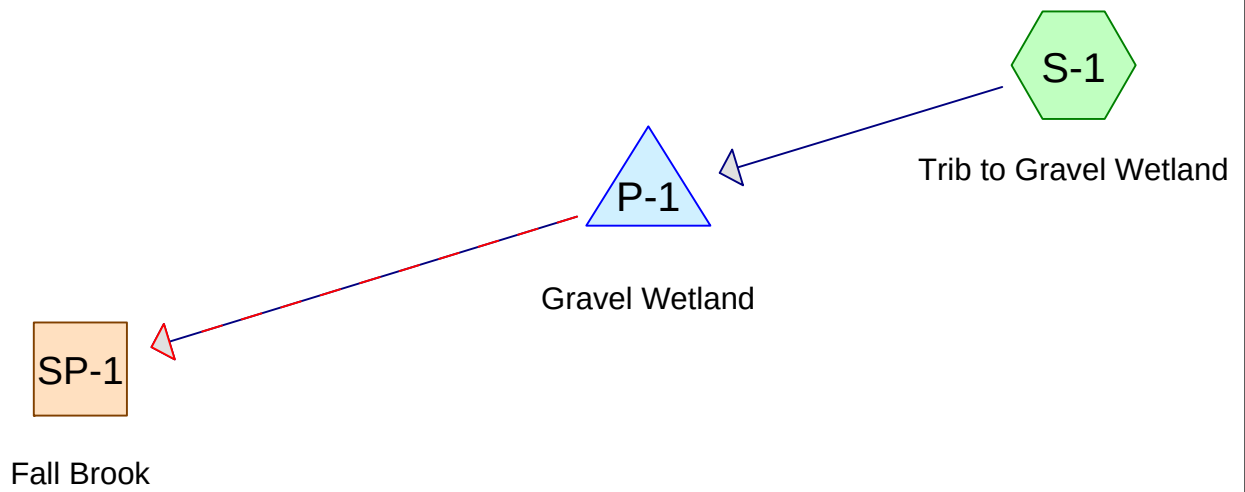
applying the mulch, anchor the mulch with plastic netting to prevent wind from moving the mulch off the disturbed soil.

6.0 INSPECTION AND MAINTENANCE

Inspection and maintenance are required of all erosion and sedimentation control measures outlined in this plan. The Owner shall identify a qualified firm or person prior to construction to perform inspections and identify maintenance needs for the proposed project. Refer to the Inspection, Maintenance, and Housekeeping plan for this project (provided under separate cover) for an outline of the associated inspection and maintenance requirements.

ATTACHMENT 12.6

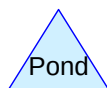
PRE-DEVELOPMENT HYDROCAD REPORT



Subcat



Reach



Pond



Link

Routing Diagram for Final Existing Gravel Wetland

Prepared by Microsoft, Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Printed 8/24/2017

Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
9.591	74	>75% Grass cover, Good, HSG C (S-1)
8.748	98	Paved parking & roofs (S-1)
18.339	85	TOTAL AREA

Final Existing Gravel Wetland

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
9.591	HSG C	S-1
0.000	HSG D	
8.748	Other	S-1
18.339		TOTAL AREA

Final Existing Gravel Wetland

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

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	9.591	0.000	0.000	9.591	>75% Grass cover, Good	S-1
0.000	0.000	0.000	0.000	8.748	8.748	Paved parking & roofs	S-1
0.000	0.000	9.591	0.000	8.748	18.339	TOTAL AREA	

Final Existing Gravel Wetland

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 5

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	S-1	0.00	0.00	1,361.0	0.0050	0.013	18.0	0.0	0.0
2	P-1	101.67	100.00	37.0	0.0451	0.011	12.0	0.0	0.0

Final Existing Gravel Wetland

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 6

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-1: Trib to Gravel Wetland Runoff Area=798,844 sf 47.70% Impervious Runoff Depth=1.73"
Flow Length=1,523' Tc=23.3 min CN=85 Runoff=21.88 cfs 2.647 af

Reach SP-1: Fall Brook Avg. Flow Depth=0.44' Max Vel=2.36 fps Inflow=6.64 cfs 2.647 af
n=0.035 L=250.0' S=0.0120 '/ Capacity=908.60 cfs Outflow=6.63 cfs 2.647 af

Pond P-1: Gravel Wetland Peak Elev=106.48' Storage=42,999 cf Inflow=21.88 cfs 2.647 af
Primary=0.00 cfs 0.000 af Secondary=6.64 cfs 2.647 af Outflow=6.64 cfs 2.647 af

Total Runoff Area = 18.339 ac Runoff Volume = 2.647 af Average Runoff Depth = 1.73"
52.30% Pervious = 9.591 ac 47.70% Impervious = 8.748 ac

Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Printed 8/24/2017

Page 7

Summary for Subcatchment S-1: Trib to Gravel Wetland

Runoff = 21.88 cfs @ 12.28 hrs, Volume= 2.647 af, Depth= 1.73"

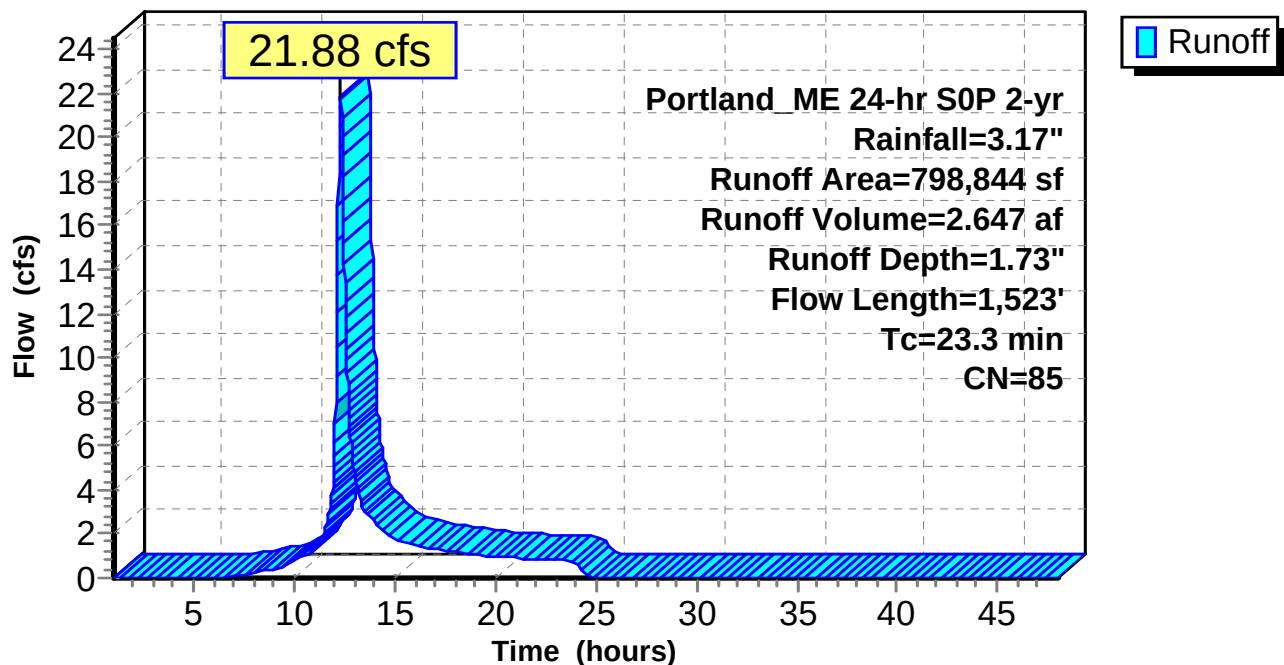
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Area (sf)	CN	Description
381,055	98	Paved parking & roofs
417,789	74	>75% Grass cover, Good, HSG C
798,844	85	Weighted Average
417,789		52.30% Pervious Area
381,055		47.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	162	0.0100	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.4	1,361	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
23.3	1,523	Total			

Subcatchment S-1: Trib to Gravel Wetland

Hydrograph



Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Printed 8/24/2017

Page 8

Summary for Reach SP-1: Fall Brook

Inflow Area = 18.339 ac, 47.70% Impervious, Inflow Depth = 1.73" for 2-yr event
Inflow = 6.64 cfs @ 12.76 hrs, Volume= 2.647 af
Outflow = 6.63 cfs @ 12.78 hrs, Volume= 2.647 af, Atten= 0%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
Max. Velocity= 2.36 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 3.8 min

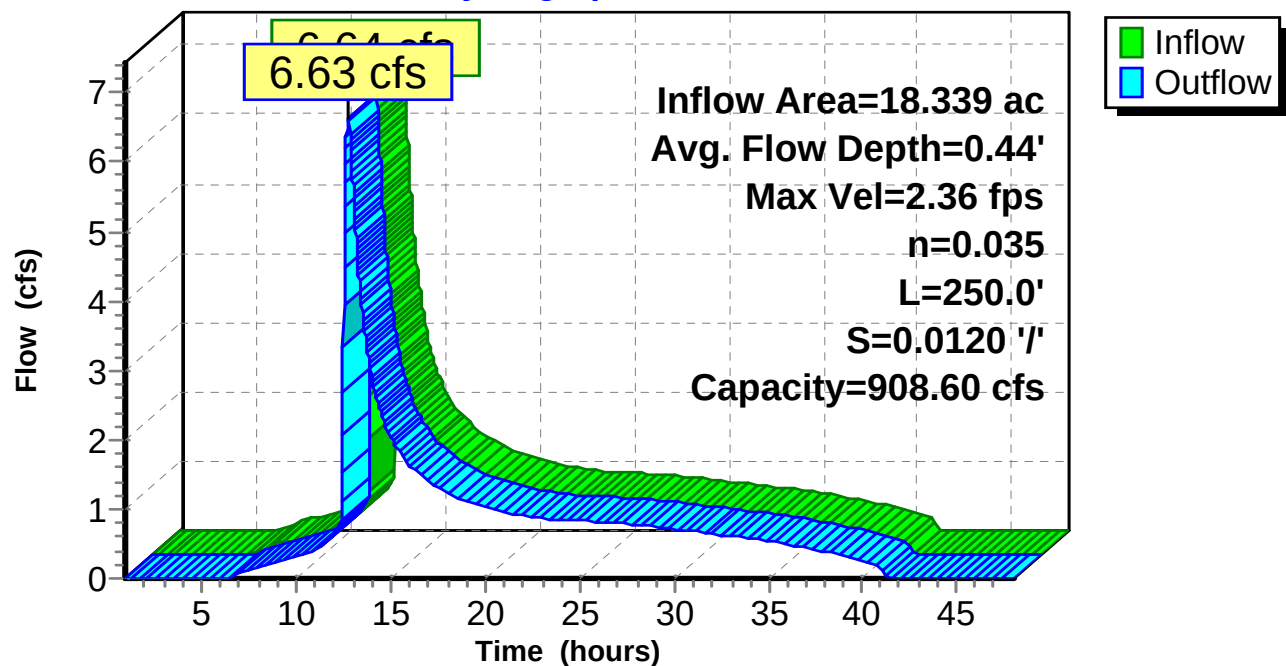
Peak Storage= 703 cf @ 12.78 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 3.0 '/' Top Width= 35.00'
Length= 250.0' Slope= 0.0120 '/'
Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: Fall Brook

Hydrograph



Final Existing Gravel Wetland

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 9

Summary for Pond P-1: Gravel Wetland

Inflow Area = 18.339 ac, 47.70% Impervious, Inflow Depth = 1.73" for 2-yr event
 Inflow = 21.88 cfs @ 12.28 hrs, Volume= 2.647 af
 Outflow = 6.64 cfs @ 12.76 hrs, Volume= 2.647 af, Atten= 70%, Lag= 28.6 min
 Primary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
 Secondary = 6.64 cfs @ 12.76 hrs, Volume= 2.647 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 106.48' @ 12.76 hrs Surf.Area= 15,808 sf Storage= 42,999 cf

Plug-Flow detention time= 367.2 min calculated for 2.646 af (100% of inflow)
 Center-of-Mass det. time= 367.5 min (1,237.1 - 869.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378
Device	Routing	Invert	Outlet Devices		
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64		
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf		
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600		
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32		

Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Printed 8/24/2017

Page 10

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=102.00' TW=91.00' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=6.64 cfs @ 12.76 hrs HW=106.48' TW=91.44' (Dynamic Tailwater)

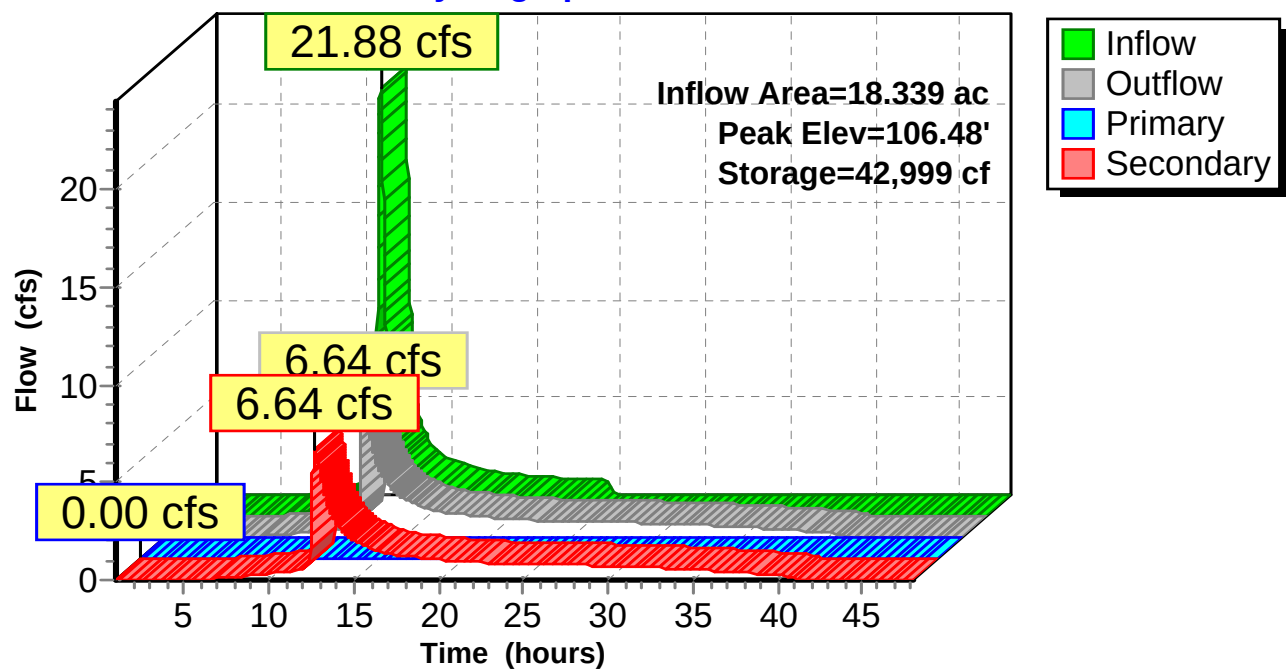
3=Culvert (Passes 6.64 cfs of 7.85 cfs potential flow)

4=Orifice/Grate (Orifice Controls 0.91 cfs @ 10.38 fps)

5=Broad-Crested Rectangular Weir (Weir Controls 5.73 cfs @ 1.99 fps)

Pond P-1: Gravel Wetland

Hydrograph



Final Existing Gravel Wetland

Portland_ME 24-hr SOP 10-yr Rainfall=4.71"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 11

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-1: Trib to Gravel Wetland Runoff Area=798,844 sf 47.70% Impervious Runoff Depth=3.10"
Flow Length=1,523' Tc=23.3 min CN=85 Runoff=37.55 cfs 4.739 af

Reach SP-1: Fall Brook Avg. Flow Depth=1.05' Max Vel=3.79 fps Inflow=32.55 cfs 4.739 af
n=0.035 L=250.0' S=0.0120 ' Capacity=908.60 cfs Outflow=32.41 cfs 4.739 af

Pond P-1: Gravel Wetland Peak Elev=107.13' Storage=53,923 cf Inflow=37.55 cfs 4.739 af
Primary=24.12 cfs 0.842 af Secondary=8.43 cfs 3.897 af Outflow=32.55 cfs 4.739 af

Total Runoff Area = 18.339 ac Runoff Volume = 4.739 af Average Runoff Depth = 3.10"
52.30% Pervious = 9.591 ac 47.70% Impervious = 8.748 ac

Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

Printed 8/24/2017

Page 12

Summary for Subcatchment S-1: Trib to Gravel Wetland

Runoff = 37.55 cfs @ 12.28 hrs, Volume= 4.739 af, Depth= 3.10"

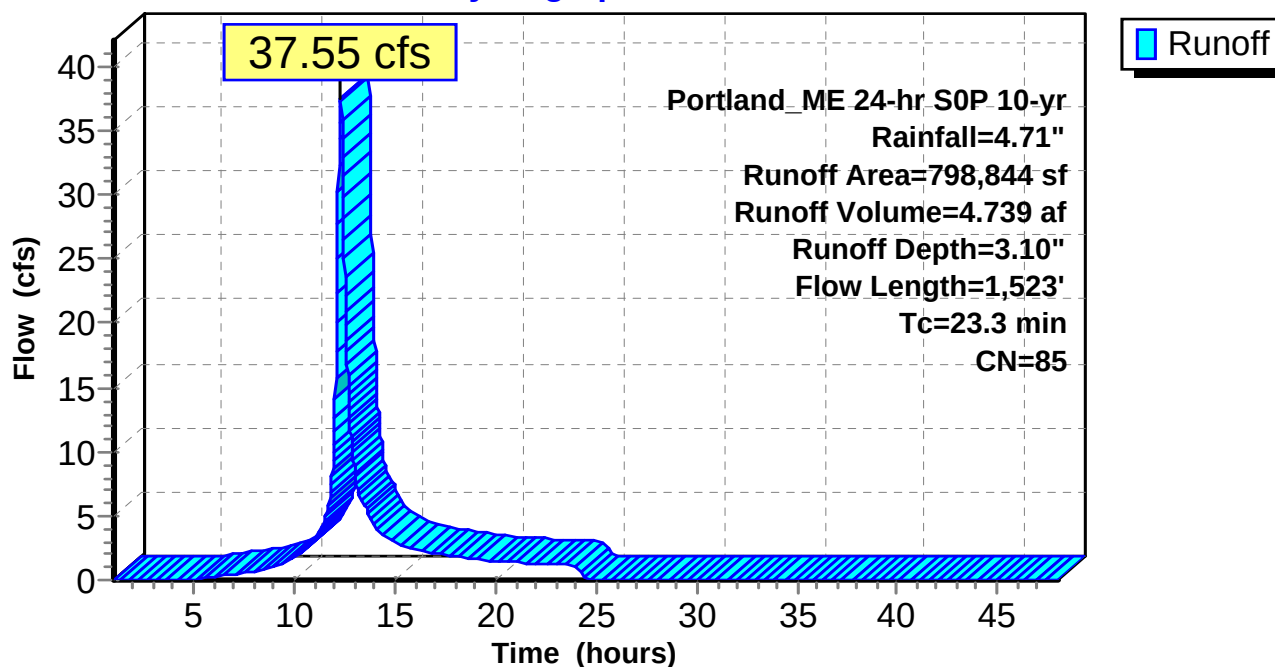
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

Area (sf)	CN	Description
381,055	98	Paved parking & roofs
417,789	74	>75% Grass cover, Good, HSG C
798,844	85	Weighted Average
417,789		52.30% Pervious Area
381,055		47.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	162	0.0100	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.4	1,361	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
23.3	1,523	Total			

Subcatchment S-1: Trib to Gravel Wetland

Hydrograph



Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 10-yr Rainfall=4.71"

Printed 8/24/2017

Page 13

Summary for Reach SP-1: Fall Brook

Inflow Area = 18.339 ac, 47.70% Impervious, Inflow Depth = 3.10" for 10-yr event
Inflow = 32.55 cfs @ 12.39 hrs, Volume= 4.739 af
Outflow = 32.41 cfs @ 12.40 hrs, Volume= 4.739 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
Max. Velocity= 3.79 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 3.4 min

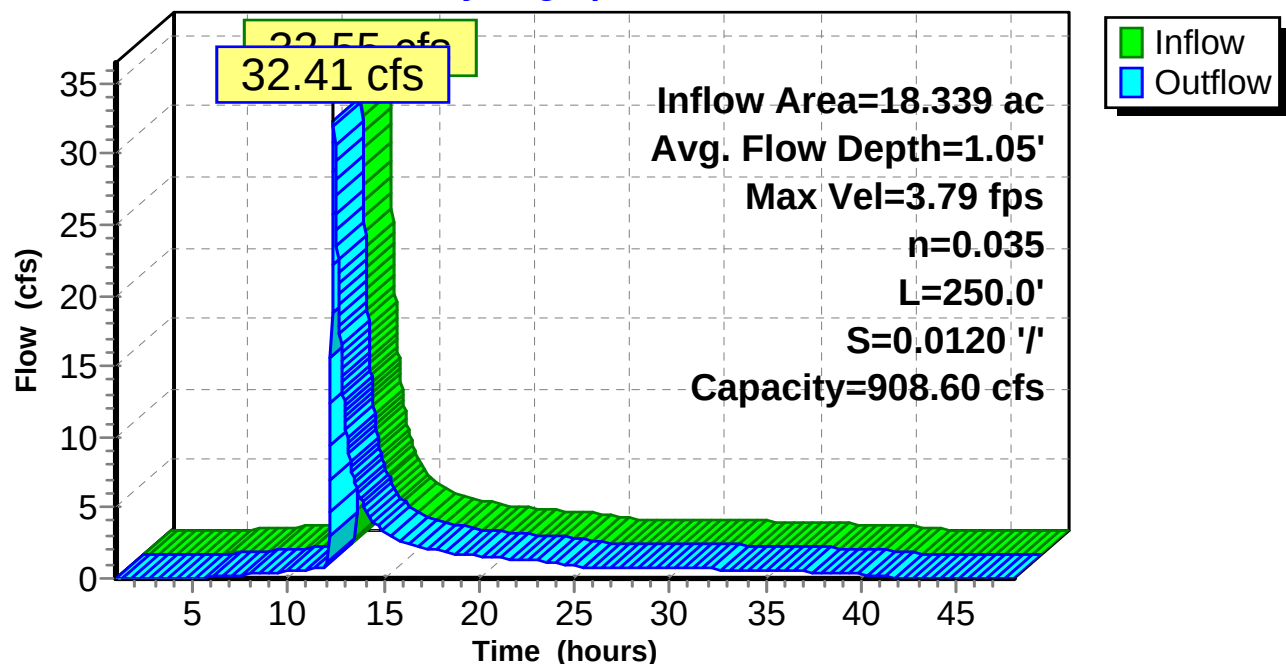
Peak Storage= 2,139 cf @ 12.40 hrs
Average Depth at Peak Storage= 1.05'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 3.0 '/' Top Width= 35.00'
Length= 250.0' Slope= 0.0120 '/'
Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: Fall Brook

Hydrograph



Final Existing Gravel Wetland

Portland_ME 24-hr SOP 10-yr Rainfall=4.71"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 14

Summary for Pond P-1: Gravel Wetland

Inflow Area = 18.339 ac, 47.70% Impervious, Inflow Depth = 3.10" for 10-yr event
 Inflow = 37.55 cfs @ 12.28 hrs, Volume= 4.739 af
 Outflow = 32.55 cfs @ 12.39 hrs, Volume= 4.739 af, Atten= 13%, Lag= 6.5 min
 Primary = 24.12 cfs @ 12.39 hrs, Volume= 0.842 af
 Secondary = 8.43 cfs @ 12.39 hrs, Volume= 3.897 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.13' @ 12.39 hrs Surf.Area= 17,780 sf Storage= 53,923 cf

Plug-Flow detention time= 225.7 min calculated for 4.737 af (100% of inflow)
 Center-of-Mass det. time= 226.0 min (1,069.4 - 843.4)

Volume	Invert	Avail.Storage	Storage Description									
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)									
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)							
102.00	3,572	549.0	0	0	3,572							
103.00	6,200	771.0	4,826	4,826	26,901							
104.00	9,020	829.0	7,566	12,392	34,329							
105.00	11,611	872.0	10,288	22,680	40,211							
106.00	14,502	904.0	13,030	35,710	44,820							
107.00	17,279	924.0	15,870	51,580	47,870							
108.00	21,203	764.0	19,208	70,788	69,378							
Device	Routing	Invert	Outlet Devices									
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64									
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf									
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600									
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32									

Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 10-yr Rainfall=4.71"

Printed 8/24/2017

Page 15

Primary OutFlow Max=24.05 cfs @ 12.39 hrs HW=107.13' TW=92.05' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 20.38 cfs @ 2.15 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 3.67 cfs @ 0.86 fps)

Secondary OutFlow Max=8.42 cfs @ 12.39 hrs HW=107.13' TW=92.05' (Dynamic Tailwater)

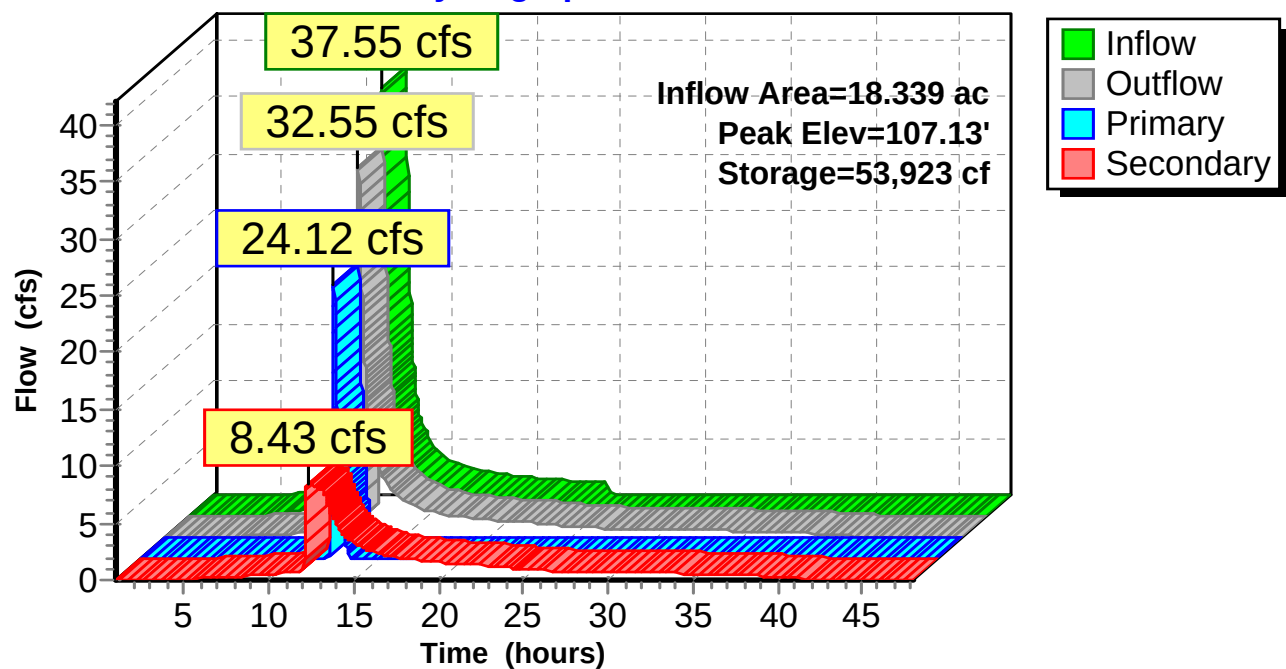
3=Culvert (Inlet Controls 8.42 cfs @ 10.73 fps)

4=Orifice/Grate (Passes < 0.97 cfs potential flow)

5=Broad-Crested Rectangular Weir (Passes < 23.20 cfs potential flow)

Pond P-1: Gravel Wetland

Hydrograph



Final Existing Gravel Wetland

Portland_ME 24-hr SOP 25-yr Rainfall=5.92"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 16

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-1: Trib to Gravel Wetland Runoff Area=798,844 sf 47.70% Impervious Runoff Depth=4.23"
Flow Length=1,523' Tc=23.3 min CN=85 Runoff=49.55 cfs 6.460 af

Reach SP-1: Fall Brook Avg. Flow Depth=1.28' Max Vel=4.22 fps Inflow=48.03 cfs 6.460 af
n=0.035 L=250.0' S=0.0120 ' Capacity=908.60 cfs Outflow=47.92 cfs 6.460 af

Pond P-1: Gravel Wetland Peak Elev=107.28' Storage=56,592 cf Inflow=49.55 cfs 6.460 af
Primary=39.48 cfs 1.736 af Secondary=8.55 cfs 4.724 af Outflow=48.03 cfs 6.460 af

Total Runoff Area = 18.339 ac Runoff Volume = 6.460 af Average Runoff Depth = 4.23"
52.30% Pervious = 9.591 ac 47.70% Impervious = 8.748 ac

Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 25-yr Rainfall=5.92"

Printed 8/24/2017

Page 17

Summary for Subcatchment S-1: Trib to Gravel Wetland

Runoff = 49.55 cfs @ 12.28 hrs, Volume= 6.460 af, Depth= 4.23"

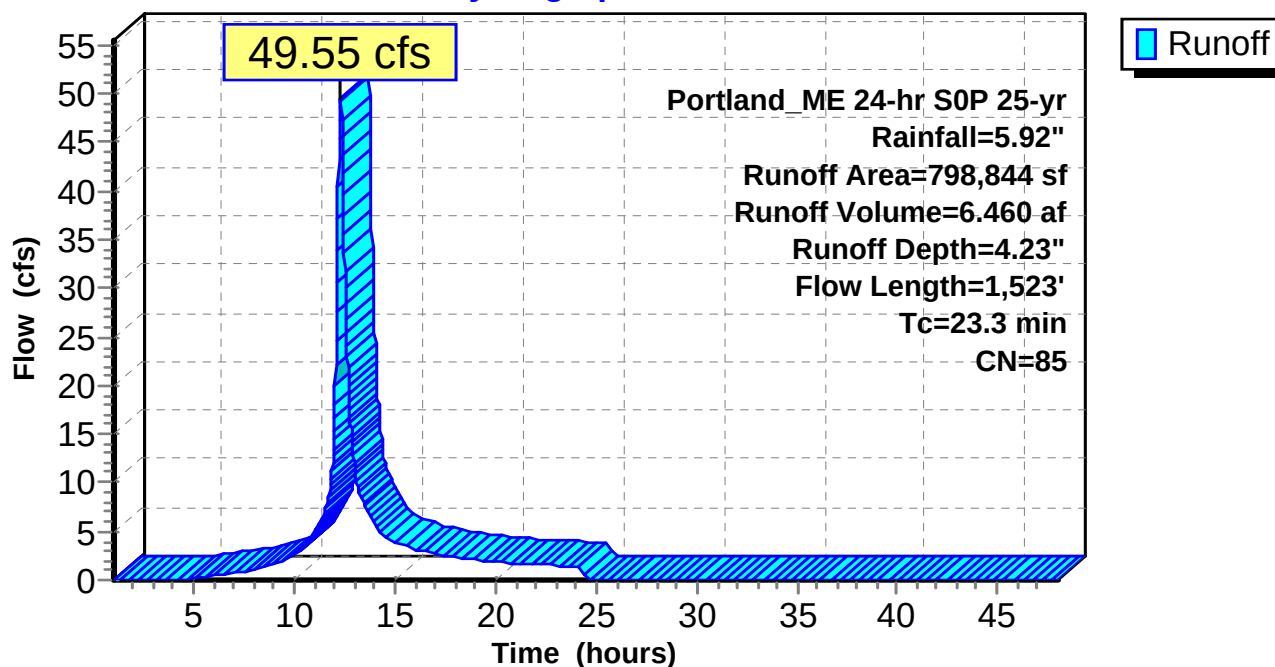
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 25-yr Rainfall=5.92"

Area (sf)	CN	Description
381,055	98	Paved parking & roofs
417,789	74	>75% Grass cover, Good, HSG C
798,844	85	Weighted Average
417,789		52.30% Pervious Area
381,055		47.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	162	0.0100	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.4	1,361	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
23.3	1,523	Total			

Subcatchment S-1: Trib to Gravel Wetland

Hydrograph



Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 25-yr Rainfall=5.92"

Printed 8/24/2017

Page 18

Summary for Reach SP-1: Fall Brook

Inflow Area = 18.339 ac, 47.70% Impervious, Inflow Depth = 4.23" for 25-yr event
Inflow = 48.03 cfs @ 12.33 hrs, Volume= 6.460 af
Outflow = 47.92 cfs @ 12.34 hrs, Volume= 6.460 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
Max. Velocity= 4.22 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.28 fps, Avg. Travel Time= 3.3 min

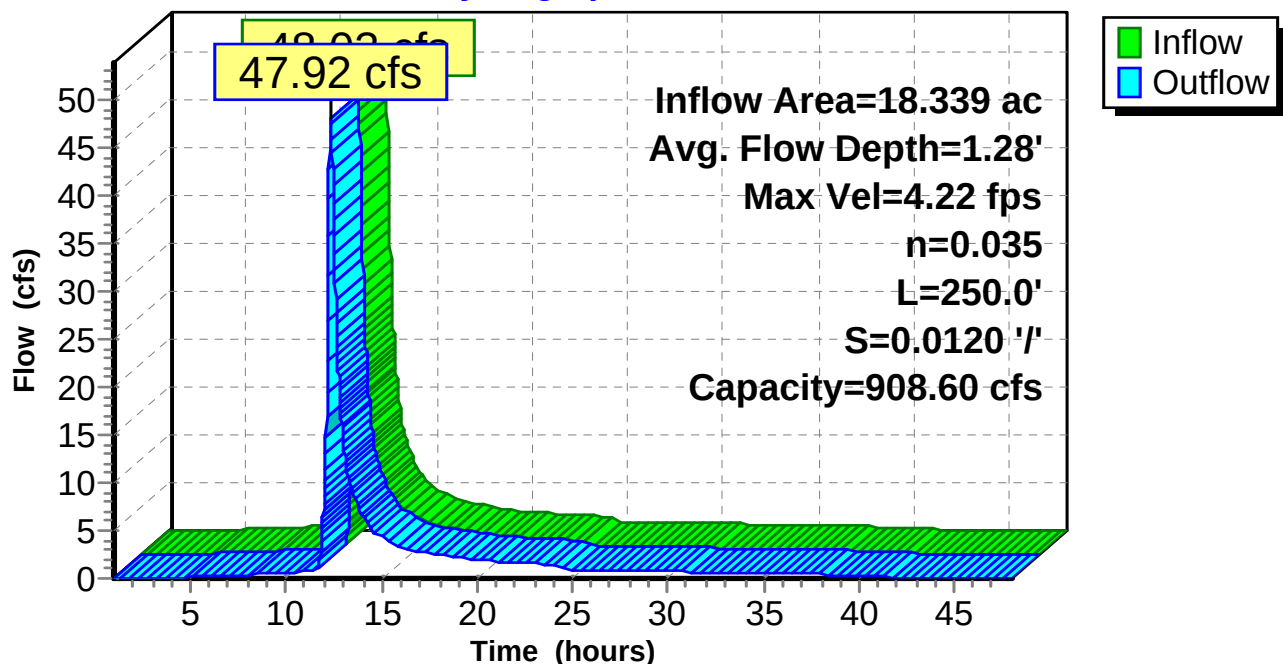
Peak Storage= 2,836 cf @ 12.34 hrs
Average Depth at Peak Storage= 1.28'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 3.0 '/' Top Width= 35.00'
Length= 250.0' Slope= 0.0120 '/'
Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: Fall Brook

Hydrograph



Final Existing Gravel Wetland

Portland_ME 24-hr SOP 25-yr Rainfall=5.92"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 19

Summary for Pond P-1: Gravel Wetland

Inflow Area = 18.339 ac, 47.70% Impervious, Inflow Depth = 4.23" for 25-yr event
 Inflow = 49.55 cfs @ 12.28 hrs, Volume= 6.460 af
 Outflow = 48.03 cfs @ 12.33 hrs, Volume= 6.460 af, Atten= 3%, Lag= 3.0 min
 Primary = 39.48 cfs @ 12.33 hrs, Volume= 1.736 af
 Secondary = 8.55 cfs @ 12.33 hrs, Volume= 4.724 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.28' @ 12.33 hrs Surf.Area= 18,343 sf Storage= 56,592 cf

Plug-Flow detention time= 176.0 min calculated for 6.457 af (100% of inflow)
 Center-of-Mass det. time= 176.4 min (1,007.0 - 830.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 25-yr Rainfall=5.92"

Printed 8/24/2017

Page 20

Primary OutFlow Max=39.41 cfs @ 12.33 hrs HW=107.28' TW=92.28' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 27.85 cfs @ 2.38 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 11.56 cfs @ 1.29 fps)

Secondary OutFlow Max=8.55 cfs @ 12.33 hrs HW=107.28' TW=92.28' (Dynamic Tailwater)

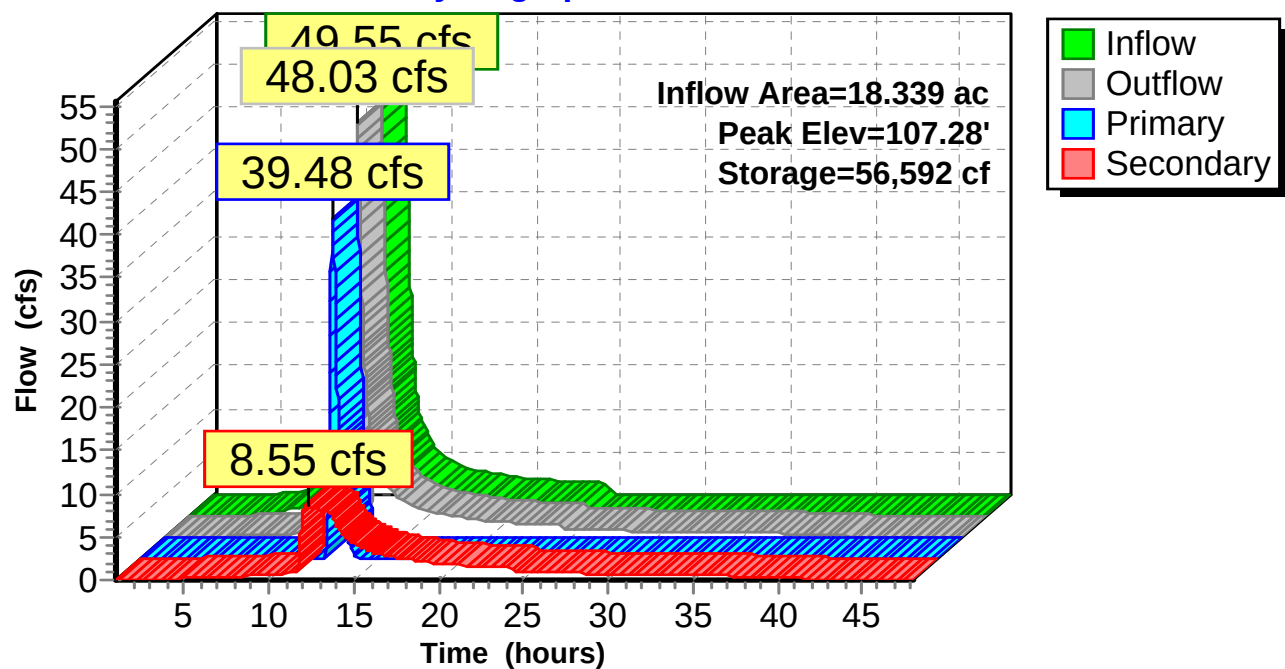
3=Culvert (Inlet Controls 8.55 cfs @ 10.89 fps)

4=Orifice/Grate (Passes < 0.98 cfs potential flow)

5=Broad-Crested Rectangular Weir (Passes < 28.18 cfs potential flow)

Pond P-1: Gravel Wetland

Hydrograph



Final Existing Gravel Wetland*Portland_ME 24-hr SOP 200-yr Rainfall=9.97"*

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 21

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-1: Trib to Gravel Wetland Runoff Area=798,844 sf 47.70% Impervious Runoff Depth=8.13"
Flow Length=1,523' Tc=23.3 min CN=85 Runoff=88.07 cfs 12.418 af

Reach SP-1: Fall Brook Avg. Flow Depth=1.72' Max Vel=4.96 fps Inflow=87.03 cfs 12.418 af
n=0.035 L=250.0' S=0.0120 ' /' Capacity=908.60 cfs Outflow=86.92 cfs 12.418 af

Pond P-1: Gravel Wetland Peak Elev=107.55' Storage=61,697 cf Inflow=88.07 cfs 12.418 af
Primary=78.26 cfs 5.124 af Secondary=8.77 cfs 7.295 af Outflow=87.03 cfs 12.418 af

Total Runoff Area = 18.339 ac Runoff Volume = 12.418 af Average Runoff Depth = 8.13"
52.30% Pervious = 9.591 ac 47.70% Impervious = 8.748 ac

Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Printed 8/24/2017

Page 22

Summary for Subcatchment S-1: Trib to Gravel Wetland

Runoff = 88.07 cfs @ 12.28 hrs, Volume= 12.418 af, Depth= 8.13"

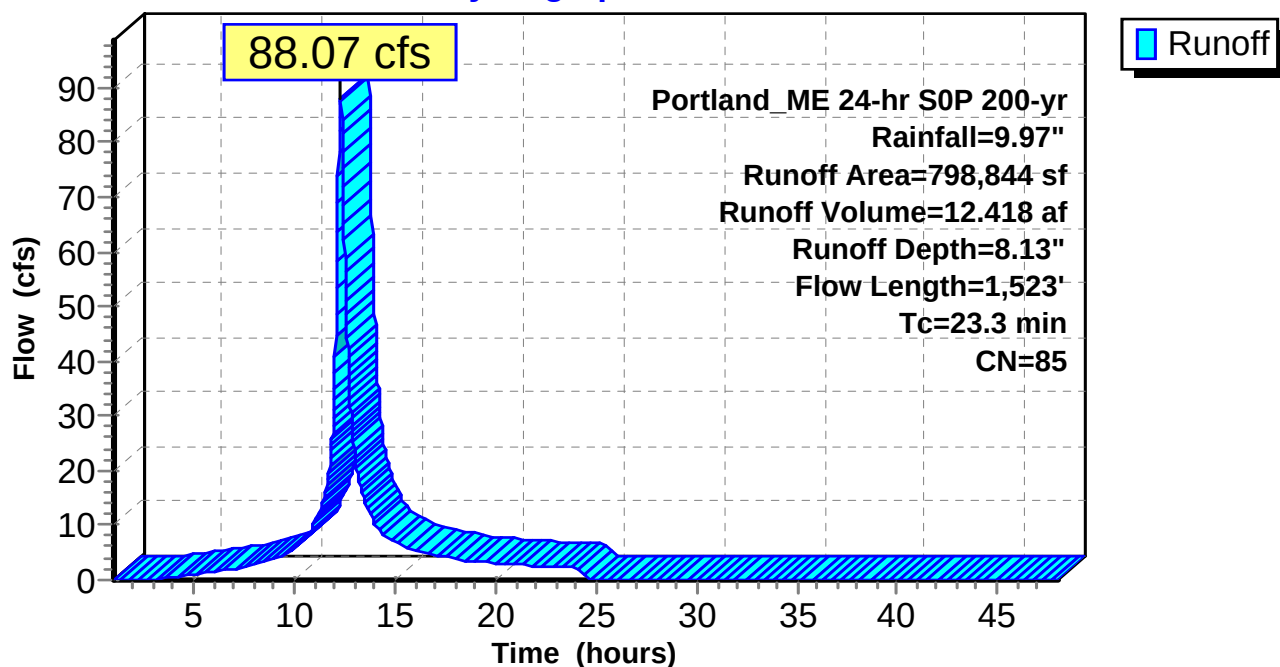
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Area (sf)	CN	Description
381,055	98	Paved parking & roofs
417,789	74	>75% Grass cover, Good, HSG C
798,844	85	Weighted Average
417,789		52.30% Pervious Area
381,055		47.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	162	0.0100	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.4	1,361	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
23.3	1,523	Total			

Subcatchment S-1: Trib to Gravel Wetland

Hydrograph



Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Printed 8/24/2017

Page 23

Summary for Reach SP-1: Fall Brook

Inflow Area = 18.339 ac, 47.70% Impervious, Inflow Depth = 8.13" for 200-yr event
Inflow = 87.03 cfs @ 12.31 hrs, Volume= 12.418 af
Outflow = 86.92 cfs @ 12.32 hrs, Volume= 12.418 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
Max. Velocity= 4.96 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.47 fps, Avg. Travel Time= 2.8 min

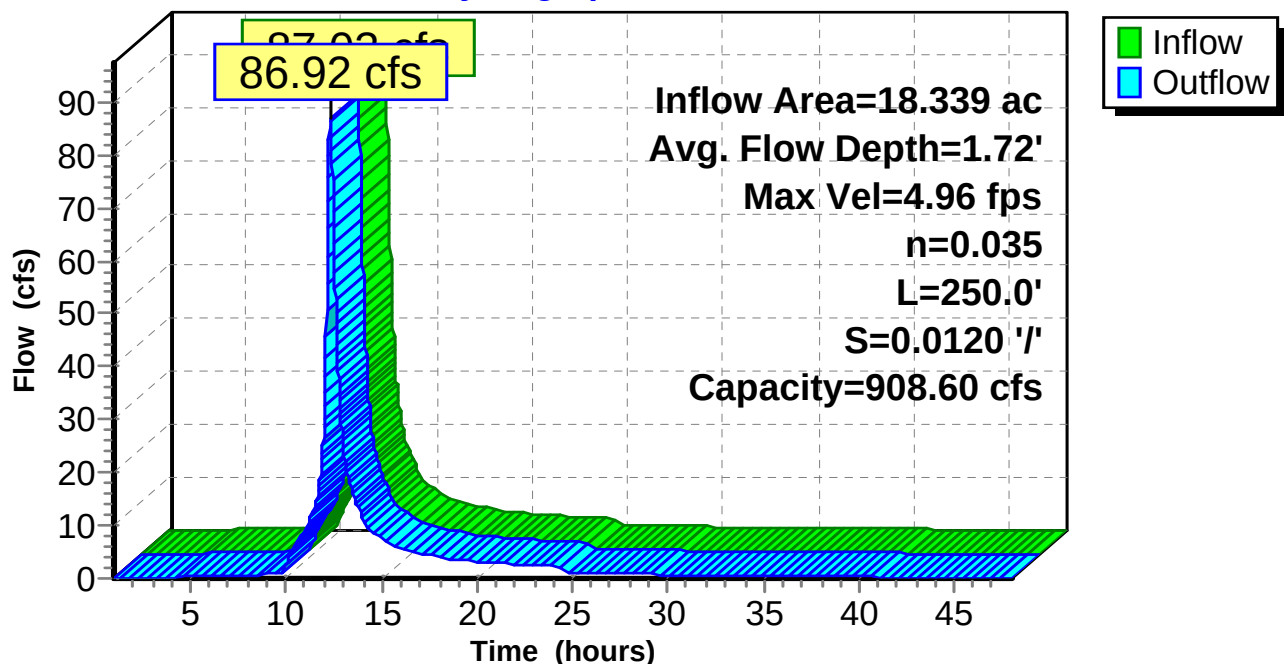
Peak Storage= 4,379 cf @ 12.32 hrs
Average Depth at Peak Storage= 1.72'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 3.0 '/' Top Width= 35.00'
Length= 250.0' Slope= 0.0120 '/'
Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: Fall Brook

Hydrograph



Final Existing Gravel Wetland

Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 24

Summary for Pond P-1: Gravel Wetland

Inflow Area = 18.339 ac, 47.70% Impervious, Inflow Depth = 8.13" for 200-yr event
 Inflow = 88.07 cfs @ 12.28 hrs, Volume= 12.418 af
 Outflow = 87.03 cfs @ 12.31 hrs, Volume= 12.418 af, Atten= 1%, Lag= 2.0 min
 Primary = 78.26 cfs @ 12.31 hrs, Volume= 5.124 af
 Secondary = 8.77 cfs @ 12.31 hrs, Volume= 7.295 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.55' @ 12.31 hrs Surf.Area= 19,396 sf Storage= 61,697 cf

Plug-Flow detention time= 106.4 min calculated for 12.413 af (100% of inflow)
 Center-of-Mass det. time= 106.8 min (912.8 - 806.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Printed 8/24/2017

Page 25

Primary OutFlow Max=78.15 cfs @ 12.31 hrs HW=107.55' TW=92.72' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 43.38 cfs @ 2.75 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 34.77 cfs @ 1.97 fps)

Secondary OutFlow Max=8.77 cfs @ 12.31 hrs HW=107.55' TW=92.72' (Dynamic Tailwater)

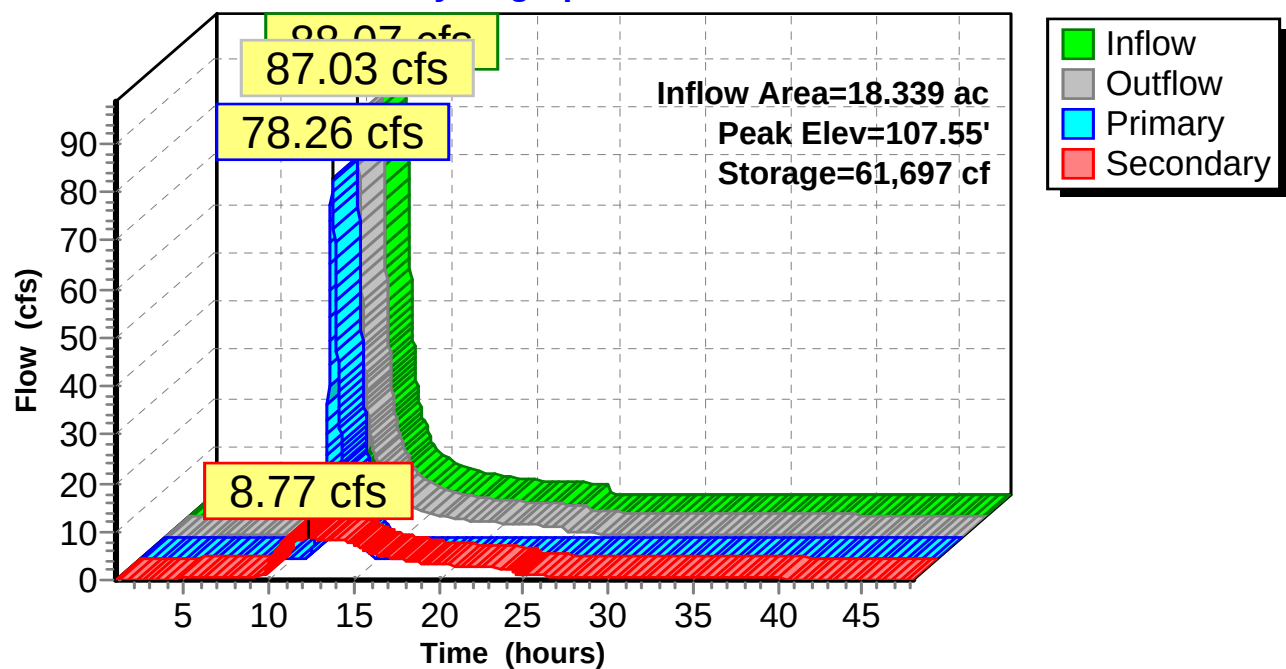
3=Culvert (Inlet Controls 8.77 cfs @ 11.17 fps)

4=Orifice/Grate (Passes < 1.00 cfs potential flow)

5=Broad-Crested Rectangular Weir (Passes < 38.18 cfs potential flow)

Pond P-1: Gravel Wetland

Hydrograph



Final Existing Gravel Wetland

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 26

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-1: Trib to Gravel

Runoff Area=798,844 sf 47.70% Impervious Runoff Depth=10.66"
Flow Length=1,523' Tc=23.3 min CN=85 Runoff=112.15 cfs 16.284 af

Reach SP-1: Fall Brook

Avg. Flow Depth=1.94' Max Vel=5.29 fps Inflow=110.91 cfs 16.284 af
n=0.035 L=250.0' S=0.0120 '/ Capacity=908.60 cfs Outflow=110.79 cfs 16.284 af

Pond P-1: Gravel Wetland

Peak Elev=107.69' Storage=64,446 cf Inflow=112.15 cfs 16.284 af
Primary=102.03 cfs 7.652 af Secondary=8.89 cfs 8.632 af Outflow=110.91 cfs 16.284 af

Total Runoff Area = 18.339 ac Runoff Volume = 16.284 af Average Runoff Depth = 10.66"
52.30% Pervious = 9.591 ac 47.70% Impervious = 8.748 ac

Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Printed 8/24/2017

Page 27

Summary for Subcatchment S-1: Trib to Gravel Wetland

Runoff = 112.15 cfs @ 12.28 hrs, Volume= 16.284 af, Depth=10.66"

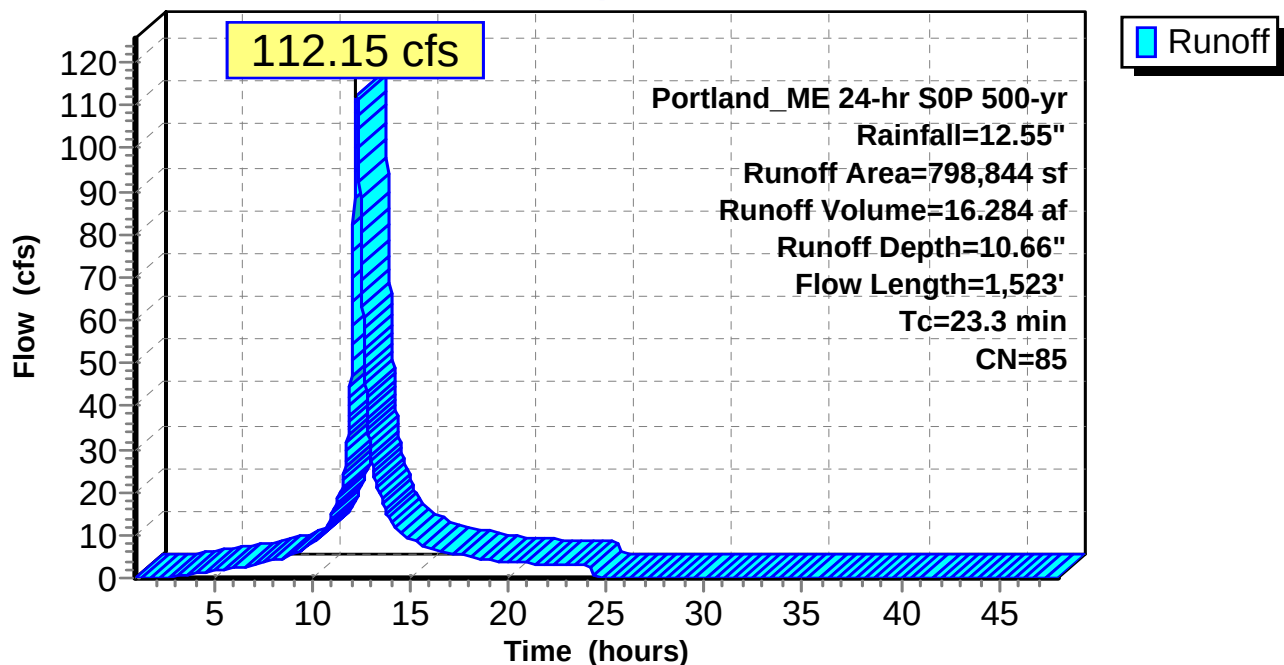
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Area (sf)	CN	Description
381,055	98	Paved parking & roofs
417,789	74	>75% Grass cover, Good, HSG C
798,844	85	Weighted Average
417,789		52.30% Pervious Area
381,055		47.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.9	162	0.0100	0.15		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.4	1,361	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
23.3	1,523	Total			

Subcatchment S-1: Trib to Gravel Wetland

Hydrograph



Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Printed 8/24/2017

Page 28

Summary for Reach SP-1: Fall Brook

Inflow Area = 18.339 ac, 47.70% Impervious, Inflow Depth = 10.66" for 500-yr event
Inflow = 110.91 cfs @ 12.31 hrs, Volume= 16.284 af
Outflow = 110.79 cfs @ 12.32 hrs, Volume= 16.284 af, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
Max. Velocity= 5.29 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.57 fps, Avg. Travel Time= 2.7 min

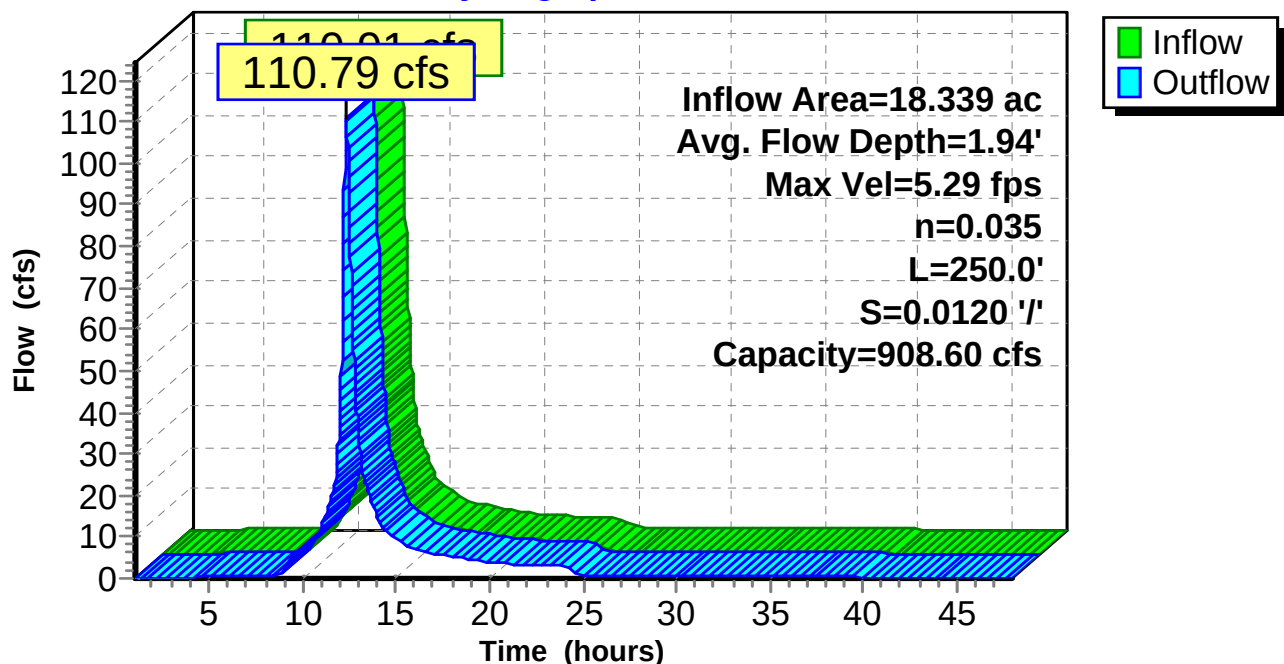
Peak Storage= 5,234 cf @ 12.32 hrs
Average Depth at Peak Storage= 1.94'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 3.0 '/' Top Width= 35.00'
Length= 250.0' Slope= 0.0120 '/'
Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: Fall Brook

Hydrograph



Final Existing Gravel Wetland

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 29

Summary for Pond P-1: Gravel Wetland

Inflow Area = 18.339 ac, 47.70% Impervious, Inflow Depth = 10.66" for 500-yr event
 Inflow = 112.15 cfs @ 12.28 hrs, Volume= 16.284 af
 Outflow = 110.91 cfs @ 12.31 hrs, Volume= 16.284 af, Atten= 1%, Lag= 1.9 min
 Primary = 102.03 cfs @ 12.31 hrs, Volume= 7.652 af
 Secondary = 8.89 cfs @ 12.31 hrs, Volume= 8.632 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.69' @ 12.31 hrs Surf.Area= 19,951 sf Storage= 64,446 cf

Plug-Flow detention time= 86.6 min calculated for 16.277 af (100% of inflow)
 Center-of-Mass det. time= 87.0 min (884.0 - 797.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Final Existing Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Printed 8/24/2017

Page 30

Primary OutFlow Max=101.90 cfs @ 12.31 hrs HW=107.69' TW=92.93' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 52.44 cfs @ 2.94 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 49.46 cfs @ 2.24 fps)

Secondary OutFlow Max=8.89 cfs @ 12.31 hrs HW=107.69' TW=92.93' (Dynamic Tailwater)

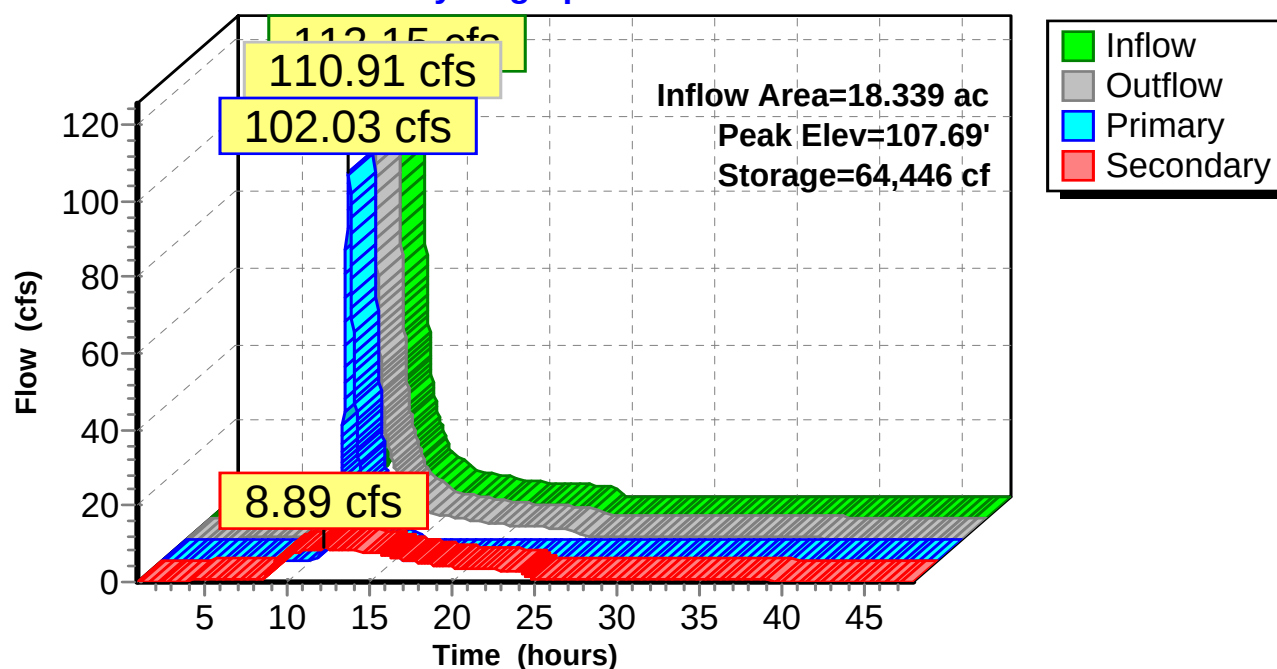
3=Culvert (Inlet Controls 8.89 cfs @ 11.31 fps)

4=Orifice/Grate (Passes < 1.02 cfs potential flow)

5=Broad-Crested Rectangular Weir (Passes < 43.66 cfs potential flow)

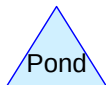
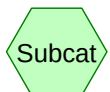
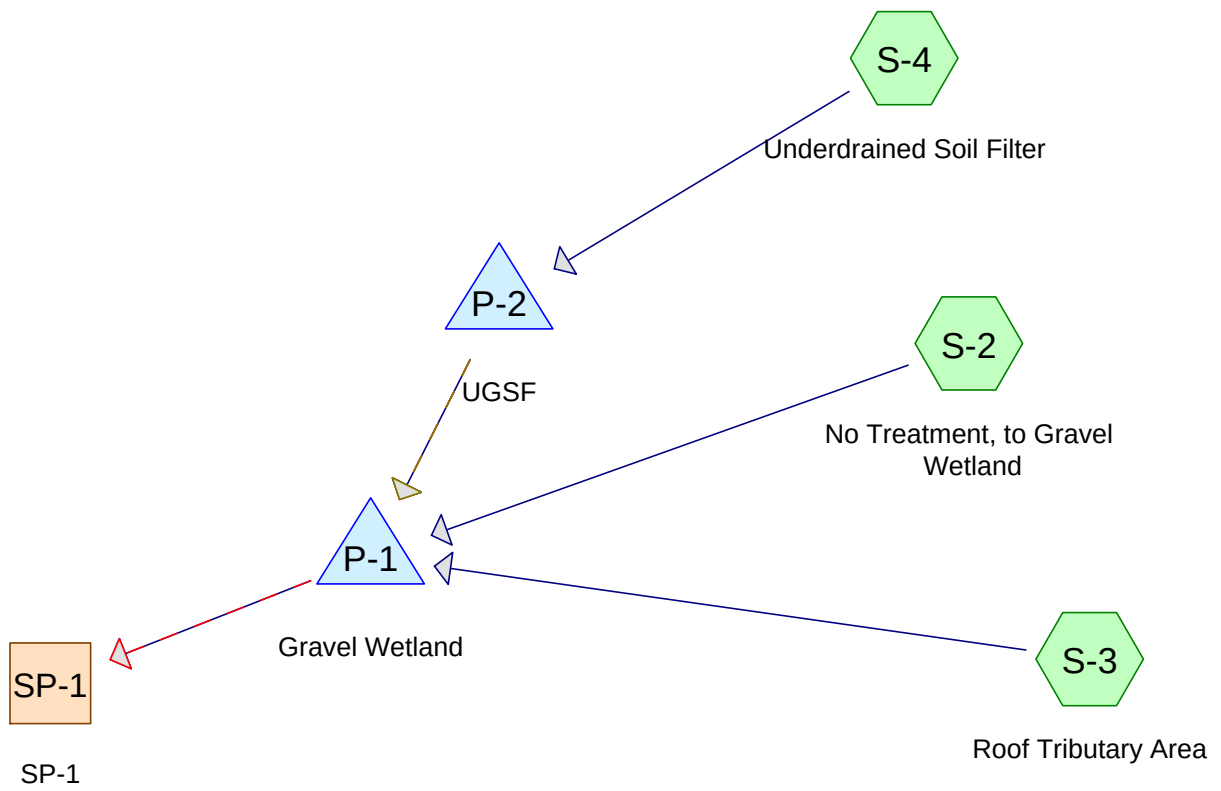
Pond P-1: Gravel Wetland

Hydrograph



ATTACHMENT 12.7

POST-DEVELOPMENT HYDROCAD REPORT



Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Printed 8/24/2017

Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.668	98	(S-4)
0.238	75	(S-4)
9.353	74	>75% Grass cover, Good, HSG C (S-2)
8.080	98	Paved parking & roofs (S-2)
0.761	98	Unconnected roofs, HSG A (S-3)
19.100	86	TOTAL AREA

Final Proposed Gravel Wetland

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.761	HSG A	S-3
0.000	HSG B	
9.353	HSG C	S-2
0.000	HSG D	
8.986	Other	S-2, S-4
19.100		TOTAL AREA

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Printed 8/24/2017

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	0.000	0.000	0.906	0.906		S-4
0.000	0.000	9.353	0.000	0.000	9.353	>75% Grass cover, Good	S-2
0.000	0.000	0.000	0.000	8.080	8.080	Paved parking & roofs	S-2
0.761	0.000	0.000	0.000	0.000	0.761	Unconnected roofs	S-3
0.761	0.000	9.353	0.000	8.986	19.100	TOTAL AREA	

Final Proposed Gravel Wetland

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 5

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	S-2	0.00	0.00	1,327.0	0.0050	0.013	18.0	0.0	0.0
2	S-3	0.00	0.00	15.0	0.0100	0.013	15.0	0.0	0.0
3	S-3	0.00	0.00	500.0	0.0100	0.013	18.0	0.0	0.0
4	P-1	101.67	100.00	37.0	0.0451	0.011	12.0	0.0	0.0
5	P-2	106.00	105.50	50.0	0.0100	0.013	15.0	0.0	0.0

Final Proposed Gravel Wetland

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 6

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-2: No Treatment, to Runoff Area=759,387 sf 46.35% Impervious Runoff Depth=1.73"
Flow Length=1,612' Tc=29.3 min CN=85 Runoff=18.27 cfs 2.516 af

Subcatchment S-3: Roof Tributary Area Runoff Area=33,157 sf 100.00% Impervious Runoff Depth>2.94"
Flow Length=665' Tc=7.0 min CN=98 Runoff=2.28 cfs 0.186 af

Subcatchment S-4: Underdrained Soil Filter Runoff Area=39,458 sf 73.75% Impervious Runoff Depth=2.32"
Tc=7.0 min CN=92 Runoff=2.33 cfs 0.175 af

Reach SP-1: SP-1 Avg. Flow Depth=0.47' Max Vel=2.42 fps Inflow=7.25 cfs 2.840 af
n=0.035 L=250.0' S=0.0120 '/' Capacity=908.60 cfs Outflow=7.23 cfs 2.839 af

Pond P-1: Gravel Wetland Peak Elev=106.51' Storage=43,462 cf Inflow=18.75 cfs 2.839 af
Primary=0.04 cfs 0.000 af Secondary=7.21 cfs 2.839 af Outflow=7.25 cfs 2.840 af

Pond P-2: UGSF Peak Elev=112.04' Storage=3,798 cf Inflow=2.33 cfs 0.175 af
Primary=0.03 cfs 0.083 af Secondary=0.22 cfs 0.054 af Tertiary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.137 af

Total Runoff Area = 19.100 ac Runoff Volume = 2.878 af Average Runoff Depth = 1.81"
50.21% Pervious = 9.591 ac 49.79% Impervious = 9.509 ac

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Printed 8/24/2017

Page 7

Summary for Subcatchment S-2: No Treatment, to Gravel Wetland

Runoff = 18.27 cfs @ 12.35 hrs, Volume= 2.516 af, Depth= 1.73"

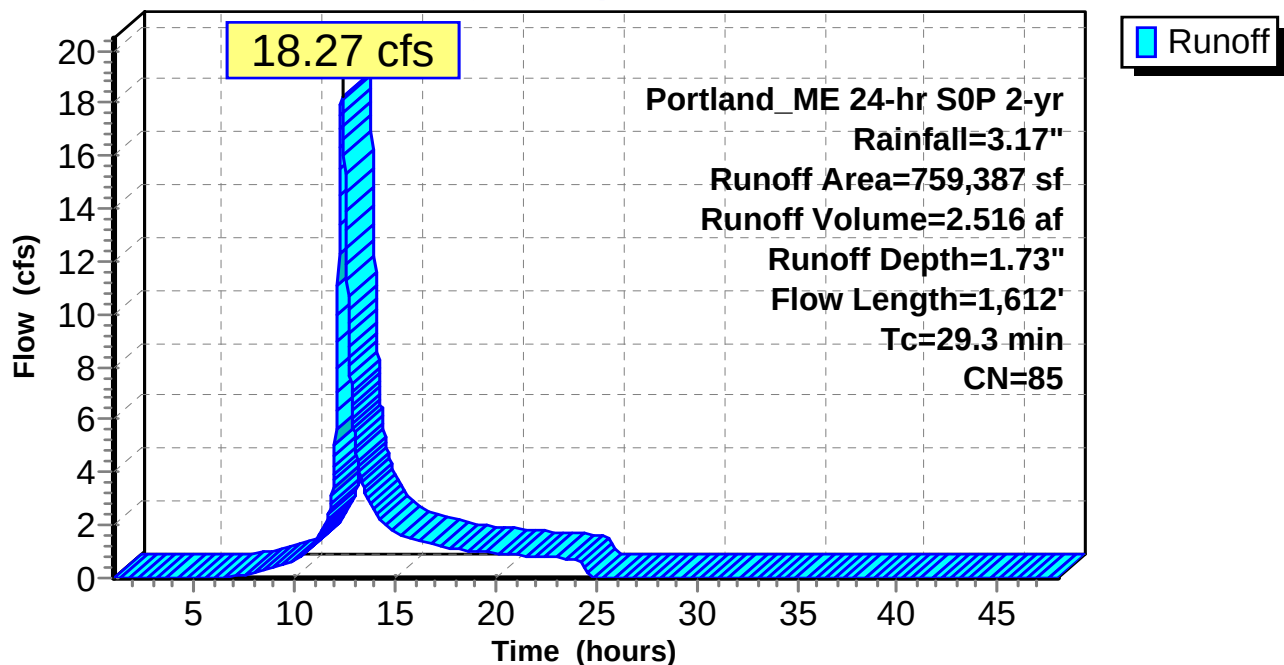
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Area (sf)	CN	Description
351,954	98	Paved parking & roofs
407,433	74	>75% Grass cover, Good, HSG C
759,387	85	Weighted Average
407,433		53.65% Pervious Area
351,954		46.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	285	0.0150	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.3	1,327	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
29.3	1,612	Total			

Subcatchment S-2: No Treatment, to Gravel Wetland

Hydrograph



Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Printed 8/24/2017

Page 8

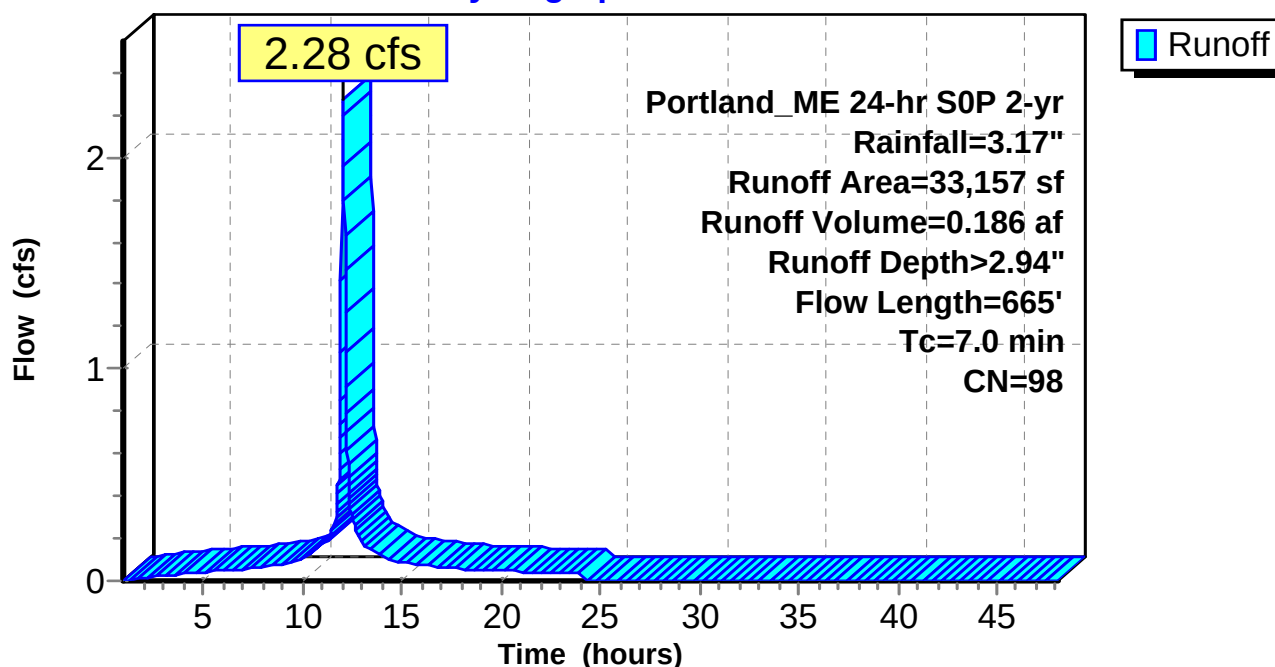
Summary for Subcatchment S-3: Roof Tributary Area

Runoff = 2.28 cfs @ 12.05 hrs, Volume= 0.186 af, Depth> 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Area (sf)	CN	Description
33,157	98	Unconnected roofs, HSG A
33,157		100.00% Impervious Area
33,157		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.58		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
0.0	15	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.4	500	0.0100	5.94	10.50	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
4.0					Direct Entry, Min TC 7
7.0	665	Total			

Subcatchment S-3: Roof Tributary Area**Hydrograph**

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Printed 8/24/2017

Page 9

Summary for Subcatchment S-4: Underdrained Soil Filter

Runoff = 2.33 cfs @ 12.05 hrs, Volume= 0.175 af, Depth= 2.32"

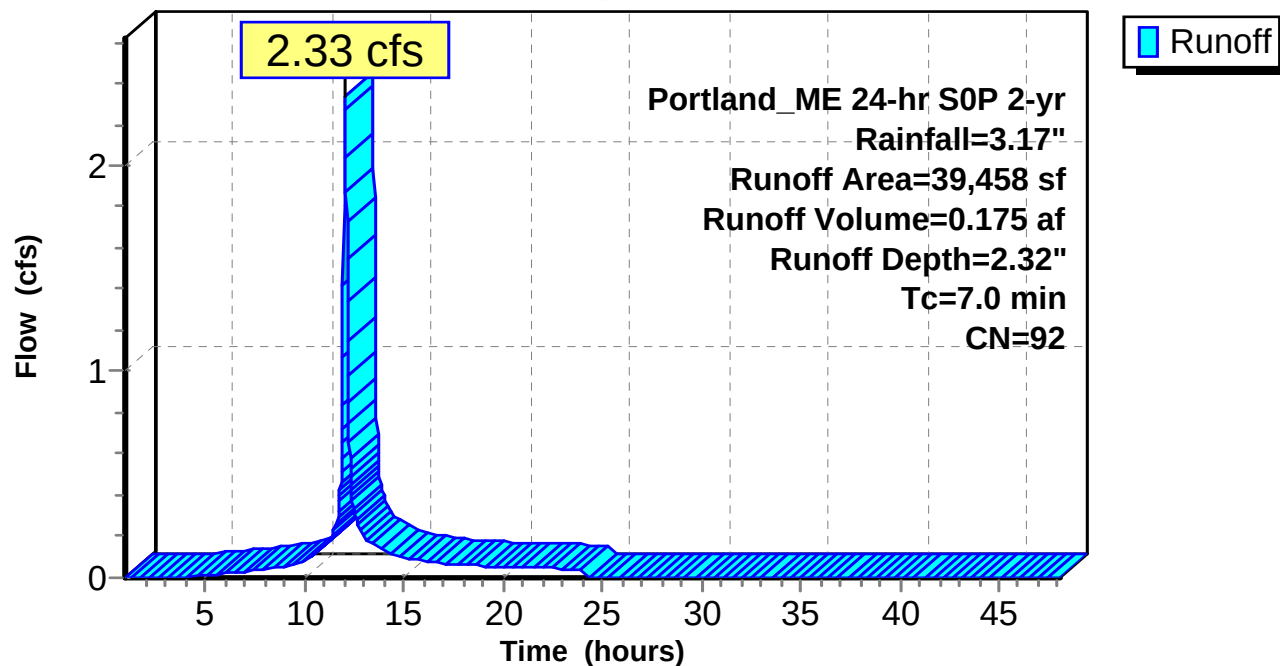
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

	Area (sf)	CN	Description
*	29,102	98	
*	10,356	75	
	39,458	92	Weighted Average
	10,356		26.25% Pervious Area
	29,102		73.75% Impervious Area

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

Subcatchment S-4: Underdrained Soil Filter

Hydrograph



Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Printed 8/24/2017

Page 10

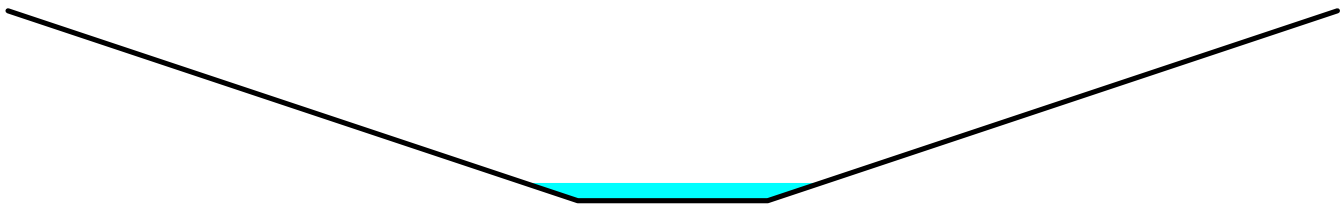
Summary for Reach SP-1: SP-1

Inflow Area = 19.100 ac, 49.79% Impervious, Inflow Depth > 1.78" for 2-yr event
Inflow = 7.25 cfs @ 12.84 hrs, Volume= 2.840 af
Outflow = 7.23 cfs @ 12.86 hrs, Volume= 2.839 af, Atten= 0%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
Max. Velocity= 2.42 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 1.00 fps, Avg. Travel Time= 4.2 min

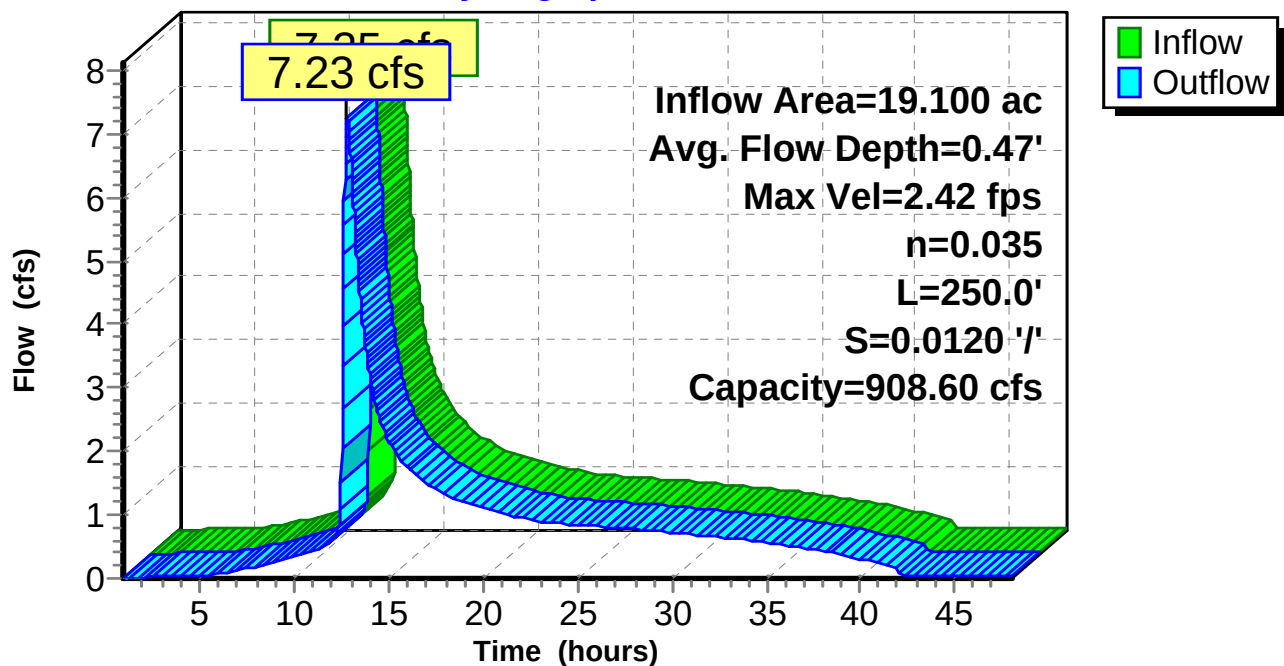
Peak Storage= 746 cf @ 12.86 hrs
Average Depth at Peak Storage= 0.47'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 3.0 '/' Top Width= 35.00'
Length= 250.0' Slope= 0.0120 '/'
Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: SP-1

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 11

Summary for Pond P-1: Gravel Wetland

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=149)

Inflow Area = 19.100 ac, 49.79% Impervious, Inflow Depth > 1.78" for 2-yr event
 Inflow = 18.75 cfs @ 12.35 hrs, Volume= 2.839 af
 Outflow = 7.25 cfs @ 12.84 hrs, Volume= 2.840 af, Atten= 61%, Lag= 29.6 min
 Primary = 0.04 cfs @ 12.84 hrs, Volume= 0.000 af
 Secondary = 7.21 cfs @ 12.84 hrs, Volume= 2.839 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 106.51' @ 12.84 hrs Surf.Area= 15,889 sf Storage= 43,462 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 351.2 min (1,241.5 - 890.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378
Device	Routing	Invert	Outlet Devices		
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64		
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 ' / Cc= 0.900 n= 0.011, Flow Area= 0.79 sf		
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600		
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32		

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Printed 8/24/2017

Page 12

Primary OutFlow Max=0.04 cfs @ 12.84 hrs HW=106.51' TW=91.47' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 0.04 cfs @ 0.25 fps)

2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=7.21 cfs @ 12.84 hrs HW=106.51' TW=91.47' (Dynamic Tailwater)

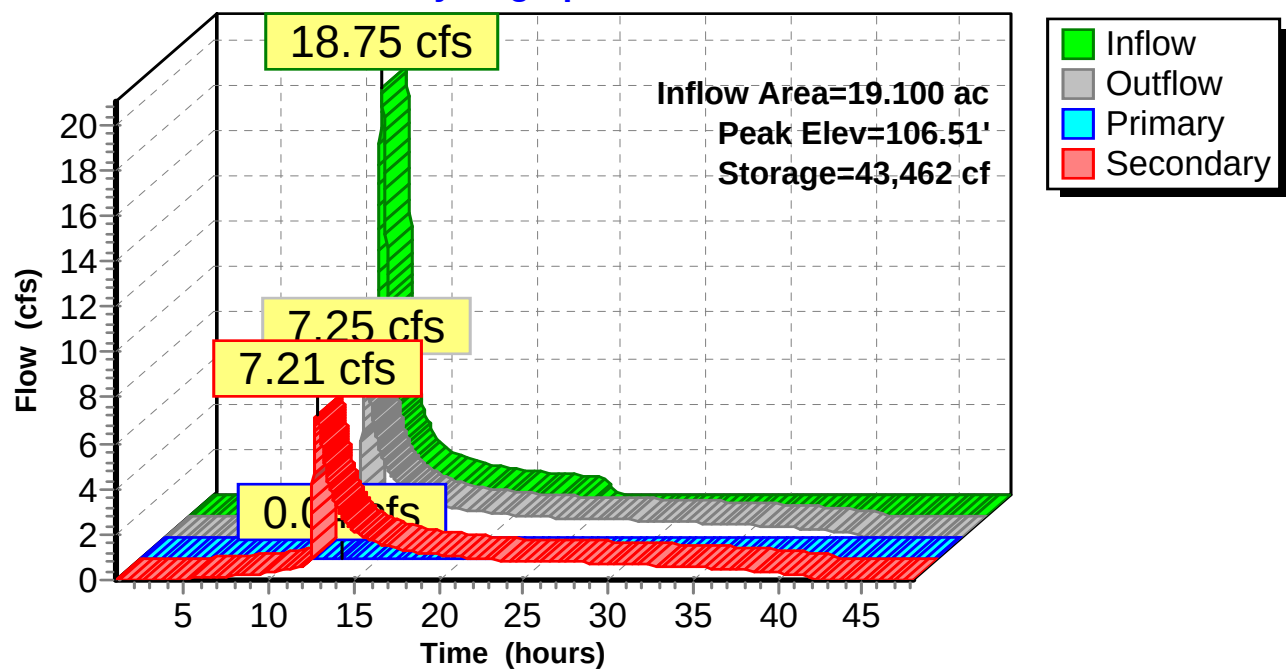
3=Culvert (Passes 7.21 cfs of 7.88 cfs potential flow)

4=Orifice/Grate (Orifice Controls 0.91 cfs @ 10.41 fps)

5=Broad-Crested Rectangular Weir (Weir Controls 6.30 cfs @ 2.06 fps)

Pond P-1: Gravel Wetland

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 13

Summary for Pond P-2: UGSF

Inflow Area = 0.906 ac, 73.75% Impervious, Inflow Depth = 2.32" for 2-yr event
 Inflow = 2.33 cfs @ 12.05 hrs, Volume= 0.175 af
 Outflow = 0.25 cfs @ 12.75 hrs, Volume= 0.137 af, Atten= 89%, Lag= 41.8 min
 Primary = 0.03 cfs @ 12.75 hrs, Volume= 0.083 af
 Secondary = 0.22 cfs @ 12.75 hrs, Volume= 0.054 af
 Tertiary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 112.04' @ 12.75 hrs Surf.Area= 2,978 sf Storage= 3,798 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 530.0 min (1,345.4 - 815.4)

Volume	Invert	Avail.Storage	Storage Description
#1	110.50'	8,850 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.50	1,950	0	0
113.50	3,950	8,850	8,850

Device	Routing	Invert	Outlet Devices
#1	Secondary	106.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 106.00' / 105.50' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	112.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	110.50'	0.375 in/hr Exfiltration over Surface area
#4	Tertiary	113.00'	250.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

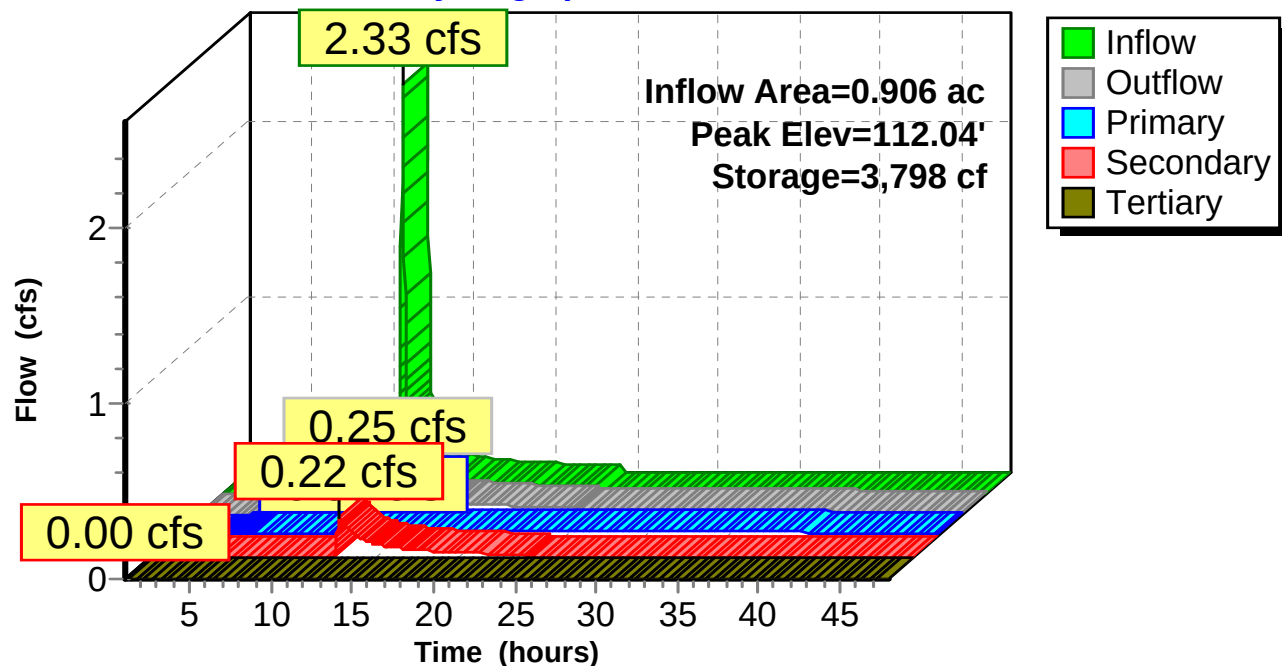
Primary OutFlow Max=0.03 cfs @ 12.75 hrs HW=112.04' TW=106.49' (Dynamic Tailwater)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Secondary OutFlow Max=0.22 cfs @ 12.75 hrs HW=112.04' TW=106.49' (Dynamic Tailwater)
 ↑ **1=Culvert** (Passes 0.22 cfs of 10.86 cfs potential flow)
 ↑ **2=Orifice/Grate** (Weir Controls 0.22 cfs @ 0.67 fps)

Tertiary OutFlow Max=0.00 cfs @ 1.00 hrs HW=110.50' TW=102.00' (Dynamic Tailwater)
 ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2: UGSF

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr SOP 10-yr Rainfall=4.71"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 15

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-2: No Treatment, to Runoff Area=759,387 sf 46.35% Impervious Runoff Depth=3.10"
Flow Length=1,612' Tc=29.3 min CN=85 Runoff=31.70 cfs 4.505 af

Subcatchment S-3: Roof Tributary Area Runoff Area=33,157 sf 100.00% Impervious Runoff Depth>4.47"
Flow Length=665' Tc=7.0 min CN=98 Runoff=3.20 cfs 0.284 af

Subcatchment S-4: Underdrained Soil Filter Runoff Area=39,458 sf 73.75% Impervious Runoff Depth=3.81"
Tc=7.0 min CN=92 Runoff=3.49 cfs 0.287 af

Reach SP-1: SP-1 Avg. Flow Depth=1.02' Max Vel=3.73 fps Inflow=30.62 cfs 5.038 af
n=0.035 L=250.0' S=0.0120 ' Capacity=908.60 cfs Outflow=30.54 cfs 5.037 af

Pond P-1: Gravel Wetland Peak Elev=107.11' Storage=53,535 cf Inflow=33.54 cfs 5.038 af
Primary=22.21 cfs 0.918 af Secondary=8.41 cfs 4.120 af Outflow=30.62 cfs 5.038 af

Pond P-2: UGSF Peak Elev=112.22' Storage=4,345 cf Inflow=3.49 cfs 0.287 af
Primary=0.03 cfs 0.086 af Secondary=2.73 cfs 0.163 af Tertiary=0.00 cfs 0.000 af Outflow=2.75 cfs 0.249 af

Total Runoff Area = 19.100 ac Runoff Volume = 5.076 af Average Runoff Depth = 3.19"
50.21% Pervious = 9.591 ac 49.79% Impervious = 9.509 ac

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

Printed 8/24/2017

Page 16

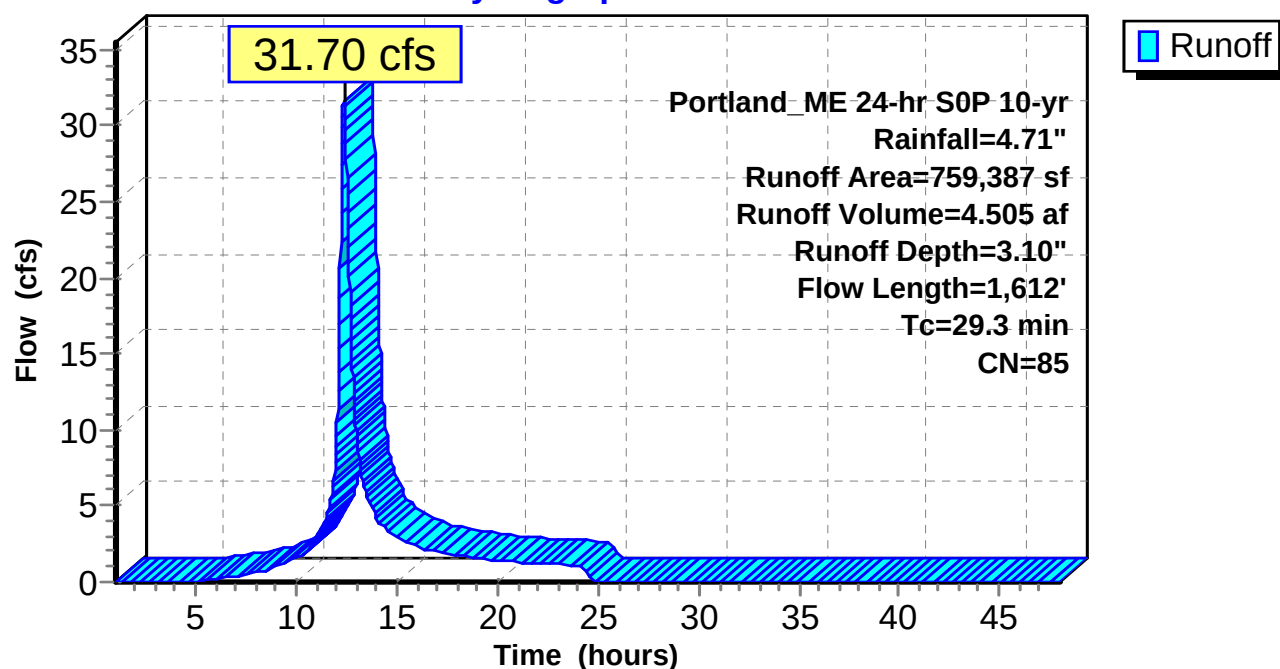
Summary for Subcatchment S-2: No Treatment, to Gravel Wetland

Runoff = 31.70 cfs @ 12.35 hrs, Volume= 4.505 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

Area (sf)	CN	Description
351,954	98	Paved parking & roofs
407,433	74	>75% Grass cover, Good, HSG C
759,387	85	Weighted Average
407,433		53.65% Pervious Area
351,954		46.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	285	0.0150	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.3	1,327	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
29.3	1,612	Total			

Subcatchment S-2: No Treatment, to Gravel Wetland**Hydrograph**

Final Proposed Gravel Wetland

Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 17

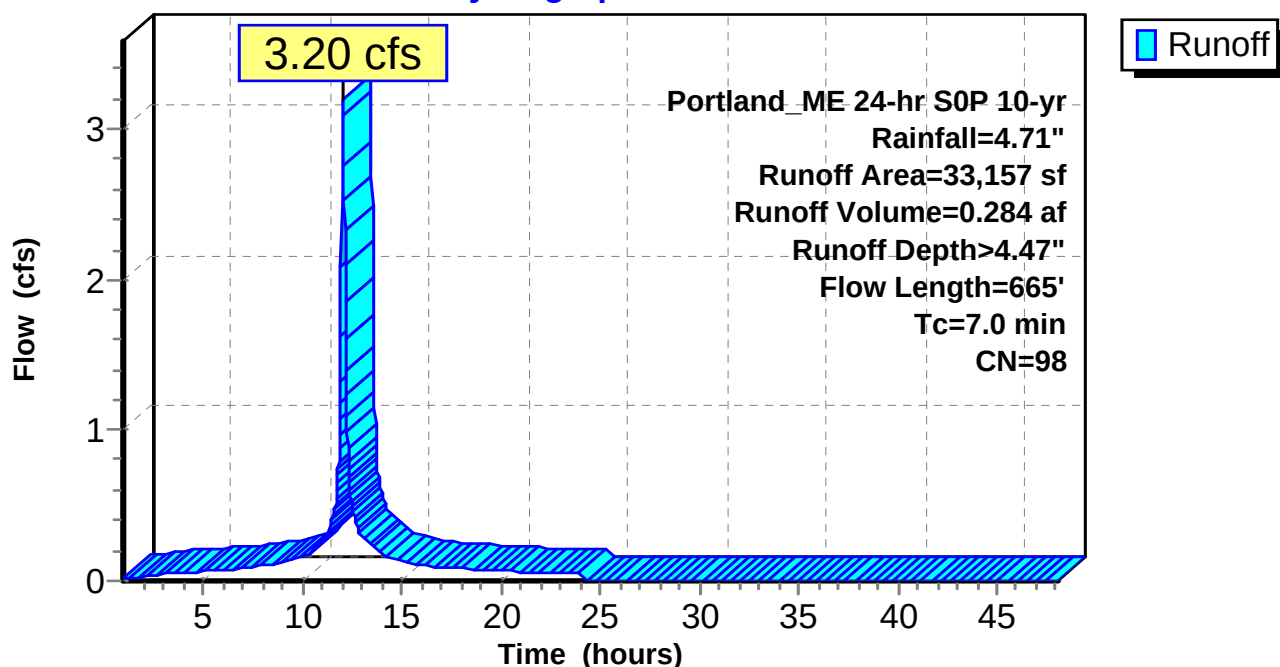
Summary for Subcatchment S-3: Roof Tributary Area

Runoff = 3.20 cfs @ 12.05 hrs, Volume= 0.284 af, Depth> 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

Area (sf)	CN	Description
33,157	98	Unconnected roofs, HSG A
33,157		100.00% Impervious Area
33,157		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.58		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
0.0	15	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.4	500	0.0100	5.94	10.50	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
4.0					Direct Entry, Min TC 7
7.0	665	Total			

Subcatchment S-3: Roof Tributary Area**Hydrograph**

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

Printed 8/24/2017

Page 18

Summary for Subcatchment S-4: Underdrained Soil Filter

Runoff = 3.49 cfs @ 12.05 hrs, Volume= 0.287 af, Depth= 3.81"

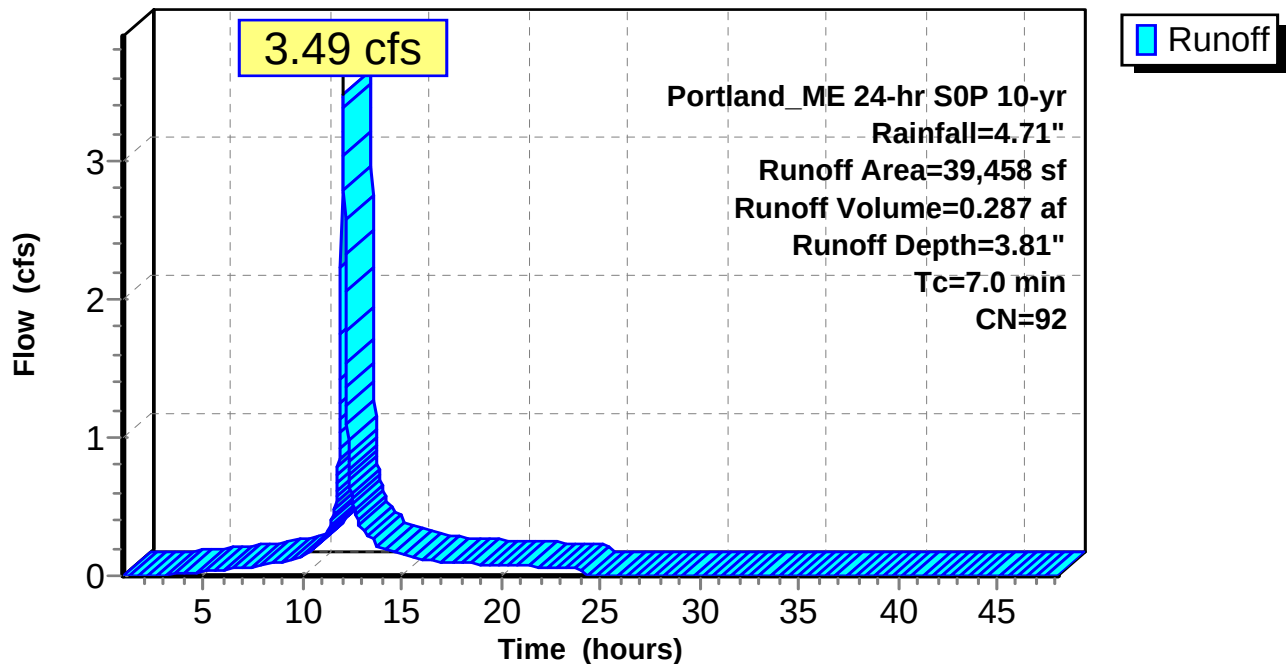
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

	Area (sf)	CN	Description
*	29,102	98	
*	10,356	75	
	39,458	92	Weighted Average
	10,356		26.25% Pervious Area
	29,102		73.75% Impervious Area

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

Subcatchment S-4: Underdrained Soil Filter

Hydrograph



Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 10-yr Rainfall=4.71"

Printed 8/24/2017

Page 19

Summary for Reach SP-1: SP-1

Inflow Area = 19.100 ac, 49.79% Impervious, Inflow Depth > 3.17" for 10-yr event
Inflow = 30.62 cfs @ 12.45 hrs, Volume= 5.038 af
Outflow = 30.54 cfs @ 12.46 hrs, Volume= 5.037 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
Max. Velocity= 3.73 fps, Min. Travel Time= 1.1 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 3.8 min

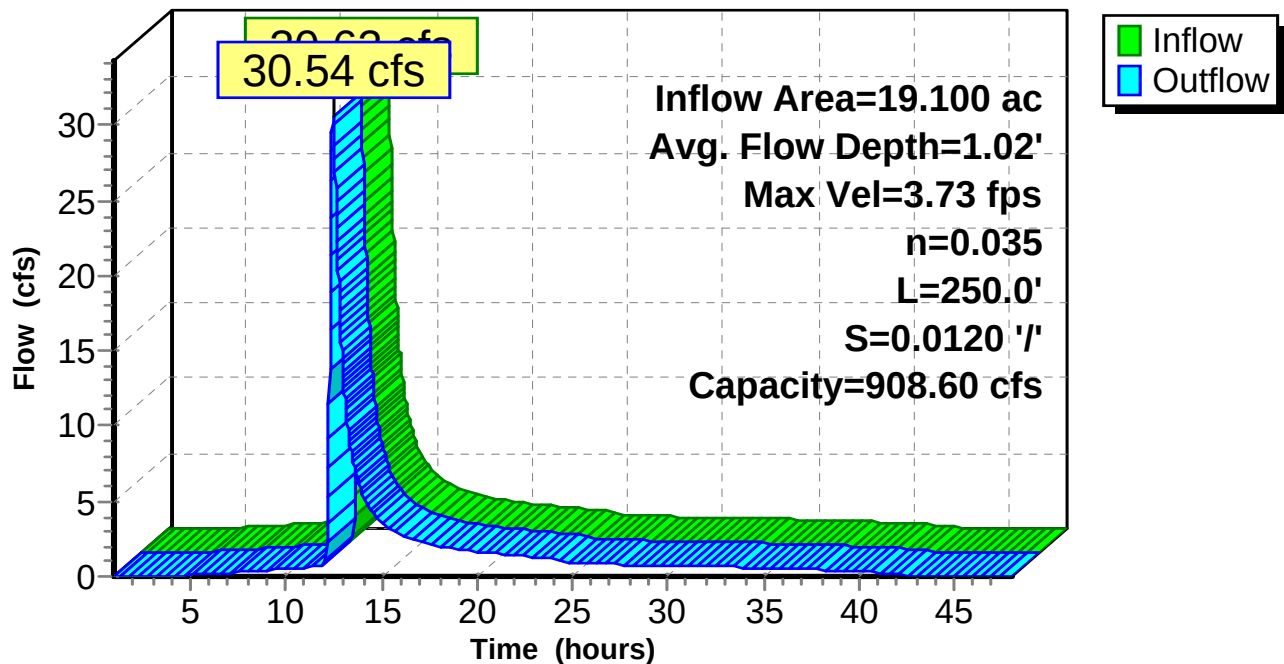
Peak Storage= 2,049 cf @ 12.46 hrs
Average Depth at Peak Storage= 1.02'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 3.0 '/' Top Width= 35.00'
Length= 250.0' Slope= 0.0120 '/'
Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: SP-1

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr SOP 10-yr Rainfall=4.71"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 20

Summary for Pond P-1: Gravel Wetland

Inflow Area = 19.100 ac, 49.79% Impervious, Inflow Depth > 3.16" for 10-yr event
 Inflow = 33.54 cfs @ 12.34 hrs, Volume= 5.038 af
 Outflow = 30.62 cfs @ 12.45 hrs, Volume= 5.038 af, Atten= 9%, Lag= 6.5 min
 Primary = 22.21 cfs @ 12.45 hrs, Volume= 0.918 af
 Secondary = 8.41 cfs @ 12.45 hrs, Volume= 4.120 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.11' @ 12.45 hrs Surf.Area= 17,698 sf Storage= 53,535 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 217.6 min (1,073.8 - 856.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 10-yr Rainfall=4.71"

Printed 8/24/2017

Page 21

Primary OutFlow Max=22.16 cfs @ 12.45 hrs HW=107.11' TW=92.02' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 19.35 cfs @ 2.11 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 2.81 cfs @ 0.79 fps)

Secondary OutFlow Max=8.41 cfs @ 12.45 hrs HW=107.11' TW=92.02' (Dynamic Tailwater)

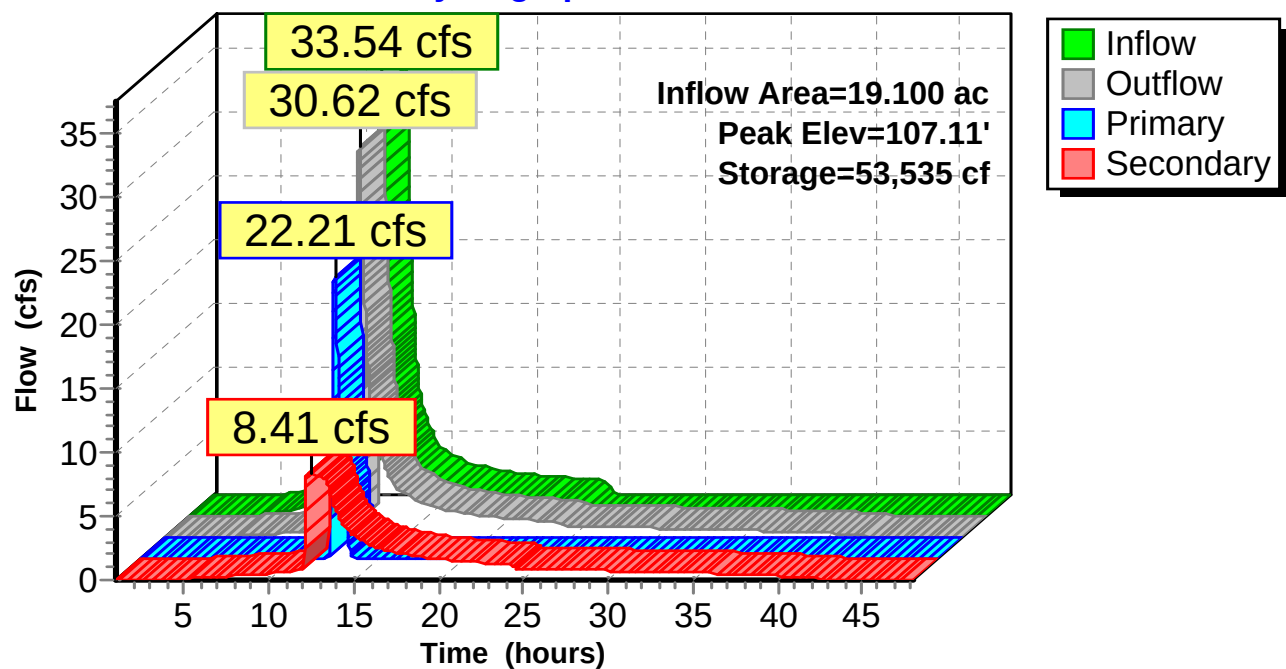
3=Culvert (Inlet Controls 8.41 cfs @ 10.70 fps)

4=Orifice/Grate (Passes < 0.97 cfs potential flow)

5=Broad-Crested Rectangular Weir (Passes < 22.51 cfs potential flow)

Pond P-1: Gravel Wetland

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 22

Summary for Pond P-2: UGSF

Inflow Area = 0.906 ac, 73.75% Impervious, Inflow Depth = 3.81" for 10-yr event
 Inflow = 3.49 cfs @ 12.05 hrs, Volume= 0.287 af
 Outflow = 2.75 cfs @ 12.13 hrs, Volume= 0.249 af, Atten= 21%, Lag= 4.5 min
 Primary = 0.03 cfs @ 12.13 hrs, Volume= 0.086 af
 Secondary = 2.73 cfs @ 12.13 hrs, Volume= 0.163 af
 Tertiary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3

Peak Elev= 112.22' @ 12.13 hrs Surf.Area= 3,098 sf Storage= 4,345 cf

Plug-Flow detention time= 380.1 min calculated for 0.249 af (87% of inflow)

Center-of-Mass det. time= 311.1 min (1,106.5 - 795.4)

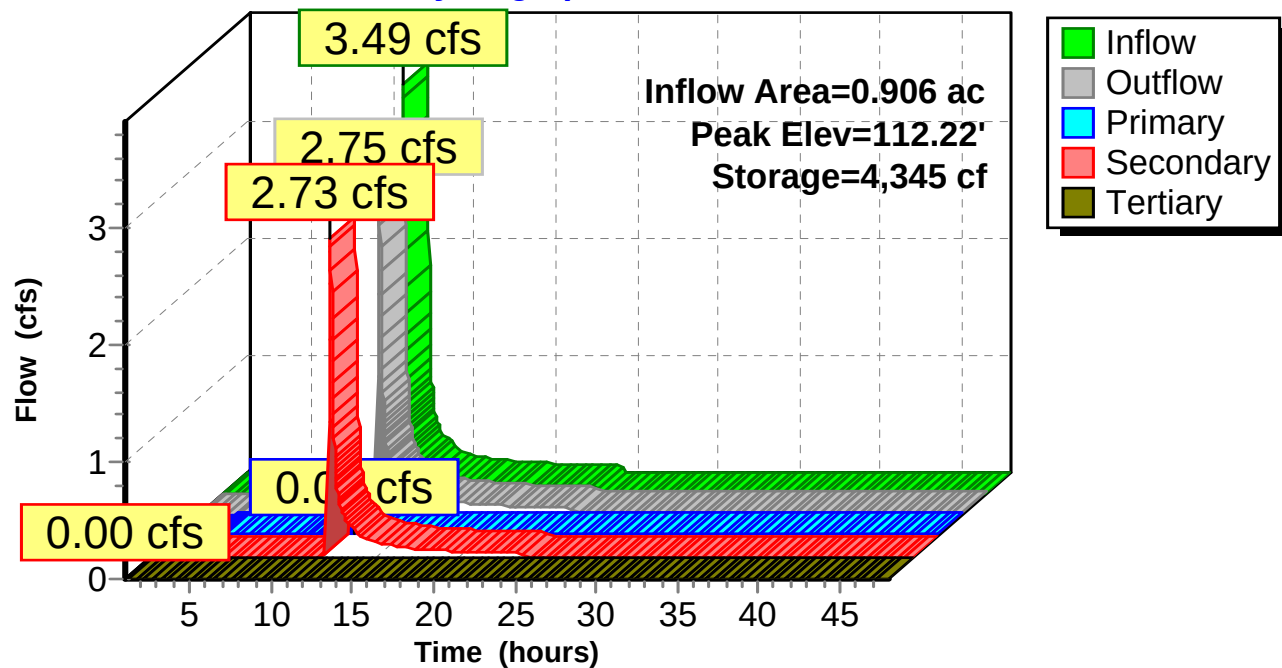
Volume	Invert	Avail.Storage	Storage Description
#1	110.50'	8,850 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.50	1,950	0	0
113.50	3,950	8,850	8,850

Device	Routing	Invert	Outlet Devices
#1	Secondary	106.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 106.00' / 105.50' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	112.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	110.50'	0.375 in/hr Exfiltration over Surface area
#4	Tertiary	113.00'	250.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.03 cfs @ 12.13 hrs HW=112.22' TW=106.14' (Dynamic Tailwater)↑**3=Exfiltration** (Exfiltration Controls 0.03 cfs)**Secondary OutFlow** Max=2.72 cfs @ 12.13 hrs HW=112.22' TW=106.14' (Dynamic Tailwater)↑**1=Culvert** (Passes 2.72 cfs of 11.04 cfs potential flow)↑**2=Orifice/Grate** (Weir Controls 2.72 cfs @ 1.54 fps)**Tertiary OutFlow** Max=0.00 cfs @ 1.00 hrs HW=110.50' TW=102.00' (Dynamic Tailwater)↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2: UGSF

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr SOP 25-yr Rainfall=5.92"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 24

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-2: No Treatment, to Runoff Area=759,387 sf 46.35% Impervious Runoff Depth=4.23"
Flow Length=1,612' Tc=29.3 min CN=85 Runoff=42.04 cfs 6.141 af

Subcatchment S-3: Roof Tributary Area Runoff Area=33,157 sf 100.00% Impervious Runoff Depth>5.68"
Flow Length=665' Tc=7.0 min CN=98 Runoff=3.83 cfs 0.360 af

Subcatchment S-4: Underdrained Soil Filter Runoff Area=39,458 sf 73.75% Impervious Runoff Depth=4.99"
Tc=7.0 min CN=92 Runoff=4.30 cfs 0.377 af

Reach SP-1: SP-1 Avg. Flow Depth=1.22' Max Vel=4.11 fps Inflow=43.51 cfs 6.839 af
n=0.035 L=250.0' S=0.0120 ' Capacity=908.60 cfs Outflow=43.45 cfs 6.839 af

Pond P-1: Gravel Wetland Peak Elev=107.24' Storage=55,877 cf Inflow=44.43 cfs 6.839 af
Primary=34.99 cfs 1.883 af Secondary=8.52 cfs 4.956 af Outflow=43.51 cfs 6.839 af

Pond P-2: UGSF Peak Elev=112.28' Storage=4,525 cf Inflow=4.30 cfs 0.377 af
Primary=0.03 cfs 0.087 af Secondary=3.86 cfs 0.251 af Tertiary=0.00 cfs 0.000 af Outflow=3.89 cfs 0.338 af

Total Runoff Area = 19.100 ac Runoff Volume = 6.878 af Average Runoff Depth = 4.32"
50.21% Pervious = 9.591 ac 49.79% Impervious = 9.509 ac

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 25-yr Rainfall=5.92"

Printed 8/24/2017

Page 25

Summary for Subcatchment S-2: No Treatment, to Gravel Wetland

Runoff = 42.04 cfs @ 12.35 hrs, Volume= 6.141 af, Depth= 4.23"

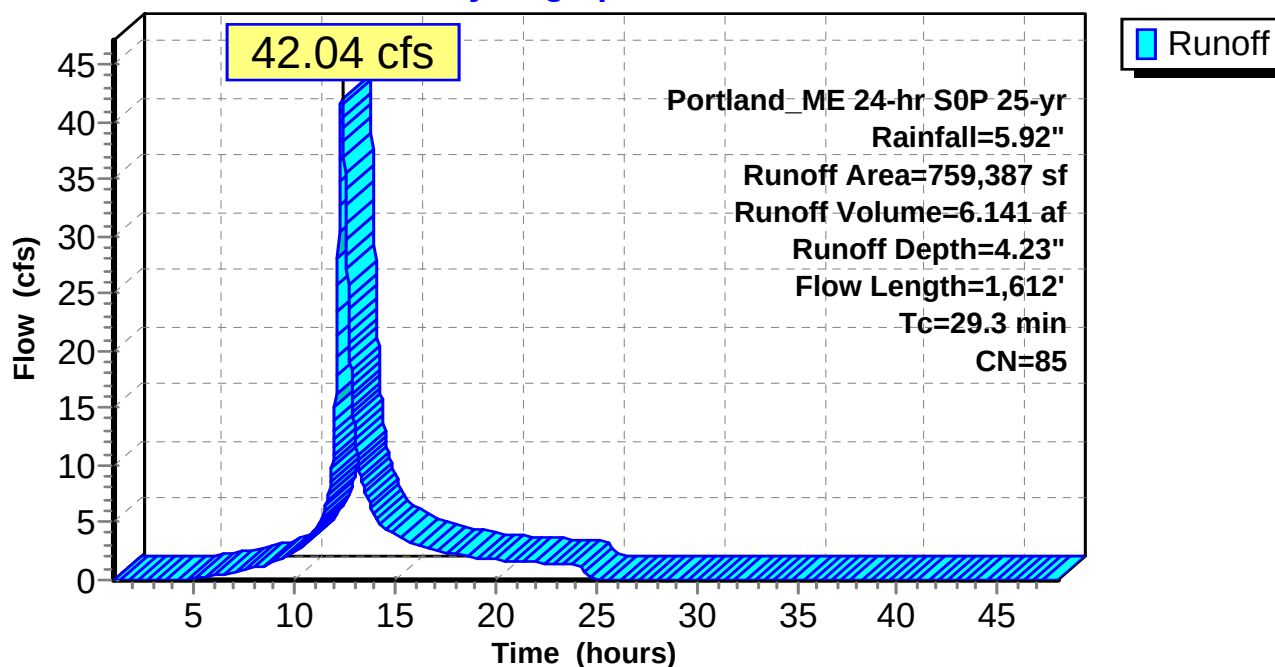
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 25-yr Rainfall=5.92"

Area (sf)	CN	Description
351,954	98	Paved parking & roofs
407,433	74	>75% Grass cover, Good, HSG C
759,387	85	Weighted Average
407,433		53.65% Pervious Area
351,954		46.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	285	0.0150	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.3	1,327	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
29.3	1,612	Total			

Subcatchment S-2: No Treatment, to Gravel Wetland

Hydrograph



Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 25-yr Rainfall=5.92"

Printed 8/24/2017

Page 26

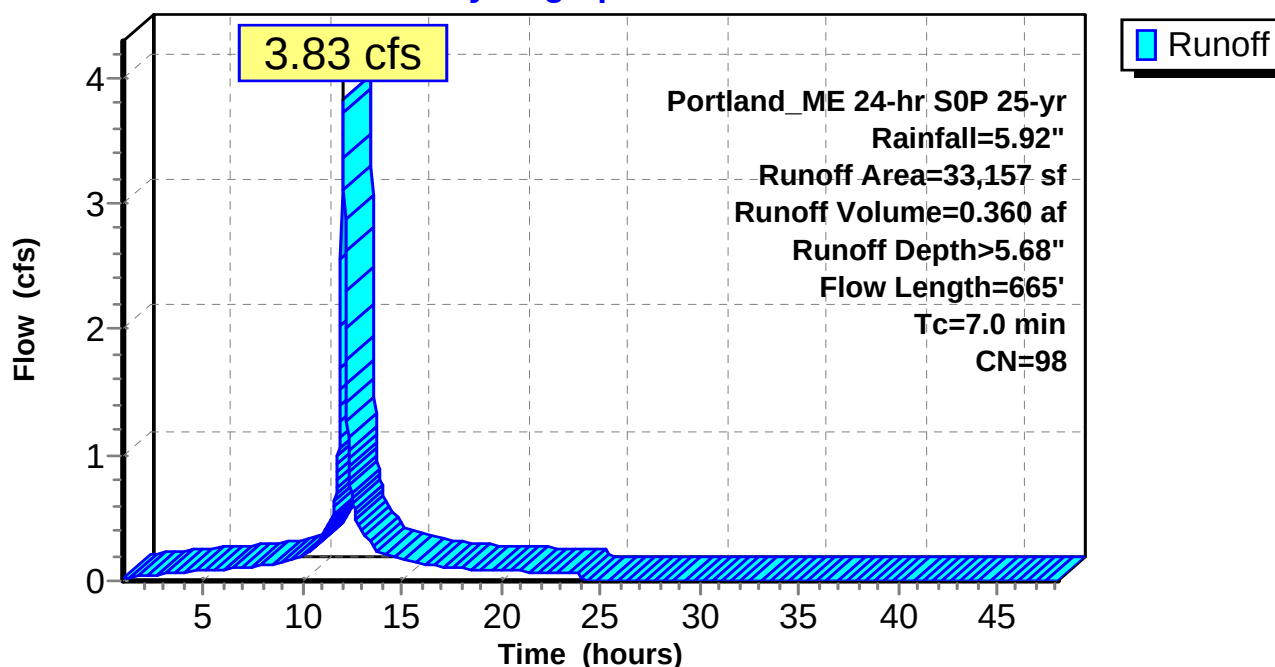
Summary for Subcatchment S-3: Roof Tributary Area

Runoff = 3.83 cfs @ 12.05 hrs, Volume= 0.360 af, Depth> 5.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 25-yr Rainfall=5.92"

Area (sf)	CN	Description
33,157	98	Unconnected roofs, HSG A
33,157		100.00% Impervious Area
33,157		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.58		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
0.0	15	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.4	500	0.0100	5.94	10.50	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
4.0					Direct Entry, Min TC 7
7.0	665	Total			

Subcatchment S-3: Roof Tributary Area**Hydrograph**

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 25-yr Rainfall=5.92"

Printed 8/24/2017

Page 27

Summary for Subcatchment S-4: Underdrained Soil Filter

Runoff = 4.30 cfs @ 12.05 hrs, Volume= 0.377 af, Depth= 4.99"

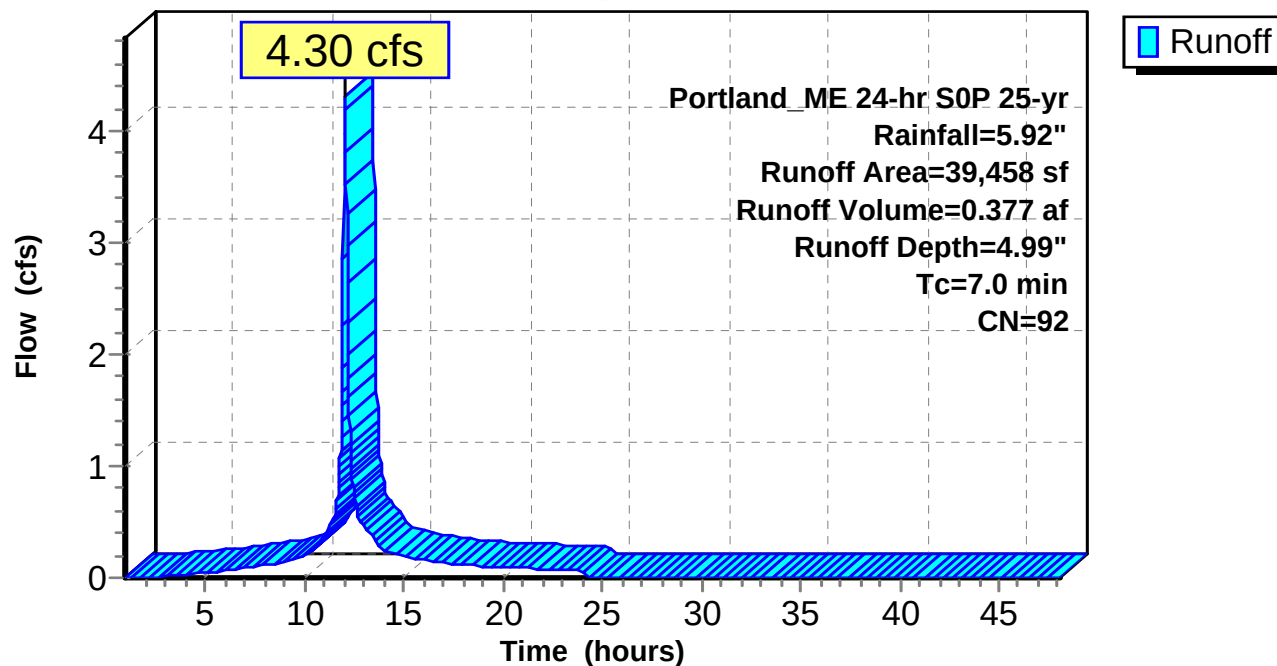
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 25-yr Rainfall=5.92"

	Area (sf)	CN	Description
*	29,102	98	
*	10,356	75	
	39,458	92	Weighted Average
	10,356		26.25% Pervious Area
	29,102		73.75% Impervious Area

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

Subcatchment S-4: Underdrained Soil Filter

Hydrograph



Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 25-yr Rainfall=5.92"

Printed 8/24/2017

Page 28

Summary for Reach SP-1: SP-1

Inflow Area = 19.100 ac, 49.79% Impervious, Inflow Depth > 4.30" for 25-yr event
Inflow = 43.51 cfs @ 12.39 hrs, Volume= 6.839 af
Outflow = 43.45 cfs @ 12.40 hrs, Volume= 6.839 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
Max. Velocity= 4.11 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.18 fps, Avg. Travel Time= 3.5 min

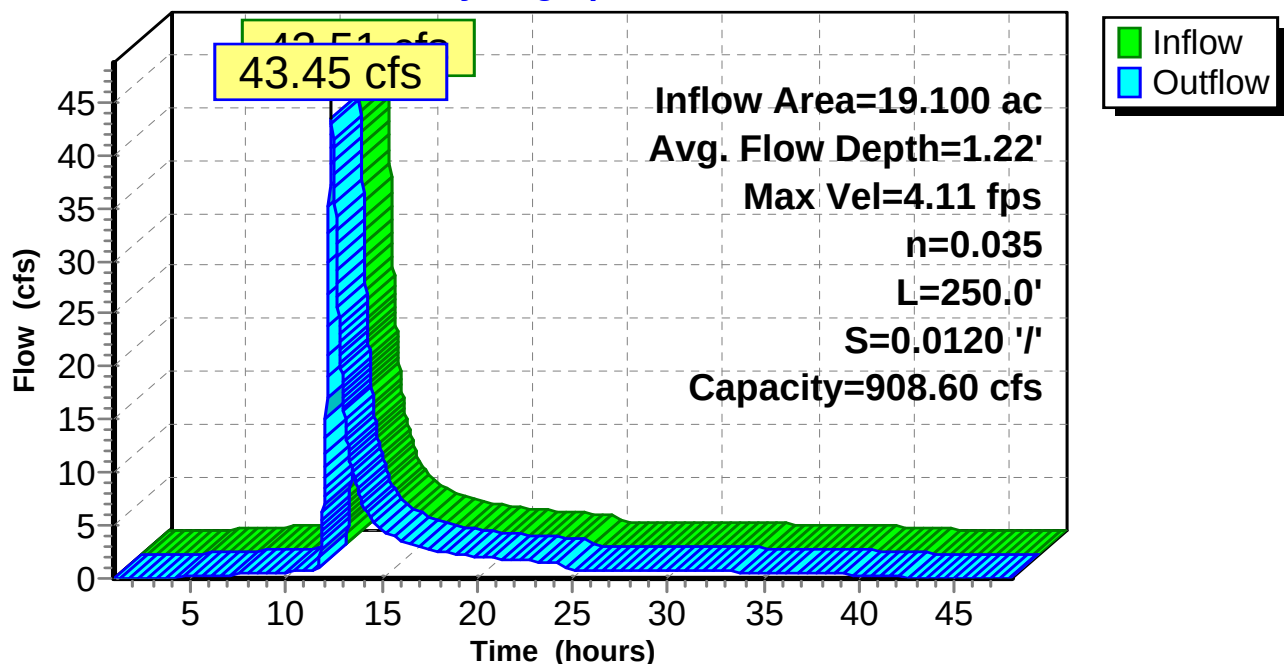
Peak Storage= 2,642 cf @ 12.40 hrs
Average Depth at Peak Storage= 1.22'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 3.0 '/' Top Width= 35.00'
Length= 250.0' Slope= 0.0120 '/'
Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: SP-1

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr SOP 25-yr Rainfall=5.92"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 29

Summary for Pond P-1: Gravel Wetland

Inflow Area = 19.100 ac, 49.79% Impervious, Inflow Depth > 4.30" for 25-yr event
 Inflow = 44.43 cfs @ 12.34 hrs, Volume= 6.839 af
 Outflow = 43.51 cfs @ 12.39 hrs, Volume= 6.839 af, Atten= 2%, Lag= 3.0 min
 Primary = 34.99 cfs @ 12.39 hrs, Volume= 1.883 af
 Secondary = 8.52 cfs @ 12.39 hrs, Volume= 4.956 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.24' @ 12.39 hrs Surf.Area= 18,193 sf Storage= 55,877 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 170.5 min (1,011.4 - 840.9)

Volume	Invert	Avail.Storage	Storage Description		
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 25-yr Rainfall=5.92"

Printed 8/24/2017

Page 30

Primary OutFlow Max=34.95 cfs @ 12.39 hrs HW=107.24' TW=92.22' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 25.82 cfs @ 2.32 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 9.14 cfs @ 1.18 fps)

Secondary OutFlow Max=8.52 cfs @ 12.39 hrs HW=107.24' TW=92.22' (Dynamic Tailwater)

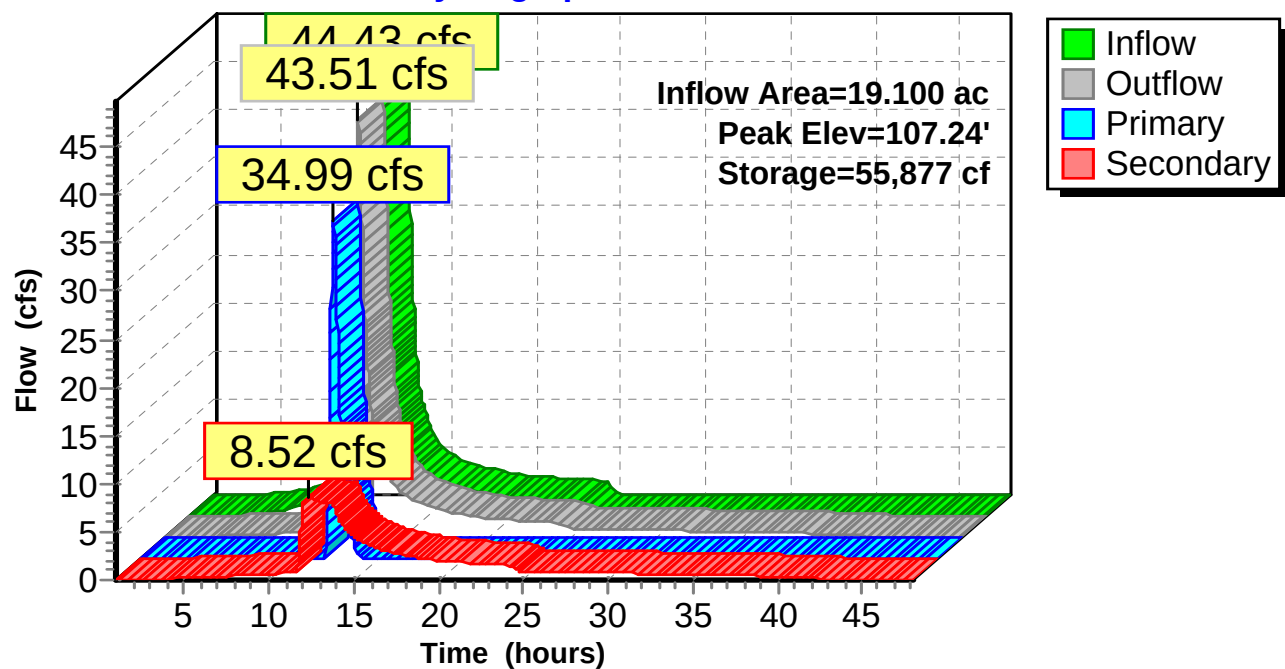
3=Culvert (Inlet Controls 8.52 cfs @ 10.84 fps)

4=Orifice/Grate (Passes < 0.98 cfs potential flow)

5=Broad-Crested Rectangular Weir (Passes < 26.83 cfs potential flow)

Pond P-1: Gravel Wetland

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr S0P 25-yr Rainfall=5.92"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 31

Summary for Pond P-2: UGSF

Inflow Area = 0.906 ac, 73.75% Impervious, Inflow Depth = 4.99" for 25-yr event
 Inflow = 4.30 cfs @ 12.05 hrs, Volume= 0.377 af
 Outflow = 3.89 cfs @ 12.10 hrs, Volume= 0.338 af, Atten= 10%, Lag= 2.6 min
 Primary = 0.03 cfs @ 12.10 hrs, Volume= 0.087 af
 Secondary = 3.86 cfs @ 12.10 hrs, Volume= 0.251 af
 Tertiary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 112.28' @ 12.10 hrs Surf.Area= 3,136 sf Storage= 4,525 cf

Plug-Flow detention time= 297.3 min calculated for 0.338 af (90% of inflow)
 Center-of-Mass det. time= 241.7 min (1,027.2 - 785.6)

Volume	Invert	Avail.Storage	Storage Description
#1	110.50'	8,850 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.50	1,950	0	0
113.50	3,950	8,850	8,850

Device	Routing	Invert	Outlet Devices
#1	Secondary	106.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 106.00' / 105.50' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	112.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	110.50'	0.375 in/hr Exfiltration over Surface area
#4	Tertiary	113.00'	250.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.03 cfs @ 12.10 hrs HW=112.28' TW=106.85' (Dynamic Tailwater)

↑ **3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Secondary OutFlow Max=3.85 cfs @ 12.10 hrs HW=112.28' TW=106.85' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 3.85 cfs of 10.87 cfs potential flow)

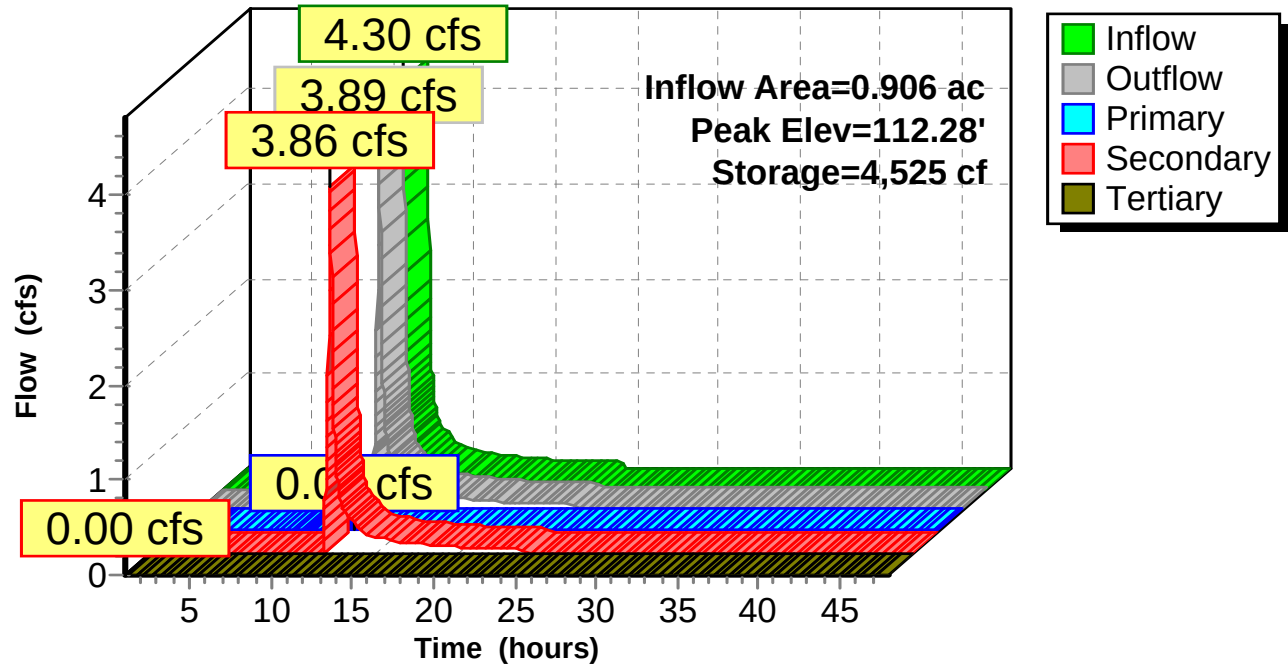
↑ **2=Orifice/Grate** (Weir Controls 3.85 cfs @ 1.73 fps)

Tertiary OutFlow Max=0.00 cfs @ 1.00 hrs HW=110.50' TW=102.00' (Dynamic Tailwater)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2: UGSF

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 33

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-2: No Treatment, to Runoff Area=759,387 sf 46.35% Impervious Runoff Depth=8.13"
Flow Length=1,612' Tc=29.3 min CN=85 Runoff=75.56 cfs 11.805 af

Subcatchment S-3: Roof Tributary Area Runoff Area=33,157 sf 100.00% Impervious Runoff Depth>9.71"
Flow Length=665' Tc=7.0 min CN=98 Runoff=5.93 cfs 0.616 af

Subcatchment S-4: Underdrained Soil Filter Runoff Area=39,458 sf 73.75% Impervious Runoff Depth=9.00"
Tc=7.0 min CN=92 Runoff=6.89 cfs 0.679 af

Reach SP-1: SP-1 Avg. Flow Depth=1.64' Max Vel=4.84 fps Inflow=79.08 cfs 13.061 af
n=0.035 L=250.0' S=0.0120 '/' Capacity=908.60 cfs Outflow=79.02 cfs 13.061 af

Pond P-1: Gravel Wetland Peak Elev=107.50' Storage=60,774 cf Inflow=79.86 cfs 13.061 af
Primary=70.34 cfs 5.495 af Secondary=8.73 cfs 7.567 af Outflow=79.08 cfs 13.061 af

Pond P-2: UGSF Peak Elev=112.39' Storage=4,878 cf Inflow=6.89 cfs 0.679 af
Primary=0.03 cfs 0.090 af Secondary=6.38 cfs 0.550 af Tertiary=0.00 cfs 0.000 af Outflow=6.41 cfs 0.640 af

Total Runoff Area = 19.100 ac Runoff Volume = 13.100 af Average Runoff Depth = 8.23"
50.21% Pervious = 9.591 ac 49.79% Impervious = 9.509 ac

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 200-yr Rainfall=9.97"

Printed 8/24/2017

Page 34

Summary for Subcatchment S-2: No Treatment, to Gravel Wetland

Runoff = 75.56 cfs @ 12.35 hrs, Volume= 11.805 af, Depth= 8.13"

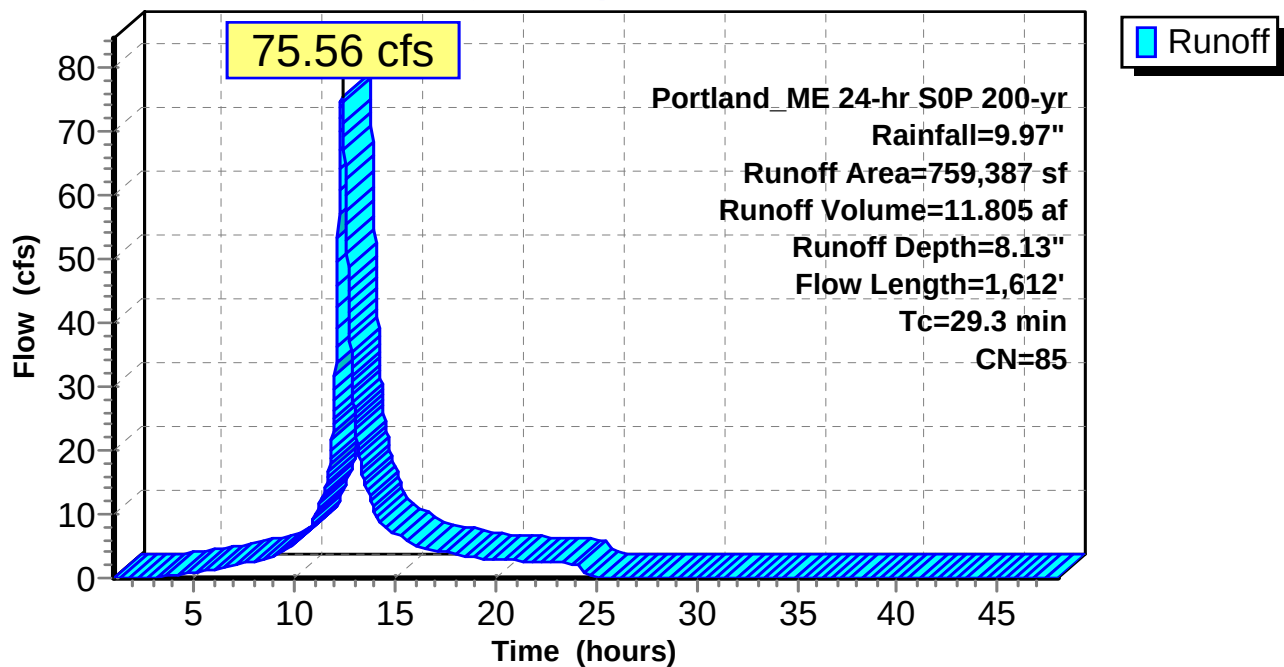
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 200-yr Rainfall=9.97"

Area (sf)	CN	Description
351,954	98	Paved parking & roofs
407,433	74	>75% Grass cover, Good, HSG C
759,387	85	Weighted Average
407,433		53.65% Pervious Area
351,954		46.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	285	0.0150	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.3	1,327	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
29.3	1,612	Total			

Subcatchment S-2: No Treatment, to Gravel Wetland

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 35

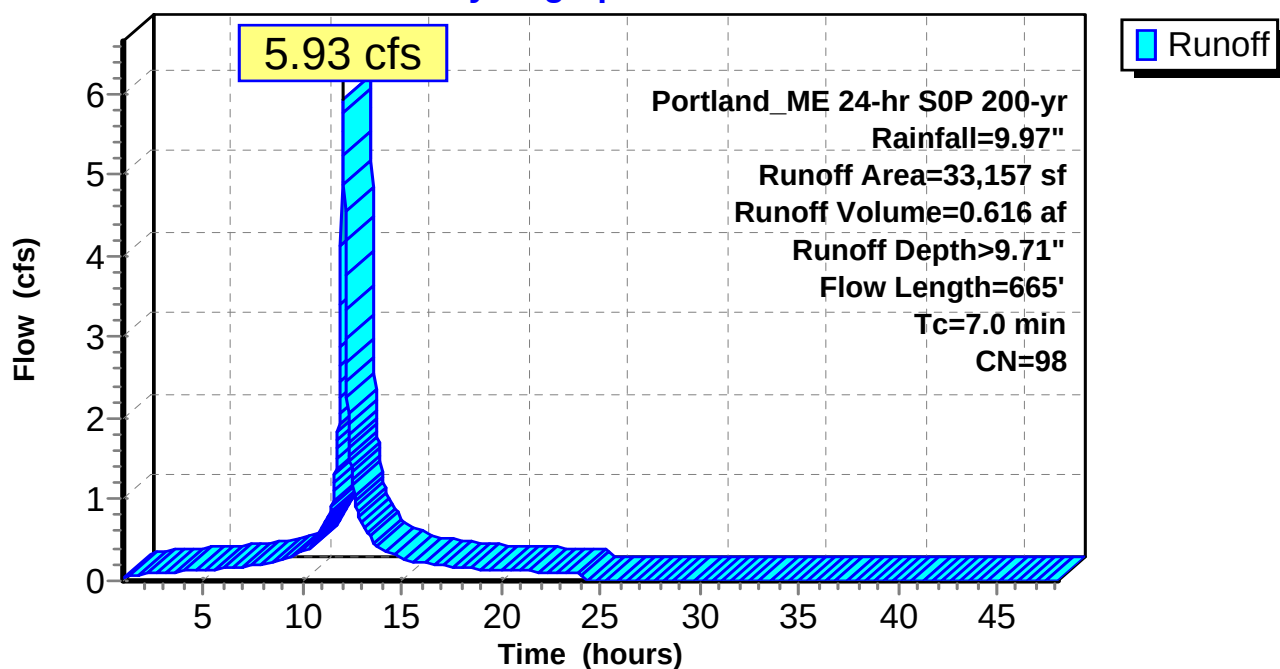
Summary for Subcatchment S-3: Roof Tributary Area

Runoff = 5.93 cfs @ 12.05 hrs, Volume= 0.616 af, Depth> 9.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Area (sf)	CN	Description
33,157	98	Unconnected roofs, HSG A
33,157		100.00% Impervious Area
33,157		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.58		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
0.0	15	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.4	500	0.0100	5.94	10.50	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
4.0					Direct Entry, Min TC 7
7.0	665	Total			

Subcatchment S-3: Roof Tributary Area**Hydrograph**

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Printed 8/24/2017

Page 36

Summary for Subcatchment S-4: Underdrained Soil Filter

Runoff = 6.89 cfs @ 12.05 hrs, Volume= 0.679 af, Depth= 9.00"

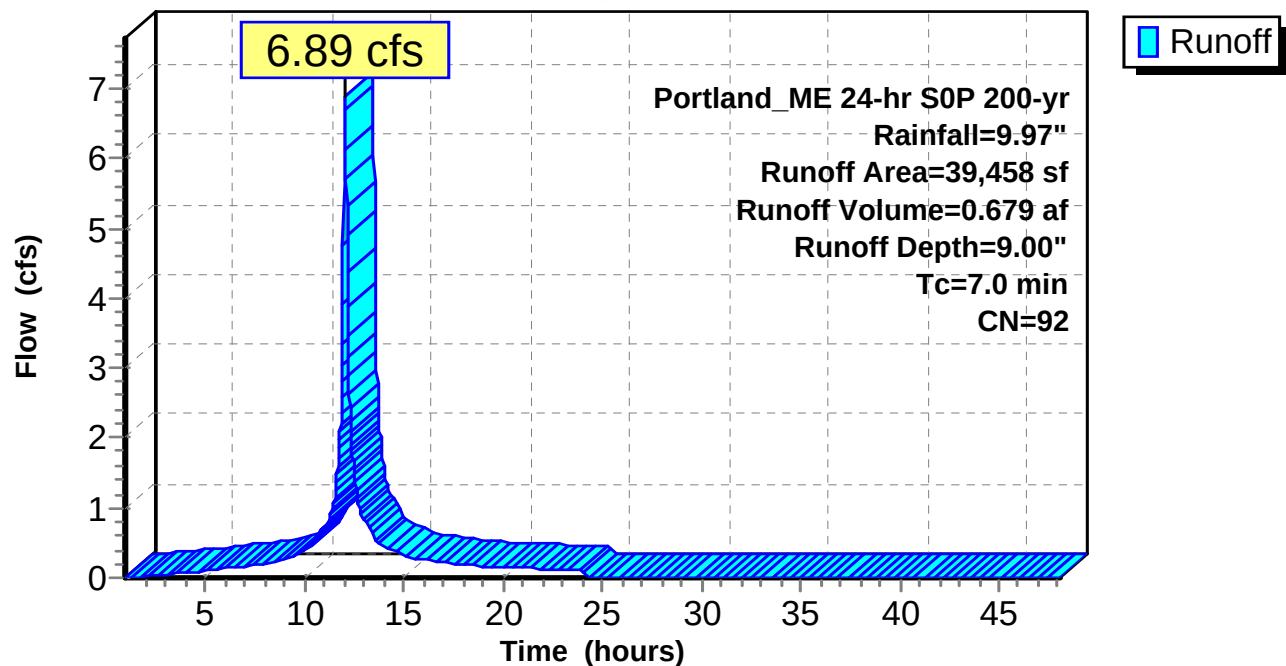
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

	Area (sf)	CN	Description
*	29,102	98	
*	10,356	75	
	39,458	92	Weighted Average
	10,356		26.25% Pervious Area
	29,102		73.75% Impervious Area

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

Subcatchment S-4: Underdrained Soil Filter

Hydrograph



Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Printed 8/24/2017

Page 37

Summary for Reach SP-1: SP-1

Inflow Area = 19.100 ac, 49.79% Impervious, Inflow Depth > 8.21" for 200-yr event
Inflow = 79.08 cfs @ 12.37 hrs, Volume= 13.061 af
Outflow = 79.02 cfs @ 12.38 hrs, Volume= 13.061 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
Max. Velocity= 4.84 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 3.1 min

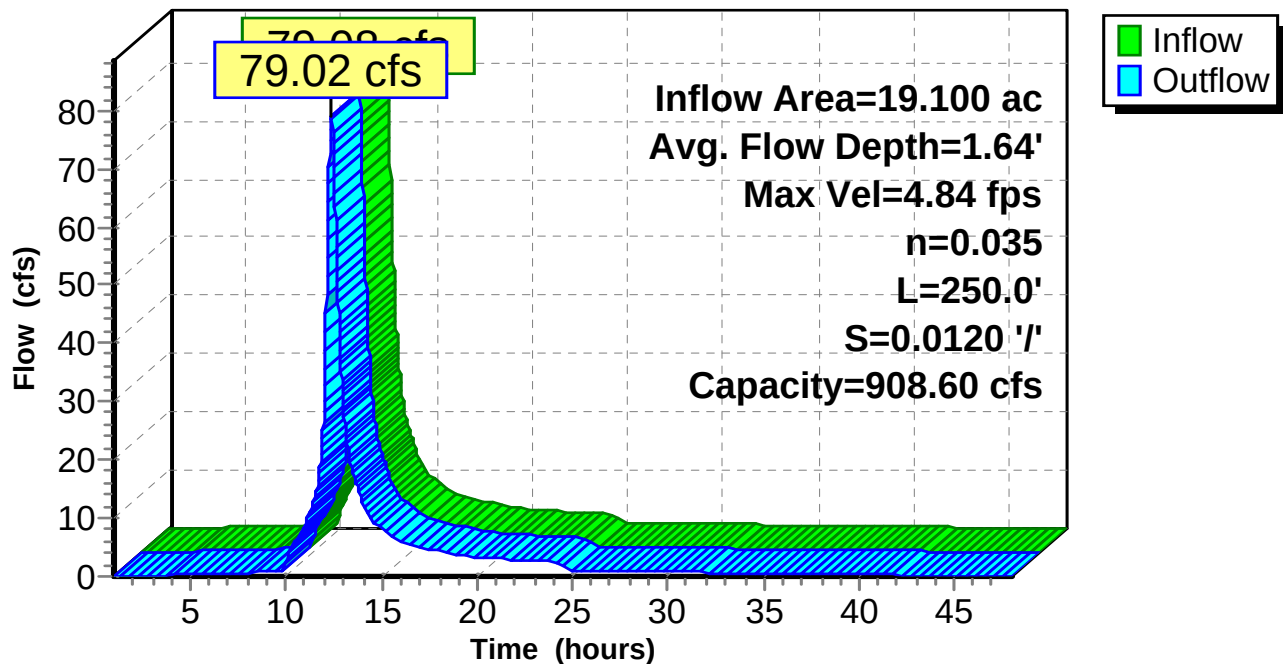
Peak Storage= 4,084 cf @ 12.38 hrs
Average Depth at Peak Storage= 1.64'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 3.0 ' / ' Top Width= 35.00'
Length= 250.0' Slope= 0.0120 ' / '
Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: SP-1

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 38

Summary for Pond P-1: Gravel Wetland

Inflow Area = 19.100 ac, 49.79% Impervious, Inflow Depth > 8.21" for 200-yr event
 Inflow = 79.86 cfs @ 12.34 hrs, Volume= 13.061 af
 Outflow = 79.08 cfs @ 12.37 hrs, Volume= 13.061 af, Atten= 1%, Lag= 2.0 min
 Primary = 70.34 cfs @ 12.37 hrs, Volume= 5.495 af
 Secondary = 8.73 cfs @ 12.37 hrs, Volume= 7.567 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.50' @ 12.37 hrs Surf.Area= 19,207 sf Storage= 60,774 cf

Plug-Flow detention time= 103.7 min calculated for 13.061 af (100% of inflow)
 Center-of-Mass det. time= 103.7 min (917.0 - 813.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378
Device	Routing	Invert	Outlet Devices		
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64		
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf		
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600		
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32		

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Printed 8/24/2017

Page 39

Primary OutFlow Max=70.29 cfs @ 12.37 hrs HW=107.50' TW=92.64' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 40.44 cfs @ 2.69 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 29.86 cfs @ 1.85 fps)

Secondary OutFlow Max=8.73 cfs @ 12.37 hrs HW=107.50' TW=92.64' (Dynamic Tailwater)

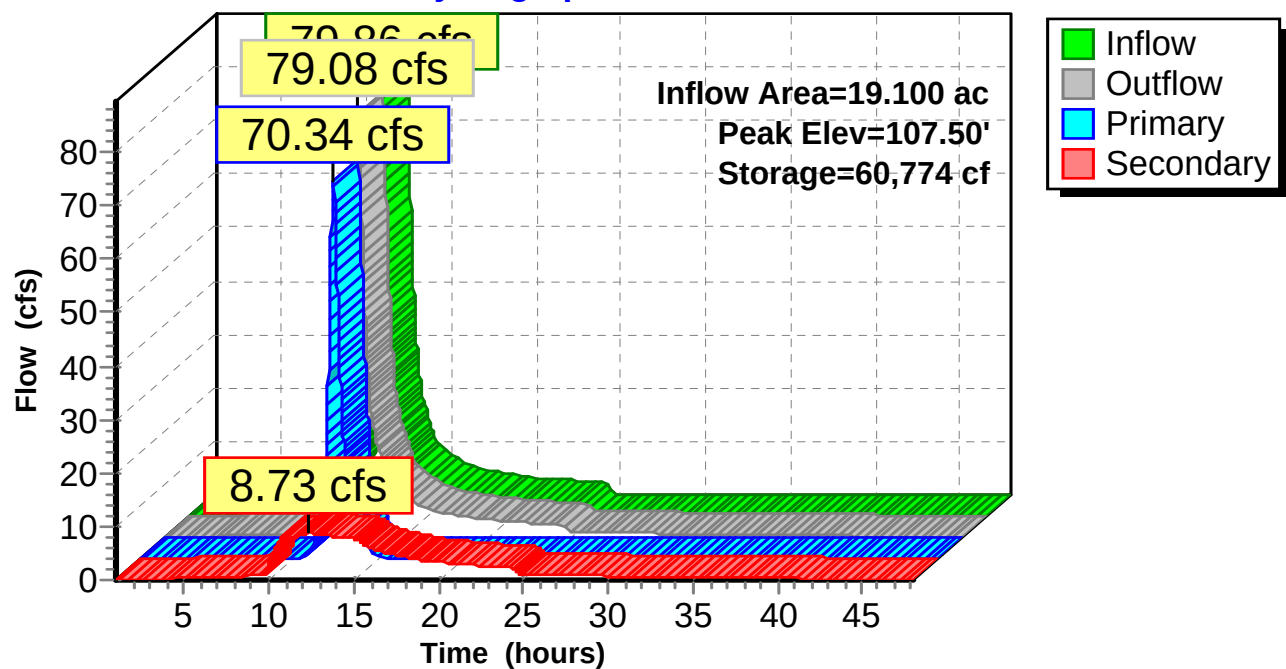
3=Culvert (Inlet Controls 8.73 cfs @ 11.12 fps)

4=Orifice/Grate (Passes < 1.00 cfs potential flow)

5=Broad-Crested Rectangular Weir (Passes < 36.36 cfs potential flow)

Pond P-1: Gravel Wetland

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 40

Summary for Pond P-2: UGSF

Inflow Area = 0.906 ac, 73.75% Impervious, Inflow Depth = 9.00" for 200-yr event
 Inflow = 6.89 cfs @ 12.05 hrs, Volume= 0.679 af
 Outflow = 6.41 cfs @ 12.09 hrs, Volume= 0.640 af, Atten= 7%, Lag= 2.3 min
 Primary = 0.03 cfs @ 12.09 hrs, Volume= 0.090 af
 Secondary = 6.38 cfs @ 12.09 hrs, Volume= 0.550 af
 Tertiary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 112.39' @ 12.09 hrs Surf.Area= 3,210 sf Storage= 4,878 cf

Plug-Flow detention time= 180.6 min calculated for 0.640 af (94% of inflow)
 Center-of-Mass det. time= 146.5 min (913.9 - 767.4)

Volume	Invert	Avail.Storage	Storage Description
#1	110.50'	8,850 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.50	1,950	0	0
113.50	3,950	8,850	8,850

Device	Routing	Invert	Outlet Devices
#1	Secondary	106.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 106.00' / 105.50' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	112.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	110.50'	0.375 in/hr Exfiltration over Surface area
#4	Tertiary	113.00'	250.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

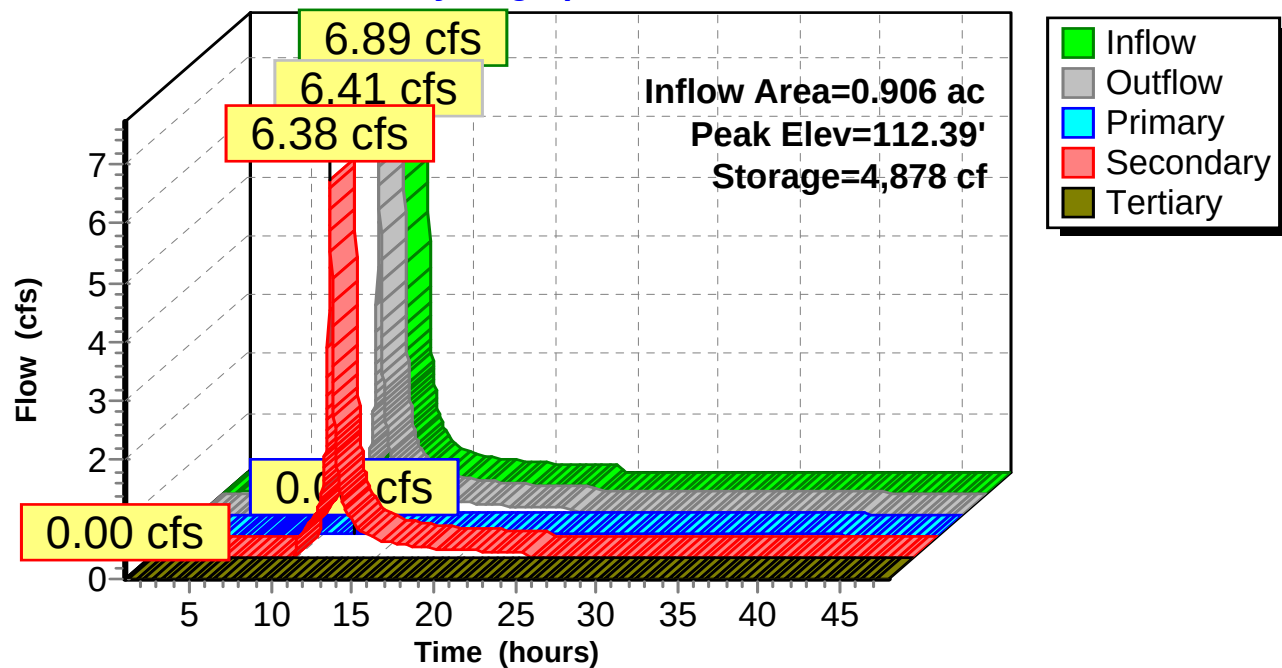
Primary OutFlow Max=0.03 cfs @ 12.09 hrs HW=112.39' TW=107.26' (Dynamic Tailwater)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Secondary OutFlow Max=6.35 cfs @ 12.09 hrs HW=112.39' TW=107.26' (Dynamic Tailwater)
 ↑ **1=Culvert** (Passes 6.35 cfs of 10.57 cfs potential flow)
 ↑ **2=Orifice/Grate** (Weir Controls 6.35 cfs @ 2.04 fps)

Tertiary OutFlow Max=0.00 cfs @ 1.00 hrs HW=110.50' TW=102.00' (Dynamic Tailwater)
 ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2: UGSF

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 42

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-2: No Treatment, to Runoff Area=759,387 sf 46.35% Impervious Runoff Depth=10.66"
Flow Length=1,612' Tc=29.3 min CN=85 Runoff=96.59 cfs 15.480 af

Subcatchment S-3: Roof Tributary Area Runoff Area=33,157 sf 100.00% Impervious Runoff Depth>12.28"
Flow Length=665' Tc=7.0 min CN=98 Runoff=7.22 cfs 0.779 af

Subcatchment S-4: Underdrained Soil Runoff Area=39,458 sf 73.75% Impervious Runoff Depth=11.56"
Tc=7.0 min CN=92 Runoff=8.46 cfs 0.873 af

Reach SP-1: SP-1 Avg. Flow Depth=1.85' Max Vel=5.17 fps Inflow=101.21 cfs 17.093 af
n=0.035 L=250.0' S=0.0120 '/' Capacity=908.60 cfs Outflow=101.15 cfs 17.092 af

Pond P-1: Gravel Wetland Peak Elev=107.63' Storage=63,317 cf Inflow=102.12 cfs 17.093 af
Primary=92.37 cfs 8.173 af Secondary=8.84 cfs 8.919 af Outflow=101.21 cfs 17.093 af

Pond P-2: UGSF Peak Elev=112.45' Storage=5,072 cf Inflow=8.46 cfs 0.873 af
Primary=0.03 cfs 0.092 af Secondary=7.92 cfs 0.743 af Tertiary=0.00 cfs 0.000 af Outflow=7.95 cfs 0.834 af

Total Runoff Area = 19.100 ac Runoff Volume = 17.131 af Average Runoff Depth = 10.76"
50.21% Pervious = 9.591 ac 49.79% Impervious = 9.509 ac

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Printed 8/24/2017

Page 43

Summary for Subcatchment S-2: No Treatment, to Gravel Wetland

Runoff = 96.59 cfs @ 12.35 hrs, Volume= 15.480 af, Depth=10.66"

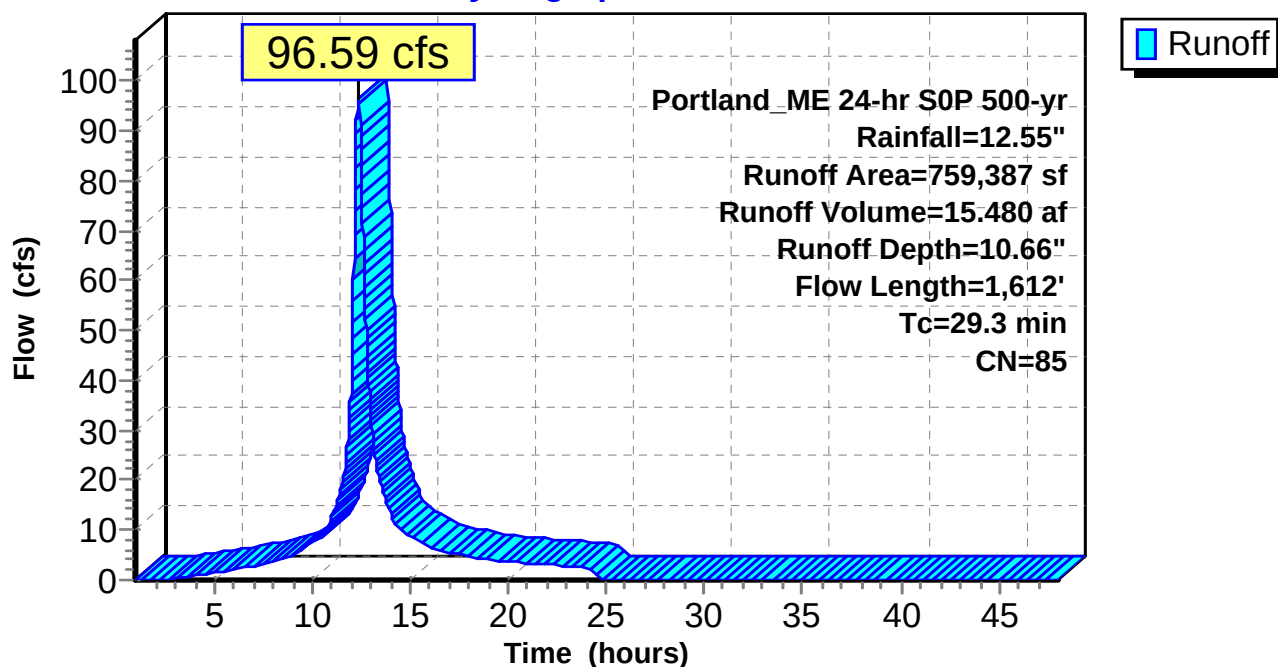
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Area (sf)	CN	Description
351,954	98	Paved parking & roofs
407,433	74	>75% Grass cover, Good, HSG C
759,387	85	Weighted Average
407,433		53.65% Pervious Area
351,954		46.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	285	0.0150	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.3	1,327	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
29.3	1,612	Total			

Subcatchment S-2: No Treatment, to Gravel Wetland

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 44

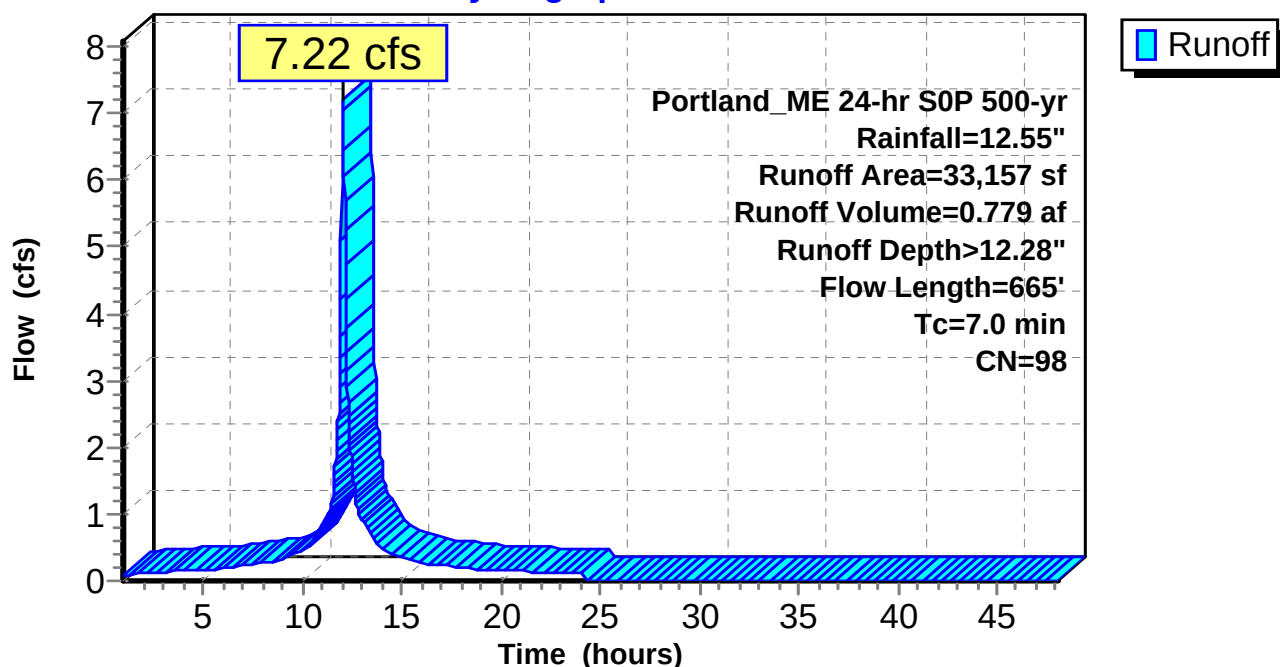
Summary for Subcatchment S-3: Roof Tributary Area

Runoff = 7.22 cfs @ 12.05 hrs, Volume= 0.779 af, Depth>12.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Area (sf)	CN	Description
33,157	98	Unconnected roofs, HSG A
33,157		100.00% Impervious Area
33,157		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.58		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
0.0	15	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.4	500	0.0100	5.94	10.50	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
4.0					Direct Entry, Min TC 7
7.0	665	Total			

Subcatchment S-3: Roof Tributary Area**Hydrograph**

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Printed 8/24/2017

Page 45

Summary for Subcatchment S-4: Underdrained Soil Filter

Runoff = 8.46 cfs @ 12.05 hrs, Volume= 0.873 af, Depth=11.56"

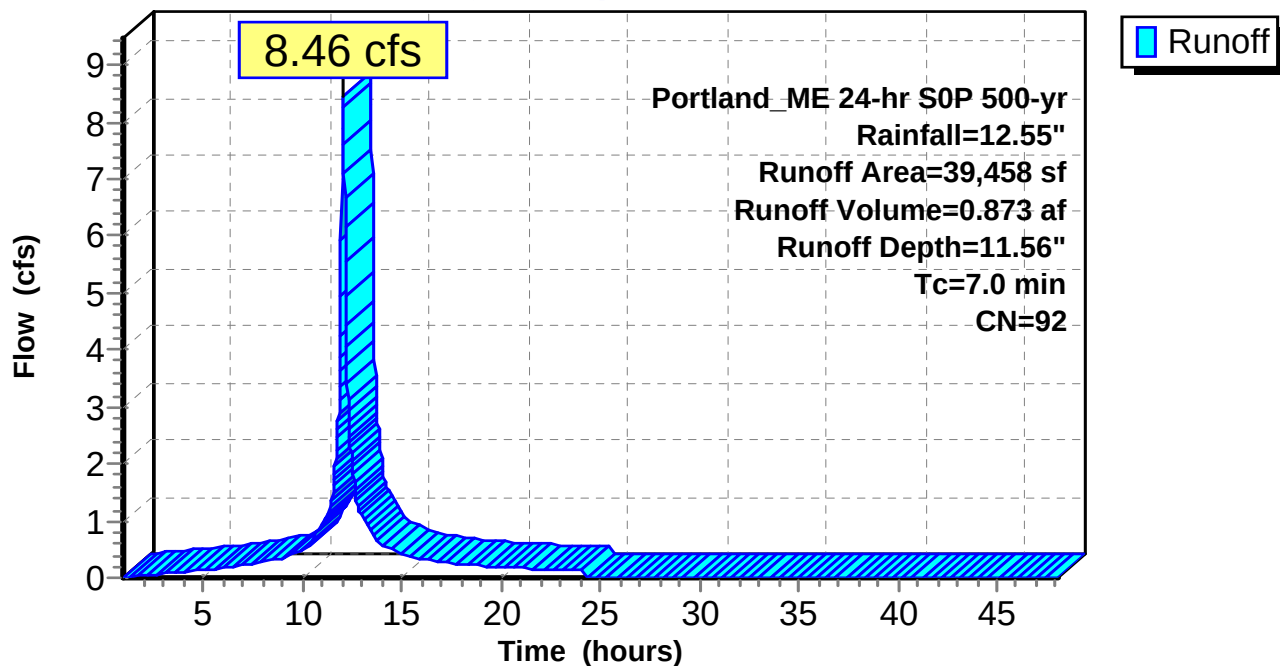
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

	Area (sf)	CN	Description
*	29,102	98	
*	10,356	75	
	39,458	92	Weighted Average
	10,356		26.25% Pervious Area
	29,102		73.75% Impervious Area

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

Subcatchment S-4: Underdrained Soil Filter

Hydrograph



Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Printed 8/24/2017

Page 46

Summary for Reach SP-1: SP-1

Inflow Area = 19.100 ac, 49.79% Impervious, Inflow Depth > 10.74" for 500-yr event
Inflow = 101.21 cfs @ 12.37 hrs, Volume= 17.093 af
Outflow = 101.15 cfs @ 12.38 hrs, Volume= 17.092 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
Max. Velocity= 5.17 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.46 fps, Avg. Travel Time= 2.9 min

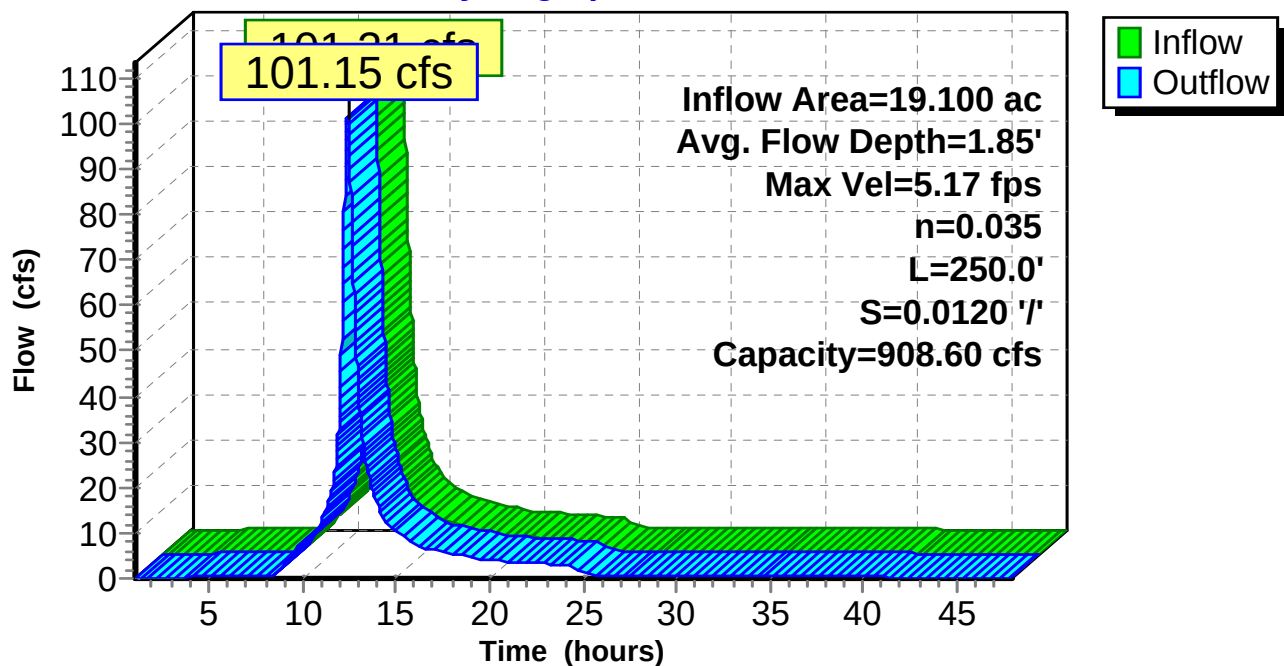
Peak Storage= 4,895 cf @ 12.38 hrs
Average Depth at Peak Storage= 1.85'
Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
Side Slope Z-value= 3.0 ' / ' Top Width= 35.00'
Length= 250.0' Slope= 0.0120 ' / '
Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: SP-1

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 47

Summary for Pond P-1: Gravel Wetland

Inflow Area = 19.100 ac, 49.79% Impervious, Inflow Depth > 10.74" for 500-yr event
 Inflow = 102.12 cfs @ 12.34 hrs, Volume= 17.093 af
 Outflow = 101.21 cfs @ 12.37 hrs, Volume= 17.093 af, Atten= 1%, Lag= 1.9 min
 Primary = 92.37 cfs @ 12.37 hrs, Volume= 8.173 af
 Secondary = 8.84 cfs @ 12.37 hrs, Volume= 8.919 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.63' @ 12.37 hrs Surf.Area= 19,724 sf Storage= 63,317 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 84.6 min (888.0 - 803.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378
Device	Routing	Invert	Outlet Devices		
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64		
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf		
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600		
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32		

Final Proposed Gravel Wetland

Prepared by Microsoft

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Printed 8/24/2017

Page 48

Primary OutFlow Max=92.31 cfs @ 12.37 hrs HW=107.63' TW=92.85' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 48.70 cfs @ 2.86 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 43.61 cfs @ 2.15 fps)

Secondary OutFlow Max=8.84 cfs @ 12.37 hrs HW=107.63' TW=92.85' (Dynamic Tailwater)

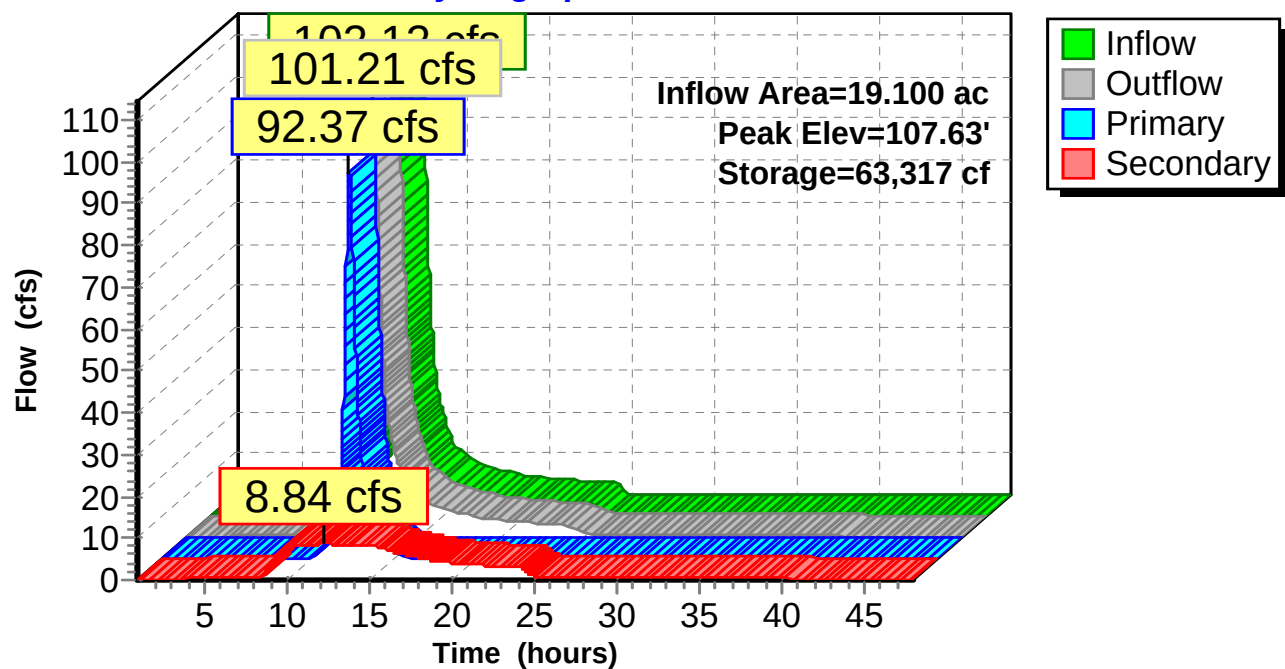
3=Culvert (Inlet Controls 8.84 cfs @ 11.26 fps)

4=Orifice/Grate (Passes < 1.01 cfs potential flow)

5=Broad-Crested Rectangular Weir (Passes < 41.42 cfs potential flow)

Pond P-1: Gravel Wetland

Hydrograph



Final Proposed Gravel Wetland

Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Prepared by Microsoft

Printed 8/24/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 49

Summary for Pond P-2: UGSF

Inflow Area = 0.906 ac, 73.75% Impervious, Inflow Depth = 11.56" for 500-yr event
 Inflow = 8.46 cfs @ 12.05 hrs, Volume= 0.873 af
 Outflow = 7.95 cfs @ 12.09 hrs, Volume= 0.834 af, Atten= 6%, Lag= 2.2 min
 Primary = 0.03 cfs @ 12.09 hrs, Volume= 0.092 af
 Secondary = 7.92 cfs @ 12.09 hrs, Volume= 0.743 af
 Tertiary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 112.45' @ 12.09 hrs Surf.Area= 3,251 sf Storage= 5,072 cf

Plug-Flow detention time= 146.1 min calculated for 0.834 af (96% of inflow)
 Center-of-Mass det. time= 119.2 min (880.2 - 761.0)

Volume	Invert	Avail.Storage	Storage Description
#1	110.50'	8,850 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
110.50	1,950	0	0
113.50	3,950	8,850	8,850

Device	Routing	Invert	Outlet Devices
#1	Secondary	106.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 106.00' / 105.50' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	112.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	110.50'	0.375 in/hr Exfiltration over Surface area
#4	Tertiary	113.00'	250.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

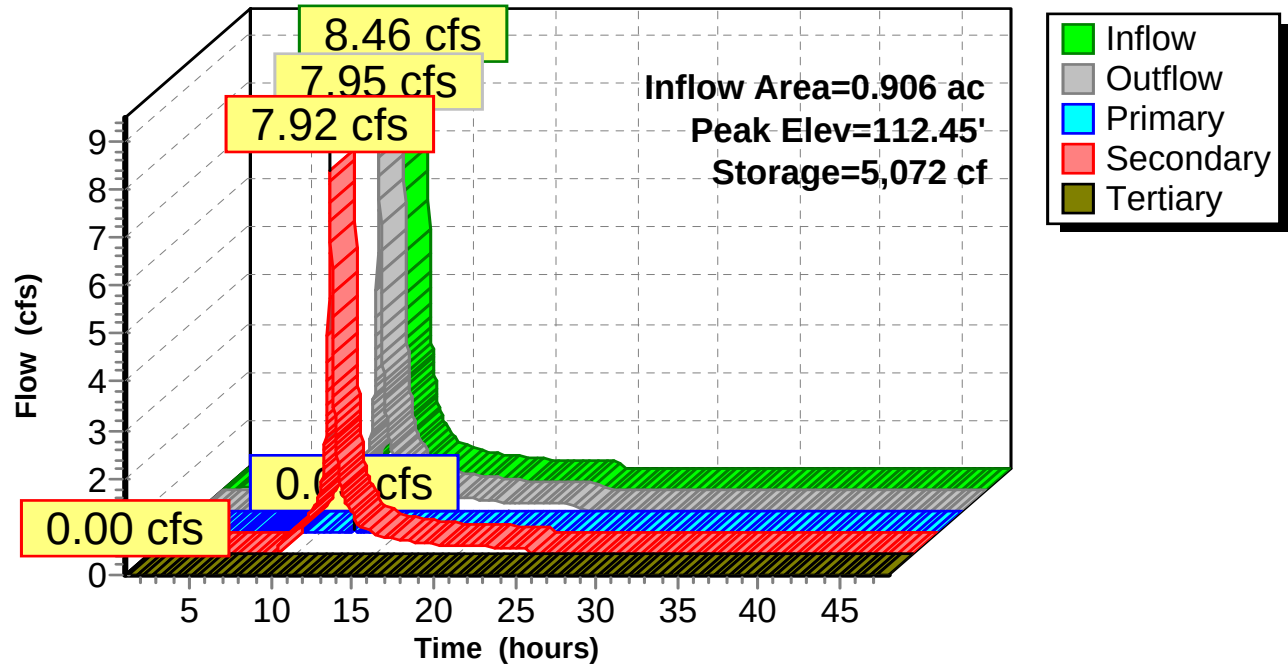
Primary OutFlow Max=0.03 cfs @ 12.09 hrs HW=112.45' TW=107.38' (Dynamic Tailwater)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.03 cfs)

Secondary OutFlow Max=7.88 cfs @ 12.09 hrs HW=112.45' TW=107.38' (Dynamic Tailwater)
 ↑ **1=Culvert** (Passes 7.88 cfs of 10.50 cfs potential flow)
 ↑ **2=Orifice/Grate** (Weir Controls 7.88 cfs @ 2.19 fps)

Tertiary OutFlow Max=0.00 cfs @ 1.00 hrs HW=110.50' TW=102.00' (Dynamic Tailwater)
 ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2: UGSF

Hydrograph



Section 13: Consistency with City Master Plans

13.0 City Master Plans Consistency

<http://www.portlandmaine.gov/DocumentCenter/Home/View/14564>

The Lyseth/Lyman-Moore campus is noted within the “Green Spaces, Blue Edges” master plan, dated December 2001. Within this document, the following information from a 1980 survey was identified:

The 1980 recreation survey had the following comments on this park:

- Additional adjacent land should be acquired;
- A little league complex and an additional soccer field should be constructed;
- A master plan is needed;
- Current space on the site should be redesigned; and
- The site has poor vehicle circulation.

The existing circulation is being re-constructed as part of the proposed project in order to increase the efficiency and safety of school access. Acquisition of additional land is not a portion of this proposed project. Athletics fields improvements have been permitted through a separate contract, and incorporate current needs for athletics fields and facilities.

13.1 Lyseth/Lyman-Moore Master Plan

Wright-Pierce had completed the Lyseth/Lyman-Moore master plan as part of a separate contract. The proposed plan largely incorporates the suggestions for improved parking, circulation, and athletic fields identified within that report.

The proposed project will mitigate 2 locations where roof drains enter the sanitary sewer and re-locate these flows to the storm drain. At this time, there still will remain one location of roof drainage from Lyman-Moore Middle School that will enter the sanitary sewer instead of the storm drain. This location will not be redirected to the storm drain as it would require pipe modifications within the inside of the building, and cannot be as simply rerouted as the other two locations.

Section 14: Capacity to Serve Letters

14.0 Capacity to Serve Letters

Ability/capacity to Serve letters were sent to the following utilities:

Water (Portland Water District)

Sewer (Portland DPW)

Electric (Central Maine Power)

Gas (Unitil)

Communications (Fairpoint)

Responses were obtained from Unitil indicating that the existing infrastructure was adequate. Portland Water District indicated that coordination would be necessary for a previous phase of the project, regarding construction adjacent to their water main easement on the southern portion of the property. Meetings were held with Portland DPW to discuss the proposed improvements to the stormwater infrastructure, and documentation of these discussions is indicated within Section 12 of this application.

Electric and Communications confirmations were not received. However, there are no increases to the existing service loads or uses for these utilities on-site, and therefore it is not anticipated that these responses would be required to complete the proposed projects.

Section 15: Solid Waste Generation

15.0 Solid Waste

Solid waste is currently stored in external receptacles and hauled off-site for disposal. No increase of solid waste generation is anticipated as a result of the proposed project, as the proposed project is to address capacity needs for parking and circulation at the existing facilities and not to provide for additional uses at the facilities. No changes in solid waste disposal are proposed as a result of the proposed project.

Section 16: Fire Department Technical Standards

16.0 Fire Department Technical Standards

It is understood that no expansions to the existing buildings will be made, and as such fire department standards for the existing buildings will not be addressed.

For site access items, existing fire hydrant locations have been identified on the existing conditions plan. From the pre-application meeting, it was discussed that a 16'-wide fire access lane would be required around the northern and southern face for the elementary school, and the northern face of the middle school. These locations have been identified within the proposed plans.

Heading east from Junior Street towards the elementary school location, a 12'-wide lane is proposed, with a 8' temporary parking area located adjacent to the lane (20'-wide total). This is included as it is noted that in the existing condition, a 16'-wide lane provides the ability to park on both sides of the roadway, even with signage indicating otherwise. As such, the applicant is requesting a waiver for this fire access location to be accepted as 12'-wide, which allows for maneuvering and access, but does not provide a wide enough area that could promote illicit parking.

Section 17: Consistency with City of Portland Design Manual

17.0 Consistency with City of Portland Design Manual

Sections of the City of Portland Design Manual have been identified within this section, including applicability and identification of any waivers. If a section has not been identified as being applicable to the proposed project, then that section has been given an N/A for the site.

17.1 Transportation Systems and Street Design Standards:

Information regarding traffic studies is indicated within Section 10 of this permit application. Minor modifications are being made to parking lot and circulation grading as part of the proposed upgrades, but no entrances to the abutting streets will not be re-graded, and as such alignment or drives/roads has not been evaluated as part of the proposed project beyond the circulation efforts identified in Section 10.

Sidewalks and driveway aprons are proposed to be asphalt with granite curing, with an alternate bid to include for slipform concrete curbing. Sidewalk width is greater than 5' in all areas, and no vertical level changes greater than 1/4" are proposed. Sidewalk slopes are designed to be at the running slope of the proposed circulation areas that they abut, with a cross-slope of 2%. Sidewalk ramps have been designed in accordance with section 1.8.4.

Aggregates for roadway surface and base pavement, as well as base gravels and pipe support gravels, have been detailed to be in accordance with section 1.10.

Parking spaces have been designed in accordance with the technical manual, including for compact parking spaces and minimum drive aisles. motorcycle and Scooter parking are proposed as part of the parking lot re-striping. Section 19 of this permit application discusses the project's ability to meet Division 20 of the City Land Use Code and Site Plan Standards.

Bicycle parking locations have been designed in accordance with section 1.15. Bicycle parking needs and the ability to meet Division 20 have been identified in Section 19 of this permit application.

Public crosswalks have been designed in accordance with section 1.20, and include for MUTCD signs, as the proposed circulation and parking developments are located within a school facility.

17.2 Sanitary Sewer and Storm Drain Design Standards

Proposed design is in accordance with the applicable sections of Division 24 of the City Code.

Storm drain trunk pipes are designed to carry stormwater flow through pipes sized as indicated in the plans. A calculation is included to show a minimum of 3cfs flow through the proposed pipes. The proposed drainage system has been designed to replace an existing broken storm drain. The proposed storm drain is designed to incorporate future reconstruction of the parking lot. Pipe material shall be in accordance with technical manual. Underdrains are sized at 4" for the stormwater treatment facility; stormwater treatment design has been included in Section 12 of this manual.

Catch basins have been designed in accordance with Figure II-2. Calculations indicating the ability to pass flows of 3cfs have been attached to this section.

There are two structures where roof drains are proposed to be separated from the sanitary sewer. In both of these locations, the roof drains and sanitary sewers are combined within vault structures. As such, separation will occur through constructing an air-tight masonry wall between the two structures, as indicated in details submitted with the project plans, submitted as part of this application.

Standard aggregates have been proposed for use within the circulation facility. Sod, or loam and seed, will cover the proposed aggregates that are not to be paved or planted.

17.3 Public Safety Standards

The proposed project is designed to improve existing pedestrian, vehicle, and bus traffic, and as such the physical features of the site layout have been designed in order to better accommodate safe site access.

Locations of existing fire hydrants have been identified on the project plans. No fire hydrants are proposed to be modified or relocated.

Emergency access lanes are discussed in Section 16 of this permit application.

The proposed project is altering site access/circulation, and as these standards, as well as emergency access, are identified in Section 10 of this application. The proposed project is not a subdivision, and therefore subdivision standards are not anticipated to apply.

Blasting to remove ledge is not part of the proposed project based upon the results of the site soil borings. If ledge is encountered, it will likely remain in place unless it is very close to the proposed surface, or near to proposed pipe locations. If ledge is to be removed, it shall be done through mechanical means.

17.4 Landscaping and Landscape Preservation Standards

Significant natural features have been identified on the existing conditions plan, and were identified in the report by Jones Associates, included within Section 11. Trees greater than 10" diameter have been identified on the existing conditions plan.

Landscaping measures have been incorporated into parking areas, except in areas where snow removal would become impractical if plantings were included.

No retaining walls are proposed as part of the project. A stockade fence is proposed as a screen along the northern edge of the parcel where screening is required but not provided.

Trees are proposed along the edge of the circulation area in locations where their placement is practicable in an effort to provide the general effect of street trees throughout the site. However, where the proposed site layout is not that of a typical street, street trees standards were not anticipated to be designed.

Shrubs consist of at least 50% native plantings, including winterberry and lilac.

Trees are proposed to be installed at the edge of the parking area, with boulders installed adjacent to the proposed trees to deter vehicles from driving on the newly renovated fields. The trees will be an approved species in accordance with the technical standards, as indicated in the landscaping plan and details. Grasses will be 100% Kentucky Bluegrass for any disturbances abutting the athletics fields. Grasses will be a standard MaineDEP grass application in other locations.

17.5 Portland Stormwater Management Standards

Section 12 of this permit application includes for applicability with this section. Please see Section 12 for additional information.

17.6 Erosion and Sedimentation Control Standards for Two-Family Homes

An erosion and sedimentation control plan and report has been developed as part of the permit and contract drawings. This proposed plan and report is in accordance with Maine DEP regulations, and can be found in Section 12.

17.7 Soil Survey Standards

A high intensity soil survey is not required for the proposed project, as the project is being constructed largely on developed soils. However, please see the borings and medium-intensity soils information provided in Section 11.

17.8 Standards for Development in and Adjacent to Wetlands

The site was observed for wetlands by Jones Consultants, and their associated wetlands report has been included as an appendix to Section 11. No work that is not considered

maintenance activities shall be completed within 25-feet of the delineated boundary of Fall Brook or associated wetlands. The proposed project does not anticipate filling any wetlands.

17.9 Water Supply Standards

N/A

17.10 Municipal Street Lighting Standards:

N/A

17.11 Shadow Standards:

N/A

17.12 Site Lighting Standards:

Two utility poles with lighting, are being relocated, no more than 5' to accommodate for creating drive aisles that are in accordance with the City Standards. Light poles are being relocated farther away from any property boundaries, and as such it is not anticipated that a formal review of site lighting would be completed as part of the proposed project.

17.13 Boundary Survey Requirements

A stamped boundary survey has not been provided for the proposed project. Whereas no property lines are proposed to be adjusted, an existing conditions plan has instead been developed using existing survey information, supplemented with information obtained through field observations. However, the remainder of the requirements have been met set forth within this section for items that are required to be included.

17.14 Standards for Local Site Location of Development Review:

N/A

17.15 Solar Energy Generation:

N/A

ATTACHMENT 17.1

PIPE CAPACITY CALCULATIONS

Lyseth-Lyman Moore School
City of Portland, Maine

CAPACITY OF PIPES FLOWING FULL
MINIMUM SLOPES USED IN DESIGN

Pipe Dia. (inches)	Pipe Dia. (feet)	Area (sq. ft.)	R (ft)	Slope (ft/ft)	Capacity with pipe flowing full		Velocity (n=0.012) (ft/s)	Capacity with pipe flowing full	
					(MGD) (n=0.012)	(MGD) (n=0.015)		(CFS) (n=0.013)	(CFS) (n=0.015)
Minimum Slopes - Sewers									
12	1	0.785	0.25	0.004	1.58	1.26	3.115	2.444093	1.955274
15	1.25	1.226563	0.3125	0.0028	2.40	1.92	3.024	3.70788	2.966304
18	1.5	1.76625	0.375	0.0022	3.45	2.76	3.028	5.344836	4.275869

Quick Flow Conversions:
1 CFS = 448.8 GPM
1 CFS = 0.646 MGD
1 MGD = 1.548 CFS
1 MGD = 694.4 GPM

Section 18: HVAC and Manufacturing Emissions Requirements

18.0 HVAC and Manufacturing Emissions Requirements

There are no applicable manufacturing emissions requirements or HVAC requirements as the project does not propose any additional changes to the site buildings.

Section 19: Compliance with Site Plan and Parking Standards

19.0 Consistency with City of Portland Design Manual

Portions of the City of Portland City Code, Chapter 14, include Site Plan Standards (14-526), and Parking (Division 20). The following information discusses these items, with the understanding that most information is either not applicable to this particular development, or has been included in another specific section of this permit application.

19.1 Site Plan Standards:

Transportation standards have been addressed in Section 17 of this application addressing impacts on abutting streets, site circulation, sidewalk use, and incorporation of school busses. Snow storage has been indicated as part of Sheet C-7 of the permitting plans. Information regarding any Transportation Demand Management plan is identified in Section 10 of this application.

Locations of significant natural features have been identified on the existing conditions plan. No removal of trees within zoning setbacks is proposed.

Parking lot landscaping has been provided for the proposed project. The City requires 2 trees per 5 spaces. 48 trees will remain in the parking area following demolition, and 30 new trees are proposed. 177 parking spaces are proposed, and providing 2 trees for every 5 would require a minimum of 71 trees. Whereas 78 trees will be retained or provided, the proposed project meets this standard.

The ability to have trees in islands every 40 spaces was not strictly able to be met, as new parking facilities are retrofits of existing sites that do not meet the parking lot landscape requirements, and are being designed in locations that are very difficult to plow (specifically, the parking lot adjacent to the middle school and the basketball courts, where maneuvering adjacent to fences and buildings would become a very difficult task.). However, trees are incorporated along the eastern side of this parking area, and existing

trees, incorporated as part of an earlier project phase, are along the southern side of the elementary school parking facility. The applicant is requesting a waiver for this standard.

19.2 Parking Standards

Bicycle Parking, in the form of two 14-bicycle racks, has been provided at locations adjacent to the west entrance for the elementary school, and to the north entrance for the middle school. These improvements include for a total of 28 new bicycles. The City standard is for 20 bicycles for each of the first 100 parking spaces and, then one bicycle for each additional 10 parking spaces. With 177 spaces provided, this would total 28 bicycle parking spaces. This standard is met, and exceeds the recommendations of racks for 8-10 bicycles provided in the City's 2011 SR2S study, included in Section 10 of this permit application.

There are 135 existing parking spaces, with 177 parking spaces proposed, not counting for motorcycle and scooter parking, which results in an increase of 42 parking spaces. This value does not include for the temporary parking areas for parent drop-off locations. Per Section 14-332-d of requirements for parking spaces, one parking space is required per each classroom used for teaching purposes. Per conversations with the applicant, there are 32 Teaching Classrooms at Lyseth, and 50 Teaching Classrooms at Lyman Moore. Therefore, 82 parking spaces are required for school uses. Per 14-332.1-c, off-street parking is required to be adequate to "serve projected employee and visitor needs". There are 4 athletic fields at the facility, and 177 parking spaces, 95 of which would be dedicated to the athletics fields during school hours. For athletics events, the existing parking lot only fills on peak event days, and is anticipated to continue to meet these demands.

58 parking spaces are compact spaces, which accounts for 33% of parking spaces. Per the City standards, 20% of parking spaces are allowed to be compact spaces. These spaces are to be used by school staff, who would be more used to parking in similar spaces on a regular occurrence than those parking in a standard high-turnover parking lot. These spaces also exceed the sizes of existing parking spaces and aisles, which are currently not striped to

City standard. Recognizing these items, the applicant is requesting a waiver to exceed the percentage of allowable compact parking spaces.

October 26, 2017
Project Number 13352C

RE: Neighborhood Certification

I, Michael Guethle, hereby certify that a neighborhood meeting was held on October 18, 2017 at the Lyman Moore Middle School at 6:30 PM to 8:00PM.

I also certify that on October 6, 2017, invitations were mailed to the following:

1. All addresses on the mailing list provided by the Planning Division which includes property owners within 500 feet of the proposed development or within 1000 feet of a proposed industrial subdivision or industrial zone change.
2. Residents on the "interested parties" list.
3. A digital copy of the notice was also provided to the Planning Division (jmy@portlandmaine.gov and ldobson@portlandmaine.gov) and the assigned planner (Jean Fraser) to be forwarded to those on the interested citizen list who receive e-mail notices.

Please note that items 1 and 2 of the above list was provided to our office by the Planning Division.

Signed,



Michael Guethle, P.E.

Project Engineer, Wright-Pierce

Attached to this certification are:

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

October 5, 2017
Project Number 13352C

Dear Neighbor:

Please join us for a neighborhood meeting to discuss the Portland Parks, Facilities and Recreation Department's plans for improvements to site circulation, pedestrian access, parking, drainage, and site landscaping for the Lyseth-Lyman Moore Campus, located at 171 Auburn Street in Portland, Maine.

Please note that while the funding for these site improvements is currently included in the City's school improvement referendum items, we will only be discussing the technical aspects of site improvements at the upcoming meeting.

Meeting Location: Lyman Moore Middle School Cafeteria, 171 Auburn Street, Portland Maine.

Meeting Date: Wednesday, October 18, 2017

Meeting Time: 6:30 PM – 7:30 PM

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 contact our office at 207-319-1512.

Sincerely,



Michael Guethle, P.E.
Project Engineer, Wright-Pierce

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

City of Portland, ME
October 18, 2017 - Public Meeting
SIGN-IN-SHEET



Name (please print)	Signature	Address
DOUGLAS RICE		11 MILE ISLAND SOME 140 TOSHOM.ME 04086
Victoria Tim St. Hilaire		43 BARTLEY Ave Portland ME 04103
Keith Farnsworth		11 Shingle Way Portland ME 04103
Debbie Smith		33 BARTLEY Ave Portland, ME 04103
Dan Winship		26 Fallen Portland ME 04103
Shuckeywell		70 Bartley Ave 04103
Staci Hanson		33 Heather Rd 04103
BEN DONALDSON		80 Westm. St. Ave 04103 + 171 Allen Ave. 04103

NEIGHBORHOOD MEETING MINUTES

Meeting Date: October 18, 2017
Location: Lyman Moore Cafeteria
Project Number: 13352C

Presenters: Michael Guethle (Wright-Pierce); Doug Rice (Wright-Pierce); David Onos (City of Portland)
Attendees: Attached

A neighborhood meeting for Lyseth – Lyman Moore Circulation and Access Improvements was held to inform the project abutters and interested parties about the proposed project. The presentation was completed in PowerPoint format, with full-size plans available on easels for attendees to view and comment on. Given the small turnout for the project, the nature of the presentation was very interactive and collaborative, while following the general outline indicated below:

- Introduced Project Team
- Discussed Project History
- Discussed the Funding Source, and Development of The School Referendum
- Reviewed Site Circulation
- Reviewed Site Parking and Access
- Discussed Environmental Impacts
- Reviewed Site Landscaping

From these discussion topics, the majority of the questions were related to the project site circulation. Several of the attendees lived in the adjacent neighborhood that is connected to the parcel by Junior Street. Questions and responses regarding site circulation are highlighted below:

- Presenters highlighted how bus circulation and parent drop-off circulation are the impetus of the project, and how emergency vehicle access and bus access guided the majority of project development.
- Attendees discussed how the bus turnaround into the Middle School is a point of contention for access to Junior Street. They requested that no passenger cars be allowed to access this loop during peak drop-off hour. They also noted it would be preferred to shut down this site access location.
- Attendees noted vehicle speed within the neighborhood at Junior Street is a concern. Proposed suggestions from attendees included making this road a one-way; minimize parking during certain hours; shutting down access during peak hours; traffic calming within the neighborhood; and traffic calming at the site access location.
- Presenters stressed that several of these items are not a result of increases in traffic from the proposed site, and how the proposed development is not increasing the amount of traffic within the parcel. Presenters also noted how much of these comments mention locations external to the site, and that enforcement of existing regulations for speed and parking should be a priority.

NEIGHBORHOOD MEETING MINUTES



Meeting Date: October 18, 2017

Page 2 of 2

Presenters stated that this information will be included in meeting minutes, and relayed to Planning.

- Attendees noted that the crosswalk from Junior Street into the development could be located at both sides of the street to more easily convey pedestrian access to the schools. Presenters agreed that this was a good suggestion.
- Traffic increase itself was not noted as a concern during the meeting.

The remainder of the presentation focused on the parking, access, and project landscaping. These discussions included:

- Presenters discussed the need for drop-off enforcement and signage, which attendees agreed was critical to the successful completion of the project.
- Presenters reviewed environmental impacts, and discussed the proposed stormwater treatment methods. Attendees asked if rain gardens were evaluated, and presenters re-enforced how salt/sand limitations existed for installing a rain garden. Presenters also highlighted how proposed stormwater basins will not be as deep as the gravel wetland at the existing site.
- Presenters discussed parking needs and screening needs, to which there were no questions.
- Presenters discussed minimal modifications to lighting, to which there were no questions.
- Presenters discussed walking/pedestrian circulation on campus. Attendees made suggestion to “soften” corners and make larger radii to sweep along paths, as most pedestrians will likely create shortcuts in locations between sidewalks.
- Presenters discussed landscaping. No comments were mentioned from abutters.



November 22, 2017
W-P Project No. 13352C

Jean Fraser, Planning Division
City of Portland
389 Congress Street
Portland, ME 04101

Subject: Lyseth-Lyman Moore Circulation and Access Improvements
Responses to Site Plan Review Comments

Wright-Pierce has developed the following responses to comments provided during the Site Plan Review.

Parking and Traffic

The following responses are to comments provided in an e-mail from Tom Errico, P.E., to Jean Fraser, City Planner, on October 26, 2017. The full comments are included as an attachment to this document.

- 1) Diagonal parking spaces are 60-degree parking spaces that are designed in accordance with City Technical Manual standards to be either 9'x18' parking spaces or 8'x15' compact parking spaces. Details have been provided in the updated revision to confirm this information. Please note that the dimensions on the Plans are on a scale of nearest foot unless otherwise noted, and that details provided shall prevail.
- 2) A waiver for compact parking spaces is included in Section 19 of the submitted Site Plan Permit. Wright-Pierce can provide this information upon request if the originally provided request is not available or adequate.
- 3) Travel lanes were made consistent in the proposed revision, with 12' travel lane for vehicles, a 16' travel lane for busses, and an 8' parking location for all vehicles.
- 4) Diagonal parking spaces are 60-degree parking spaces that are designed in accordance with City Technical Manual standards to be either 9'x18' parking spaces or compact parking spaces. A detail has been provided to confirm this information.
- 5) Curb extensions have been provided at crosswalk locations in front of the Middle School and Elementary School entrances in the updated plans.
- 6) Improvements have been made to the Junior Street intersection location to clarify vehicle movements. The location has been evaluated to confirm that bus and emergency vehicle access can be provided to this location, while making pedestrian and traffic movements more typical. Improvements include

realigning the vehicle flow, adding stop signs and stop lines, straightening the sidewalk between Junior Street and the Middle School, and additional striping and signage.

- 7) Improvements have been made to the multi-way intersection between the elementary and middle schools to clarify traffic movements. Improvements include sidewalk relocation along the south side of the elementary school, and additional signage and striping for vehicles in this location
- 8) The sidewalk connection between the schools has been slightly modified. Through conversations with the applicant, it is understood that there is infrequent movement between the two schools as each school has its own facilities.
- 9) Vertical granite curb is proposed throughout the majority of the site to better define parking locations. Striping and signage is proposed in high-turnover drop off areas to identify the difference between these locations and permanent parking areas.

Sincerely,
WRIGHT-PIERCE



Michael Guethle, P.E.
Project Engineer
Michael.guethle@wright-pierce.com



171 Auburn Street/LLM Campus Project - Preliminary Traffic Comments

1 message

Tom Errico <thomas.errico@tylin.com>

Thu, Oct 26, 2017 at 4:01 PM

To: Jean Fraser <jf@portlandmaine.gov>

Cc: Keith Gray <kgray@portlandmaine.gov>, Katherine Earley <kas@portlandmaine.gov>, Jeremiah Bartlett <JBartlett@portlandmaine.gov>, Bruce Hyman <bhyman@portlandmaine.gov>, "Jeff Tarling (JST@portlandmaine.gov)" <JST@portlandmaine.gov>, Lauren Swett <lszett@woodardcurran.com>

Hi Jean – I have reviewed the project plans and offer the following preliminary traffic comments.

- The applicant shall confirm that the diagonal parking spaces meet City standards for width.
- The applicant is proposing a significant number of compact parking spaces. The applicant should note if the number of compact parking spaces requires a waiver from City standards and if so provide documentation in support of the waiver.
- Bus drop-off area dimensions vary throughout the site (10 foot bus lane/10 foot travel lane; 8 foot bus lane/12 foot travel lane; 8 foot bus lane/16 foot travel lane; 8 foot bus lane/14.5 foot travel lane). An explanation shall be provided.
- The dimensions of the 15 visitor parking spaces do not meet City standards. An explanation shall be provided.
- A crosswalk construction detail shall be provided.
- I would suggest that curb extensions be considered at the 5-Minute parking area center crosswalk near the Lyseth School and at the 5-minute parking area leading to Lyman-Moore School. The curb extensions will prevent vehicles from blocking crosswalks.
- It is unclear if vehicle movements from Jr. Street are permitted to proceed straight through to the entry roadway system. Revisions to signage and pavement markings may be required to regulate vehicle circulation.

- The plan needs to incorporate a traffic control plan for the multi-way intersection of the circulatory roadway and side parking lot areas. I find the configuration to be confusing and potentially problematic.
- I find the sidewalk connection between the two schools (at the multi-way intersection) to be indirect and thus may lead to pedestrians walking in an uncontrolled location.
- During field observations, vehicles tend to park in areas not necessarily designated for parking (grass areas). It is unclear if the plan implements measures to prevent vehicles from parking in undesirable locations.

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

[Twitter](#) | [Facebook](#) | [LinkedIn](#) | [Google+](#)

"One Vision, One Company"

November 22, 2017
W-P Project No. 13352C

Jean Fraser, Planning Division
City of Portland
389 Congress Street
Portland, ME 04101

Subject: Lyseth-Lyman Moore Circulation and Access Improvements
Responses to Stormwater Review Comments

The following responses are to comments provided in a memorandum from Lauren Swett, P.E. to Jean Fraser, City Planner, on October 31, 2017. A follow-up to this letter providing confirmation was dated on November 15, 2017. The full comments are included as Attachment 1 to this document.

1) Stormwater Management Plan Review Comments

- a. Final construction documents will indicate the need for a Maine Construction General Permit, which will be provided by the contractor following the bid phase of the project.
- b. An infiltration rate of 2.41 in/hr has been incorporated in an updated revision of the HydroCAD modeling for the post-development conditions. This report has been included as Attachment 2 to this document.
- c. The site has been re-evaluated to meet the Urban Impaired Stream Standard in accordance with Chapter 501 requirements.
 - i. The water quality storm for the project generates a total of 2,768 Cubic Feet of stormwater runoff that requires treatment. This area includes 30,419 SF of roof area and 2,800 Square Feet of other impervious areas. Additional runoff mitigation for the water quality storm is required to meet the Urban Impaired Stream Standard. The credit calculation, below, notes the total credit to be 0.172 credits.

Proposed New Impervious Area				
Location	Total Impervious (sf)	Total Impervious (acre)	Credits Per Acre	Credits Required
Roof Area	30,419	0.70	0.20	0.140
Additional Impervious	2,800	0.06	0.50	0.032
Total			0.172	

- ii. The proposed Grassed Underdrained Soil Filter has been expanded to accommodate additional surface flows. The tributary area to this location was sized to be in accordance with the General Standards to provide mitigation credits. This treatment incorporates flows from a school lot, which is defined as a medium-turnover lot by Chapter 501 with an associated credit of 1.2 credits/acre. The tributary area to the filter has been increased by 7,414 Square Feet, or 0.17 acres. Calculations for the credits have been indicated below:

Total Treated Amount							
System ID	Additional Area draining to system		Credits Per Acre		Impervious Credits	Landscaped Credits	TOTAL CREDITS PROVIDED
	Treated Impervious (ac)	Treated Landscaped Area (ac)	Impervious Treated	Landscaped Treated			
UGSF-1	0.170	0.000	1.2	0.3	0.204	0.000	0.204

- iii. The sizing of the Grassed Underdrained Soil Filter is indicated in the two below tables. The first table indicates the total treatment needed from the proposed development, as provided in the Stormwater Management Report, Section 12 of the original Site Plan application. The second table indicates the total treatment necessary for the Urban Impaired Stream Standard.

<u>Underdrained Soil Filter 1</u>					
<u>Subcatchment Review</u>					
Total Impervious Surfaces	29102	sf	0.67	acres	
Total Non-Impervious Developed Surfaces	10356	sf	0.24	acres	
Total Drainage Area	39458	sf	0.91	acres	
<u>Basin Design</u>					
	<u>Treatment</u>	<u>Total acres</u>	<u>Multiplier</u>	<u>Volume</u>	
	Impervious Area	0.668	1.0	2,425	
	Developed Area	0.238	0.4	345	
	Treatment Volume Required			2,770	cf
	Treatment Volume Provided			3,707	cf
Surface Area at Filter Elevation	2471	s.f.			
Water Quality Volume (18-inch Ponding)	3707	cf			
<u>Surface Area Check</u>					
	Impervious	29102	5%	1,455	
	Non-Impervious Developed Area	10356	2%	207	
	Total Surface Area Required, min.			1,662	sf

<u>Underdrained Soil Filter 1: Urban Impaired Additions</u>					
<u>Subcatchment Review</u>					
Total Impervious Surfaces		7414	sf	0.17	acres
Total Non-Impervious Developed Surfaces		0	sf	0.00	acres
Total Drainage Area		7414	sf	0.17	acres
<u>Basin Design</u>					
		<u>Treatment</u>	<u>Total acres</u>	<u>Multiplier</u>	<u>Volume</u>
Impervious Area		0.170	1.0	618	
Developed Area		0.000	0.4	-	
		Treatment Volume Required			618 cf
		Treatment Volume Provided			3,707 cf
Surface Area at Filter Elevation		2471	s.f.		
Water Quality Volume (18-inch Ponding)		3706.5	cf		
		<u>Surface Area Check</u>			
Impervious		7414	5%	371	
Non-Impervious Developed Area		0	2%	-	
		Total Surface Area Required, min.			371 sf

- iv. From the information provided above, treatment volume is provided within the modified Grassed Underdrained Soil Filter to satisfy the General Standard for the proposed development (2,770 CF). The Soil Filter is sized to treat an additional amount of the site's surface area in accordance with the General Standards to provide mitigation credits to meet the Urban Impaired Stream Standards (618 CF). These two values total 3,388 CF, which is less than the total treatment volume of 3,707 CF. Therefore, the proposed modifications meet both the General Standard and the Urban Impaired Stream Standard.
- d. The pre- and post-development areas vary as 30,419 SF of roof area is conveyed to the sanitary sewer in the pre-development condition. The areas have been revisited, and Subcatchment 2 has been modified to provide the correct subcatchment area (2,800 sf of non-impervious surfaces was not removed in the original submission to counteract the increase of impervious surface). Runoff rates were modified slightly from the original submission, but remain similar in that the 2-year storm is the only evaluated interval storm where the post-development runoff rate exceeds the pre-development conditions.

Runoff Rates for Interval Storm Years (CFS)

<i>Study Point</i>	<i>Pre 2-yr</i>	<i>Post 2-yr</i>	<i>Pre 10-yr</i>	<i>Post 10-yr</i>	<i>Pre 25-yr</i>	<i>Post 25-yr</i>
SP-1, Original	6.63	7.23	32.41	30.54	47.92	43.45
SP-1, Review		7.43		29.86		43.20

- e. The time of concentration for Subcatchment 1 has been modified to be correctly represented on the plan. Sheet flow for Subcatchment 2 has not been changed since the original submission because the creation of a sidewalk changes the flow patterns in the post-development conditions.
- 2) Sewer and stormwater catch basins/manholes have been numbered/lettered for ease of review.
 - 3) The proposed snow storage location is the same as the existing snow storage location. A barrier fence exists, and drainage improvements are proposed in this location to improve drainage and swale additional snowmelt into catch basins.
 - 4) Whereas the project is a City/Facilities project, the applicant is reviewing options for contracting with a private maintenance and inspection company, or contracting with other City departments in the area. If allowed, it is preferred that a formal maintenance agreement can be incorporated as a condition of approval for this application. The applicant is aware that the cost for post-construction maintenance will be the responsibility of the applicant.

Sincerely,
WRIGHT-PIERCE



Michael Guethle, P.E.
Project Engineer
Michael.guethle@wright-pierce.com



MEMORANDUM



TO: Jean Fraser, Planner
FROM: Lauren Swett, P.E., and Amy LeBel, E.I.T.
DATE: October 31, 2017
RE: Lyseth Lyman-Moore Campus Improvements Peer Review

Woodard & Curran has reviewed the Level III Site Plan Application for the proposed development project located at 171 Auburn Street in Portland, Maine. The project involves circulation, access and parking improvements for an elementary and middle school campus.

Documents Reviewed by Woodard & Curran

- Level III Site Plan Application and attachments, dated August 31, 2017, prepared by Wright-Pierce on behalf of the City of Portland.
- Engineering Plans, Sheets C1-14 and Figures 1-4, , dated September 1, 2017, prepared by Wright-Pierce, on behalf of the City of Portland.

Comments

- 1) In accordance with Section 5 of the City of Portland Technical Manual, a Level III development project is required to submit a stormwater management plan pursuant to the regulations of MaineDEP Chapter 500 Stormwater Management Rules, including conformance with the Basic, General, and Flooding Standards. We offer the following comments:
 - a) Basic Standard: The Applicant has provided a plan, notes, and details to address erosion and sediment control requirements, inspection and maintenance requirements, and good housekeeping practices in accordance with Appendix A, B, & C of MaineDEP Chapter 500.
 - Note that the project may require a Notice of Intent to Comply with the Maine Construction General Permit.
 - b) General Standard: The project is increasing impervious surface by 2,800 SF, and will also incorporate an additional 30,419 SF of roof area via roof drains to be disconnected from the sewer, and is required to include stormwater management features for stormwater quality control. The Applicant is proposing a grassed underdrained soil filter. The following comments should be addressed:
 - The Applicant has identified a media exfiltration rate of 0.375 in/hr. As this varies from the Maine DEP standard, justification for this rate should be provided.
 - c) Urban Impaired Stream Standard: The project is located within the Fall Brook watershed and is subject to the Urban Impaired Stream Standard. The Applicant has requested a waiver from the Urban Impaired Stream Standard, due to the existing gravel wetland design condition. We are reviewing this waiver request with the Department of Public Works.
 - d) Flooding Standard: The project is increasing impervious surface by 2,800 SF, and will also incorporate an additional 30,419 SF of roof area via roof drains to be disconnected from the sewer, and is required to control the rate or quantity of stormwater runoff from the site. The project will result in an increase in the 2-year storm, and decreases in the 10- and 25-year storm. We agree that the 2-year storm increase is small and we are reviewing this waiver request with the Department of Public Works. However, the following comments should be addressed:
 - The pre- and post- development project areas do not match. The Applicant should clarify the areas included.
 - The Applicant should review their time of concentration flow paths for Subcatchments S1 (pre) and S2 (post). The TC path for S1 shown on the pre-development drainage plan (pipe flow) does not match the path utilized in HydroCAD (sheet flow). S2 should be reviewed to ensure that the



non-impacted existing area of the site is evaluated in a similar manner to the pre-development model (i.e. similar amounts of sheet flow).

- 2) We suggest, for ease of review and coordination during construction that all of the proposed structures be numbered.
- 3) Snow storage has been designated in an area to the east of the building. This is very close to the property boundary and abutting neighbors. Applicant should verify that adequate buffering is provided from the neighbors, and additional definition of grading should be provided to ensure that the snow melt does not impact the neighbors.

MEMORANDUM



TO: Jean Fraser, Planner
FROM: Lauren Swett, P.E.
DATE: November 15, 2017
RE: Lyseth Lyman-Moore Campus Improvements Peer Review – Additional comments

Woodard & Curran has reviewed the Level III Site Plan Application for the proposed development project located at 171 Auburn Street in Portland, Maine. The project involves circulation, access and parking improvements for an elementary and middle school campus.

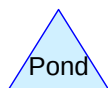
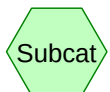
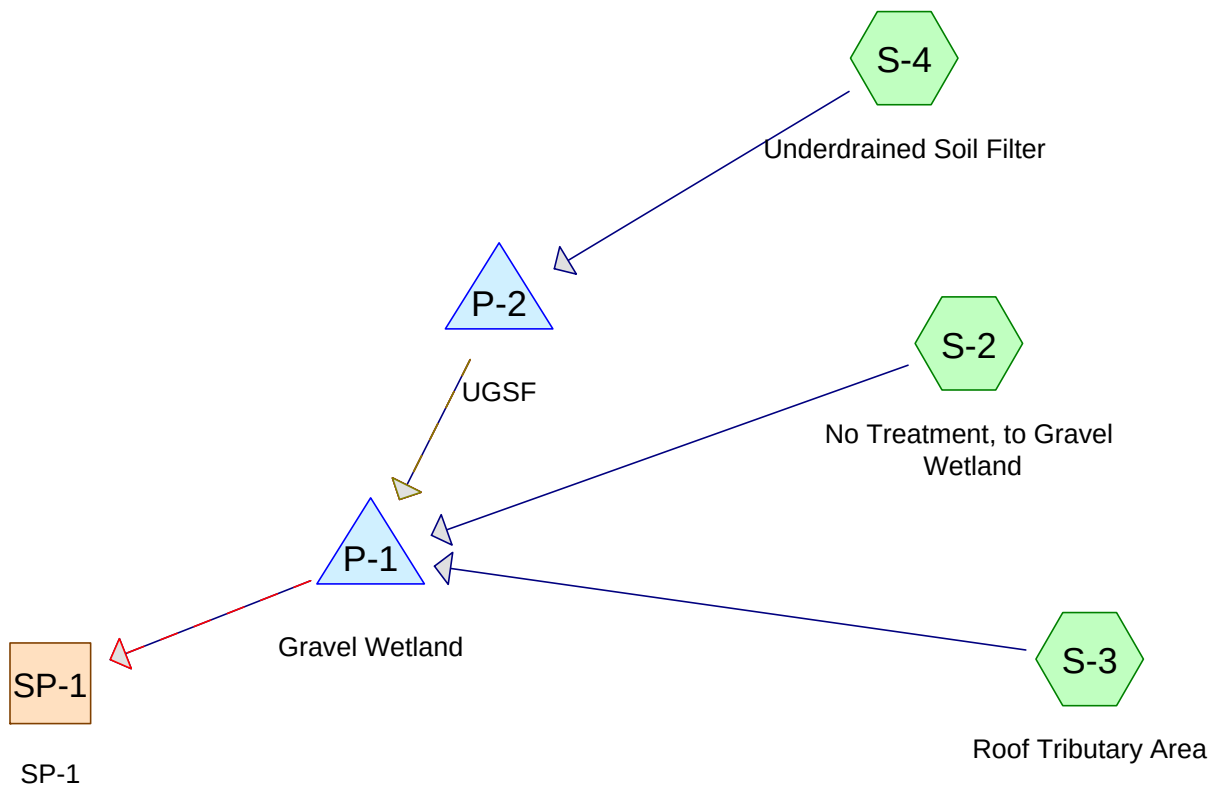
Documents Reviewed by Woodard & Curran

- Level III Site Plan Application and attachments, dated August 31, 2017, prepared by Wright-Pierce on behalf of the City of Portland.
- Engineering Plans, Sheets C1-14 and Figures 1-4, , dated September 1, 2017, prepared by Wright-Pierce, on behalf of the City of Portland.

We have reviewed the project with the City Department of Public Works, and can provide the following clarifications on the Applicant's proposed waivers.

Comments

- 1) The Applicant has requested a waiver of the flooding standard. With only a minor increase in the 2-year storm event, a waiver of the flooding standard can be supported.
- 2) The Applicant has requested a waiver of the urban impaired stream standard. Upon review by the Department of Public Works, it was established that there is no waiver option for the Urban Impaired Stream Standard. The City does not have the authority to waive this standard for a stream that is in non-attainment of the State water quality standards. There are two options for meeting the standard: (1) provide additional stormwater management per the standard; (2) pay into the Compensation Fee Utilization Plan for Fall Brook per the Maine DEP standard calculation. The City is in agreement that the removal of roof runoff from the combined sewer system will help with the overall goal of reducing CSO volumes to Back Cove. However, this action would not have a beneficial impact on Fall Brook, which is the purpose of the UIS Standard, so this work cannot be used to justify a waiver of the standard.
- 3) In addition, a stormwater management agreement will be required for the new stormwater treatment system. The City of Portland Department of Public Works will continue to maintain and inspect the existing gravel wetland. The Applicant will be required to inspect, maintain, and report on the underdrained soil filter in accordance with the Chapter 32 stormwater requirements. Public Works has indicated that arrangements may be made to have the same company perform inspections for the two systems, and that the options can be discussed with the School Department.



Routing Diagram for During Permit Proposed Gravel Wetland
 Prepared by Microsoft, Printed 11/17/2017
 HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

During_Permit Proposed Gravel Wetland

Prepared by Microsoft

Printed 11/17/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.838	98	(S-4)
0.238	75	(S-4)
9.289	74	>75% Grass cover, Good, HSG C (S-2)
7.910	98	Paved parking & roofs (S-2)
0.761	98	Unconnected roofs, HSG A (S-3)
19.036	86	TOTAL AREA

During_Permit Proposed Gravel Wetland

Prepared by Microsoft

Printed 11/17/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 3

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.761	HSG A	S-3
0.000	HSG B	
9.289	HSG C	S-2
0.000	HSG D	
8.986	Other	S-2, S-4
19.036		TOTAL AREA

During_Permit Proposed Gravel Wetland

Prepared by Microsoft

Printed 11/17/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

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	0.000	0.000	1.076	1.076		S-4
0.000	0.000	9.289	0.000	0.000	9.289	>75% Grass cover, Good	S-2
0.000	0.000	0.000	0.000	7.910	7.910	Paved parking & roofs	S-2
0.761	0.000	0.000	0.000	0.000	0.761	Unconnected roofs	S-3
0.761	0.000	9.289	0.000	8.986	19.036	TOTAL AREA	

During_Permit Proposed Gravel Wetland

Prepared by Microsoft

Printed 11/17/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 5

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	S-2	0.00	0.00	1,327.0	0.0050	0.013	18.0	0.0	0.0
2	S-3	0.00	0.00	15.0	0.0100	0.013	15.0	0.0	0.0
3	S-3	0.00	0.00	500.0	0.0100	0.013	18.0	0.0	0.0
4	P-1	101.67	100.00	37.0	0.0451	0.011	12.0	0.0	0.0
5	P-2	106.00	105.50	50.0	0.0100	0.013	15.0	0.0	0.0

During_Permit Proposed Gravel Wetland*Portland_ME 24-hr SOP 2-yr Rainfall=3.17"*

Prepared by Microsoft

Printed 11/17/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 6

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-2: No Treatment, to Runoff Area=749,173 sf 45.99% Impervious Runoff Depth=1.73"
Flow Length=1,612' Tc=29.3 min CN=85 Runoff=18.02 cfs 2.482 af

Subcatchment S-3: Roof Tributary Area Runoff Area=33,157 sf 100.00% Impervious Runoff Depth>2.94"
Flow Length=665' Tc=7.0 min CN=98 Runoff=2.28 cfs 0.186 af

Subcatchment S-4: Underdrained Soil Filter Runoff Area=46,872 sf 77.91% Impervious Runoff Depth=2.42"
Tc=7.0 min CN=93 Runoff=2.86 cfs 0.217 af

Reach SP-1: SP-1 Avg. Flow Depth=0.47' Max Vel=2.44 fps Inflow=7.44 cfs 2.886 af
n=0.035 L=250.0' S=0.0120 '/' Capacity=908.60 cfs Outflow=7.43 cfs 2.886 af

Pond P-1: Gravel Wetland Peak Elev=106.52' Storage=43,579 cf Inflow=18.67 cfs 2.885 af
Primary=0.09 cfs 0.001 af Secondary=7.36 cfs 2.885 af Outflow=7.44 cfs 2.886 af

Pond P-2: UGSF Peak Elev=110.59' Storage=3,280 cf Inflow=2.86 cfs 0.217 af
Primary=0.20 cfs 0.217 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.217 af

Total Runoff Area = 19.036 ac Runoff Volume = 2.885 af Average Runoff Depth = 1.82"
50.05% Pervious = 9.527 ac 49.95% Impervious = 9.509 ac

Summary for Subcatchment S-2: No Treatment, to Gravel Wetland

Runoff = 18.02 cfs @ 12.35 hrs, Volume= 2.482 af, Depth= 1.73"

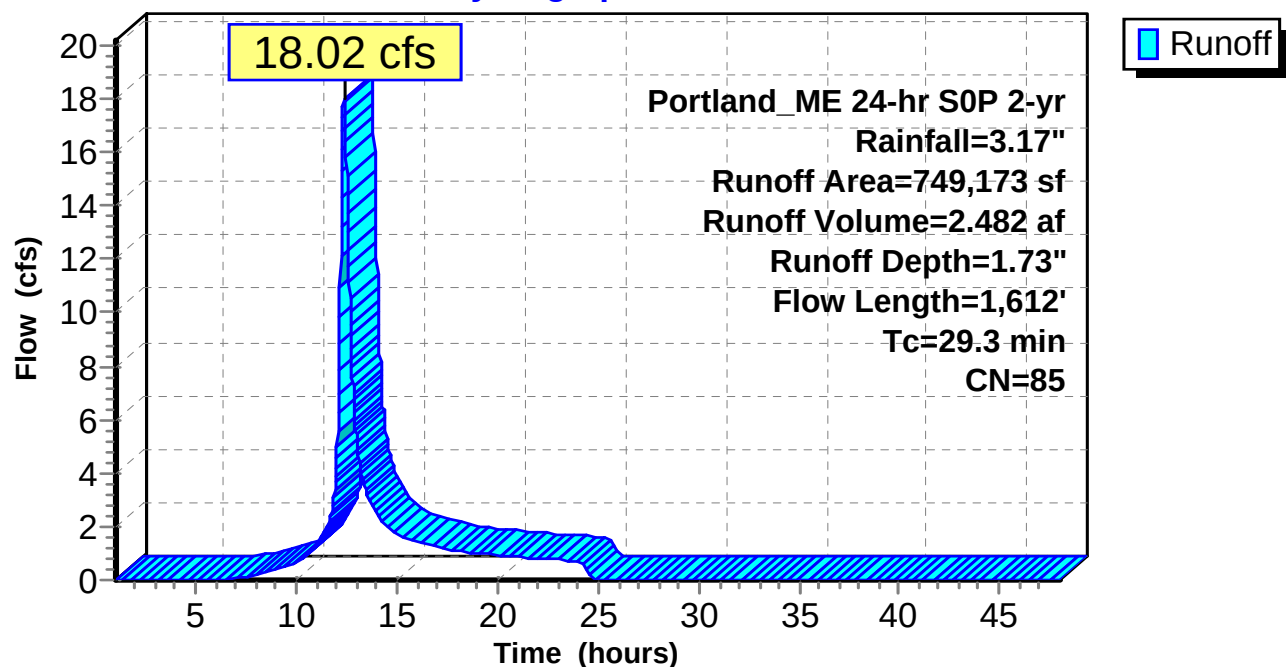
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Area (sf)	CN	Description
344,540	98	Paved parking & roofs
404,633	74	>75% Grass cover, Good, HSG C
749,173	85	Weighted Average
404,633		54.01% Pervious Area
344,540		45.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	285	0.0150	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.3	1,327	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
29.3	1,612	Total			

Subcatchment S-2: No Treatment, to Gravel Wetland

Hydrograph



Summary for Subcatchment S-3: Roof Tributary Area

Runoff = 2.28 cfs @ 12.05 hrs, Volume= 0.186 af, Depth> 2.94"

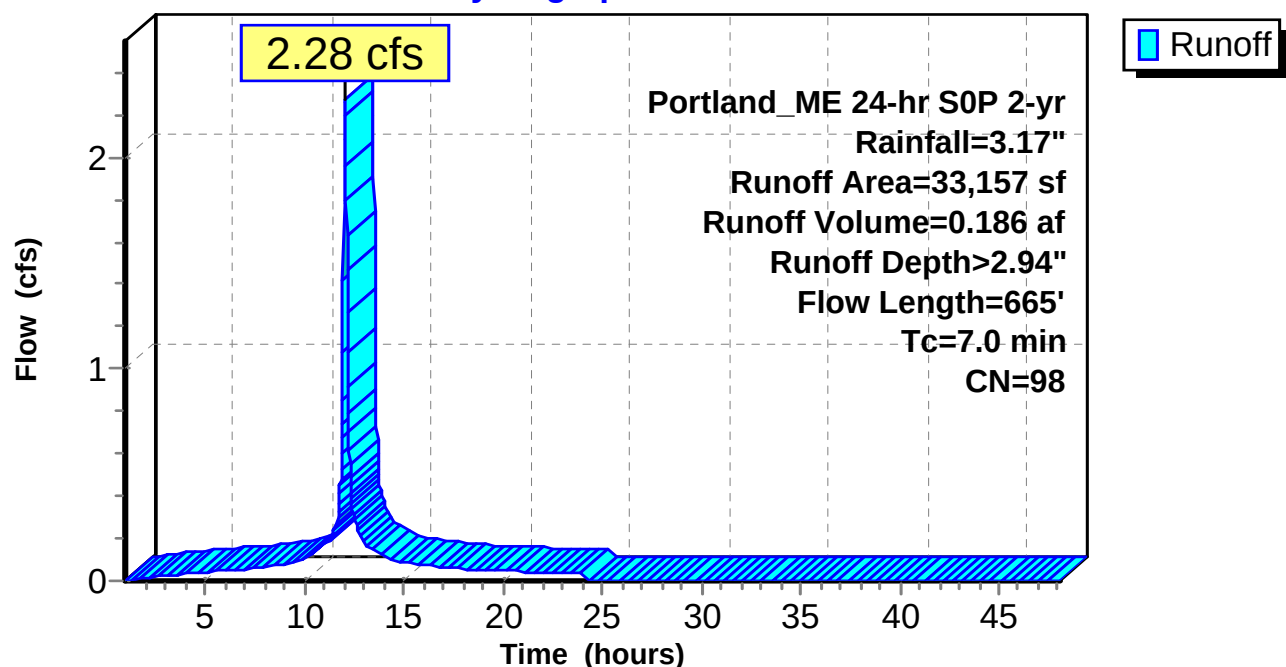
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

Area (sf)	CN	Description
33,157	98	Unconnected roofs, HSG A
33,157		100.00% Impervious Area
33,157		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.58		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
0.0	15	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.4	500	0.0100	5.94	10.50	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
4.0					Direct Entry, Min TC 7
7.0	665	Total			

Subcatchment S-3: Roof Tributary Area

Hydrograph



Summary for Subcatchment S-4: Underdrained Soil Filter

Runoff = 2.86 cfs @ 12.05 hrs, Volume= 0.217 af, Depth= 2.42"

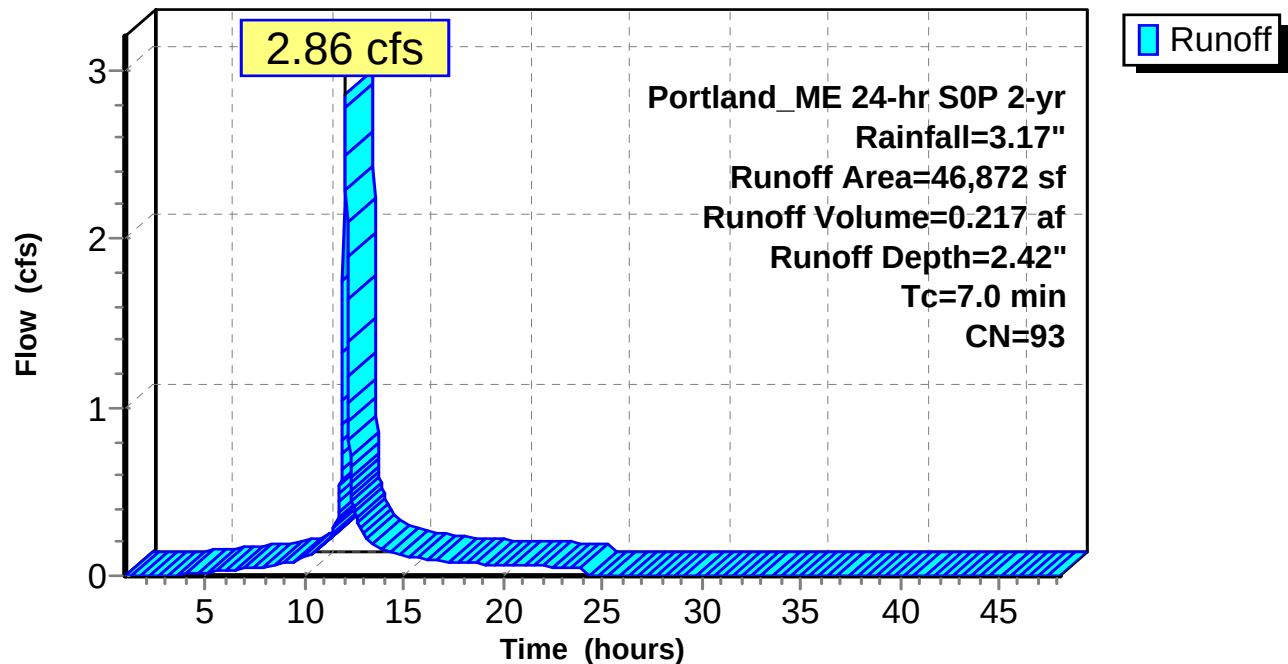
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 2-yr Rainfall=3.17"

	Area (sf)	CN	Description
*	36,516	98	
*	10,356	75	
	46,872	93	Weighted Average
	10,356		22.09% Pervious Area
	36,516		77.91% Impervious Area

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

Subcatchment S-4: Underdrained Soil Filter

Hydrograph



Summary for Reach SP-1: SP-1

Inflow Area = 19.036 ac, 49.95% Impervious, Inflow Depth > 1.82" for 2-yr event
 Inflow = 7.44 cfs @ 12.82 hrs, Volume= 2.886 af
 Outflow = 7.43 cfs @ 12.84 hrs, Volume= 2.886 af, Atten= 0%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Max. Velocity= 2.44 fps, Min. Travel Time= 1.7 min
 Avg. Velocity = 1.06 fps, Avg. Travel Time= 3.9 min

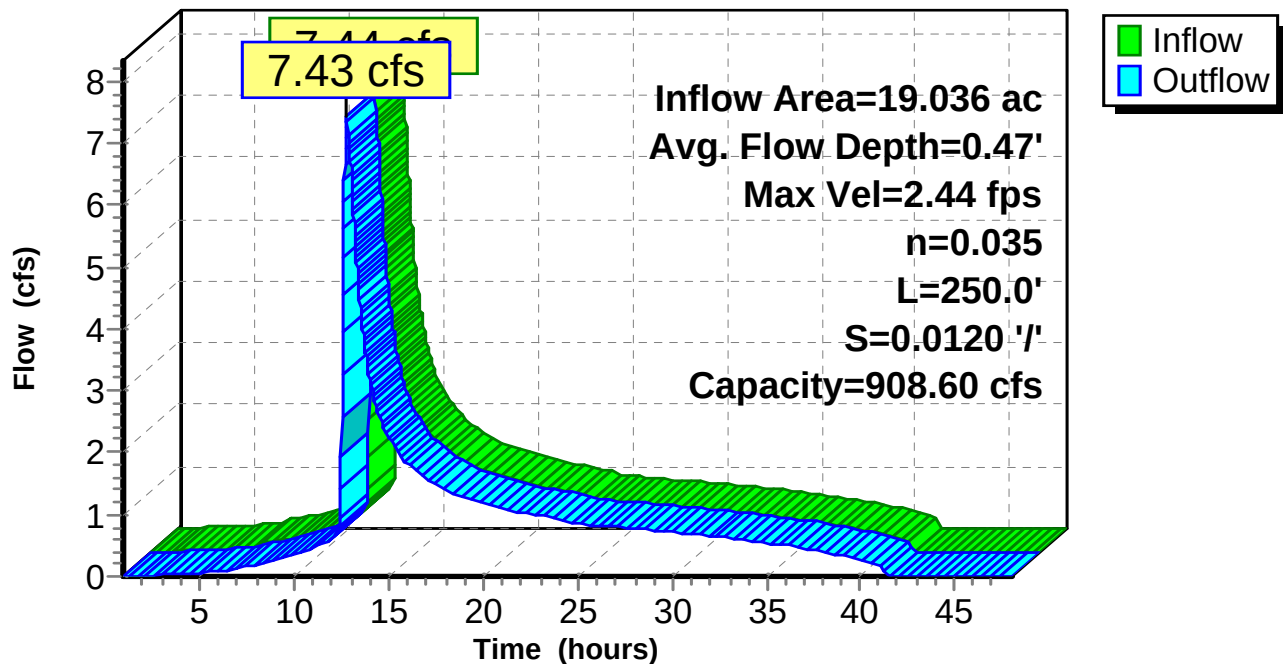
Peak Storage= 760 cf @ 12.84 hrs
 Average Depth at Peak Storage= 0.47'
 Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
 Side Slope Z-value= 3.0 '/' Top Width= 35.00'
 Length= 250.0' Slope= 0.0120 '/'
 Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: SP-1

Hydrograph



Summary for Pond P-1: Gravel Wetland

Inflow Area = 19.036 ac, 49.95% Impervious, Inflow Depth = 1.82" for 2-yr event
 Inflow = 18.67 cfs @ 12.35 hrs, Volume= 2.885 af
 Outflow = 7.44 cfs @ 12.82 hrs, Volume= 2.886 af, Atten= 60%, Lag= 28.2 min
 Primary = 0.09 cfs @ 12.82 hrs, Volume= 0.001 af
 Secondary = 7.36 cfs @ 12.82 hrs, Volume= 2.885 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 106.52' @ 12.82 hrs Surf.Area= 15,909 sf Storage= 43,579 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 344.2 min (1,217.9 - 873.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Primary OutFlow Max=0.09 cfs @ 12.82 hrs HW=106.52' TW=91.47' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 0.09 cfs @ 0.33 fps)

2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=7.35 cfs @ 12.82 hrs HW=106.52' TW=91.47' (Dynamic Tailwater)

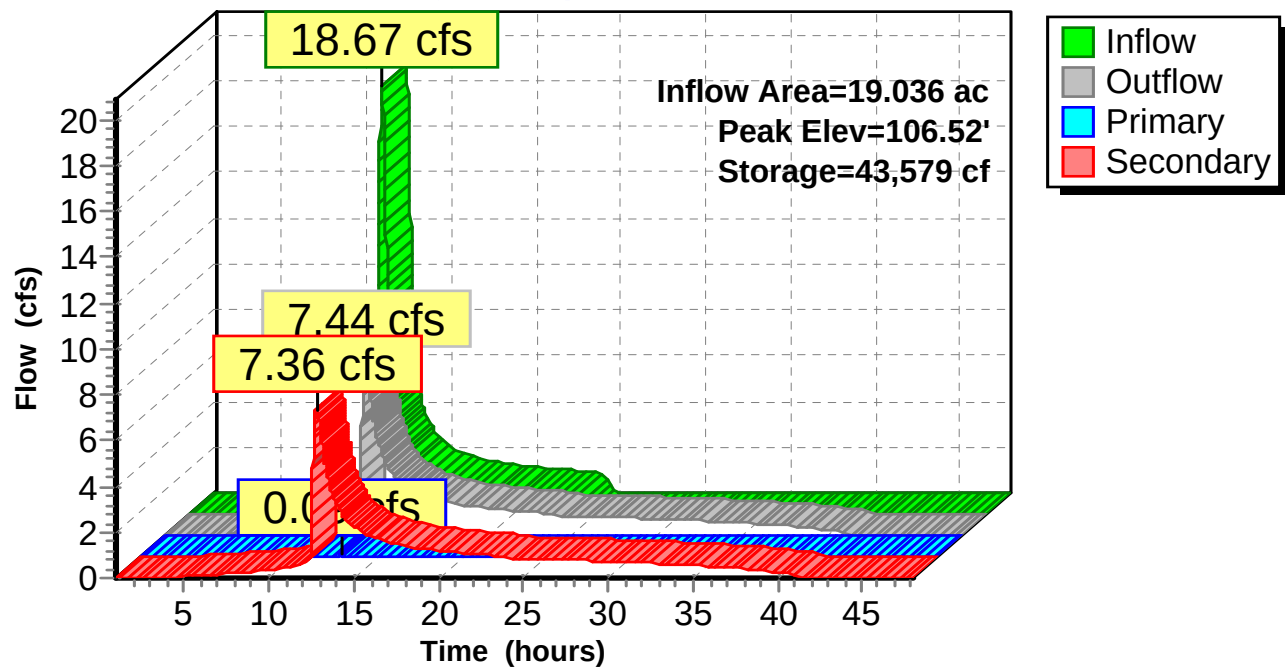
3=Culvert (Passes 7.35 cfs of 7.89 cfs potential flow)

4=Orifice/Grate (Orifice Controls 0.91 cfs @ 10.42 fps)

5=Broad-Crested Rectangular Weir (Weir Controls 6.45 cfs @ 2.08 fps)

Pond P-1: Gravel Wetland

Hydrograph



Summary for Pond P-2: UGSF

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=10)

Inflow Area = 1.076 ac, 77.91% Impervious, Inflow Depth = 2.42" for 2-yr event
 Inflow = 2.86 cfs @ 12.05 hrs, Volume= 0.217 af
 Outflow = 0.20 cfs @ 13.47 hrs, Volume= 0.217 af, Atten= 93%, Lag= 85.1 min
 Primary = 0.20 cfs @ 13.47 hrs, Volume= 0.217 af
 Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af
 Tertiary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 110.59' @ 13.47 hrs Surf.Area= 3,551 sf Storage= 3,280 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 144.7 min (953.2 - 808.5)

Volume	Invert	Avail.Storage	Storage Description
#1	109.50'	11,839 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.50	2,471	0	0
112.00	4,950	9,276	9,276
112.50	5,300	2,563	11,839

Device	Routing	Invert	Outlet Devices
#1	Secondary	106.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 106.00' / 105.50' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	111.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	109.50'	2.410 in/hr Exfiltration over Surface area
#4	Tertiary	112.00'	250.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

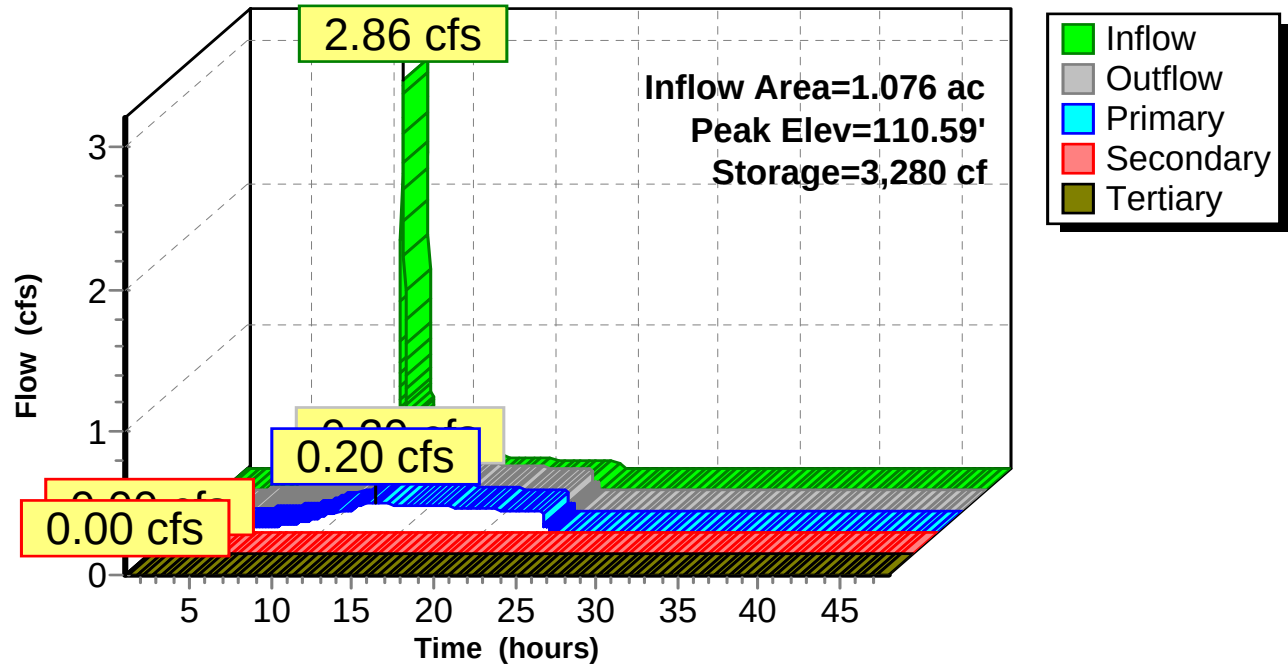
Primary OutFlow Max=0.20 cfs @ 13.47 hrs HW=110.59' TW=106.36' (Dynamic Tailwater)
 ↳ **3=Exfiltration** (Exfiltration Controls 0.20 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=109.50' TW=102.00' (Dynamic Tailwater)
 ↳ **1=Culvert** (Passes 0.00 cfs of 7.91 cfs potential flow)
 ↳ **2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 1.00 hrs HW=109.50' TW=102.00' (Dynamic Tailwater)
 ↳ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2: UGSF

Hydrograph



During_Permit Proposed Gravel Wetland*Portland_ME 24-hr SOP 10-yr Rainfall=4.71"*

Prepared by Microsoft

Printed 11/17/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 15

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-2: No Treatment, to Runoff Area=749,173 sf 45.99% Impervious Runoff Depth=3.10"
Flow Length=1,612' Tc=29.3 min CN=85 Runoff=31.27 cfs 4.445 af

Subcatchment S-3: Roof Tributary Area Runoff Area=33,157 sf 100.00% Impervious Runoff Depth>4.47"
Flow Length=665' Tc=7.0 min CN=98 Runoff=3.20 cfs 0.284 af

Subcatchment S-4: Underdrained Soil Filter Runoff Area=46,872 sf 77.91% Impervious Runoff Depth=3.91"
Tc=7.0 min CN=93 Runoff=4.23 cfs 0.351 af

Reach SP-1: SP-1 Avg. Flow Depth=1.01' Max Vel=3.70 fps Inflow=29.94 cfs 5.079 af
n=0.035 L=250.0' S=0.0120 '/' Capacity=908.60 cfs Outflow=29.86 cfs 5.079 af

Pond P-1: Gravel Wetland Peak Elev=107.10' Storage=53,394 cf Inflow=32.91 cfs 5.079 af
Primary=21.54 cfs 0.888 af Secondary=8.40 cfs 4.191 af Outflow=29.94 cfs 5.079 af

Pond P-2: UGSF Peak Elev=111.09' Storage=5,182 cf Inflow=4.23 cfs 0.351 af
Primary=0.23 cfs 0.311 af Secondary=0.71 cfs 0.040 af Tertiary=0.00 cfs 0.000 af Outflow=0.93 cfs 0.351 af

Total Runoff Area = 19.036 ac Runoff Volume = 5.079 af Average Runoff Depth = 3.20"
50.05% Pervious = 9.527 ac 49.95% Impervious = 9.509 ac

Summary for Subcatchment S-2: No Treatment, to Gravel Wetland

Runoff = 31.27 cfs @ 12.35 hrs, Volume= 4.445 af, Depth= 3.10"

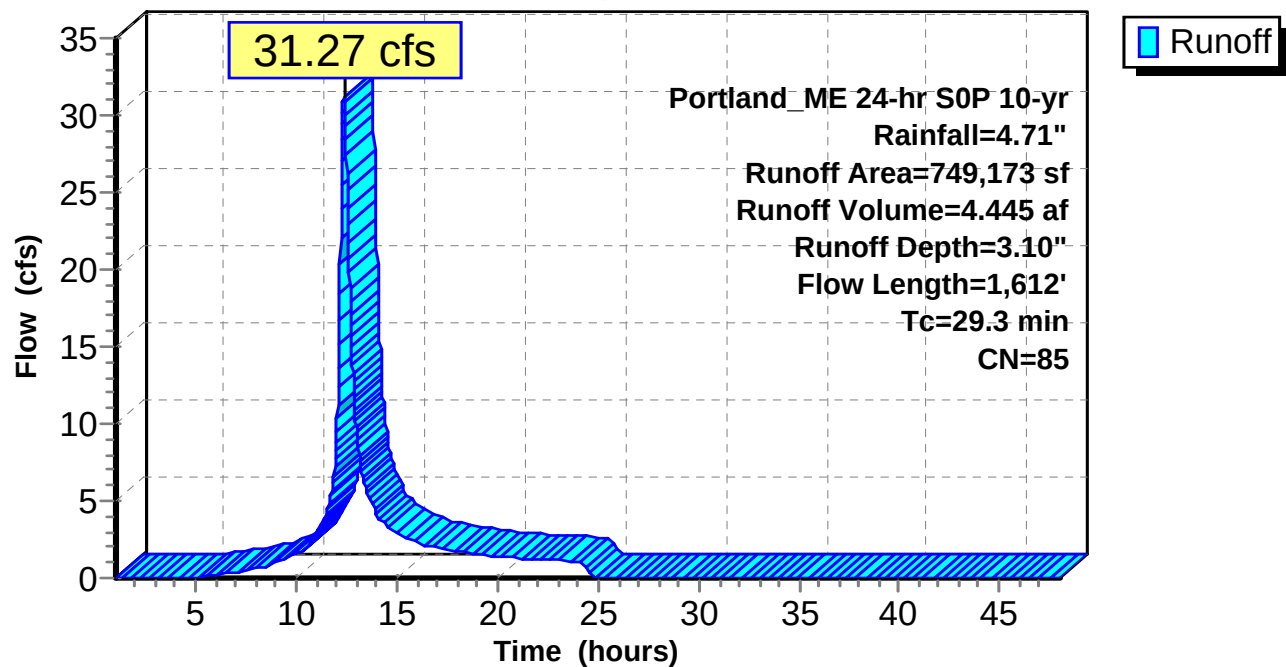
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

Area (sf)	CN	Description
344,540	98	Paved parking & roofs
404,633	74	>75% Grass cover, Good, HSG C
749,173	85	Weighted Average
404,633		54.01% Pervious Area
344,540		45.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	285	0.0150	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.3	1,327	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
29.3	1,612	Total			

Subcatchment S-2: No Treatment, to Gravel Wetland

Hydrograph



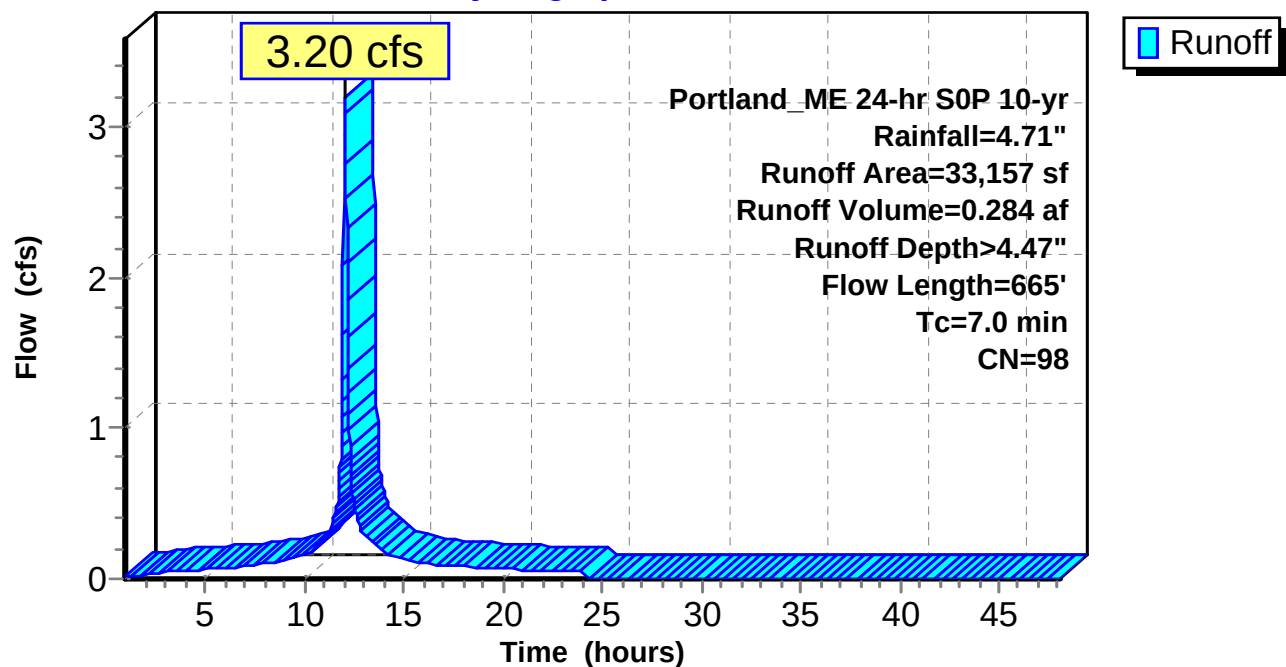
Summary for Subcatchment S-3: Roof Tributary Area

Runoff = 3.20 cfs @ 12.05 hrs, Volume= 0.284 af, Depth> 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

Area (sf)	CN	Description
33,157	98	Unconnected roofs, HSG A
33,157		100.00% Impervious Area
33,157		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.58		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
0.0	15	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.4	500	0.0100	5.94	10.50	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
4.0					Direct Entry, Min TC 7
7.0	665	Total			

Subcatchment S-3: Roof Tributary Area**Hydrograph**

Summary for Subcatchment S-4: Underdrained Soil Filter

Runoff = 4.23 cfs @ 12.05 hrs, Volume= 0.351 af, Depth= 3.91"

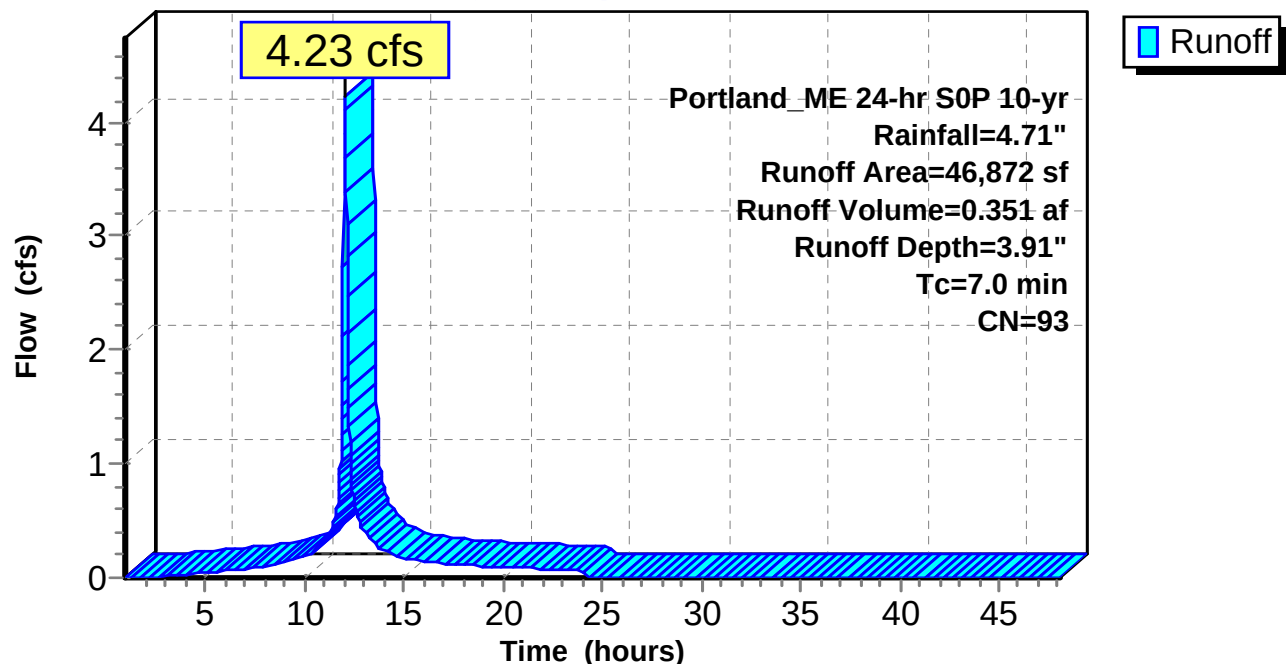
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 10-yr Rainfall=4.71"

	Area (sf)	CN	Description
*	36,516	98	
*	10,356	75	
	46,872	93	Weighted Average
	10,356		22.09% Pervious Area
	36,516		77.91% Impervious Area

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

Subcatchment S-4: Underdrained Soil Filter

Hydrograph



Summary for Reach SP-1: SP-1

Inflow Area = 19.036 ac, 49.95% Impervious, Inflow Depth > 3.20" for 10-yr event
 Inflow = 29.94 cfs @ 12.46 hrs, Volume= 5.079 af
 Outflow = 29.86 cfs @ 12.47 hrs, Volume= 5.079 af, Atten= 0%, Lag= 0.9 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Max. Velocity= 3.70 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 1.18 fps, Avg. Travel Time= 3.5 min

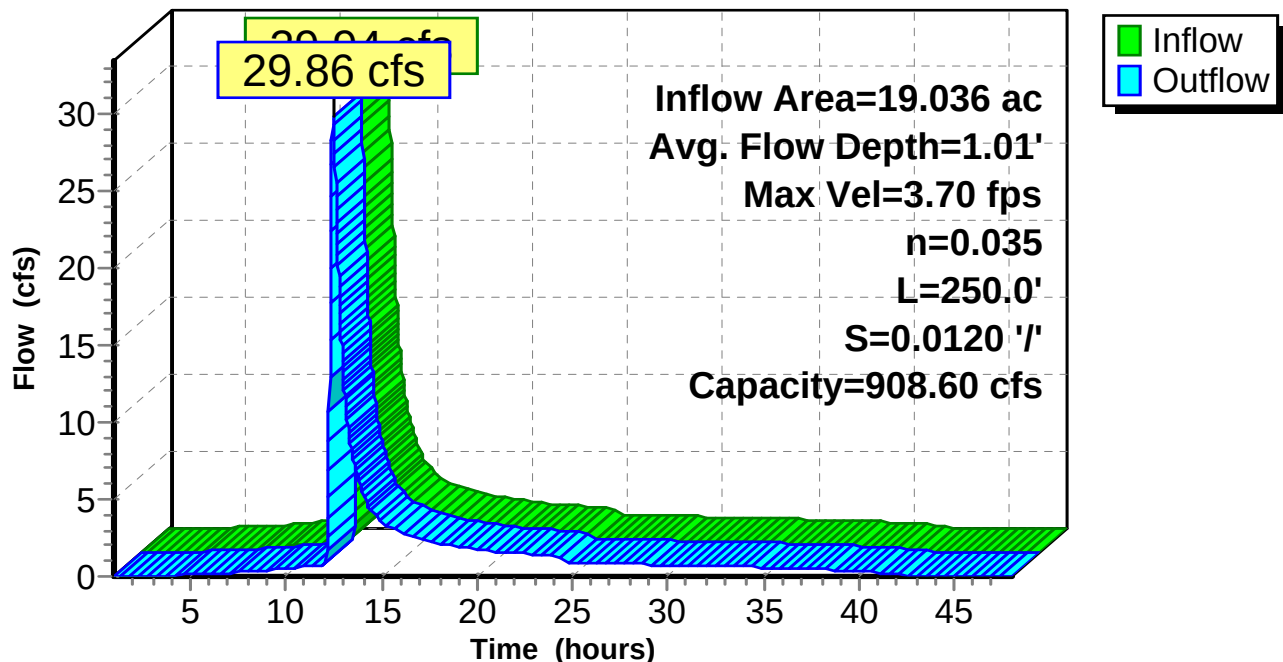
Peak Storage= 2,016 cf @ 12.47 hrs
 Average Depth at Peak Storage= 1.01'
 Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
 Side Slope Z-value= 3.0 '/' Top Width= 35.00'
 Length= 250.0' Slope= 0.0120 '/'
 Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: SP-1

Hydrograph



Summary for Pond P-1: Gravel Wetland

Inflow Area = 19.036 ac, 49.95% Impervious, Inflow Depth > 3.20" for 10-yr event
 Inflow = 32.91 cfs @ 12.35 hrs, Volume= 5.079 af
 Outflow = 29.94 cfs @ 12.46 hrs, Volume= 5.079 af, Atten= 9%, Lag= 6.7 min
 Primary = 21.54 cfs @ 12.46 hrs, Volume= 0.888 af
 Secondary = 8.40 cfs @ 12.46 hrs, Volume= 4.191 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.10' @ 12.46 hrs Surf.Area= 17,668 sf Storage= 53,394 cf

Plug-Flow detention time= 219.2 min calculated for 5.077 af (100% of inflow)
 Center-of-Mass det. time= 219.5 min (1,072.2 - 852.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Primary OutFlow Max=21.52 cfs @ 12.46 hrs HW=107.10' TW=92.00' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 18.99 cfs @ 2.10 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 2.53 cfs @ 0.76 fps)

Secondary OutFlow Max=8.40 cfs @ 12.46 hrs HW=107.10' TW=92.00' (Dynamic Tailwater)

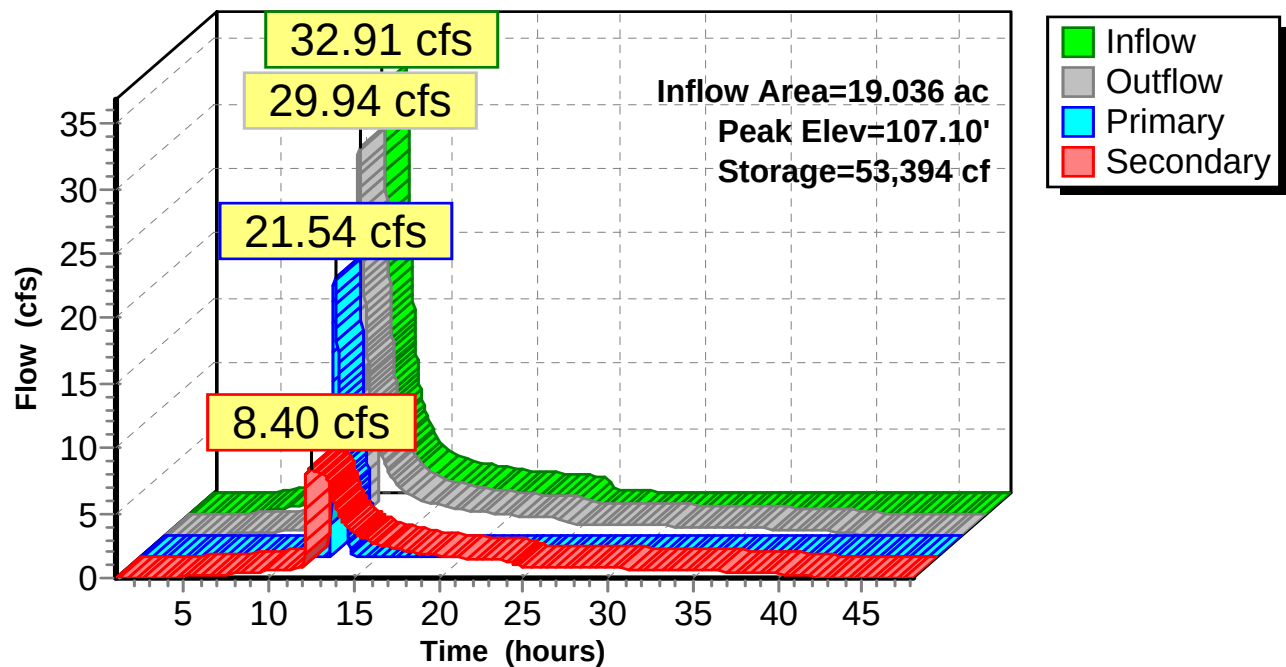
3=Culvert (Inlet Controls 8.40 cfs @ 10.69 fps)

4=Orifice/Grate (Passes < 0.96 cfs potential flow)

5=Broad-Crested Rectangular Weir (Passes < 22.27 cfs potential flow)

Pond P-1: Gravel Wetland

Hydrograph



Summary for Pond P-2: UGSF

Inflow Area = 1.076 ac, 77.91% Impervious, Inflow Depth = 3.91" for 10-yr event
 Inflow = 4.23 cfs @ 12.05 hrs, Volume= 0.351 af
 Outflow = 0.93 cfs @ 12.36 hrs, Volume= 0.351 af, Atten= 78%, Lag= 18.6 min
 Primary = 0.23 cfs @ 12.36 hrs, Volume= 0.311 af
 Secondary = 0.71 cfs @ 12.36 hrs, Volume= 0.040 af
 Tertiary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3

Peak Elev= 111.09' @ 12.36 hrs Surf.Area= 4,048 sf Storage= 5,182 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 192.0 min (981.5 - 789.6)

Volume	Invert	Avail.Storage	Storage Description
#1	109.50'	11,839 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.50	2,471	0	0
112.00	4,950	9,276	9,276
112.50	5,300	2,563	11,839

Device	Routing	Invert	Outlet Devices
#1	Secondary	106.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 106.00' / 105.50' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	111.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	109.50'	2.410 in/hr Exfiltration over Surface area
#4	Tertiary	112.00'	250.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.23 cfs @ 12.36 hrs HW=111.09' TW=107.03' (Dynamic Tailwater)

↑**3=Exfiltration** (Exfiltration Controls 0.23 cfs)

Secondary OutFlow Max=0.71 cfs @ 12.36 hrs HW=111.09' TW=107.03' (Dynamic Tailwater)

↑**1=Culvert** (Passes 0.71 cfs of 9.40 cfs potential flow)

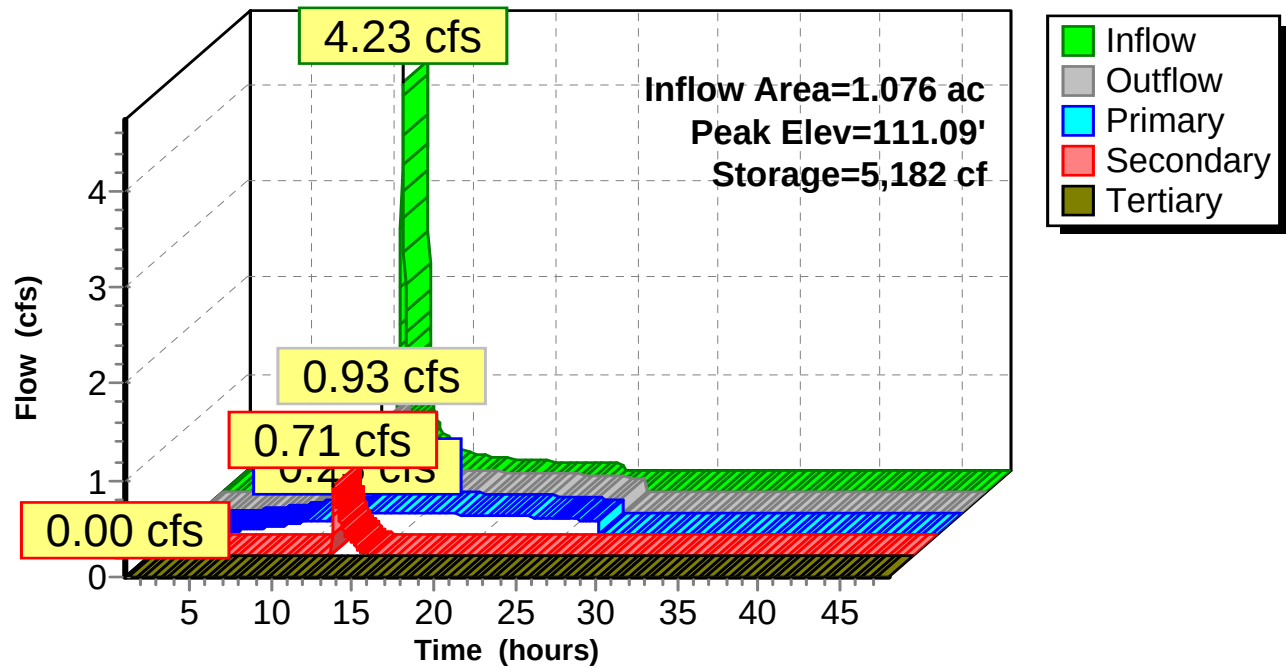
↑**2=Orifice/Grate** (Weir Controls 0.71 cfs @ 0.98 fps)

Tertiary OutFlow Max=0.00 cfs @ 1.00 hrs HW=109.50' TW=102.00' (Dynamic Tailwater)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2: UGSF

Hydrograph



During_Permit Proposed Gravel Wetland*Portland_ME 24-hr SOP 25-yr Rainfall=5.92"*

Prepared by Microsoft

Printed 11/17/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 24

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-2: No Treatment, toRunoff Area=749,173 sf 45.99% Impervious Runoff Depth=4.23"
Flow Length=1,612' Tc=29.3 min CN=85 Runoff=41.47 cfs 6.058 af**Subcatchment S-3: Roof Tributary Area**Runoff Area=33,157 sf 100.00% Impervious Runoff Depth>5.68"
Flow Length=665' Tc=7.0 min CN=98 Runoff=3.83 cfs 0.360 af**Subcatchment S-4: Underdrained Soil Filter**Runoff Area=46,872 sf 77.91% Impervious Runoff Depth=5.10"
Tc=7.0 min CN=93 Runoff=5.18 cfs 0.458 af**Reach SP-1: SP-1**Avg. Flow Depth=1.22' Max Vel=4.10 fps Inflow=43.26 cfs 6.876 af
n=0.035 L=250.0' S=0.0120 '/' Capacity=908.60 cfs Outflow=43.20 cfs 6.876 af**Pond P-1: Gravel Wetland**Peak Elev=107.24' Storage=55,836 cf Inflow=44.26 cfs 6.876 af
Primary=34.74 cfs 1.832 af Secondary=8.52 cfs 5.045 af Outflow=43.26 cfs 6.876 af**Pond P-2: UGSF**Peak Elev=111.23' Storage=5,751 cf Inflow=5.18 cfs 0.458 af
Primary=0.23 cfs 0.346 af Secondary=2.85 cfs 0.112 af Tertiary=0.00 cfs 0.000 af Outflow=3.08 cfs 0.458 af**Total Runoff Area = 19.036 ac Runoff Volume = 6.876 af Average Runoff Depth = 4.33"**
50.05% Pervious = 9.527 ac 49.95% Impervious = 9.509 ac

Summary for Subcatchment S-2: No Treatment, to Gravel Wetland

Runoff = 41.47 cfs @ 12.35 hrs, Volume= 6.058 af, Depth= 4.23"

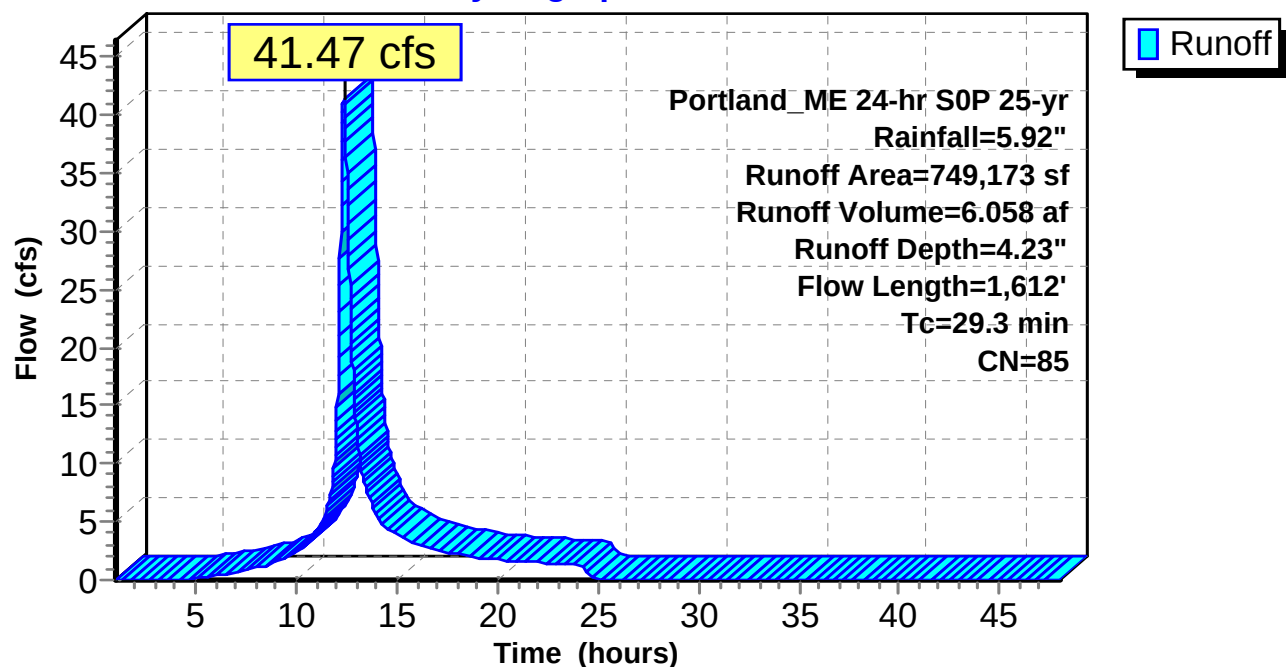
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 25-yr Rainfall=5.92"

Area (sf)	CN	Description
344,540	98	Paved parking & roofs
404,633	74	>75% Grass cover, Good, HSG C
749,173	85	Weighted Average
404,633		54.01% Pervious Area
344,540		45.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	285	0.0150	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.3	1,327	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
29.3	1,612	Total			

Subcatchment S-2: No Treatment, to Gravel Wetland

Hydrograph



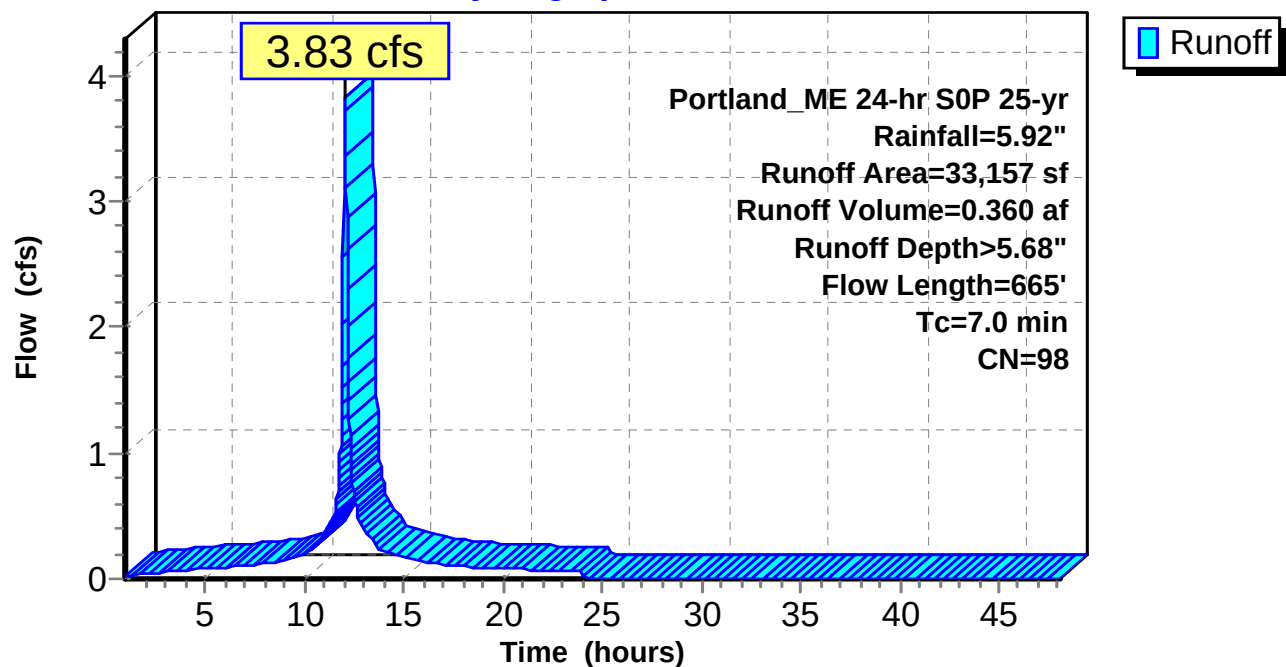
Summary for Subcatchment S-3: Roof Tributary Area

Runoff = 3.83 cfs @ 12.05 hrs, Volume= 0.360 af, Depth> 5.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 25-yr Rainfall=5.92"

Area (sf)	CN	Description
33,157	98	Unconnected roofs, HSG A
33,157		100.00% Impervious Area
33,157		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.58		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
0.0	15	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.4	500	0.0100	5.94	10.50	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
4.0					Direct Entry, Min TC 7
7.0	665	Total			

Subcatchment S-3: Roof Tributary Area**Hydrograph**

Summary for Subcatchment S-4: Underdrained Soil Filter

Runoff = 5.18 cfs @ 12.05 hrs, Volume= 0.458 af, Depth= 5.10"

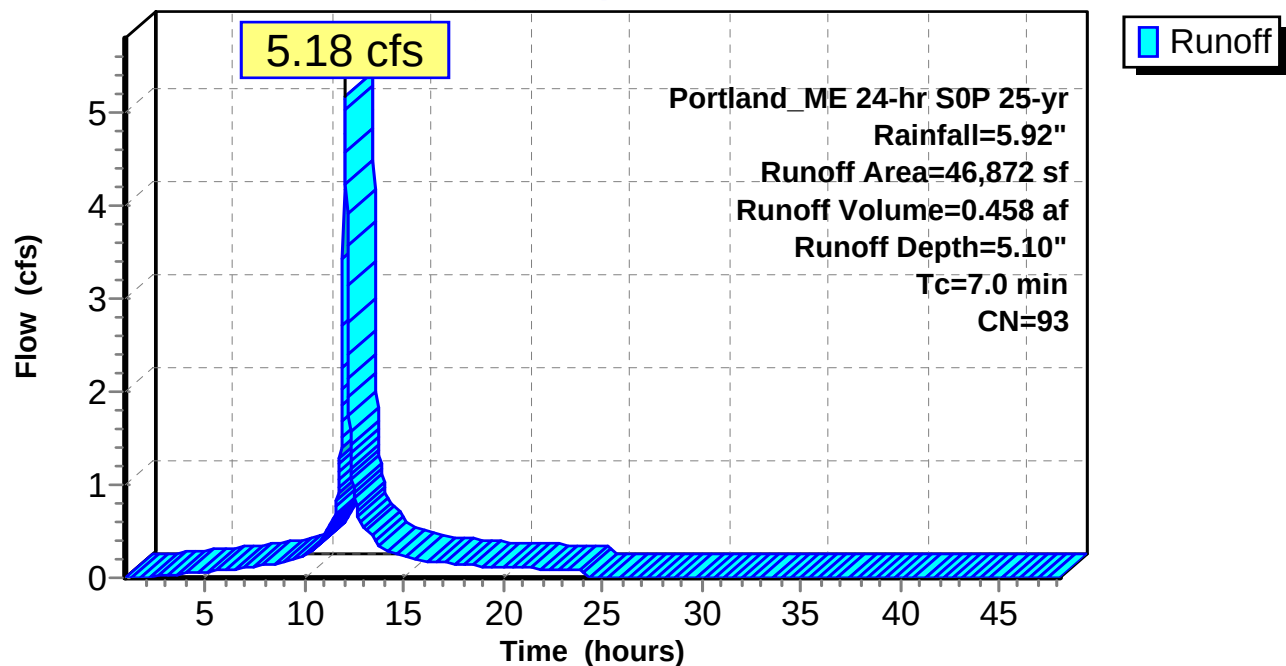
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 25-yr Rainfall=5.92"

	Area (sf)	CN	Description
*	36,516	98	
*	10,356	75	
	46,872	93	Weighted Average
	10,356		22.09% Pervious Area
	36,516		77.91% Impervious Area

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

Subcatchment S-4: Underdrained Soil Filter

Hydrograph



Summary for Reach SP-1: SP-1

Inflow Area = 19.036 ac, 49.95% Impervious, Inflow Depth > 4.33" for 25-yr event
 Inflow = 43.26 cfs @ 12.39 hrs, Volume= 6.876 af
 Outflow = 43.20 cfs @ 12.40 hrs, Volume= 6.876 af, Atten= 0%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Max. Velocity= 4.10 fps, Min. Travel Time= 1.0 min
 Avg. Velocity = 1.25 fps, Avg. Travel Time= 3.3 min

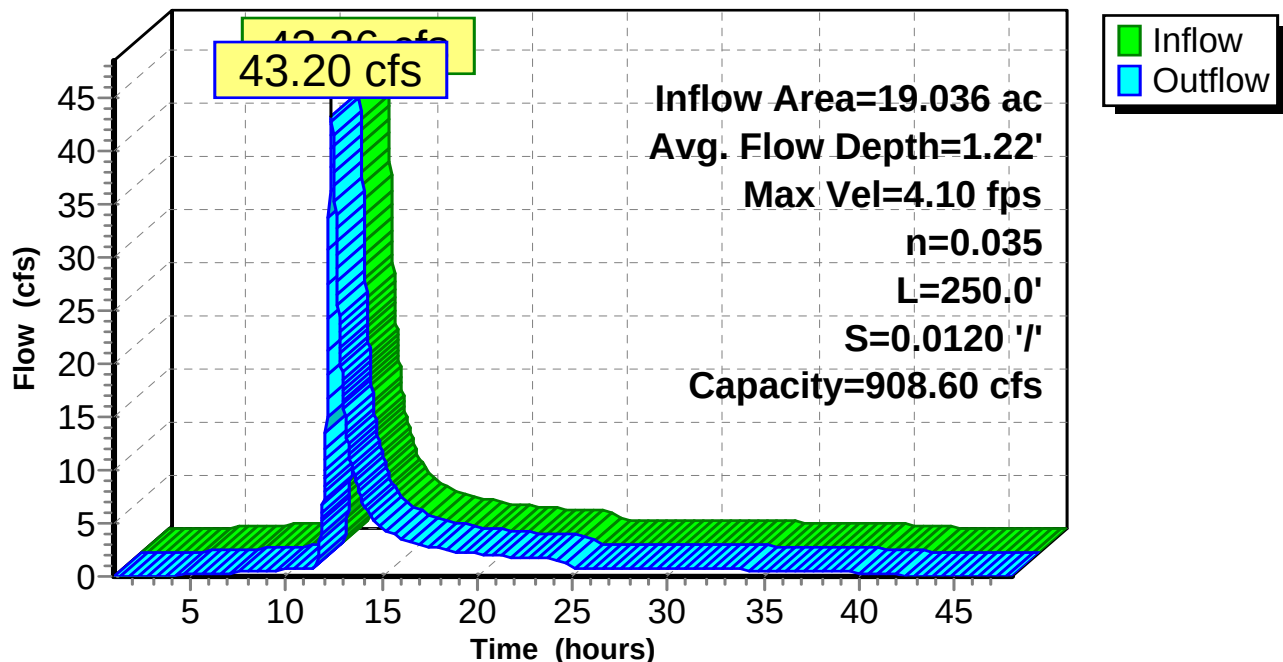
Peak Storage= 2,631 cf @ 12.40 hrs
 Average Depth at Peak Storage= 1.22'
 Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
 Side Slope Z-value= 3.0 '/' Top Width= 35.00'
 Length= 250.0' Slope= 0.0120 '/'
 Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: SP-1

Hydrograph



Summary for Pond P-1: Gravel Wetland

Inflow Area = 19.036 ac, 49.95% Impervious, Inflow Depth > 4.33" for 25-yr event
 Inflow = 44.26 cfs @ 12.34 hrs, Volume= 6.876 af
 Outflow = 43.26 cfs @ 12.39 hrs, Volume= 6.876 af, Atten= 2%, Lag= 3.1 min
 Primary = 34.74 cfs @ 12.39 hrs, Volume= 1.832 af
 Secondary = 8.52 cfs @ 12.39 hrs, Volume= 5.045 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.24' @ 12.39 hrs Surf.Area= 18,184 sf Storage= 55,836 cf

Plug-Flow detention time= 173.3 min calculated for 6.873 af (100% of inflow)
 Center-of-Mass det. time= 173.6 min (1,012.8 - 839.2)

Volume	Invert	Avail.Storage	Storage Description
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
102.00	3,572	549.0	0	0	3,572
103.00	6,200	771.0	4,826	4,826	26,901
104.00	9,020	829.0	7,566	12,392	34,329
105.00	11,611	872.0	10,288	22,680	40,211
106.00	14,502	904.0	13,030	35,710	44,820
107.00	17,279	924.0	15,870	51,580	47,870
108.00	21,203	764.0	19,208	70,788	69,378

Device	Routing	Invert	Outlet Devices
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32

Primary OutFlow Max=34.71 cfs @ 12.39 hrs HW=107.24' TW=92.22' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 25.70 cfs @ 2.32 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 9.01 cfs @ 1.17 fps)

Secondary OutFlow Max=8.51 cfs @ 12.39 hrs HW=107.24' TW=92.22' (Dynamic Tailwater)

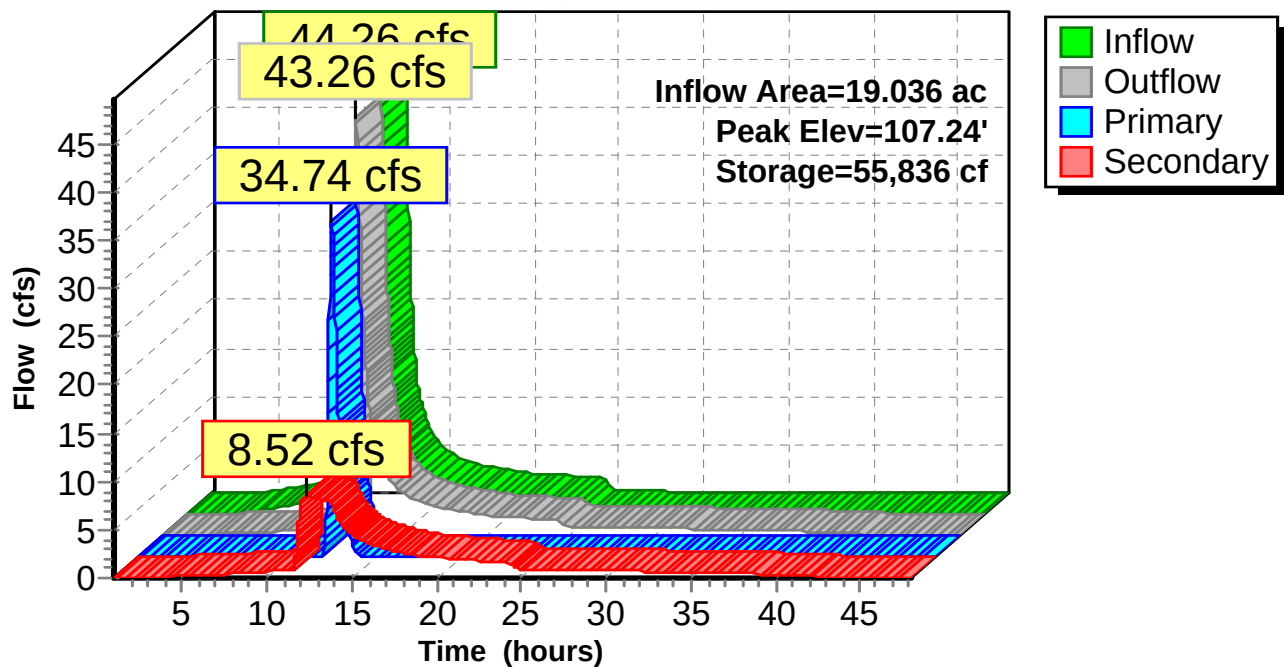
3=Culvert (Inlet Controls 8.51 cfs @ 10.84 fps)

4=Orifice/Grate (Passes < 0.98 cfs potential flow)

5=Broad-Crested Rectangular Weir (Passes < 26.75 cfs potential flow)

Pond P-1: Gravel Wetland

Hydrograph



Summary for Pond P-2: UGSF

Inflow Area = 1.076 ac, 77.91% Impervious, Inflow Depth = 5.10" for 25-yr event
 Inflow = 5.18 cfs @ 12.05 hrs, Volume= 0.458 af
 Outflow = 3.08 cfs @ 12.18 hrs, Volume= 0.458 af, Atten= 40%, Lag= 8.0 min
 Primary = 0.23 cfs @ 12.18 hrs, Volume= 0.346 af
 Secondary = 2.85 cfs @ 12.18 hrs, Volume= 0.112 af
 Tertiary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 111.23' @ 12.18 hrs Surf.Area= 4,185 sf Storage= 5,751 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 171.5 min (952.0 - 780.4)

Volume	Invert	Avail.Storage	Storage Description
#1	109.50'	11,839 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.50	2,471	0	0
112.00	4,950	9,276	9,276
112.50	5,300	2,563	11,839

Device	Routing	Invert	Outlet Devices
#1	Secondary	106.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 106.00' / 105.50' S= 0.0100 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	111.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	109.50'	2.410 in/hr Exfiltration over Surface area
#4	Tertiary	112.00'	250.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

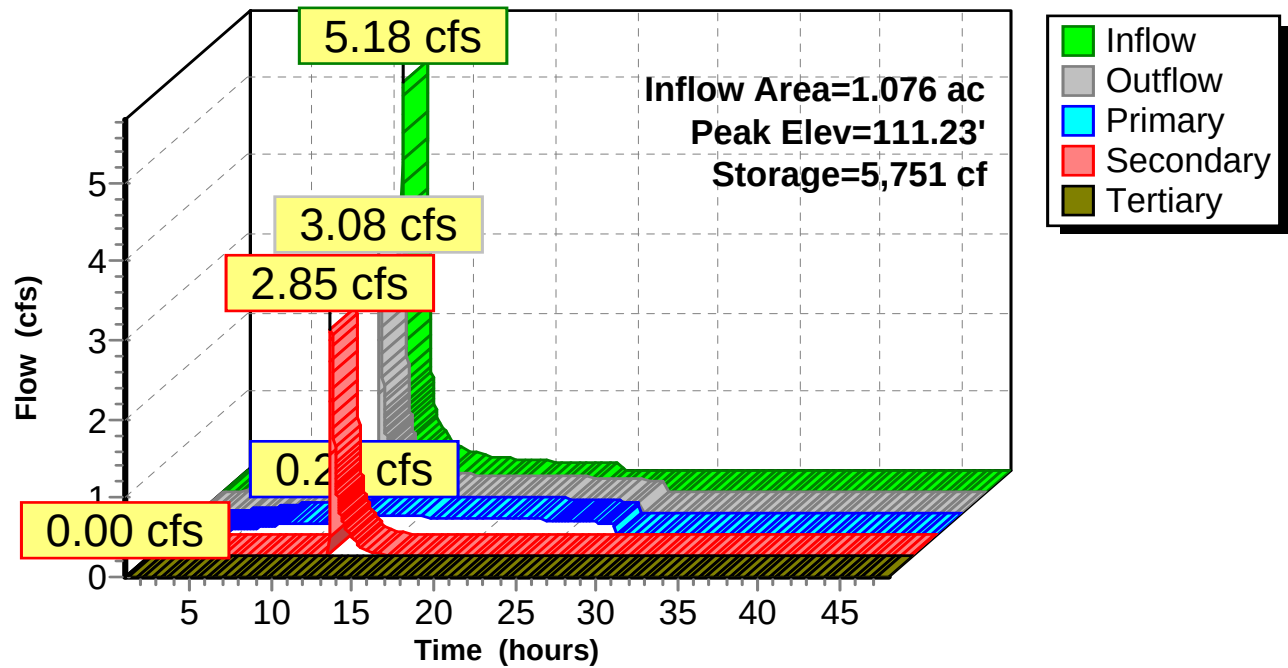
Primary OutFlow Max=0.23 cfs @ 12.18 hrs HW=111.23' TW=107.03' (Dynamic Tailwater)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.23 cfs)

Secondary OutFlow Max=2.84 cfs @ 12.18 hrs HW=111.23' TW=107.03' (Dynamic Tailwater)
 ↑ **1=Culvert** (Passes 2.84 cfs of 9.56 cfs potential flow)
 ↑ **2=Orifice/Grate** (Weir Controls 2.84 cfs @ 1.56 fps)

Tertiary OutFlow Max=0.00 cfs @ 1.00 hrs HW=109.50' TW=102.00' (Dynamic Tailwater)
 ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2: UGSF

Hydrograph



During_Permit Proposed Gravel Wetland*Portland_ME 24-hr SOP 200-yr Rainfall=9.97"*

Prepared by Microsoft

Printed 11/17/2017

HydroCAD® 10.00-12 s/n 01135 © 2014 HydroCAD Software Solutions LLC

Page 33

Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-2: No Treatment, to Runoff Area=749,173 sf 45.99% Impervious Runoff Depth=8.13"
Flow Length=1,612' Tc=29.3 min CN=85 Runoff=74.54 cfs 11.646 af

Subcatchment S-3: Roof Tributary Area Runoff Area=33,157 sf 100.00% Impervious Runoff Depth>9.71"
Flow Length=665' Tc=7.0 min CN=98 Runoff=5.93 cfs 0.616 af

Subcatchment S-4: Underdrained Soil Filter Runoff Area=46,872 sf 77.91% Impervious Runoff Depth=9.12"
Tc=7.0 min CN=93 Runoff=8.23 cfs 0.818 af

Reach SP-1: SP-1 Avg. Flow Depth=1.64' Max Vel=4.83 fps Inflow=78.78 cfs 13.080 af
n=0.035 L=250.0' S=0.0120 ' Capacity=908.60 cfs Outflow=78.71 cfs 13.080 af

Pond P-1: Gravel Wetland Peak Elev=107.50' Storage=60,739 cf Inflow=79.54 cfs 13.080 af
Primary=70.05 cfs 5.423 af Secondary=8.73 cfs 7.657 af Outflow=78.78 cfs 13.080 af

Pond P-2: UGSF Peak Elev=111.42' Storage=6,577 cf Inflow=8.23 cfs 0.818 af
Primary=0.24 cfs 0.426 af Secondary=7.15 cfs 0.392 af Tertiary=0.00 cfs 0.000 af Outflow=7.39 cfs 0.818 af

Total Runoff Area = 19.036 ac Runoff Volume = 13.080 af Average Runoff Depth = 8.25"
50.05% Pervious = 9.527 ac 49.95% Impervious = 9.509 ac

Summary for Subcatchment S-2: No Treatment, to Gravel Wetland

Runoff = 74.54 cfs @ 12.35 hrs, Volume= 11.646 af, Depth= 8.13"

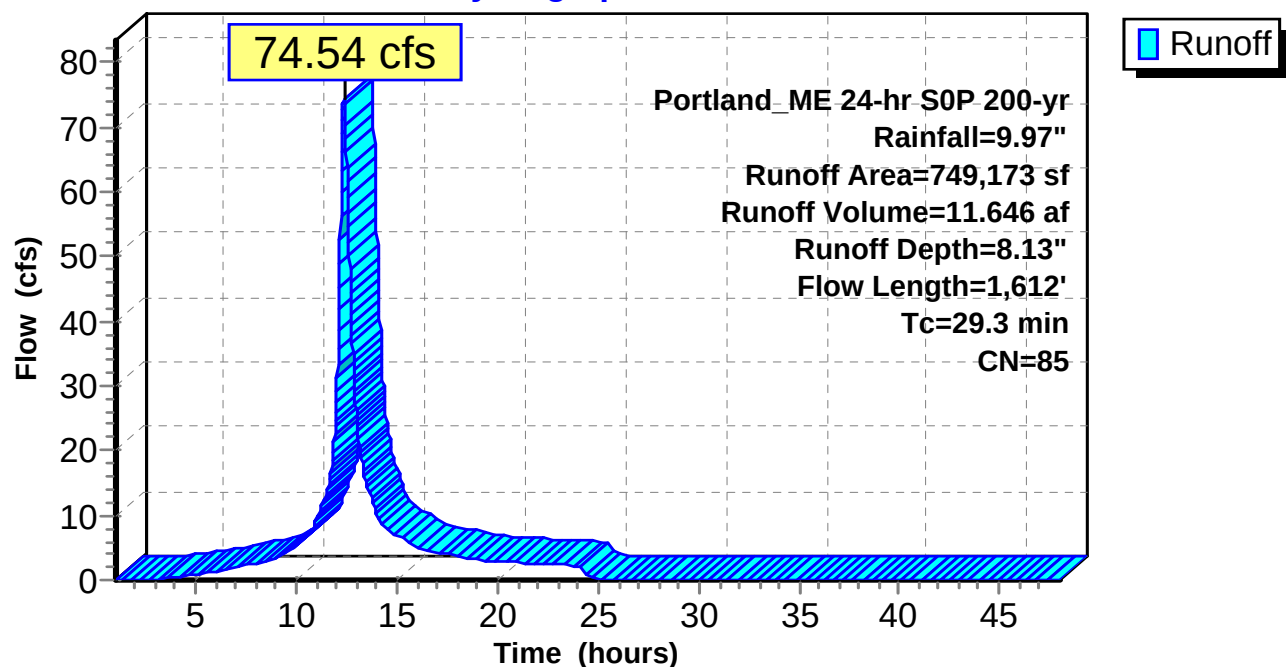
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Area (sf)	CN	Description
344,540	98	Paved parking & roofs
404,633	74	>75% Grass cover, Good, HSG C
749,173	85	Weighted Average
404,633		54.01% Pervious Area
344,540		45.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	285	0.0150	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.3	1,327	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
29.3	1,612	Total			

Subcatchment S-2: No Treatment, to Gravel Wetland

Hydrograph



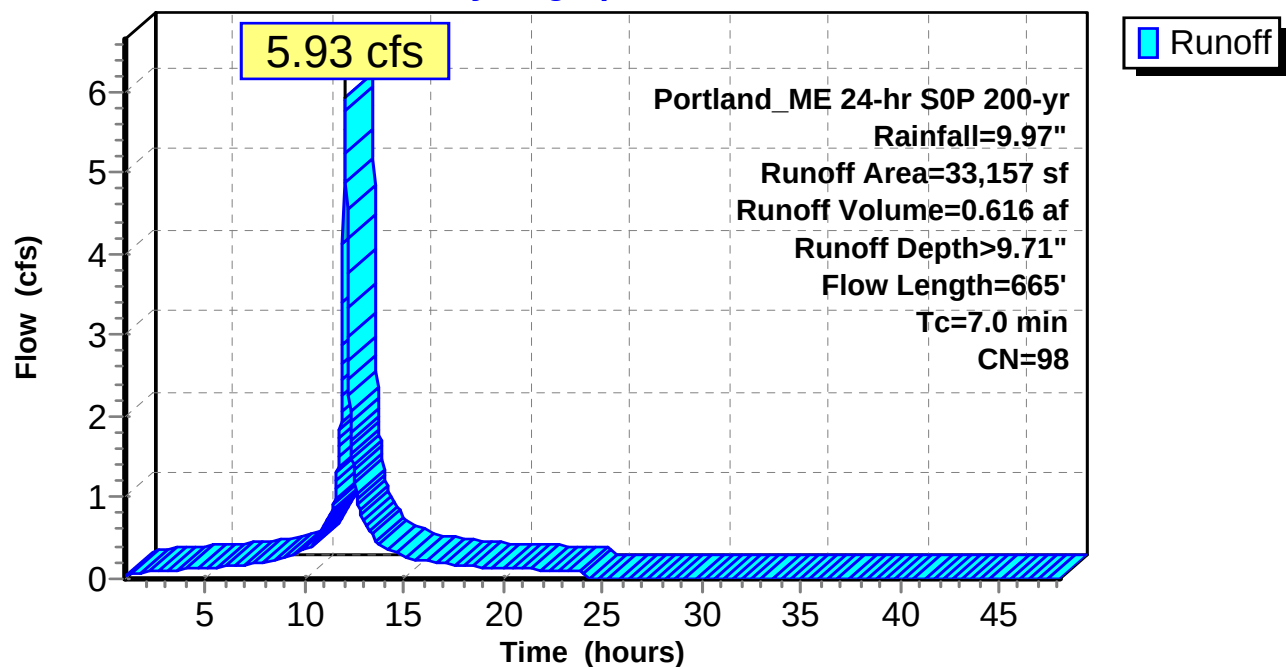
Summary for Subcatchment S-3: Roof Tributary Area

Runoff = 5.93 cfs @ 12.05 hrs, Volume= 0.616 af, Depth> 9.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr SOP 200-yr Rainfall=9.97"

Area (sf)	CN	Description
33,157	98	Unconnected roofs, HSG A
33,157		100.00% Impervious Area
33,157		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.58		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
0.0	15	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.4	500	0.0100	5.94	10.50	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
4.0					Direct Entry, Min TC 7
7.0	665	Total			

Subcatchment S-3: Roof Tributary Area**Hydrograph**

Summary for Subcatchment S-4: Underdrained Soil Filter

Runoff = 8.23 cfs @ 12.05 hrs, Volume= 0.818 af, Depth= 9.12"

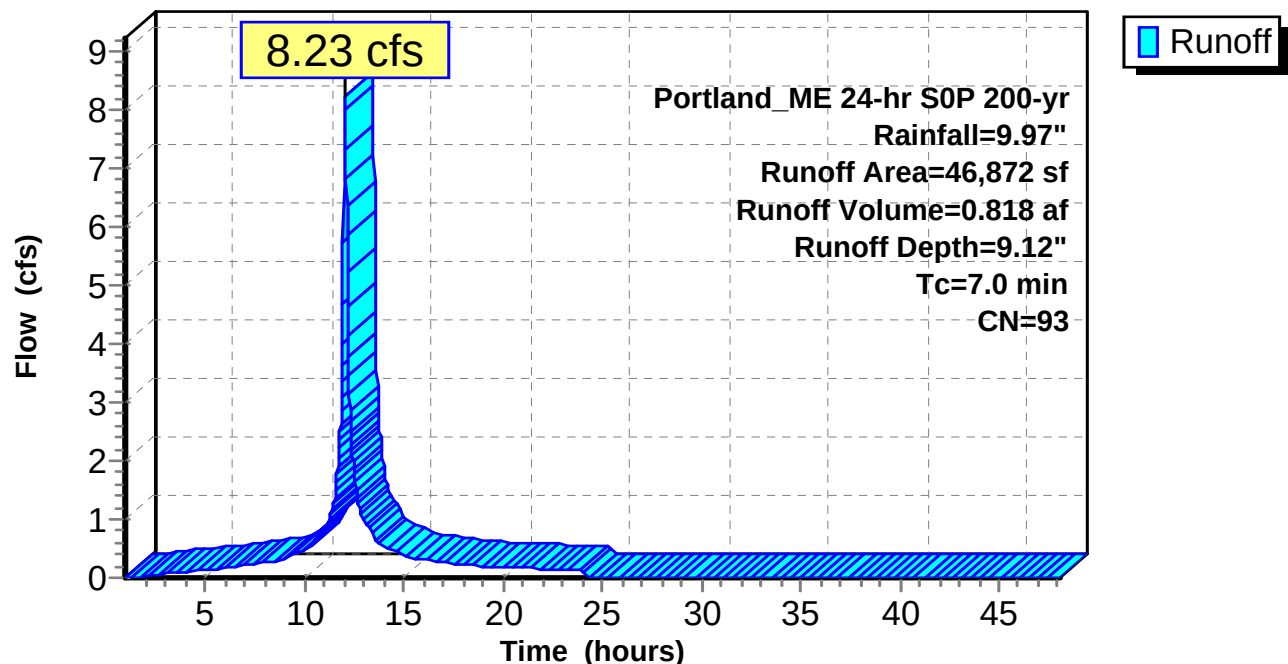
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
Portland_ME 24-hr S0P 200-yr Rainfall=9.97"

	Area (sf)	CN	Description
*	36,516	98	
*	10,356	75	
	46,872	93	Weighted Average
	10,356		22.09% Pervious Area
	36,516		77.91% Impervious Area

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

Subcatchment S-4: Underdrained Soil Filter

Hydrograph



Summary for Reach SP-1: SP-1

Inflow Area = 19.036 ac, 49.95% Impervious, Inflow Depth > 8.25" for 200-yr event
 Inflow = 78.78 cfs @ 12.37 hrs, Volume= 13.080 af
 Outflow = 78.71 cfs @ 12.38 hrs, Volume= 13.080 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Max. Velocity= 4.83 fps, Min. Travel Time= 0.9 min
 Avg. Velocity = 1.45 fps, Avg. Travel Time= 2.9 min

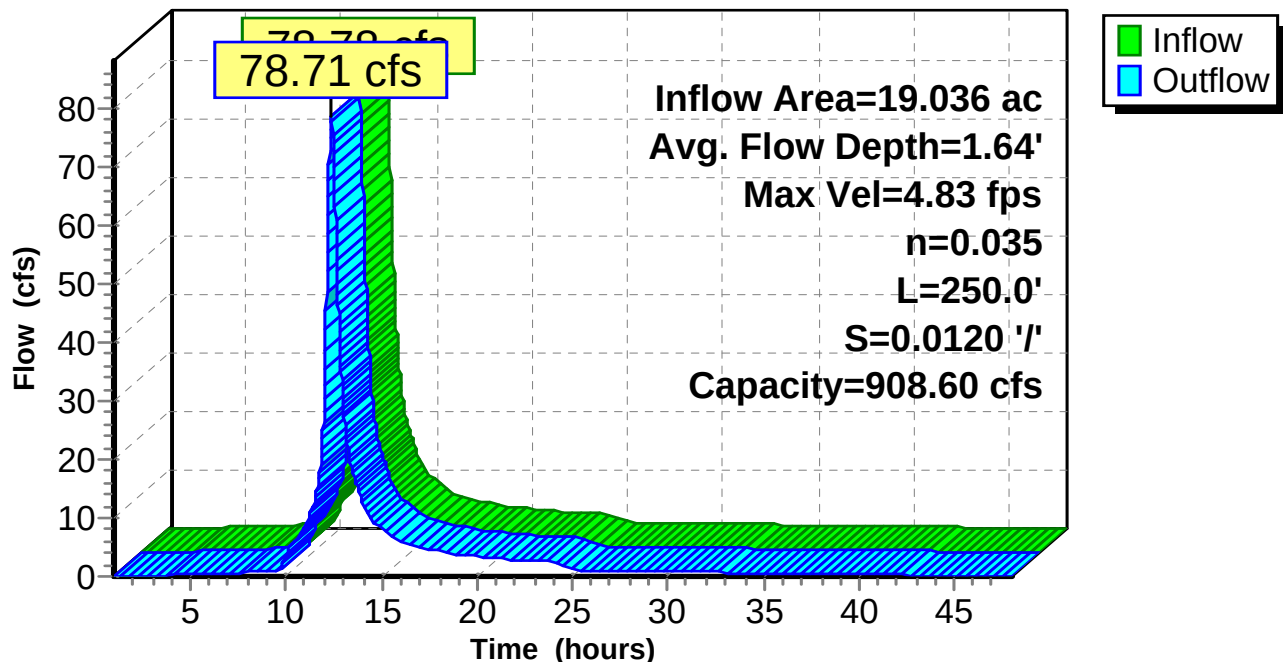
Peak Storage= 4,072 cf @ 12.38 hrs
 Average Depth at Peak Storage= 1.64'
 Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
 Side Slope Z-value= 3.0 '/' Top Width= 35.00'
 Length= 250.0' Slope= 0.0120 '/'
 Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: SP-1

Hydrograph



Summary for Pond P-1: Gravel Wetland

Inflow Area = 19.036 ac, 49.95% Impervious, Inflow Depth > 8.25" for 200-yr event
 Inflow = 79.54 cfs @ 12.34 hrs, Volume= 13.080 af
 Outflow = 78.78 cfs @ 12.37 hrs, Volume= 13.080 af, Atten= 1%, Lag= 1.9 min
 Primary = 70.05 cfs @ 12.37 hrs, Volume= 5.423 af
 Secondary = 8.73 cfs @ 12.37 hrs, Volume= 7.657 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.50' @ 12.37 hrs Surf.Area= 19,200 sf Storage= 60,739 cf

Plug-Flow detention time= 106.8 min calculated for 13.075 af (100% of inflow)
 Center-of-Mass det. time= 107.0 min (920.6 - 813.5)

Volume	Invert	Avail.Storage	Storage Description							
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)							
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)					
102.00	3,572	549.0	0	0	3,572					
103.00	6,200	771.0	4,826	4,826	26,901					
104.00	9,020	829.0	7,566	12,392	34,329					
105.00	11,611	872.0	10,288	22,680	40,211					
106.00	14,502	904.0	13,030	35,710	44,820					
107.00	17,279	924.0	15,870	51,580	47,870					
108.00	21,203	764.0	19,208	70,788	69,378					
Device	Routing	Invert	Outlet Devices							
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64							
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf							
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600							
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32							

Primary OutFlow Max=69.99 cfs @ 12.37 hrs HW=107.50' TW=92.64' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 40.32 cfs @ 2.68 fps)

2=Broad-Crested Rectangular Weir (Weir Controls 29.67 cfs @ 1.85 fps)

Secondary OutFlow Max=8.73 cfs @ 12.37 hrs HW=107.50' TW=92.64' (Dynamic Tailwater)

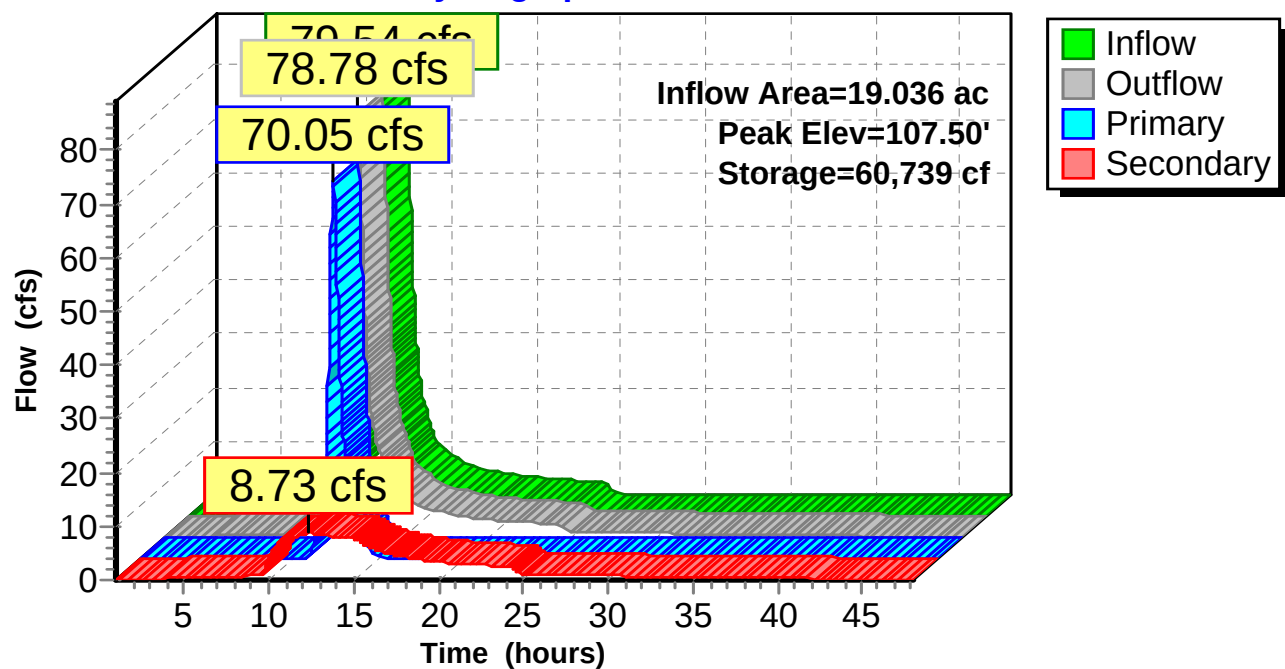
3=Culvert (Inlet Controls 8.73 cfs @ 11.12 fps)

4=Orifice/Grate (Passes < 1.00 cfs potential flow)

5=Broad-Crested Rectangular Weir (Passes < 36.28 cfs potential flow)

Pond P-1: Gravel Wetland

Hydrograph



Summary for Pond P-2: UGSF

Inflow Area = 1.076 ac, 77.91% Impervious, Inflow Depth = 9.12" for 200-yr event
 Inflow = 8.23 cfs @ 12.05 hrs, Volume= 0.818 af
 Outflow = 7.39 cfs @ 12.10 hrs, Volume= 0.818 af, Atten= 10%, Lag= 2.9 min
 Primary = 0.24 cfs @ 12.10 hrs, Volume= 0.426 af
 Secondary = 7.15 cfs @ 12.10 hrs, Volume= 0.392 af
 Tertiary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 111.42' @ 12.10 hrs Surf.Area= 4,376 sf Storage= 6,577 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 132.9 min (896.3 - 763.5)

Volume	Invert	Avail.Storage	Storage Description
#1	109.50'	11,839 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.50	2,471	0	0
112.00	4,950	9,276	9,276
112.50	5,300	2,563	11,839

Device	Routing	Invert	Outlet Devices
#1	Secondary	106.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 106.00' / 105.50' S= 0.0100 ' S Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	111.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	109.50'	2.410 in/hr Exfiltration over Surface area
#4	Tertiary	112.00'	250.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

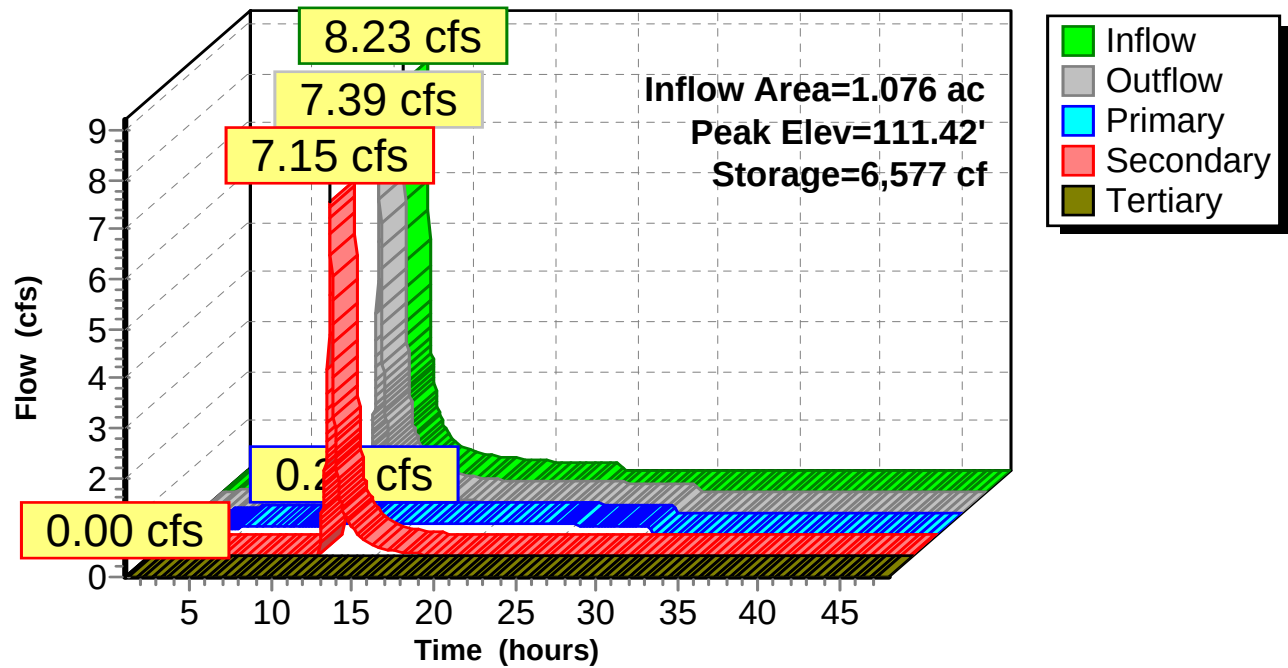
Primary OutFlow Max=0.24 cfs @ 12.10 hrs HW=111.42' TW=107.28' (Dynamic Tailwater)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.24 cfs)

Secondary OutFlow Max=7.14 cfs @ 12.10 hrs HW=111.42' TW=107.28' (Dynamic Tailwater)
 ↑ **1=Culvert** (Passes 7.14 cfs of 9.50 cfs potential flow)
 ↑ **2=Orifice/Grate** (Weir Controls 7.14 cfs @ 2.12 fps)

Tertiary OutFlow Max=0.00 cfs @ 1.00 hrs HW=109.50' TW=102.00' (Dynamic Tailwater)
 ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2: UGSF

Hydrograph



Time span=1.00-48.00 hrs, dt=0.02 hrs, 2351 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment S-2: No Treatment, to Runoff Area=749,173 sf 45.99% Impervious Runoff Depth=10.66"
Flow Length=1,612' Tc=29.3 min CN=85 Runoff=95.29 cfs 15.272 af

Subcatchment S-3: Roof Tributary Area Runoff Area=33,157 sf 100.00% Impervious Runoff Depth>12.28"
Flow Length=665' Tc=7.0 min CN=98 Runoff=7.22 cfs 0.779 af

Subcatchment S-4: Underdrained Soil Runoff Area=46,872 sf 77.91% Impervious Runoff Depth=11.69"
Tc=7.0 min CN=93 Runoff=10.08 cfs 1.048 af

Reach SP-1: SP-1 Avg. Flow Depth=1.85' Max Vel=5.16 fps Inflow=100.80 cfs 17.099 af
n=0.035 L=250.0' S=0.0120 '/' Capacity=908.60 cfs Outflow=100.72 cfs 17.099 af

Pond P-1: Gravel Wetland Peak Elev=107.63' Storage=63,269 cf Inflow=101.67 cfs 17.099 af
Primary=91.96 cfs 8.098 af Secondary=8.84 cfs 9.001 af Outflow=100.80 cfs 17.099 af

Pond P-2: UGSF Peak Elev=111.49' Storage=6,875 cf Inflow=10.08 cfs 1.048 af
Primary=0.25 cfs 0.457 af Secondary=8.94 cfs 0.591 af Tertiary=0.00 cfs 0.000 af Outflow=9.18 cfs 1.048 af

Total Runoff Area = 19.036 ac Runoff Volume = 17.098 af Average Runoff Depth = 10.78"
50.05% Pervious = 9.527 ac 49.95% Impervious = 9.509 ac

Summary for Subcatchment S-2: No Treatment, to Gravel Wetland

Runoff = 95.29 cfs @ 12.35 hrs, Volume= 15.272 af, Depth=10.66"

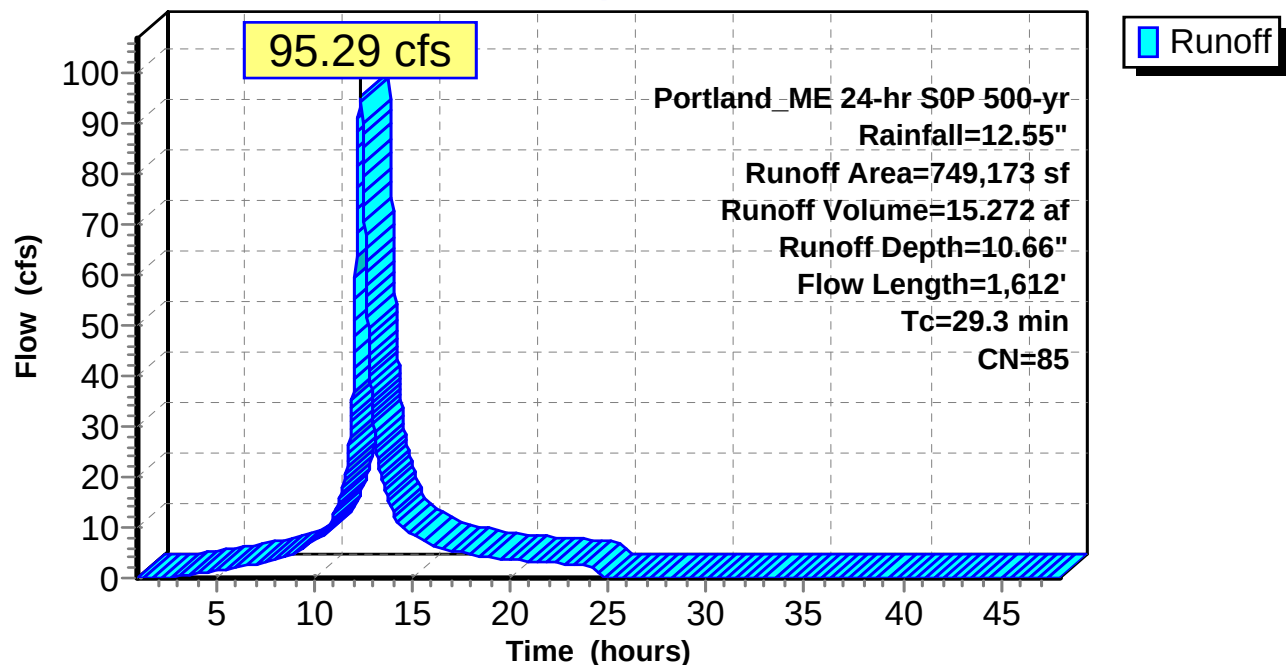
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
 Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Area (sf)	CN	Description
344,540	98	Paved parking & roofs
404,633	74	>75% Grass cover, Good, HSG C
749,173	85	Weighted Average
404,633		54.01% Pervious Area
344,540		45.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.0	285	0.0150	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.60"
5.3	1,327	0.0050	4.20	7.43	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
29.3	1,612	Total			

Subcatchment S-2: No Treatment, to Gravel Wetland

Hydrograph



Summary for Subcatchment S-3: Roof Tributary Area

Runoff = 7.22 cfs @ 12.05 hrs, Volume= 0.779 af, Depth>12.28"

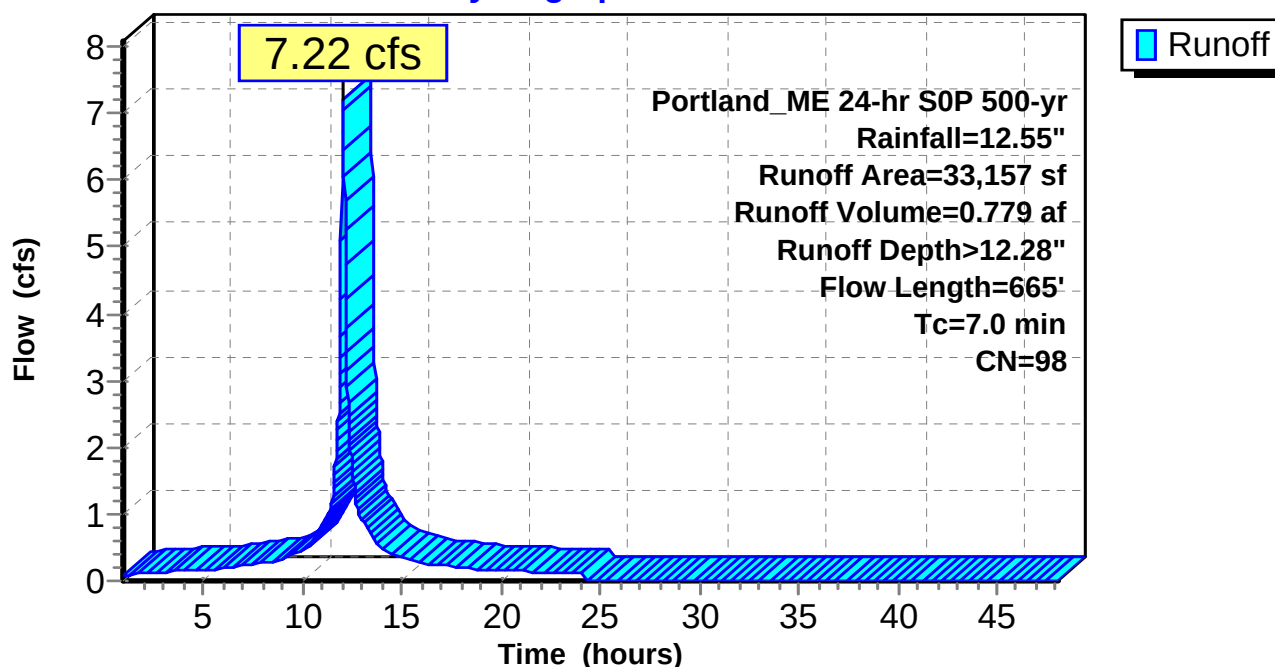
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
 Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

Area (sf)	CN	Description
33,157	98	Unconnected roofs, HSG A
33,157		100.00% Impervious Area
33,157		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.6	150	0.0200	1.58		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.60"
0.0	15	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.4	500	0.0100	5.94	10.50	Pipe Channel, 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
4.0					Direct Entry, Min TC 7
7.0	665	Total			

Subcatchment S-3: Roof Tributary Area

Hydrograph



Summary for Subcatchment S-4: Underdrained Soil Filter

Runoff = 10.08 cfs @ 12.05 hrs, Volume= 1.048 af, Depth=11.69"

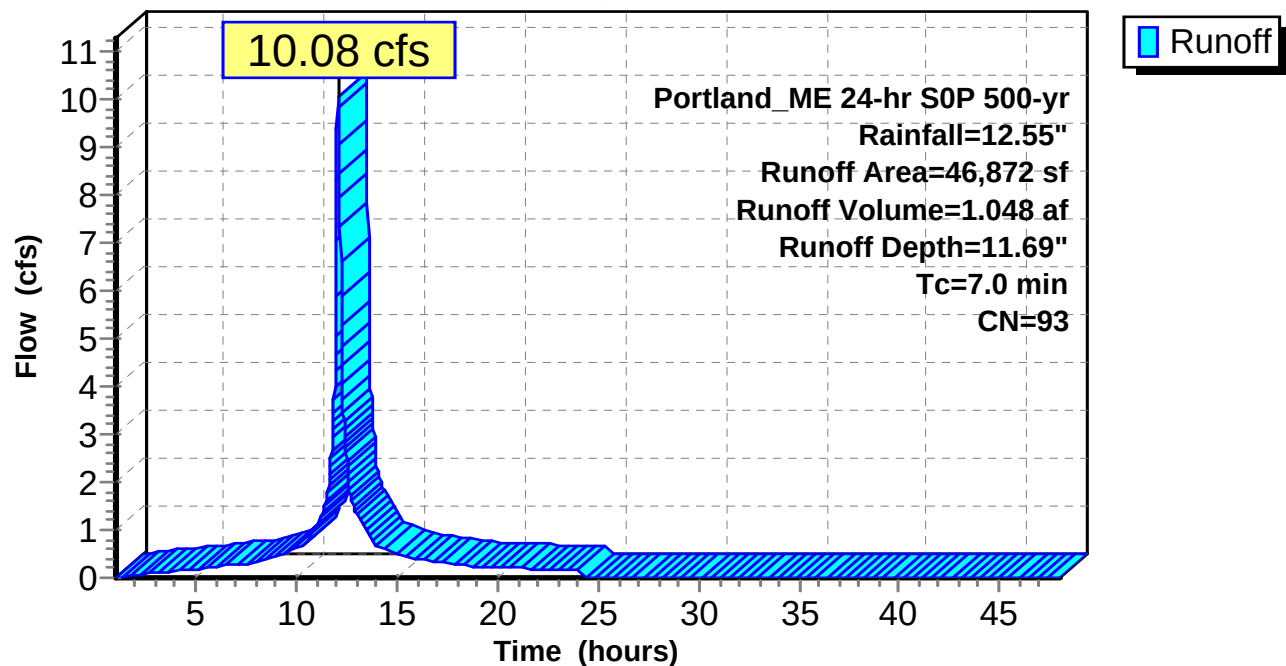
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs
 Portland_ME 24-hr S0P 500-yr Rainfall=12.55"

	Area (sf)	CN	Description
*	36,516	98	
*	10,356	75	
	46,872	93	Weighted Average
	10,356		22.09% Pervious Area
	36,516		77.91% Impervious Area

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

Subcatchment S-4: Underdrained Soil Filter

Hydrograph



Summary for Reach SP-1: SP-1

Inflow Area = 19.036 ac, 49.95% Impervious, Inflow Depth > 10.78" for 500-yr event
 Inflow = 100.80 cfs @ 12.37 hrs, Volume= 17.099 af
 Outflow = 100.72 cfs @ 12.38 hrs, Volume= 17.099 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Max. Velocity= 5.16 fps, Min. Travel Time= 0.8 min
 Avg. Velocity = 1.55 fps, Avg. Travel Time= 2.7 min

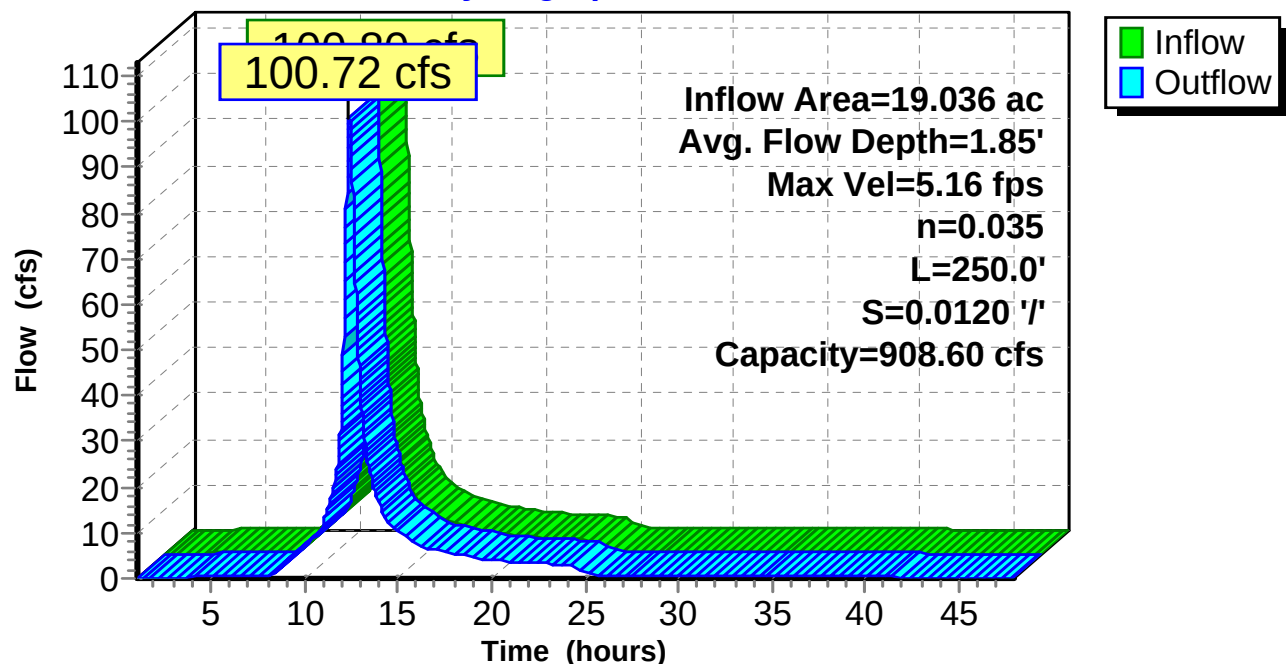
Peak Storage= 4,880 cf @ 12.38 hrs
 Average Depth at Peak Storage= 1.85'
 Bank-Full Depth= 5.00' Flow Area= 100.0 sf, Capacity= 908.60 cfs

5.00' x 5.00' deep channel, n= 0.035 High grass
 Side Slope Z-value= 3.0 '/' Top Width= 35.00'
 Length= 250.0' Slope= 0.0120 '/'
 Inlet Invert= 91.00', Outlet Invert= 88.00'



Reach SP-1: SP-1

Hydrograph



Summary for Pond P-1: Gravel Wetland

Inflow Area = 19.036 ac, 49.95% Impervious, Inflow Depth > 10.78" for 500-yr event
 Inflow = 101.67 cfs @ 12.34 hrs, Volume= 17.099 af
 Outflow = 100.80 cfs @ 12.37 hrs, Volume= 17.099 af, Atten= 1%, Lag= 1.8 min
 Primary = 91.96 cfs @ 12.37 hrs, Volume= 8.098 af
 Secondary = 8.84 cfs @ 12.37 hrs, Volume= 9.001 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 107.63' @ 12.37 hrs Surf.Area= 19,714 sf Storage= 63,269 cf

Plug-Flow detention time= 87.2 min calculated for 17.091 af (100% of inflow)
 Center-of-Mass det. time= 87.5 min (891.6 - 804.1)

Volume	Invert	Avail.Storage	Storage Description							
#1	102.00'	70,788 cf	Custom Stage Data (Irregular) Listed below (Recalc)							
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)					
102.00	3,572	549.0	0	0	3,572					
103.00	6,200	771.0	4,826	4,826	26,901					
104.00	9,020	829.0	7,566	12,392	34,329					
105.00	11,611	872.0	10,288	22,680	40,211					
106.00	14,502	904.0	13,030	35,710	44,820					
107.00	17,279	924.0	15,870	51,580	47,870					
108.00	21,203	764.0	19,208	70,788	69,378					
Device	Routing	Invert	Outlet Devices							
#1	Primary	106.50'	15.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64							
#2	Primary	107.00'	32.0' 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	Secondary	101.67'	12.0" Round Culvert L= 37.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.67' / 100.00' S= 0.0451 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf							
#4	Device 3	101.67'	4.0" Vert. Orifice/Grate C= 0.600							
#5	Device 3	106.00'	6.0' long x 0.7' 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 Coef. (English) 2.76 2.82 2.93 3.09 3.18 3.22 3.27 3.30 3.32 3.31 3.32							

Primary OutFlow Max=91.89 cfs @ 12.37 hrs HW=107.63' TW=92.85' (Dynamic Tailwater)

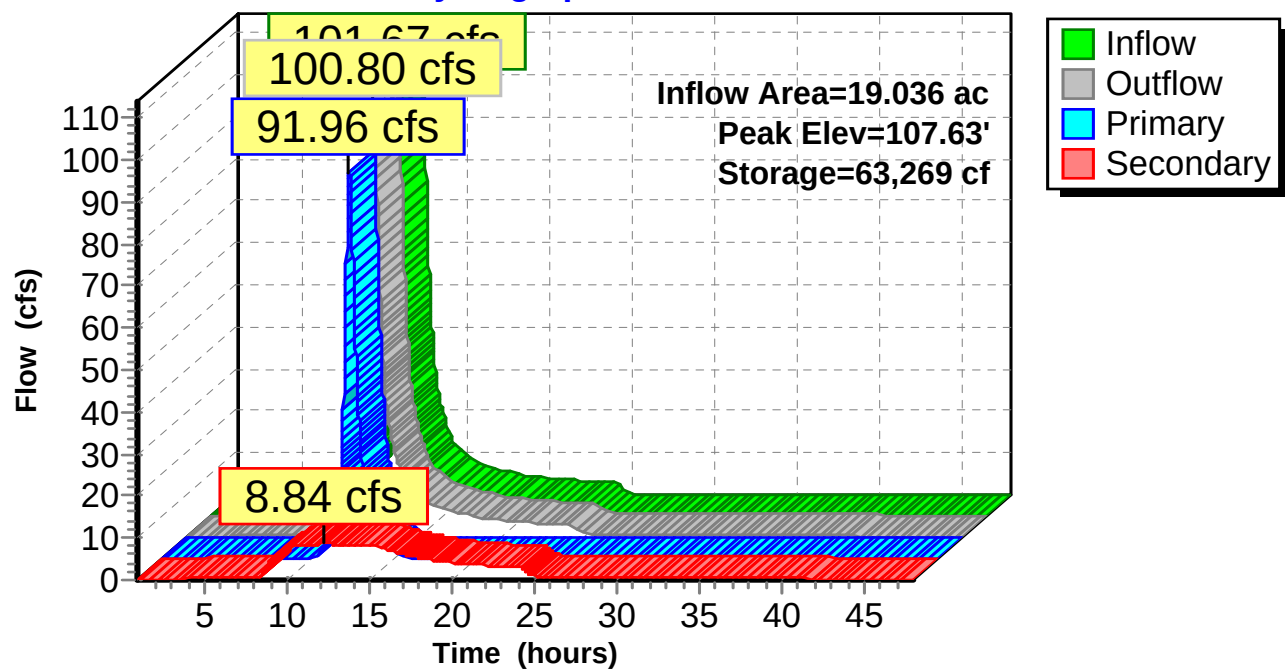
- 1=Broad-Crested Rectangular Weir (Weir Controls 48.53 cfs @ 2.86 fps)
- 2=Broad-Crested Rectangular Weir (Weir Controls 43.35 cfs @ 2.14 fps)

Secondary OutFlow Max=8.84 cfs @ 12.37 hrs HW=107.63' TW=92.85' (Dynamic Tailwater)

- 3=Culvert (Inlet Controls 8.84 cfs @ 11.25 fps)
- 4=Orifice/Grate (Passes < 1.01 cfs potential flow)
- 5=Broad-Crested Rectangular Weir (Passes < 41.32 cfs potential flow)

Pond P-1: Gravel Wetland

Hydrograph



Summary for Pond P-2: UGSF

Inflow Area = 1.076 ac, 77.91% Impervious, Inflow Depth = 11.69" for 500-yr event
 Inflow = 10.08 cfs @ 12.05 hrs, Volume= 1.048 af
 Outflow = 9.18 cfs @ 12.10 hrs, Volume= 1.048 af, Atten= 9%, Lag= 2.8 min
 Primary = 0.25 cfs @ 12.10 hrs, Volume= 0.457 af
 Secondary = 8.94 cfs @ 12.10 hrs, Volume= 0.591 af
 Tertiary = 0.00 cfs @ 1.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.02 hrs / 3
 Peak Elev= 111.49' @ 12.10 hrs Surf.Area= 4,443 sf Storage= 6,875 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 117.4 min (874.9 - 757.5)

Volume	Invert	Avail.Storage	Storage Description
#1	109.50'	11,839 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
109.50	2,471	0	0
112.00	4,950	9,276	9,276
112.50	5,300	2,563	11,839

Device	Routing	Invert	Outlet Devices
#1	Secondary	106.00'	15.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 106.00' / 105.50' S= 0.0100 ' / Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	111.00'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Primary	109.50'	2.410 in/hr Exfiltration over Surface area
#4	Tertiary	112.00'	250.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

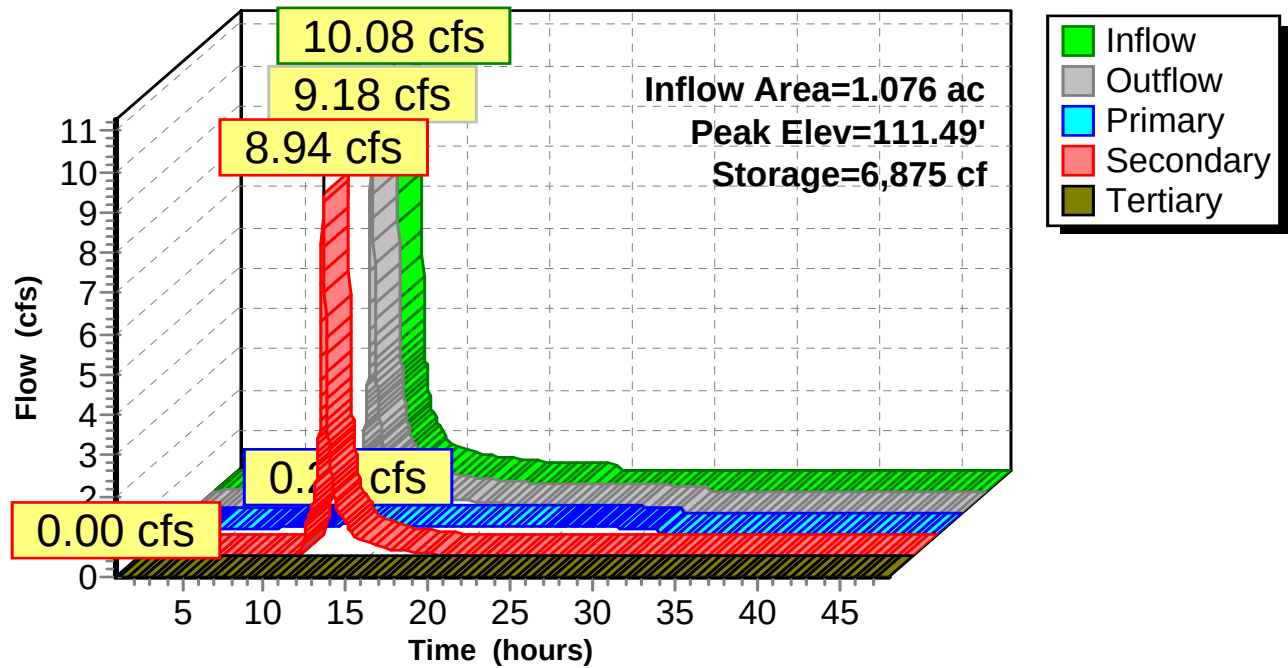
Primary OutFlow Max=0.25 cfs @ 12.10 hrs HW=111.49' TW=107.40' (Dynamic Tailwater)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.25 cfs)

Secondary OutFlow Max=8.92 cfs @ 12.10 hrs HW=111.49' TW=107.40' (Dynamic Tailwater)
 ↑ **1=Culvert** (Passes 8.92 cfs of 9.44 cfs potential flow)
 ↑ **2=Orifice/Grate** (Weir Controls 8.92 cfs @ 2.28 fps)

Tertiary OutFlow Max=0.00 cfs @ 1.00 hrs HW=109.50' TW=102.00' (Dynamic Tailwater)
 ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond P-2: UGSF

Hydrograph



November 22, 2017
W-P Project No. 13352C

Jean Fraser, Planning Division
City of Portland
389 Congress Street
Portland, ME 04101

Subject: Lyseth-Lyman Moore Circulation and Access Improvements
Responses to Site Plan Review Comments

Fire Department Comments

From a meeting with the City review staff, project planner, and the Fire Department on 11/1/2017, Fire Department comments were the following:

- 1) A request to expand the bus lanes to 16' minimum to accommodate emergency vehicle passage. The bus travel lanes are expanded in the proposed improvements.
- 2) Sloped Granite Curb will be proposed along the 12' exit lane to serve as a mountable curb. 4' of clear passage in the form of lawn or non-fibrous plantings will extend from the base of the curb to any light fixtures or trees to allow for 16' of passage in this location.
- 3) Sloped granite curb will also be placed around the inner radius for the elementary school bus drop-off location.

Sincerely,
WRIGHT-PIERCE



Michael Guethle, P.E.
Project Engineer
Michael.guethle@wright-pierce.com



November 22, 2017
W-P Project No. 13352C

Jean Fraser, Planning Division
City of Portland
389 Congress Street
Portland, ME 04101

Subject: Lyseth-Lyman Moore Circulation and Access Improvements
Responses to Site Plan Review Comments - Landscaping

The following responses are to comments provided in an e-mail from Jeff Tarling, City Arborist, to Mike Guethle, P.E. on October 27, 2017. The full comments are included as an attachment to this document.

- 1) Shrub sizes have been updated to be a minimum of 3 gallons, with 18" minimum height. Winter Red variety has been specified for winterberry, and Miss Kim variety has been specified for lilacs.
- 2) The 2 maple trees adjacent to the visitor parking location have been identified as Karpick variety. The 9 Korean Ash plants within the circulation divider have been replaced with 10 of a Bowhall Red Maple. Regal Prince variety of English Oak has been specified.
- 3) Red Maple, Bowhall variety, has been specified for the location between the parking lot and the fields. Only one type of tree has been designed to provide for a grove appearance.

Sincerely,
WRIGHT-PIERCE



Michael Guethle, P.E.
Project Engineer
Michael.guethle@wright-pierce.com



Michael A. Guethle

From: Jeff Tarling <jst@portlandmaine.gov>
Sent: Friday, October 27, 2017 11:06 AM
To: Michael A. Guethle; Jean Fraser
Subject: Re: Moore/Lyseth Site Improvements

Follow Up Flag: Follow up
Flag Status: Completed

Hi Mike -

Thanks for reviewing the Lyseth / Lyman Moore School landscape plans this morning.

Overall the plan looks good, would recommend a couple minor plant type suggestions...

a) Shrub sizes should be 3 gal minimum and desired 18 -24" size, this is for the Winterberry and Lilac. 'Winter Red' is a preferred Winterberry cultivar and 'Miss Kim' the desired lilac which is a more compact form then the common lilac and less likely to need pruning in the future.

b) Tree type recommendations: Red Maple types - we like and have good success with 'Karpick' Red Maple which is a cultivar with oval upright crown shape and good Fall color. The 'Karpicks' could be used for the (2) Red Maple shown in the Northwest corner or entrance area.

Suggested alternative for the (9) Korean Mountain Ash in the island might include 'Bowhall' Red Maple, it is upright in form and we have used it in similar situations where we are looking for height without a wide crown spread.

The (2) Korean Mt Ash near the front plaza look good as shown.

English Oak - we would suggest either the 'Regal Prince' or 'Crimson Spire' English Oak hybrid cross as a better selection then the straight English Oak.

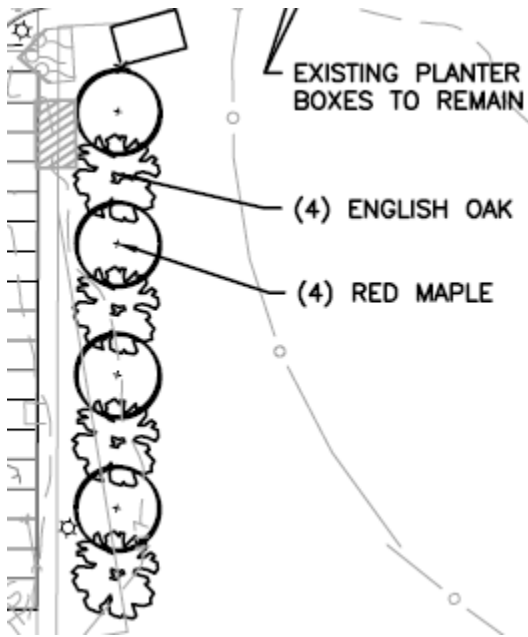
We have used all three and we find the newer hybrids really do well.

c) Planting arrangement adjustment -

At the Lyman Moore parking near basketball court, it is always best to group similar tree types vs 'odd-even' or alternating English Oak and Red Maple.

As the trees mature the trees appear as a grove. Would recommend either the 'Regal Prince' Oak or the 'Bowhall' Red Maple for this planting and have all the trees of the same species in this group. Check out the web links below.

Thanks again for going over the landscape plan.



<http://www.jfschmidt.com/pdfs/bowhallmaple.pdf>

<http://www.jfschmidt.com/pdfs/117/karpickmaple117.pdf>

<http://www.jfschmidt.com/pdfs/regalprinceoak.pdf>

<https://jfschmidt.com/introductions/crimsonspire/index.html>

Jeff Tarling
City Arborist - City of Portland Maine
Parks, Recreation & Facilities Department
Forestry & Horticulture
212 Canco Road
Portland, ME. 04103
(207) 808-5446
jst@portlandmaine.gov

On Fri, Oct 27, 2017 at 9:31 AM, Michael A. Guethle <michael.guethle@wright-pierce.com> wrote:

Want to have a quick chat around 10? Feel free to call 319-1512

Michael A. Guethle, P.E. | Project Engineer

[75 Washington Avenue, Suite 202 | Portland, ME 04101](#)

CITY OF PORTLAND PARKS, RECREATION, AND FACILITIES DEPARTMENT

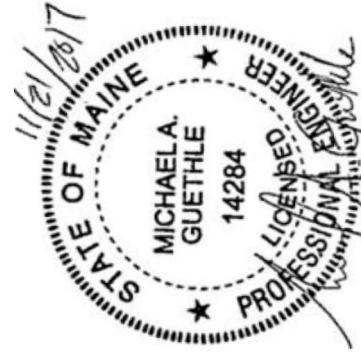
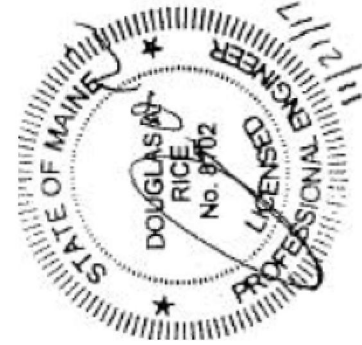


CONTRACT DRAWINGS

LYSETH LYMAN-MOORE CAMPUS CIRCULATION, ACCESS, AND PARKING IMPROVEMENTS

DESIGNED BY:

WRIGHT-PIERCE
Engineering a Better Environment
Offices Throughout New England
888.621.8156 | www.wright-pierce.com



DOUGLAS RICE, P.E.
WRIGHT-PIERCE

11-21-17

DATE

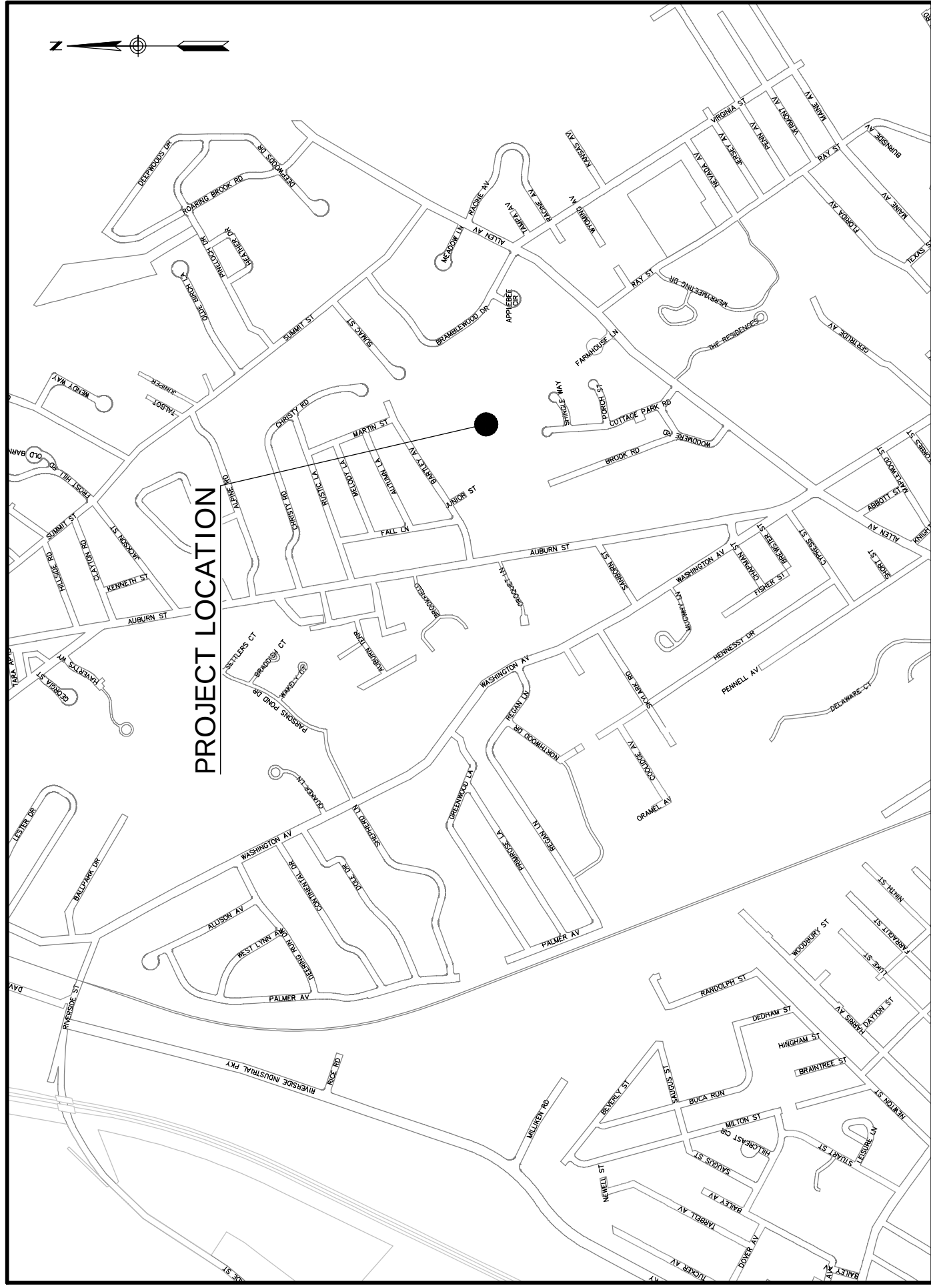
YEAR APPROVED

2017

PREPARED FOR:
DAVID ONOS, LEED AP
DIRECTOR OF PROJECT MANAGEMENT
AND PUBLIC BUILDINGS

BID NUMBER: # # #
PERMITTING SUBMISSION

ISSUED FOR PERMITTING
NOVEMBER 2017



INDEX OF PLANS

NO.	TITLE
1	COVER SHEET WITH PROJECT LOCATION MAP
2-3	GENERAL NOTES
4	EXISTING CONDITIONS & DEMOLITION PLAN
5	SITE PLAN
6	GRADING AND UTILITY PLAN
7	SNOW STORAGE AND DIMENSION PLAN
8	SIGNAGE PLAN
9-13	CONSTRUCTION DETAILS
14	LANDSCAPE PLAN
15	LANDSCAPE DETAILS



EROSION CONTROL NOTES

THIS PLAN HAS BEEN DEVELOPED TO PROVIDE A STRATEGY FOR DEALING WITH SOIL EROSION AND SEDIMENTATION DURING AND AFTER RECONSTRUCTION. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH "MAINE EROSION CONTROL AND SEDIMENTATION HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES", PUBLISHED BY THE CUMBERLAND COUNTY SOIL AND WATER DISTRICT AND MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION, LATEST EDITION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO POSSESS A COPY OF THE EROSION CONTROL PLAN AT ALL TIMES.

PRE-CONSTRUCTION PHASE

1. PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, SEDIMENT BARRIERS WILL BE STAKED/INSTALLED ACROSS THE SLOPE(S), ON THE CONTOUR AT OR JUST BELOW THE LIMITS OF CLEARING OR GRUBBING, AND/OR JUST ABOVE AND ADJACENT TO PROPERTY LINES OR WATERCOURSES TO PROTECT AGAINST CONSTRUCTION RELATED EROSION. THE PLACEMENT OF SEDIMENT BARRIERS SHALL BE COMPLETED IN ACCORDANCE WITH GUIDELINES ESTABLISHED IN BEST MANAGEMENT PRACTICES. THE CONTRACTOR SHALL MAINTAIN THE BARRIERS THROUGHOUT THE CONSTRUCTION PERIOD. THE BARRIERS SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL ALL EXPOSED SLOPES HAVE AT LEAST 85%-90% VIGOROUS PERENNIAL VEGETATIVE COVER TO PREVENT EROSION. TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER PERMANENT STABILIZATION IS ATTAINED.
2. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL PREPARE A DETAILED SCHEDULE AND MARKED UP PLAN INDICATING AREAS AND COMPONENTS OF THE WORK AND KEY DATES SHOWING DATE OF DISTURBANCE AND COMPLETION OF THE WORK. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE CITY STAFF. THREE COPIES OF THE SCHEDULE AND MARKED UP PLAN SHALL BE PROVIDED TO THE CITY THREE DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING. THE CONTRACTOR SHALL MAINTAIN THE 14 DAY LIMIT OF DISTURBANCE IN THE SCHEDULE ADDRESSING TEMPORARY AND PERMANENT VEGETATION MEASURES.

CONSTRUCTION AND POST-CONSTRUCTION PHASE

1. IN ORDER TO PROTECT THE NATURAL RESOURCES IN THE PROJECT AREA, ONLY DISTURB THOSE AREAS NECESSARY TO CONSTRUCT THE SIDEWALKS, SPECIFIED PIPING AND LANDSCAPING.
2. AREAS UNDERGOING ACTUAL CONSTRUCTION SHALL ONLY EXPOSE THAT AMOUNT OF MINERAL SOIL NECESSARY FOR PROGRESSIVE AND EFFICIENT CONSTRUCTION. AN AREA CONSIDERED OPEN IS ANY AREA NOT STABILIZED BY PAVEMENT, CONCRETE, OR OTHER PERMANENT COVER. AREAS CONSIDERED OPEN SHALL BE PROTECTED BY EROSION CONTROL MEASURES. TEMPORARY EROSION CONTROL MEASURES SHALL BE ANCHORED WITH TEMPORARY EROSION CONTROLS SHOWN IN THE DESIGN PLANS AND AS DESCRIBED WITHIN THIS EROSION CONTROL PLAN WITHIN 14-DAYS OF DISTURBANCE. AREAS LOCATED WITHIN 100' OF NATURAL RESOURCES SHALL BE ANCHORED WITH TEMPORARY EROSION CONTROL WITHIN SEVEN (7) DAYS. REFER TO WINTER EROSION CONTROL NOTES FOR THE TREATMENT OF OPEN AREAS AFTER OCTOBER 1ST OF THE CONSTRUCTION YEAR.
3. THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE LEFT IN AN UNTREATED OR UNVEGETATED CONDITION FOR A MAXIMUM OF 14 DAYS FROM FINAL GRADING OF THE LOAM. LOAM WILL BE STOCKPILED FOR FUTURE USE AND PROTECTED FROM EROSION LOSSES BY MULCH AND FILTER FABRIC/HAY BALE BARRIERS. STOCKPILES SHALL BE LOCATED WITHIN THE STAGING AREAS IDENTIFIED ON THE DRAWINGS.
4. PRIOR TO ANY GRUBBING OR CLEARING, A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE CONSTRUCTED AT THE INTERSECTION OF THE PROPOSED ENTRANCES AND EXISTING ROADWAY TO AVOID TRACKING OF MUD, DUST AND DEBRIS FROM SITE.
5. PRIOR TO GRUBBING AND CLEARING THE SITE, STORM DRAIN INLET PROTECTION SHALL BE INSTALLED AT ALL CATCH BASINS.
6. PRIOR TO GRUBBING AND CLEARING, SEDIMENT BARRIERS WILL BE INSTALLED ACROSS THE SLOPES, ON THE CONTOUR, AT OR JUST BELOW THE LIMITS OF CONSTRUCTION AND/OR JUST ABOVE ANY DOWNSLOPE ADJACENT PROPERTY OR WETLAND TO PROTECT AGAINST RELATED EROSION.
7. THE CONTRACTOR MUST INSTALL ANY ADDED MEASURES THAT MAY BE NECESSARY TO CONTROL EROSION/SEDIMENTATION FROM THE SITE DEPENDANT UPON THE ACTUAL SIZE AND WEATHER CONDITIONS. CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED, IN ORDER TO MINIMIZE AREAS WITHOUT EROSION CONTROL PROTECTION.
8. DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED ONTO OPEN AREAS. THE DISPOSAL OF POST SEEDING SEDIMENT, IF ANY SHALL, BE THE RESPONSIBILITY OF THE CONTRACTOR.
9. WHEN WORK IS IMMEDIATELY ADJACENT TO ANY NATURAL RESOURCE, INCLUDING COASTAL WETLANDS, STREAMS AND HABITATS, THE CONSTRUCTION SITE MUST BE STABILIZED PRIOR TO THE END OF THE WORK DAY OR PRIOR TO ANY STORM EVENT. SEDIMENT BARRIERS SHALL BE PLACED BETWEEN ANY NATURAL RESOURCES AND THE DISTURBED AREA.
10. NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2 TO 1) UNLESS STABILIZED WITH RIPRAP OR OTHER STRUCTURAL MEANS.
11. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS STABILIZED.

WINTER CONSTRUCTION

1. WINTER CONSTRUCTION PERIOD DEFINED: NOVEMBER 1 THROUGH APRIL 15
2. WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 0.25 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.
3. EXPOSED AREA SHOULD BE LIMITED SUCH THAT THE AREA CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.
4. CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.
5. AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW AT A RATE OF 100 LB. PER 1,000 SQUARE FEET (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ADEQUATELY ANCHORED BY AN APPROVED ANCHORING TECHNIQUE. IN ALL CASES, MULCH SHALL BE APPLIED SUCH THAT SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH.
6. DURING PERIODS OF ABOVE-FREEZING TEMPERATURES, THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1ST AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED AND IS SMOOTH, THEN THE AREA MUST BE STABILIZED WITH MULCH. IF CONSTRUCTION CONTINUES DURING FREEZING WEATHER, ALL EXPOSED AREAS SHALL BE GRADED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM EROSION BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT EXPOSED OVER THE WINTER OR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF BALES OF HAY ON STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS.
7. THE APPLICATION OF MULCH TO FINE GRADED AREAS REQUIRING STABILIZATION WILL BE AS FOLLOWS:
 - A) BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 15TH ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING, ASPHALT EMULSION, CHEMICAL TACK OR WOOD CELLULOSE FIBER.
 - B) MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 8%.
 - C) MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15%. AFTER OCTOBER 1ST, THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.
8. AFTER NOVEMBER 1ST THE CONTRACTOR SHALL APPLY MULCH AND ANCHORING ON ALL BARE EARTH AT THE END OF EACH WORKING DAY.
9. ALL AREAS TO RECEIVE MULCH SHALL BE CLEARED OF SNOW.

APPLICATIONS AND MEASURES

THE PLACEMENT OF EROSION CONTROL MEASURES SHALL BE COMPLETED IN ACCORDANCE WITH SET GUIDELINES ESTABLISHED IN BEST MANAGEMENT PRACTICES, THE EROSION CONTROL PLAN AND DETAILS IN THE PLAN SET.

1. STABILIZED CONSTRUCTION ENTRANCE/EXIT:

PRIOR TO CLEARING AND/OR GRUBBING THE SITE A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE CONSTRUCTED WHEREVER TRAFFIC WILL EXIT THE CONSTRUCTION SITE ONTO A PAVED ROADWAY IN ORDER TO MINIMIZE THE TRACKING OF SEDIMENT AND DEBRIS FROM THE CONSTRUCTION SITE ONTO PUBLIC ROADWAYS. THE ENTRANCES AND ADJACENT ROADWAY AREAS SHALL BE PERIODICALLY SWEEP OR WASHED TO FURTHER MINIMIZE THE TRACKING OF MUD, DUST OR DEBRIS FROM THE CONSTRUCTION AREA. STABILIZED CONSTRUCTION EXIT LOCATIONS SHALL BE APPROVED BY THE CITY AND ENGINEER.

2. TEMPORARY VEGETATION AND MULCH:

IF FINAL SEEDING OF THE DISTURBED AREAS IS NOT COMPLETED BY SEPTEMBER 15TH OF THE YEAR OF CONSTRUCTION, THEN ON THAT DATE THESE AREAS WILL BE GRADED AND SMOOTHED, THEN SEEDED TO A WINTER COVER CROP OF RYE AT THE RATE OF 112 LBS/ACRE OR 3 LBS/1,000 SQUARE FEET AND MULCHED AT A RATE OF 70 LBS/1,000 SQUARE FEET. THE RYE SEEDING WILL BE PROCEEDED BY AN APPLICATION OF 3 TONS OF LIME AND 1,000 LBS OF 10-10-10 FERTILIZER PER ACRE, OR ITS EQUIVALENT. IF THE RYE SEEDING DOES NOT MAKE ADEQUATE GROWTH TO PROVE AT LEAST 75% VEGETATIVE COVER BY NOVEMBER 15TH, THEN ON THAT DATE A TEMPORARY MULCH OF HAY WILL BE APPLIED TO THAT AREA AT A RATE OF 100 LBS/1,000 SQUARE FEET. AREAS STABILIZED WITH RYE MULCH WILL BE FILLED AND REGRADED USING THE CONSTRUCTION MATERIALS FROM THE PROJECT. THE MULCH SHALL BE REMOVED PRIOR TO SPRING. THE SITE SHALL NOT BE CONSIDERED COMPLETE UNTIL EACH DISTURBED AREA NOT TO BE PAVED OR TREATED WITH RIPRAP HAS A VEGETATIVE COVER OVER AT LEAST 90% OF ITS SURFACE.

ALL AREAS SEEDD DURING THE WINTER MONTHS WILL BE INSPECTED IN THE SPRING FOR ADEQUATE CATCH. ALL AREAS INSUFFICIENTLY VEGETATED (LESS THAN 75% 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.

TEMPORARY MULCH WILL BE APPLIED TO ALL EXPOSED SOIL SURFACES WITHIN FOURTEEN (14) DAYS OF EXPOSURE OR PRIOR TO ANY STORM EVENT.

3. SOIL STOCKPILES:

STOCKPILES OF SOIL OR SUBSOIL SHALL BE MULCHED WITH HAY AT A RATE OF 75 LBS/1,000 SQUARE FEET (1.5 TONS PER ACRE) OR WITH A FOUR-INCH LAYER OF WOOD WASTE EROSION CONTROL MIX. THIS WILL BE DONE WITHIN 24 HOURS OF STOCKING AND REESTABLISHED PRIOR TO ANY RAINFALL. ANY SOIL STOCKPILE WILL NOT BE PLACED (EVEN COVERED WITH HAY OR STRAW) WITHIN 100 FEET FROM ANY NATURAL RESOURCES.

4. SEDIMENT BARRIERS:

PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, SILT FENCING SHALL BE STAKED ACROSS THE SLOPE(S), ON THE CONTOUR AT OR JUST BELOW THE LIMITS OF CLEARING OR GRUBBING, AND/OR JUST ABOVE ANY ADJACENT WATERCOURSE TO PROTECT AGAINST CONSTRUCTION RELATED EROSION. MAXIMUM STAKE SPACING OF 6 FEET SHALL BE USED.

ALL SILT FENCE SHALL BE INSPECTED, REPLACED AND/OR REPAIRED WEEKLY, AS WELL AS IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL, OR WHEN SEDIMENT REACHES 1/3 THE BARRIER HEIGHT. ALL HAY BALE, FILTER FABRIC BARRIERS SHALL REMAIN IN PLACE UNTIL SEEDINGS HAVE BECOME 75% ESTABLISHED AND THEN REMOVED WITHIN 10 DAYS.

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.

5. STORM DRAIN INLET PROTECTION:

SILT SACKS OR HAY BALES SHALL BE PLACED AROUND A STORM DRAIN DROP INLET OR CURB INLET PRIOR TO PERMANENT STABILIZATION OF THE IMMEDIATE AND UP-STREAM DISTURBED AREAS. THEY SHALL BE CONSTRUCTED IN A MANNER THAT WILL FACILITATE CLEAN-OUT AND DISPOSAL OF TRAPPED SEDIMENTS AND MINIMIZE INTERFERENCE WITH CONSTRUCTION OPERATIONS. SEDIMENT BARRIERS SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. ANY CONSTRUCTION INCONVENIENCE OR DAMAGE TO ADJACENT AREAS OR STRUCTURES. INSTALL SILT SACKS AND HAY BALES IN ACCORDANCE WITH THE DETAILS AND PER MANUFACTURER'S RECOMMENDATIONS.

6. DUST CONTROL:

DUST CONTROL DURING CONSTRUCTION SHALL BE AGHEVED BY THE USE OF A WATER TRUCK TO PERIODICALLY SPRINKLE THE EXPOSED ROADWAY AREAS AS NECESSARY TO REDUCE DUST DURING THE DRY MONTHS. APPLYING OTHER DUST CONTROL PRODUCTS SUCH AS CALCIUM CHLORIDE OR OTHER MANUFACTURED PRODUCTS ARE ALLOWED IF AUTHORIZED BY THE PROPER LOCAL, STATE AND/OR FEDERAL REGULATING AGENCIES. HOWEVER, IT IS THE CONTRACTOR'S ULTIMATE RESPONSIBILITY TO MITIGATE DUST AND SOIL LOSS FROM THE SITE.

7. PERMANENT VEGETATION:

REVEGETATION MEASURES SHALL COMMENCE IMMEDIATELY UPON COMPLETION OF FINAL GRADING OF AREAS TO BE LOAMED AND SEEDED. PERMANENT REVEGETATION MEASURES INCLUDING LOAM, SEED AND MULCH SHALL MEET SECTION 615 OF THE SPECIFICATIONS.

WETLAND NOTES

1. WETLANDS AND SURFACE WATERS (EXCEPT THOSE WHICH ARE TO BE FILLED IN ACCORDANCE WITH STATE AND FEDERAL REGULATIONS) SHALL BE PROTECTED WITH SILT FENCE INSTALLED AT THE EDGE OF THE WETLAND OR THE BOUNDARY OF WETLAND DISTURBANCE.
2. IF THE WORK INCLUDES CROSSING OF WETLANDS AND/OR STREAMS, THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTIONS WORKING IN THESE AREAS.
3. ANY WETLAND CROSSING WORK SHALL BE COMPLETED BETWEEN THE PERIOD OF MAY 1 AND SEPTEMBER 30.
4. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO COMMENCING CONSTRUCTION WITHIN OR ADJACENT TO WETLAND AREAS.
5. WETLAND VEGETATIVE LAYERS SHALL BE REMOVED AND SALVAGED FOR RESTORATION OF THE DISTURBED AREAS.
6. STORAGE AREAS FOR WETLAND MATERIALS SHALL BE PROPERLY PROTECTED AGAINST EROSION.
7. SEEDING OF THE DISTURBED AREAS WITHIN WETLAND AREAS SHALL UTILIZE MIXTURES APPROPRIATE FOR WETLAND AREAS AS OUTLINED IN THE SPECIFICATIONS.

TRENCH DEWATERING

1. EXCAVATION AND INSTALLATION OF THE STORAGE CONDUIT, DRAINS AND SEWERS, AND ASSOCIATED STRUCTURES WILL REQUIRE CONTINUOUS DEWATERING THROUGHOUT CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR PREPARING AND IMPLEMENTING A DEWATERING PLAN MEETING ENVIRONMENTAL REGULATIONS AND REQUIREMENTS STIPULATED WITHIN THE CONTRACT DOCUMENTS AND PLANS. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT A WRITTEN DEWATERING PLAN TO THE CITY ENGINEER FOR REVIEW AND APPROVAL. THE DEWATERING PLAN SHALL BE REVIEWED AND APPROVED BY THE CITY ENGINEER. MAKE ADJUSTMENTS TO THE DEWATERING PLAN AS REQUIRED BY THE CITY OR OTHER AGENCIES. THE CONTRACTOR SHALL BE CONSIDERED INCIDENTAL TO THE COST OF DEWATERING AND NO EXTRA PAYMENT WILL BE MADE. ALL DEWATERING SHALL BE RUN THROUGH A PUMPED SEDIMENT REMOVAL SYSTEM EQUAL TO "DIRT BAG" OR ALTERNATIVE METHODS AS APPROVED BY THE ENGINEER. IT IS ANTICIPATED THAT HIGH VOLUMES OF "PUMPING" WILL BE REQUIRED FOR THE PROJECT. DISCHARGE LOCATIONS SHALL BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK AND COSTS ASSOCIATED WITH DEWATERING THE JOBSITE INCLUDING ANY CHANGES, MODIFICATIONS OR SPECIAL DEWATERING SYSTEMS/REQUIREMENTS TO ENSURE THE SITE IS DEWATERED. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE RELATED PAY ITEMS. WATER FROM CONSTRUCTION TRENCH DEWATERING WILL PASS FIRST THROUGH A SEDIMENT COLLECTOR BAG PRIOR TO DISCHARGE. THE DISCHARGE SITE SHALL BE SELECTED TO AVOID FLOODING AND SEDIMENT DISCHARGES TO A PROTECTED RESOURCE. IN NO CASE SHALL THE DISCHARGE WITHIN A TOWN OR CITY BAG BE LOCATED WITHIN 100 FEET OF A PROTECTED NATURAL RESOURCE UNLESS OTHERWISE APPROVED BY THE OWNER.

MONITORING

1. MAINTENANCE MEASURES WILL BE APPLIED AS NEEDED DURING THE ENTIRE CONSTRUCTION CYCLE. WEEKLY AND AFTER EACH RAINFALL, A VISUAL INSPECTION WILL BE MADE BY THE CONTRACTOR OF ALL INSTALLED EROSION CONTROL MEASURES AND REPAIRS WILL BE MADE AS NEEDED TO ENSURE THEIR CONTINUING FUNCTION AS DESIGNED. FOLLOWING THE FINAL SEEDINGS, THE SITE WILL BE INSPECTED EVERY FIFTEEN DAYS UNTIL THE SEEDINGS HAVE BEEN ESTABLISHED. ESTABLISHED MEANS A MINIMUM OF 75% OF AREA VEGETATED WITH VIGOROUS GROWTH. RESEEDING WILL BE REQUIRED IF THE SEEDING DOES NOT MEET THE ESTABLISHED CRITERIA. EROSION CONTROL MEASURES WILL BE REMOVED WITHIN 10 DAYS WHEN VEGETATION IS ADEQUATELY ESTABLISHED.

DEMOLITION NOTES

1. DEMOLITION OF EXISTING SEWERS SHALL INCLUDE EXCAVATION, REMOVAL OF SEWER PIPE AND STRUCTURES, CONCRETE CRADLE, INSTALLATION OF GRAVEL (TYPE B), COMPACTION AND SURFACE RESTORATION (EXCLUDING PAVING).
2. DEMOLITION SHALL BE COMPLETED IN COORDINATION WITH NEW INFRASTRUCTURE. THE CONTRACTOR SHALL ENSURE EXISTING ROAD SURFACE DRAINAGE IS MAINTAINED DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY DRAINAGE PROVISIONS. COSTS FOR TEMPORARY DRAINAGE PROVISIONS SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

REFERENCES:

REVISIONS:

DESIGNED BY:	MMG
DRAWN BY:	NML
CHECKED BY:	DAR
AS NOTED	11-21-17
DATE:	11-21-17



LLM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
GENERAL NOTES

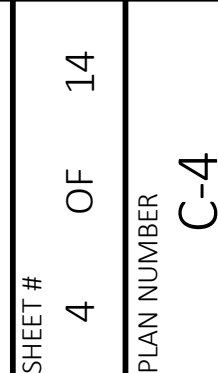
CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION



SHEET # 3 OF 14
PLAN NUMBER C-3

PERMITTING SET

ISSUED FOR PERMITTING
NOVEMBER 2017





PLAN
SCALE: 1"=50'

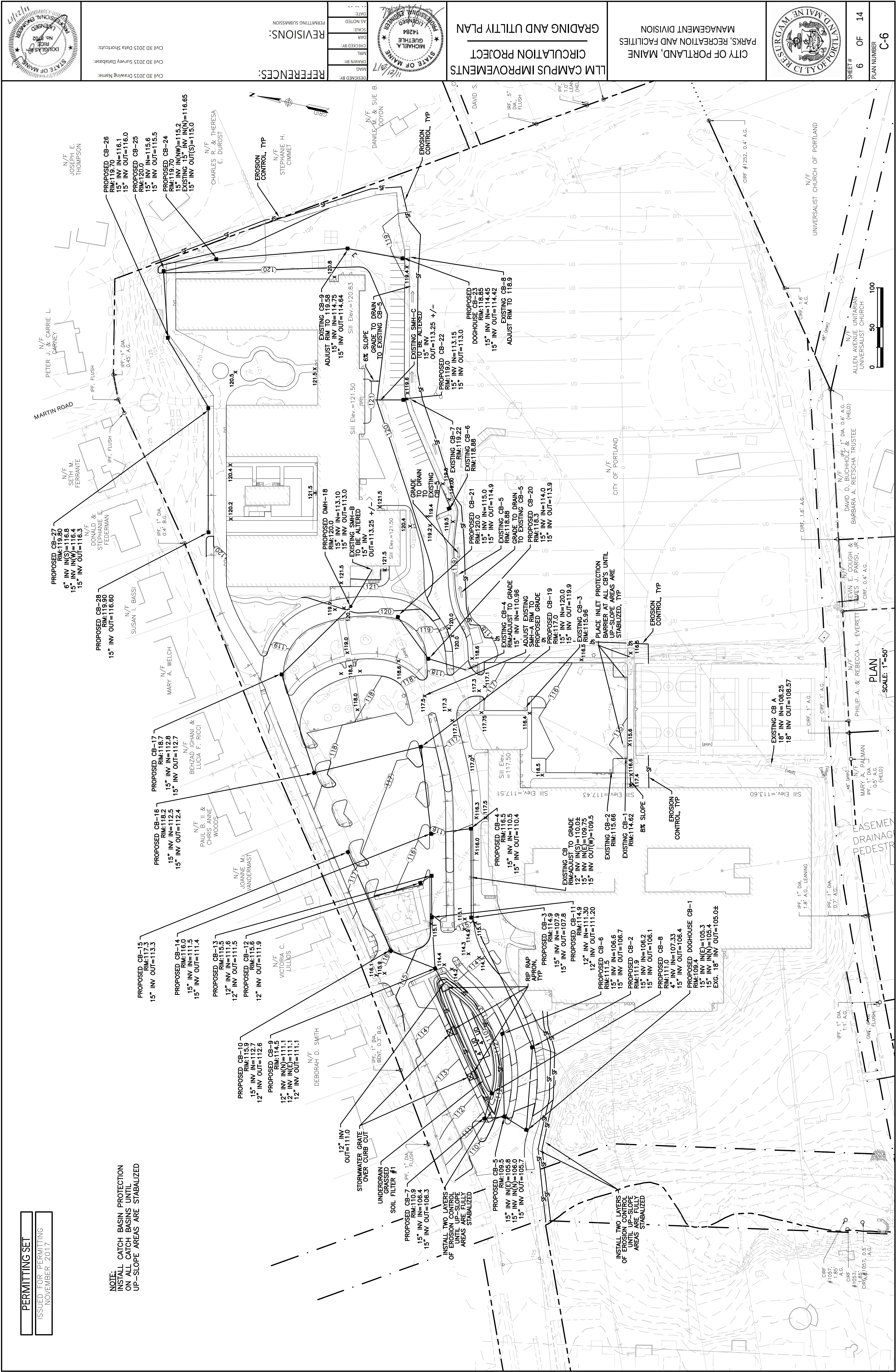
PERMITTING SET
ISSUED FOR PERMITTING
NOVEMBER 2017

LEGEND

	ASPHALT PARKING OR DRIVEWAY AREA
	SIDEWALK PAVEMENT, SEE DETAIL

PERMITTING SET
ISSUED FOR PERMITTING
NOVEMBER 2017

NOTE:
INSTALL CATCH BASIN PROTECTION
ON ALL CATCH BASINS UNTIL
UP-SLOPE AREAS ARE STABILIZED



REFERENCES:
CIVIL 3D 2015 Survey Database:
CIVIL 3D 2015 Data Shortcuts:

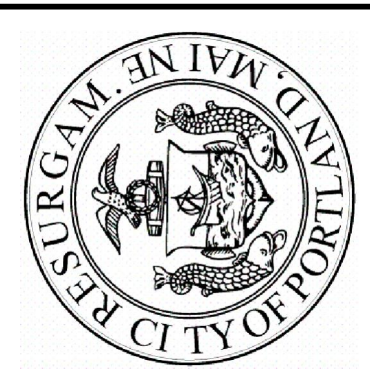
DESIGNED BY: **MAAG**
DRAWN BY: **BRANNIN BY**
CHECKED BY: **DAR**
DATE: **11/21/17**

AS NOTED
SCALE:
PERMITTING SUBMISSION



LLM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
GRADING AND UTILITY PLAN

CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION





CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION

LM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
SNOW STORAGE AND
DIMENSION PLAN

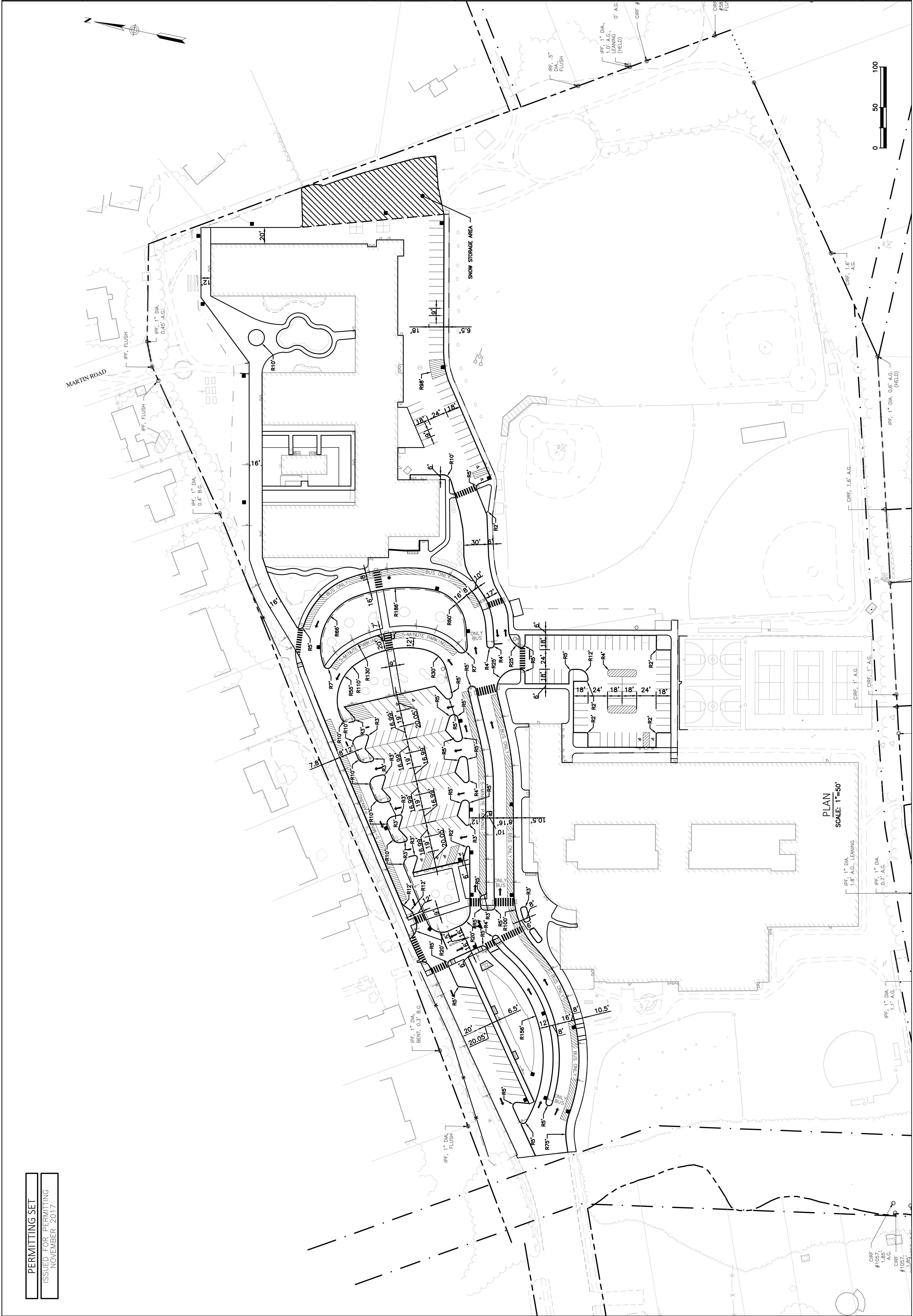
DESIGNED BY: 1/12/17
DRAWN BY: 1/12/17
CHECKED BY: 1/12/17
DATE: 11-21-17
SCALE: AS NOTED
DAS: 14284
MICHAEL GUETHLE
PROFESSIONAL ENGINEER
STATE OF MAINE

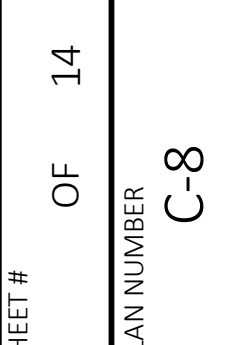
REFERENCES:
CIVIL 3D 2015 Drawing Name:
CIVIL 3D 2015 Survey Database:
CIVIL 3D 2015 Data Shortcuts:

REVISIONS:
PERMITTING SUBMISSION



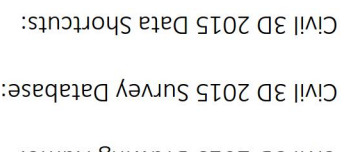
PERMITTING SET
ISSUED FOR PERMITTING
NOVEMBER 2017





LLM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
SIGNAGE PLAN

DATE:	11-21-17
AS NOTED	
SCALE:	
DAR	
CHECKED BY:	
MPL	
DRAWN BY:	
MAG	



PERMITTING SET

ISSUED FOR PERMITTING
NOVEMBER 2017



GENERAL NOTES FOR MANHOLES AND CATCH BASINS

1. ALL CONCRETE SHALL BE CLASS "A" AND HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 4000 LBS. PER SQ. INCH AT THE END OF 28 DAYS, UNLESS OTHERWISE NOTED.
2. MANHOLES MAY BE CONSTRUCTED OF MASONRY, PRECAST REINFORCED CONCRETE, OR CAST IN PLACE.
3. PRECAST REINFORCED CONE BARREL MANUFACTURED PER ASTM SPEC. C-478-67.
4. ALL STORM AND SEWER MANHOLE COVERS SHALL BE SLOID.
5. ALL SANITARY MANHOLE COVERS SHALL HAVE "SEWER" CAST INTO THE COVER. ALL STORMWATER/RAIN MANHOLE COVERS SHALL HAVE "RAIN" CAST INTO THE COVER.
6. SEWER BRICK SHALL CONFORM TO ASTM SPEC. DESIGNATE ON C-32-63, GRADE MA AND SA.
7. ALL SANITARY MANHOLES SHALL HAVE A WATERPROOFING COATING APPLIED TO THE EXTERIOR SURFACE.
8. CASTINGS SHALL CONFORM TO ASTM DESIGNATION A48-CLASS 35.
9. EXISTING MANHOLES, CATCH BASINS, FRAMES, AND COVERS SHALL BE SALVAGED BY THE CONTRACTOR, AND SHALL REMAIN THE PROPERTY OF THE CITY OF PORTLAND.
10. ALL 18" DIAMETER CATCH BASIN OUTLETS SHALL BE INSTALLED WITH A CATCH BASIN HOOD. HOODS SHALL NOT BE INSTALLED ON MAIN LINE THROUGH CATCH BASINS.
11. ALL CATCH BASINS SHALL BE INSTALLED WITH 3" SUMPS, UNLESS NOTED OTHERWISE.



1. ALL SANITARY MANHOLE COVERS SHALL HAVE "SEWER" CAST INTO THE COVER. ALL STORMWATER/DRAIN MANHOLE COVERS SHALL HAVE "DRAIN" CAST INTO THE COVER.
2. APPROVED MANHOLE FRAMES:
 - 2.1. EAST JORDAN TOWN 2008/2.
 - 2.2. APPROVED EQUAL
 - 2.3. OR APPROVED EQUAL
3. APPROVED MANHOLE COVERS:
 - 3.1. APPROVED EQUAL
 - 3.2. NENAH R-1743 EITHER "SEWER" OR "DRAIN"
 - 3.3. APPROVED EQUAL

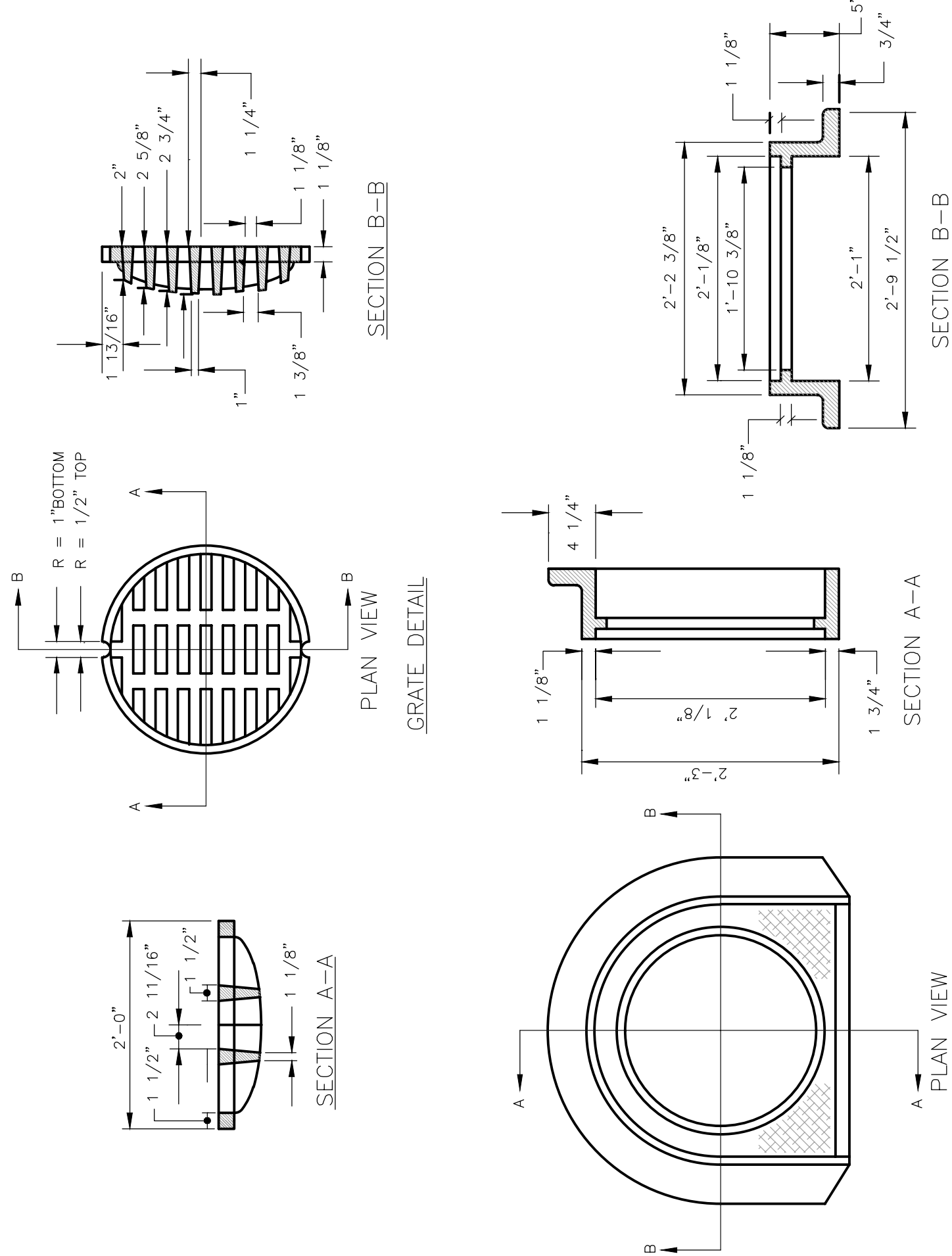
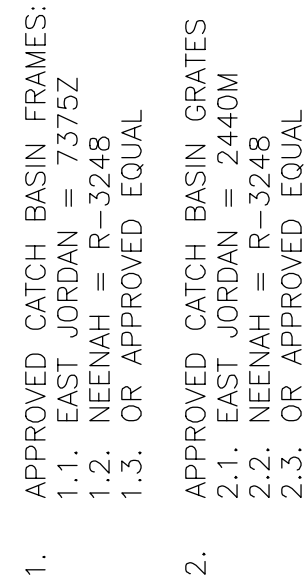


Diagram illustrating the components of a standard frame and cover assembly:

- STANDARD FRAME AND COVER
- PORTLAND CEMENT MORTAR
- ADJUST TO GRADE WITH BRICK, (3 COURSES MIN.; 8 COURSES MAX.), CONCRETE RING OR METAL RISER
- SOLDIER BRICK
- RING WITH PROJECT ENGINEER'S APPROVAL

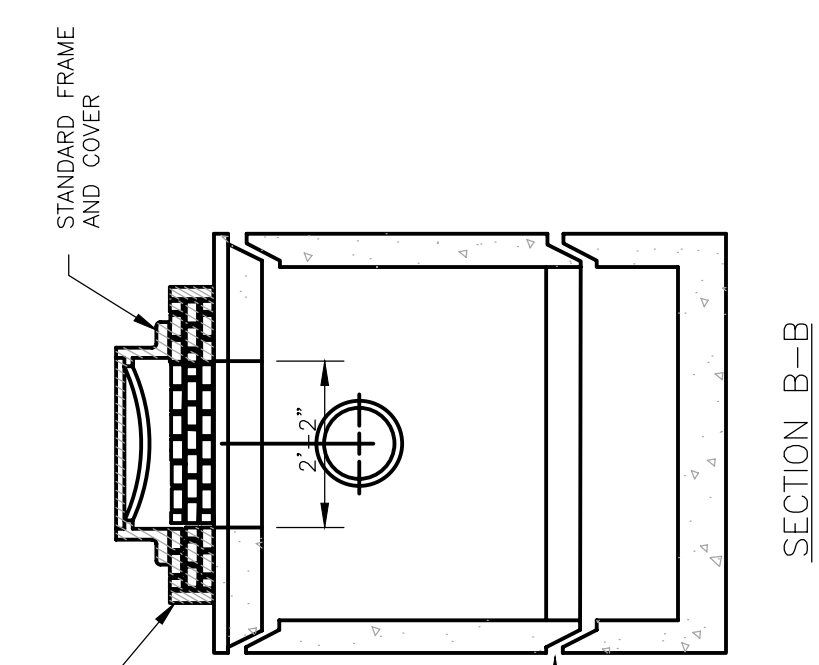


PRECAST CONCRETE CATCH BASIN
NOT TO SCALE



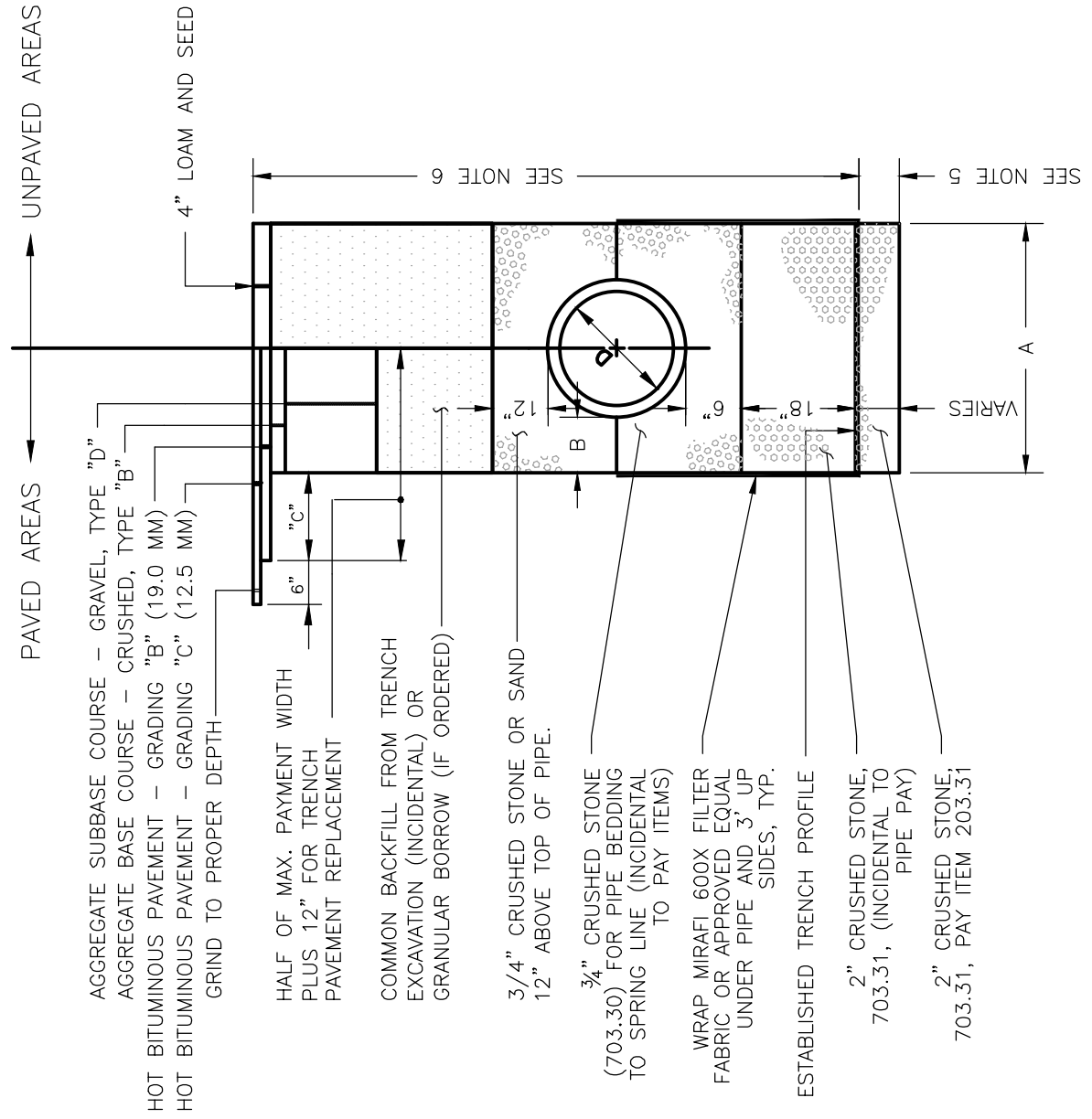
CATCH BASIN TYPE "D" FRAME & GRATE

NOT TO SCALE



FLC
C
C
-
-
H
-
-
-
C
L
C

ISSUED FOR PERMITTING
NOVEMBER 2017



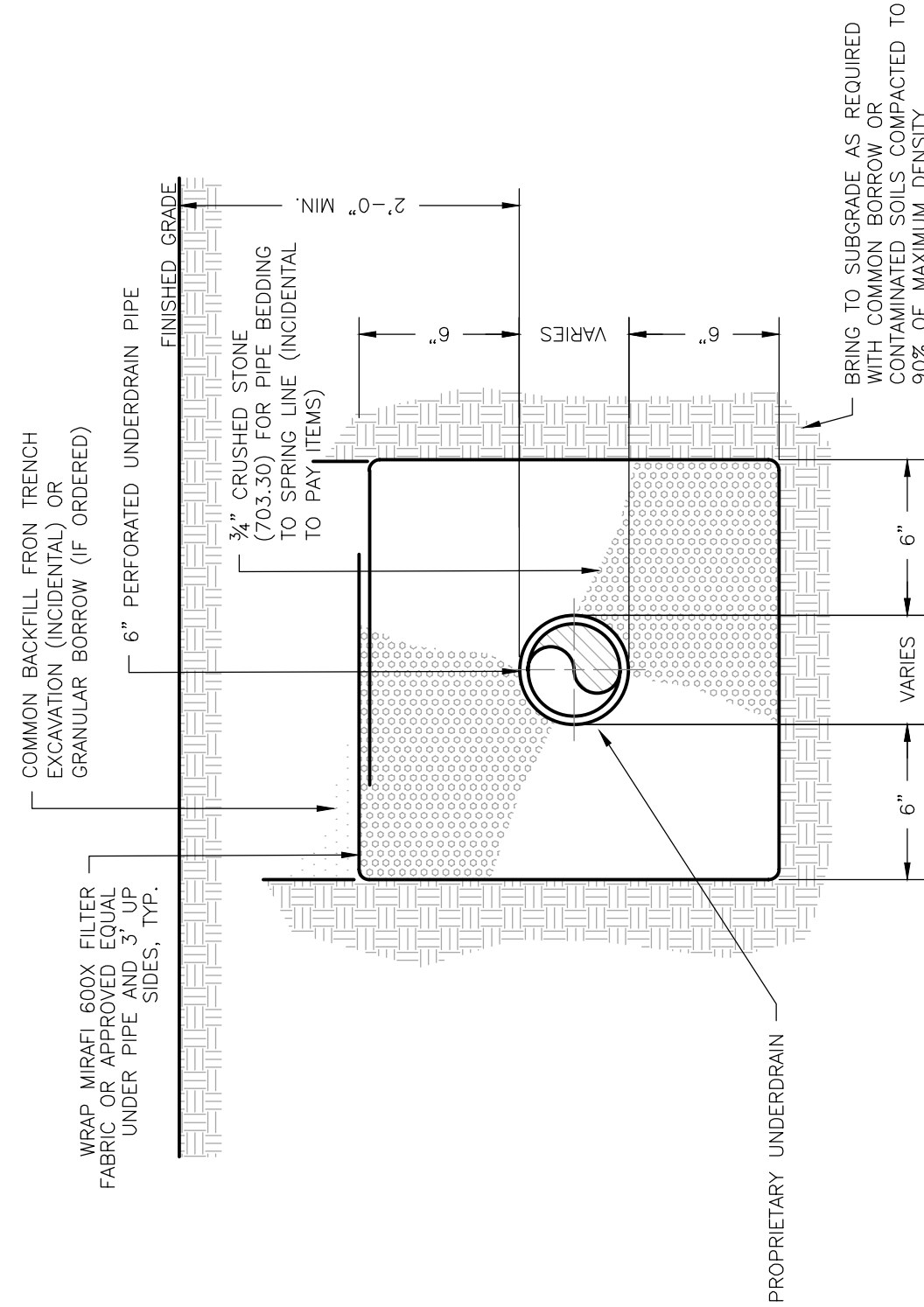
NOTES

1. ALTERNATIVE CONSTRUCTION METHODS OR PAYMENT METHODS SHALL BE APPROVED IN ADVANCE BY THE CITY.
2. IN PAVED AREAS, DEPTHS OF GRAVEL AND HOT MIX ASPHALT PAVEMENT SHALL MATCH THE GREATER OF EXISTING CONDITIONS OR THE REQUIREMENTS FOR THE CORRESPONDING STREET CLASSIFICATION.
3. DIMENSION **B** SHALL BE SUFFICIENT TO ALLOW CRUSHED STONE BEDDING TO BE PLACED AND COMPACTED UNDER THE HAUNCHES OF THE PIPE, BUT IN ALL CASES DIMENSION **B** SHALL BE AT LEAST 9".
4. DIMENSION **A** IS THE MAXIMUM WIDTH ALLOWED FOR CALCULATING PAY QUANTITIES UNDER GRANULAR BORROW, CRUSHED STONE, STRUCTURAL EARTH EXCAVATION, AND STRUCTURAL EXCAVATION. DIMENSION **A** SHALL BE BASED ON PIPE DIAMETER **D**, AS SET FORTH IN THE FOLLOWING TABLE:
5. EXCAVATION BELOW ESTABLISHED TRENCH PROFILE (IF ORDERED): PAY ITEM 206.061
6. EXCAVATION INCIDENTAL TO PIPE PAY ITEMS (PAVED AND SEEDED AREAS).
7. DEPTH OF BITUMINOUS PAVEMENT AND AGGREGATE COURSES SHALL BE DETERMINED BY SECTIONS ON SHEET 66, SHEET 67 AND SHEET 68.
8. ANY ALTERNATE TRENCHING OR PAYMENT METHODS SHALL BE APPROVED IN ADVANCE BY THE CITY OF PORTLAND, DEPARTMENT OF PUBLIC WORKS.

PIPE DIAMETER, "D"	MAX. TRENCH WIDTH, "A"	PAVEMENT WIDTH, "C"
(INCHES)	(FEET)	OUTSIDE TRENCH, "C"
	(FEET)	
4	4.0	2.5
6	4.0	2.5
8	4.0	2.5
10	4.0	2.5
12	5.0	2.5
14	5.0	2.5
16	5.0	2.0
18	5.0	2.0
20	5.0	2.0
21	5.0	2.0
22	5.0	2.0
24	6.0	1.5
26	6.0	1.5
28	6.0	1.5
30	6.0	1.5
32	7.0	1.0
34	7.0	1.0
36	7.0	1.0
38	8.0	1.0
40	8.0	1.0

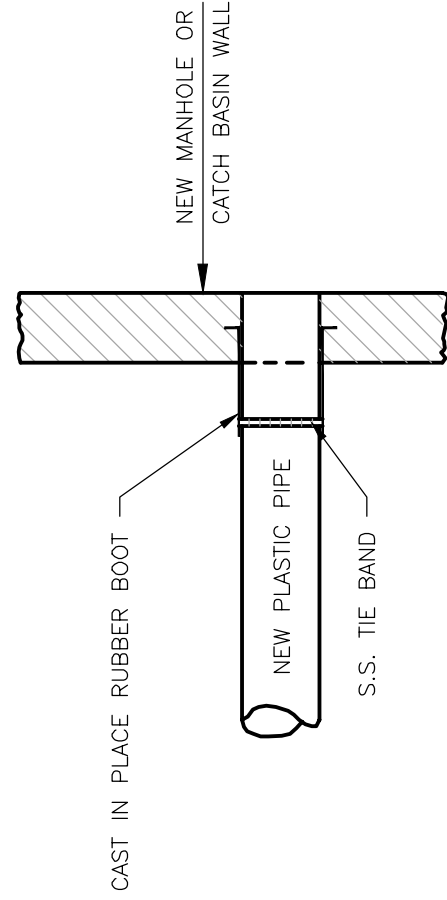
TYPICAL PIPE INSTALLATION DETAIL

NOT TO SCALE

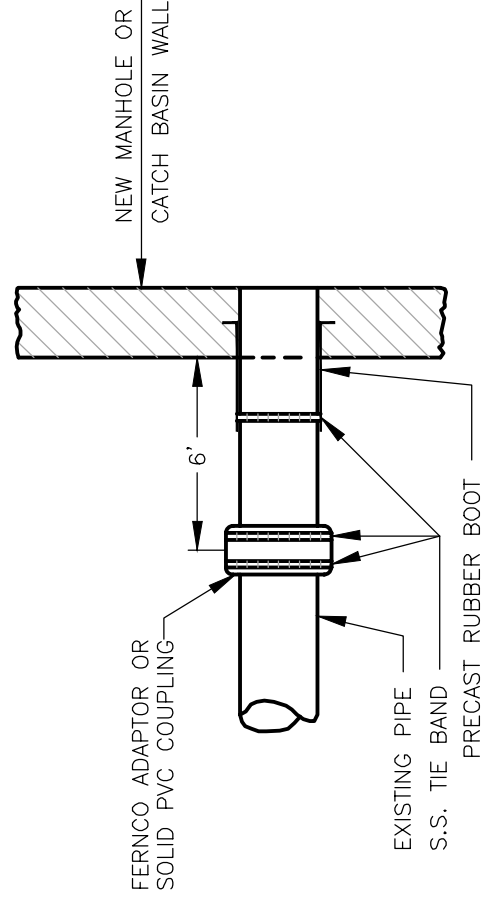


UNDERDRAIN BEDDING

NOT TO SCALE



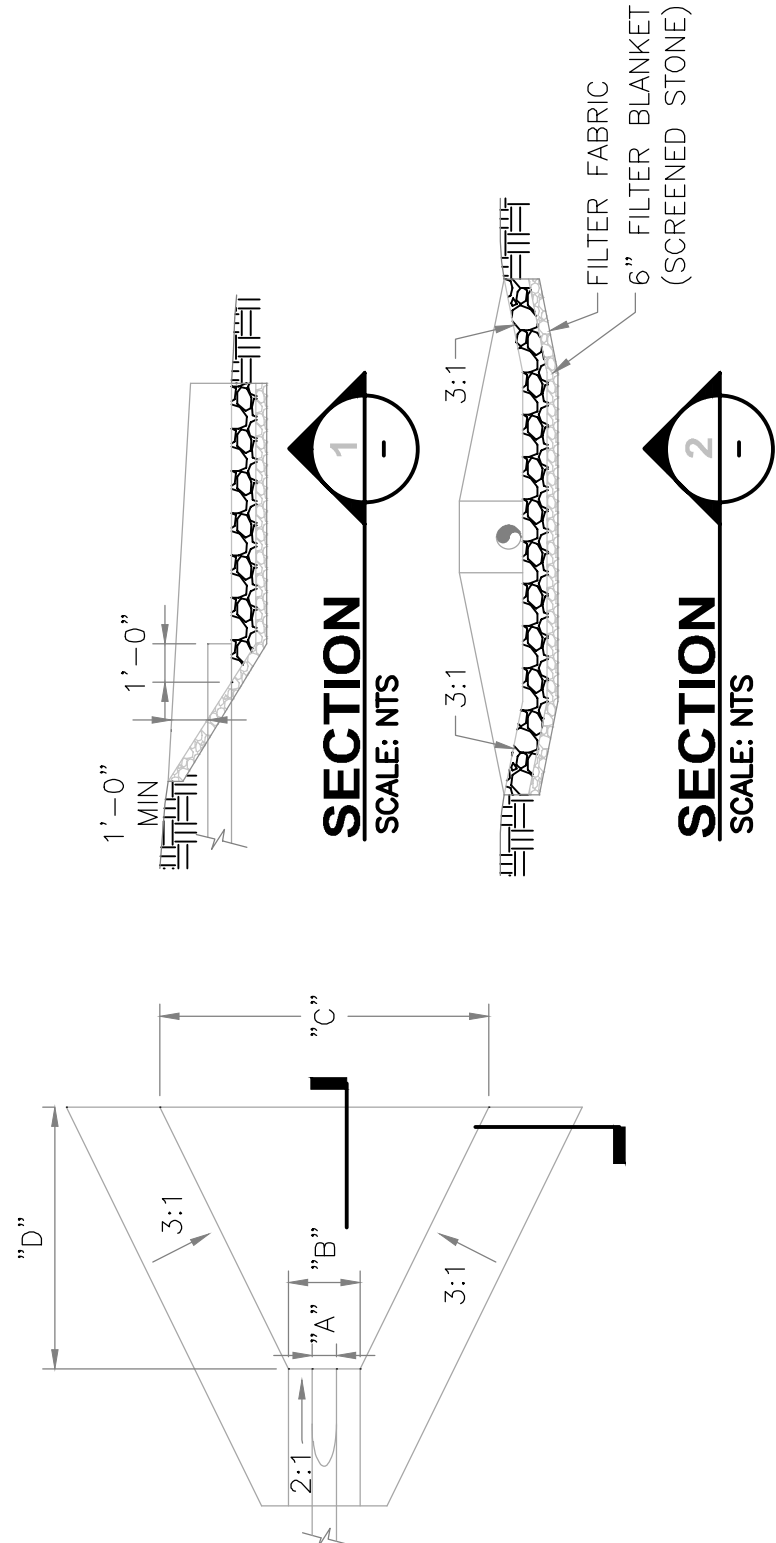
METHOD 2 – NEW CONSTRUCTION



METHOD 1 - EXISTING PIPE INTO NEW STRUCTURE

PLASTIC PIPE CONNECTIONS TO DRAINAGE STRUCTURE

NOT TO SCALE

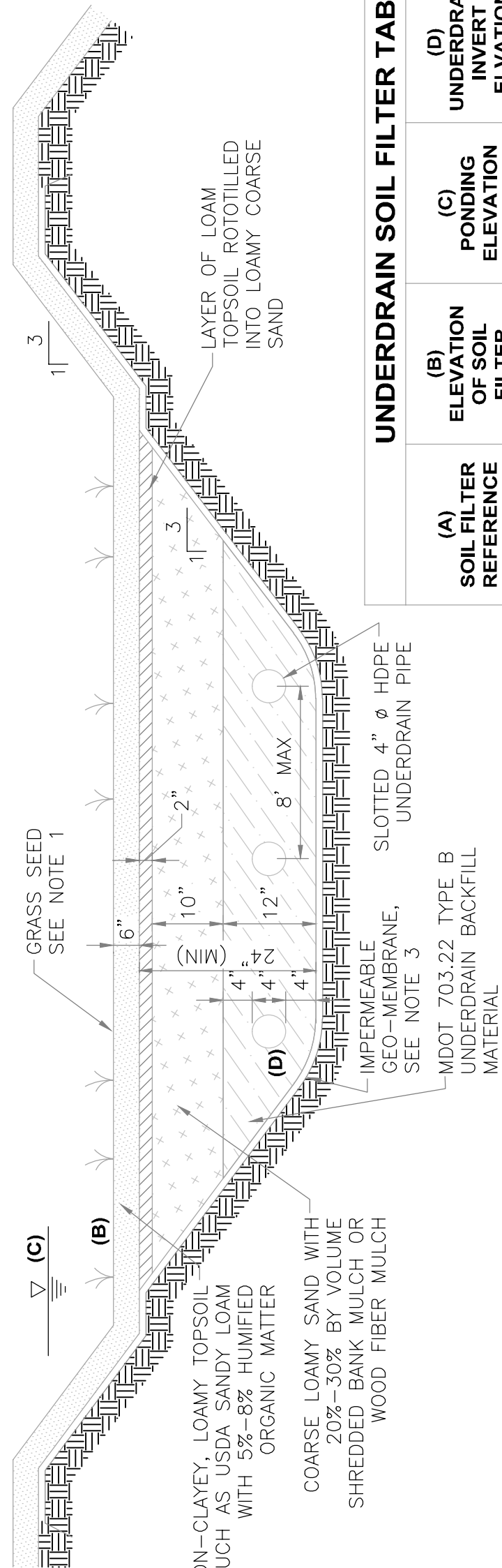


RIPRAP APRON

SCALE: NTS

RIPRAP SCHEDULE						
"A" PIPE DIAMETER (IN.)	"B" (FT)	"C" (FT)	"D" (FT)	RIPRAP CLASS	D ₅₀	RIPRAP DEPTH (FT)
12"	3'-0"	6'-0"	4'-0"	I	6"	1'-6"
15"	3'-0"	7'-0"	5'-0"	II	8"	1'-8"
36"	7'-0"	14'-6"	12'-0"	III	9"	2'-0"

TABLE I			TABLE II			TABLE III		
SPECIFICATIONS FOR LOAMY COARSE SAND			SPECIFICATIONS FOR SANDY LOAM TO FINE SANDY LOAM			SEED MIXTURE		
SEIVE #	% PASSING BY WEIGHT		SEIVE #	% PASSING BY WEIGHT		CREeping RED FESCUE	20 LBS./ACRE (0.5 LBS./1,000 S.F.)	
10	85-100		4	75-95		TALL FESCUE	20 LBS./ACRE (0.5 LBS./1,000 S.F.)	
20	70-100			50-90		BIRDSFOOT TREFOIL	8 LBS./ACRE (0.2 LBS./1,000 S.F.)	



UNDERDRAIN SOIL FILTER TABLE

(A) SOIL FILTER REFERENCE	(B) ELEVATION OF SOIL FILTER	(C) PONDING ELEVATION	(D) UNDERDRAIN INVERT ELEVATION	MIN SURFACE AREA AT SOIL FILTER ELEVATION (SF)
USF-1	109.50	111.00	107.33	2,472

NOTES:

1. GRASS SEED MIXTURE SHALL BE DROUGHT TOLERANT CONSERVATION MIX.
2. PLACE FILTER MEDIA AND LOAM TOPSOIL ONLY AFTER SITE HAS BEEN STABILIZED.
3. IMPERMEABLE GEO-MEMBRANE SHALL BE 4 LURE OR HDPE IMPERMEABLE LINER OF AT LEAST 20 MIL. THICKNESS. 60 MIL. HDPE LAGOON LINER IS ALSO ACCEPTABLE.

UNDERDRAINED SOIL FILTER CONSTRUCTION

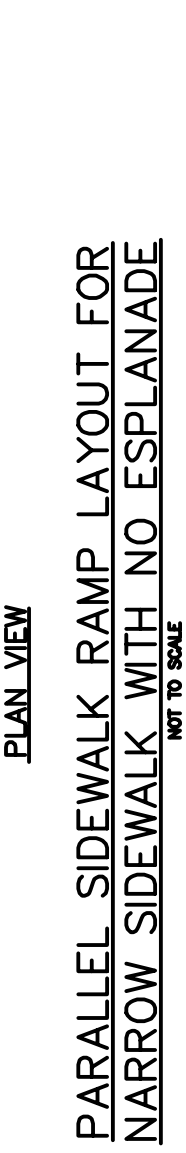
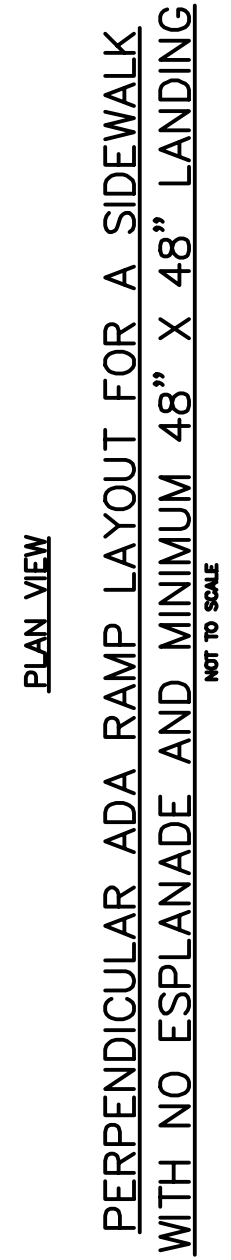
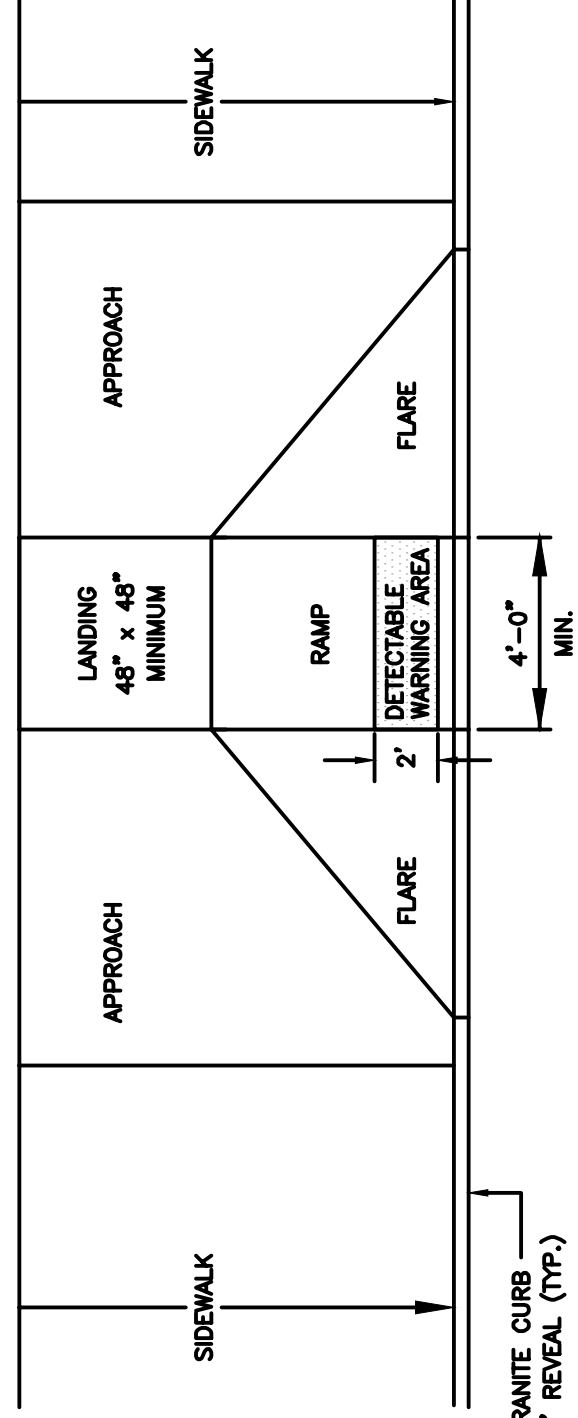
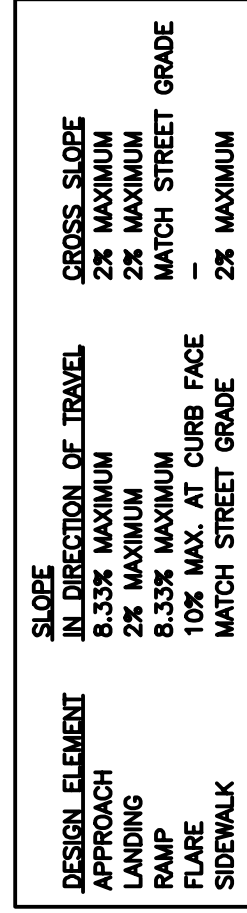
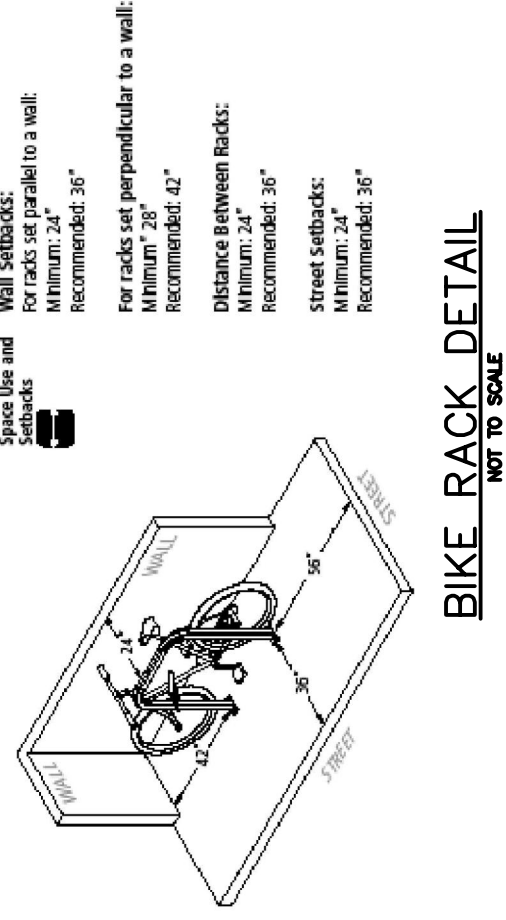
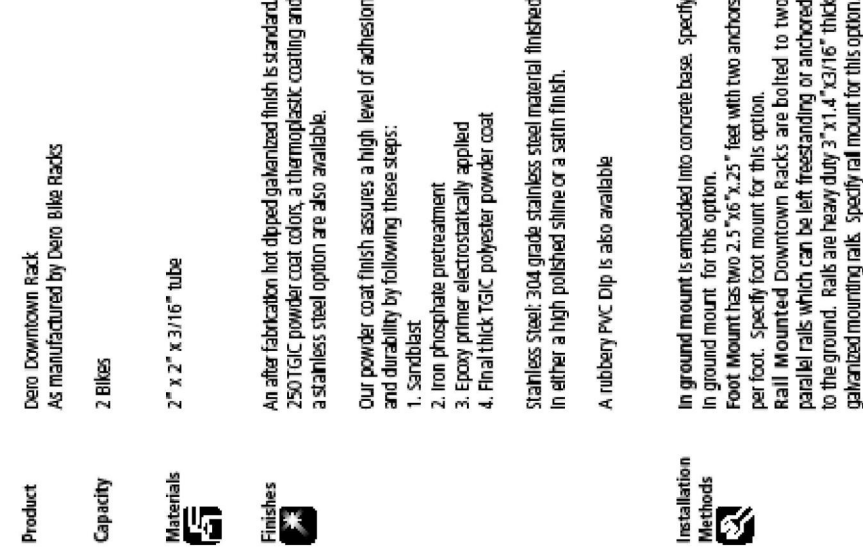
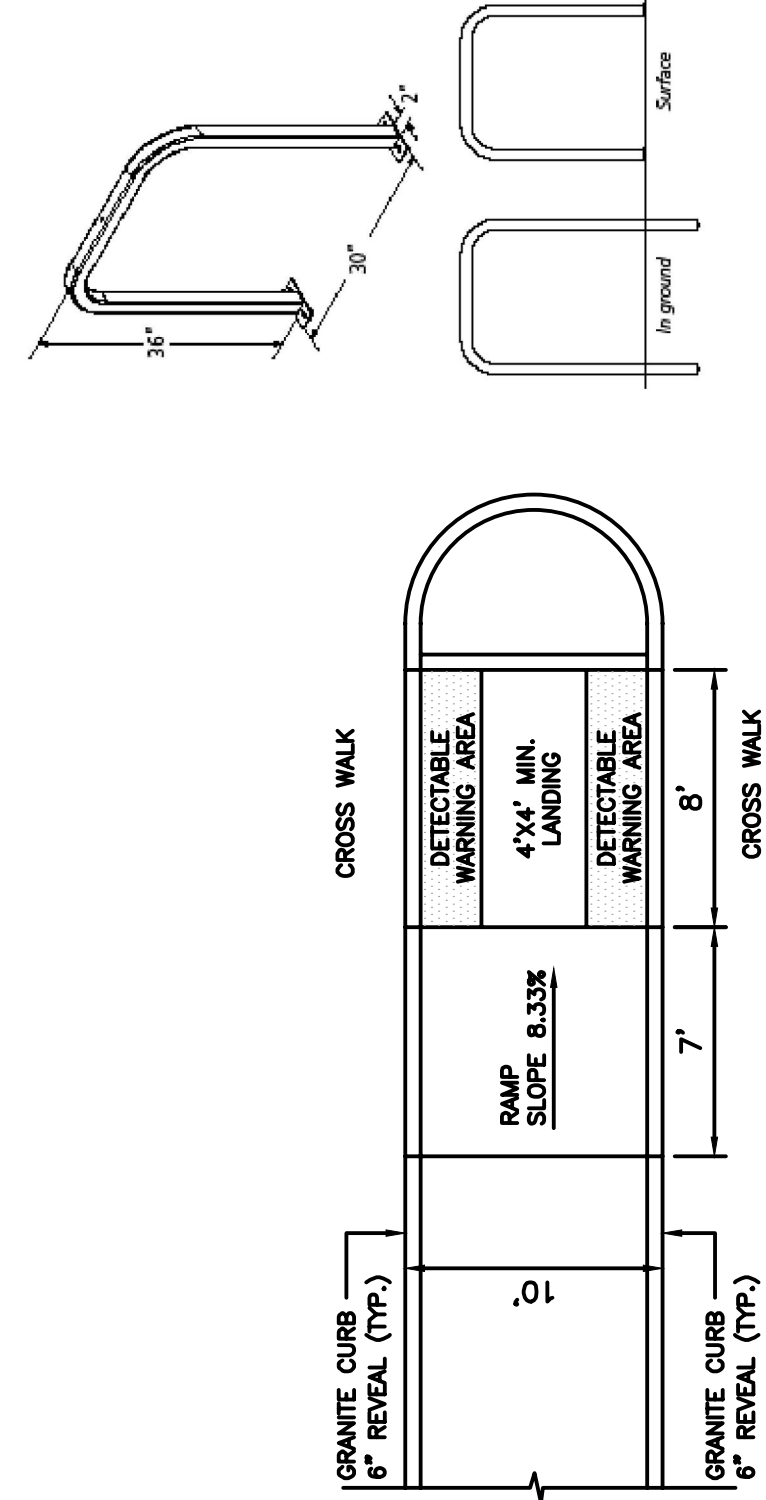
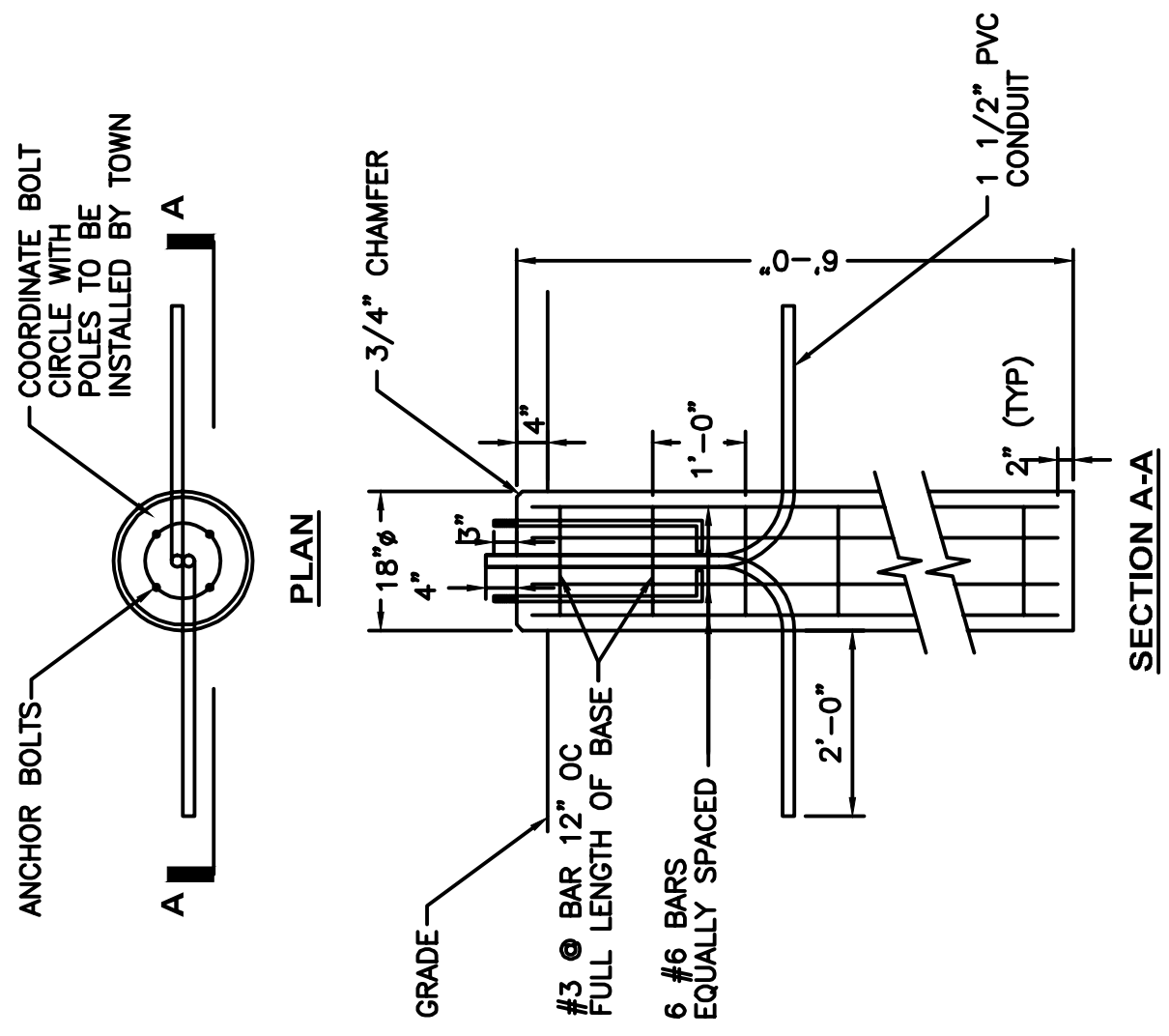
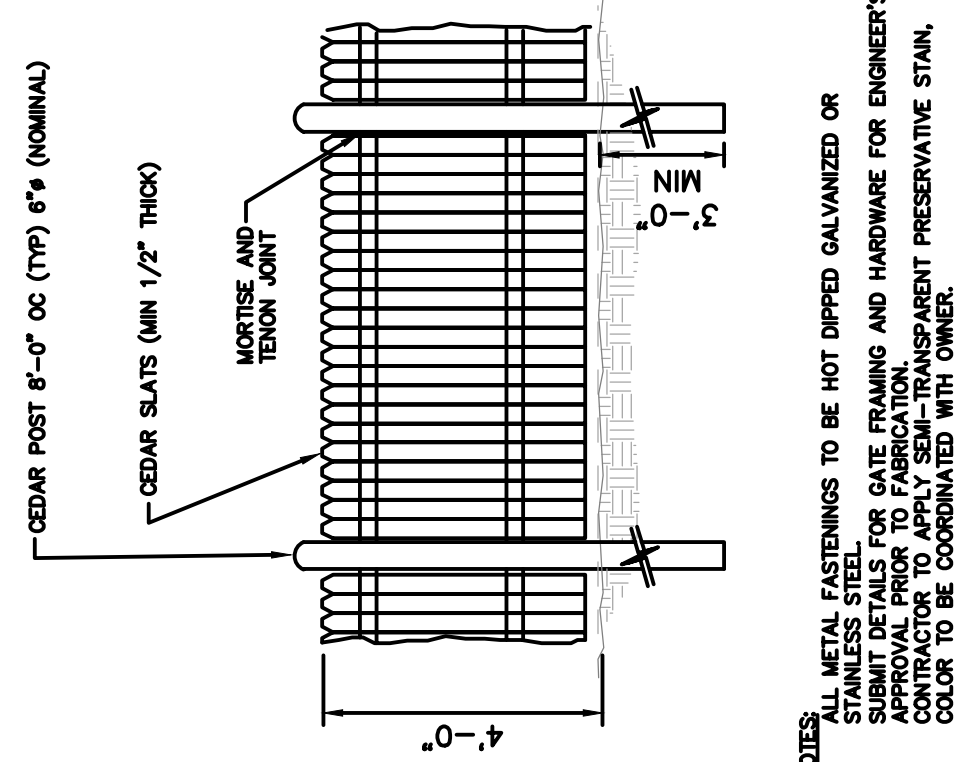
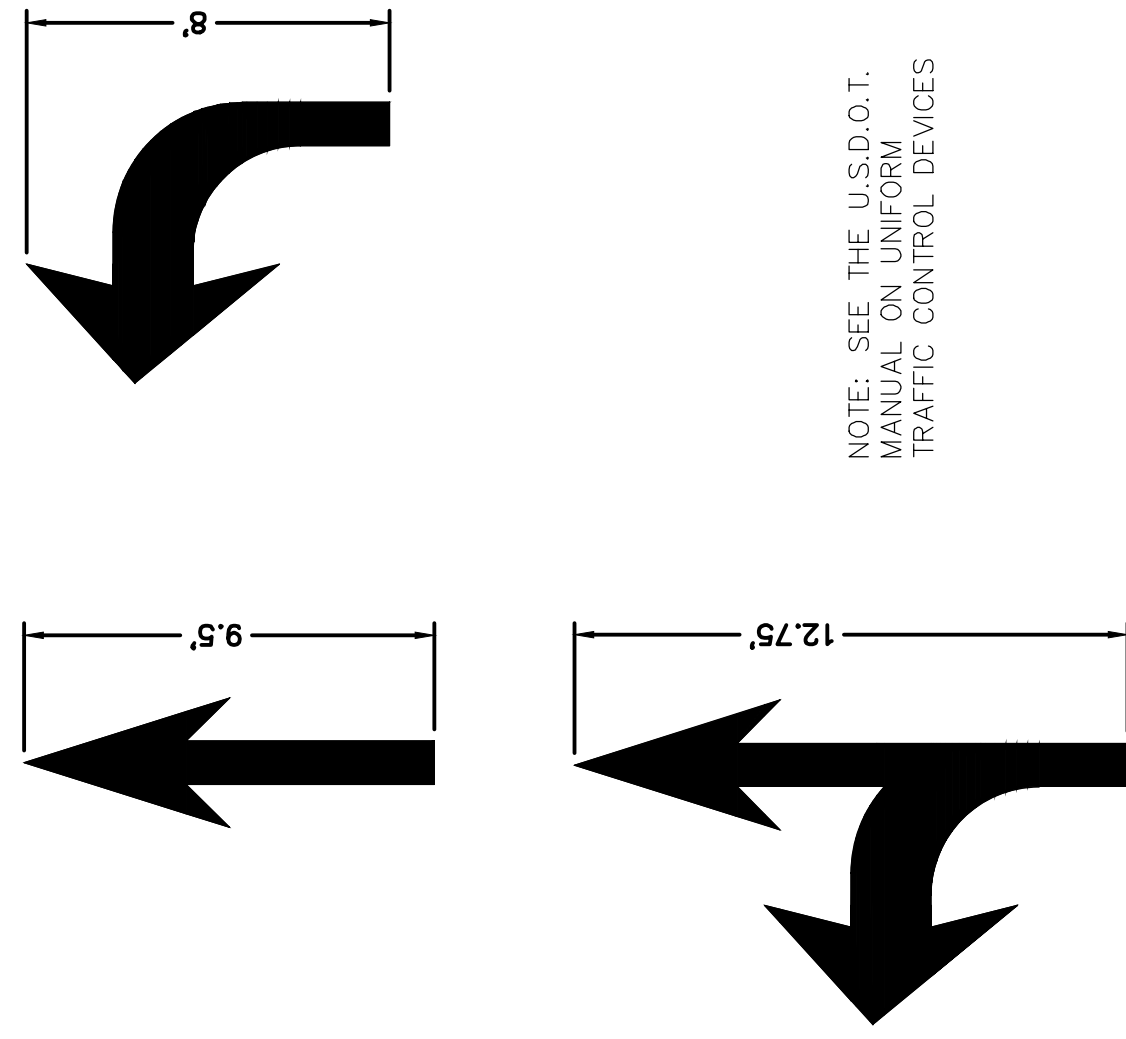
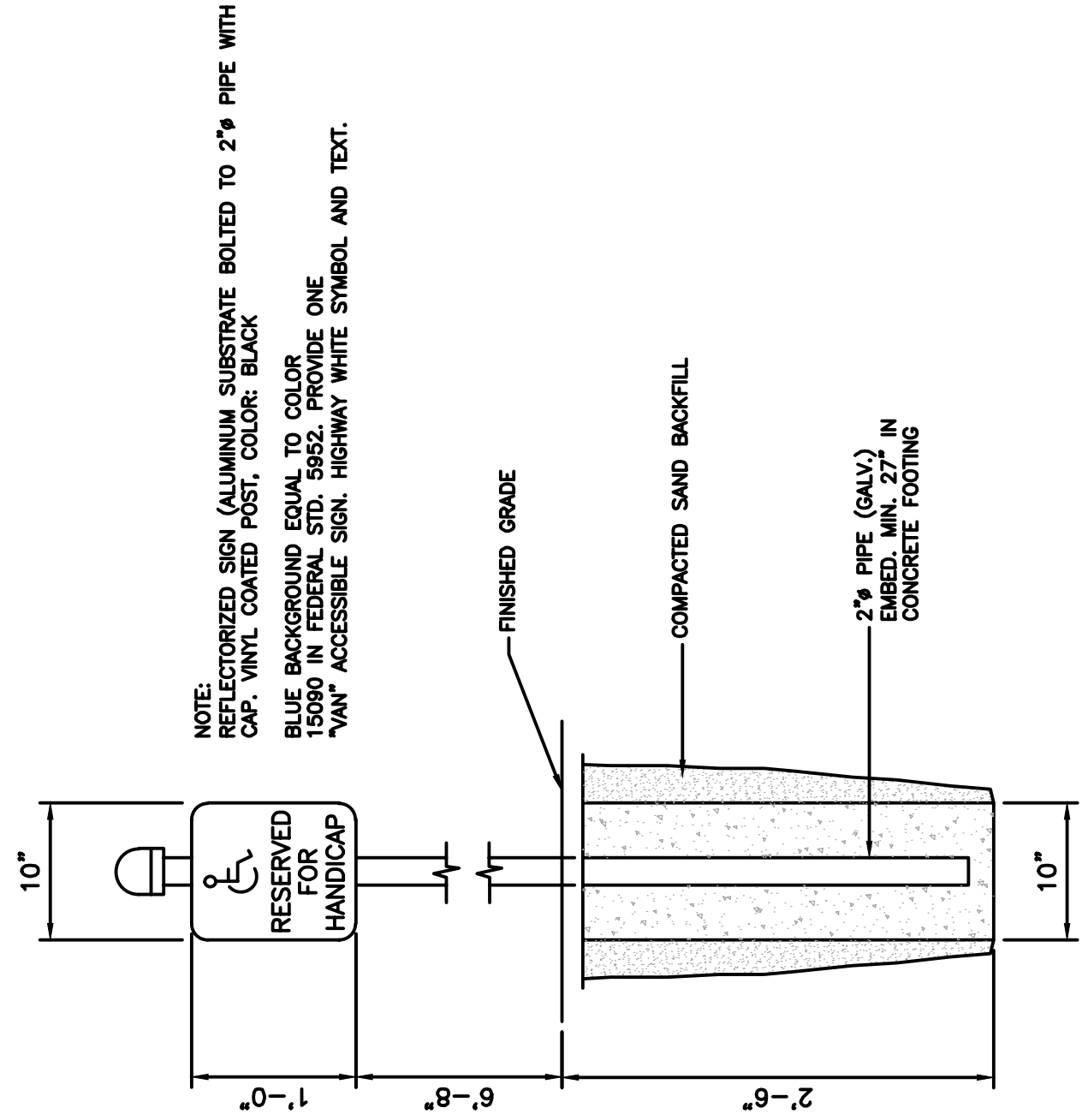
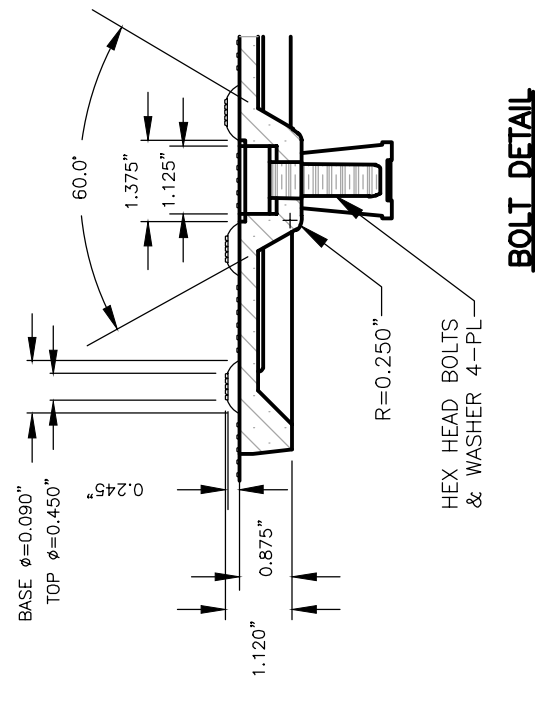
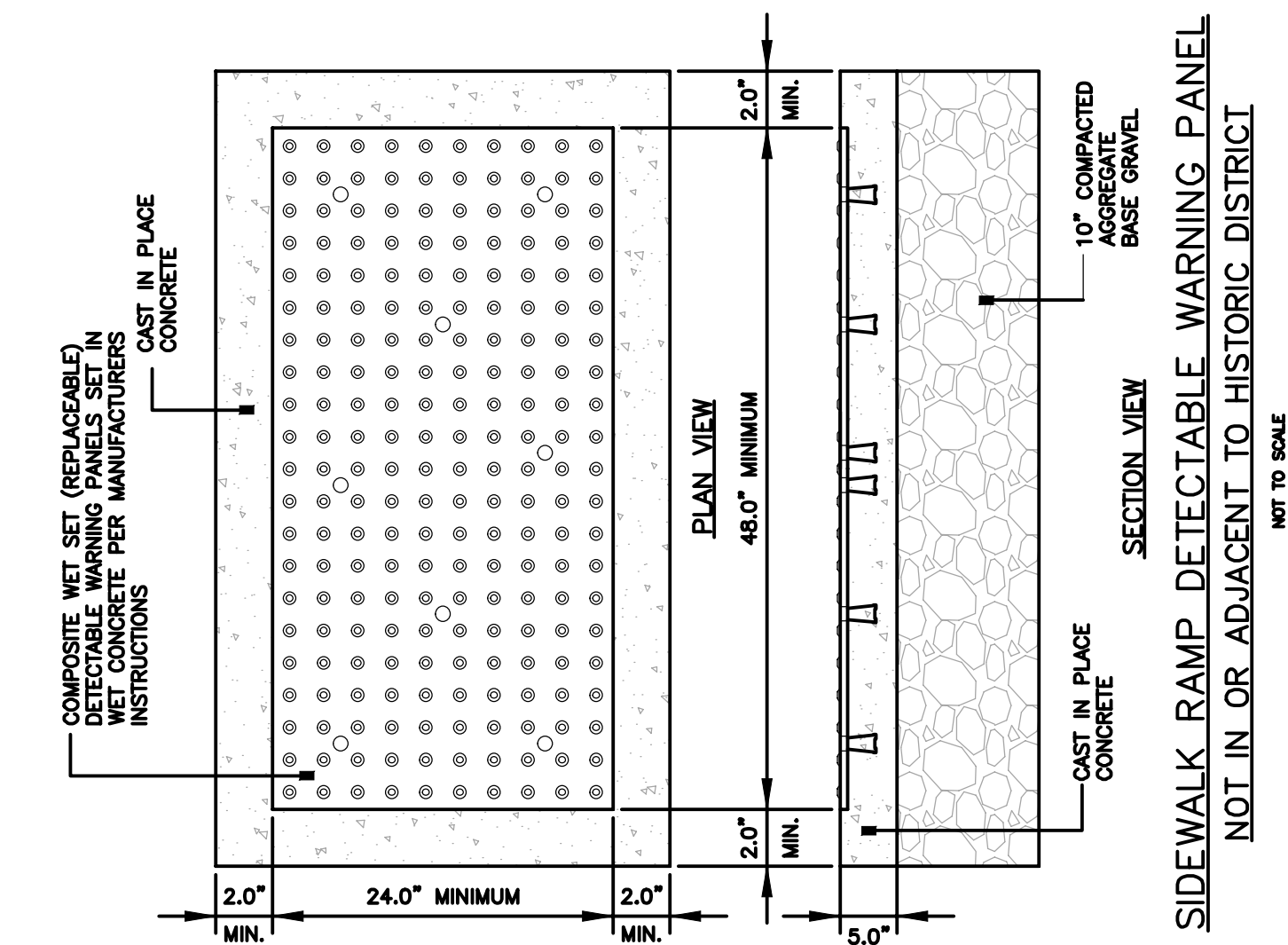
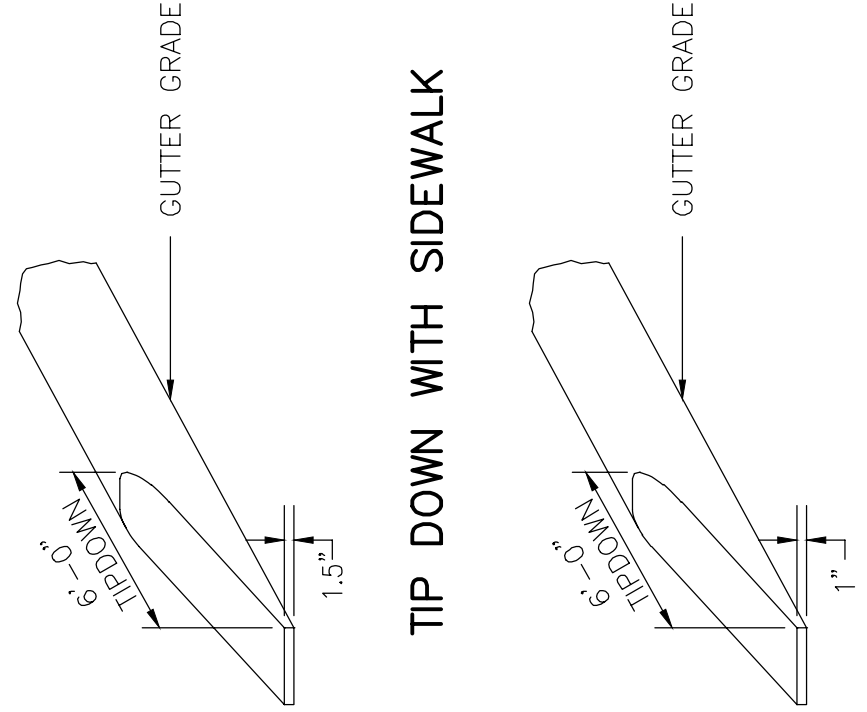
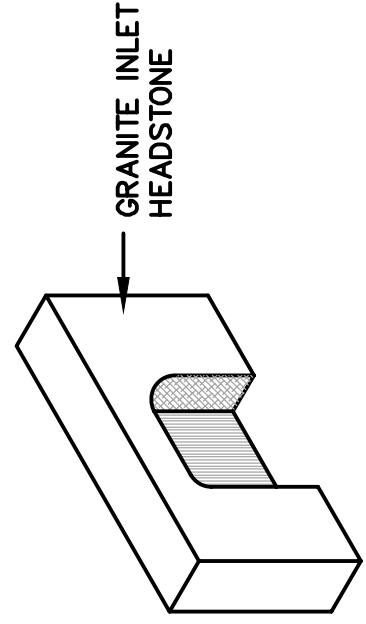
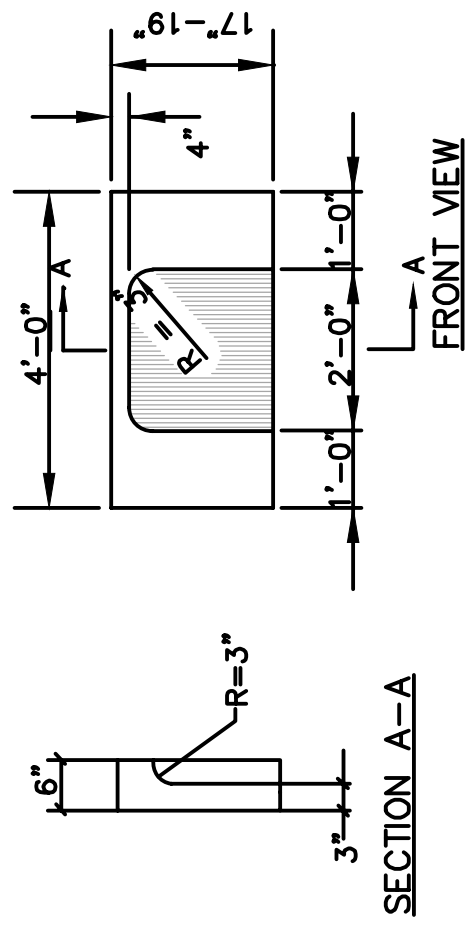
SCALE: NTS

SOIL FILTER BASIN CONSTRUCTION NOTES:

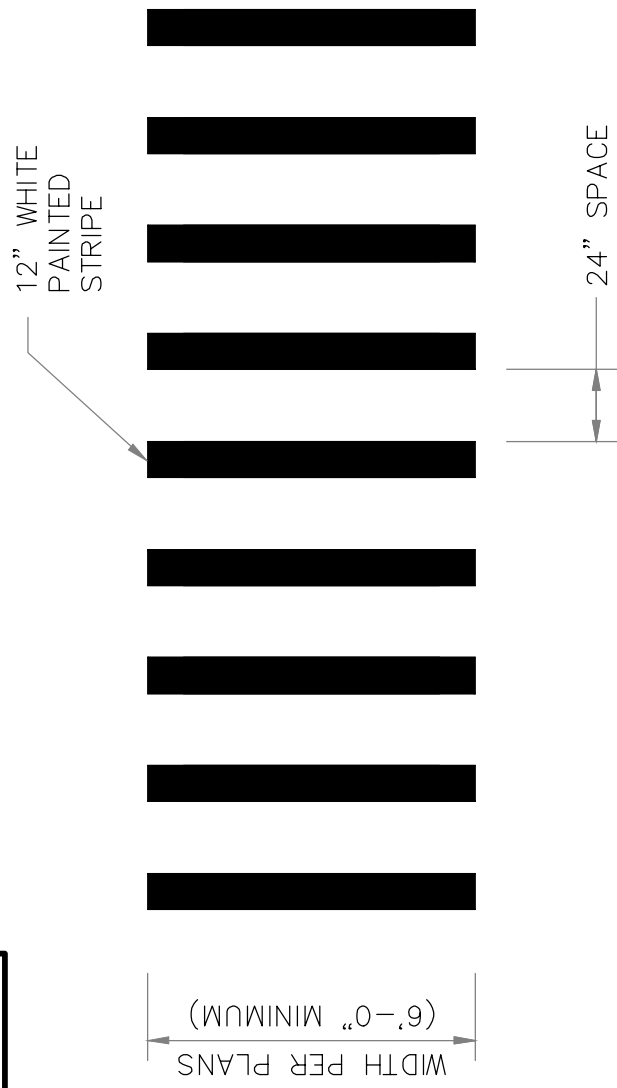
1. CONSTRUCTION OVERSIGHT: INSPECTION OF THE FILTER BASINS SHALL BE PROVIDED FOR EACH PHASE OF CONSTRUCTION BY THE DESIGN ENGINEER WITH REQUIRED REPORTING TO THE DEP. AT A MINIMUM, INSPECTIONS WILL OCCUR:
 - AFTER PRELIMINARY CONSTRUCTION OF THE FILTER GRADES AND ONCE THE UNDERDRAIN PIPES ARE INSTALLED BUT NOT BACKFILLED;
 - AFTER THE DRAINAGE LAYER IS CONSTRUCTED AND PRIOR TO THE INSTALLATION OF THE FILTER MEDIA;
 - AFTER THE FILTER MEDIA HAS BEEN INSTALLED AND SEEDED;
 - AFTER ONE YEAR TO INSPECT HEALTH OF THE VEGETATION AND MAKE CORRECTIONS.
2. TESTING AND SUBMITTALS:
 - ALL MATERIAL USED FOR THE CONSTRUCTION OF THE FILTER BASIN WILL BE APPROVED BY THE DESIGN ENGINEER AFTER TESTS BY A CERTIFIED LABORATORY SHOW THAT THEY ARE PASSING DEP SPECIFICATIONS.
 - THE CONTRACTOR SHALL IDENTIFY THE LOCATION OF THE SOURCE OF EACH COMPONENT OF THE FILTER MATERIAL. ALL RESULTS OF FIELD AND LABORATORY TESTING SHALL BE SUBMITTED TO THE PROJECT ENGINEER FOR CONFIRMATION. THE CONTRACTOR SHALL:
 - SUBMIT SAMPLES OF EACH TYPE OF MATERIAL TO BE USED FOR THE FILTER MATERIAL AND SAMPLES OF THE UNDERDRAIN BEDDING MATERIAL. SAMPLES MUST BE A COMPOSITE OF THREE DIFFERENT LOCATIONS (GRABS) FROM THE STOCKPILE OR PIT FACE. SAMPLE SIZE REQUIRED WILL BE DETERMINED BY THE TESTING LABORATORY.
 - PERFORM A SIEVE ANALYSIS CONFORMING TO ASTM C136 (STANDARD TEST METHOD FOR SIEVE ANALYSIS OF FINE AND COARSE AGGREGATES; 1996A) ON THE UNDERDRAIN BEDDING MATERIAL.
 - PERFORM A PERMEABILITY TEST ON THE SOIL FILTER MEDIA MIXTURE CONFORMING TO ASTM D2434 WITH THE MIXTURE COMPACTED TO 90– 92% OF MAXIMUM DRY DENSITY BASED ON ASTM D698.

TYPICAL PAVED PARKING AREA SECTION

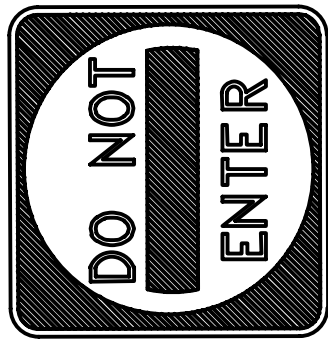
NOT TO SCALE



PERMITTING SET
ISSUED FOR PERMITTING
NOVEMBER 2017

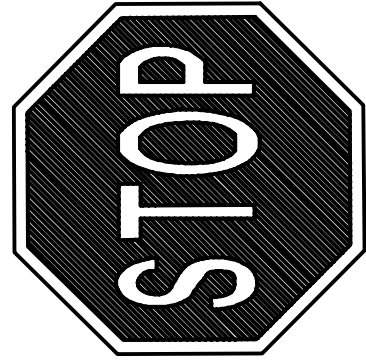


CROSSWALK LAYOUT
SCALE: NTS



R5-1

DO NOT ENTER SIGN
NOT TO SCALE



R1-1

STOP SIGN
NOT TO SCALE



R7-122

VISITOR PARKING SIGN
NOT TO SCALE



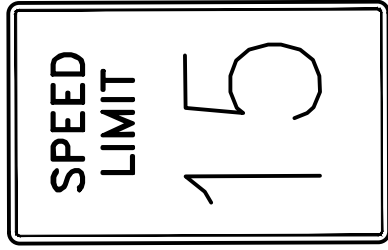
R7-8

HANDICAP PARKING SIGN
NOT TO SCALE



R7-1

NO PARKING SIGN
NOT TO SCALE



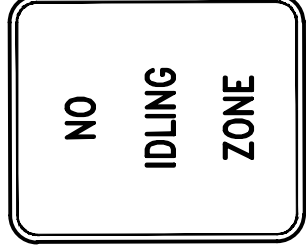
R2-1

SPEED LIMIT SIGN
NOT TO SCALE



R8-3HP

EMPLOYEE PARKING SIGN
NOT TO SCALE



NO IDLING ZONE SIGN
NOT TO SCALE

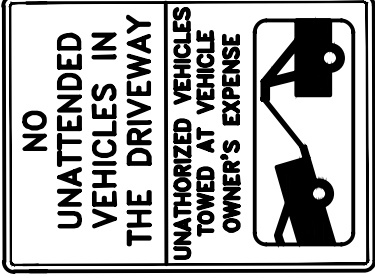


5 MINUTE PARKING SIGN
NOT TO SCALE



R6-2R

MOTORCYCLE PARKING SIGN
NOT TO SCALE

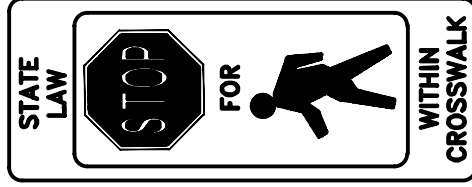


NO PARKING IN DRIVEWAY
NOT TO SCALE



R8-31

NO PARKING FIRE LANE SIGN
NOT TO SCALE



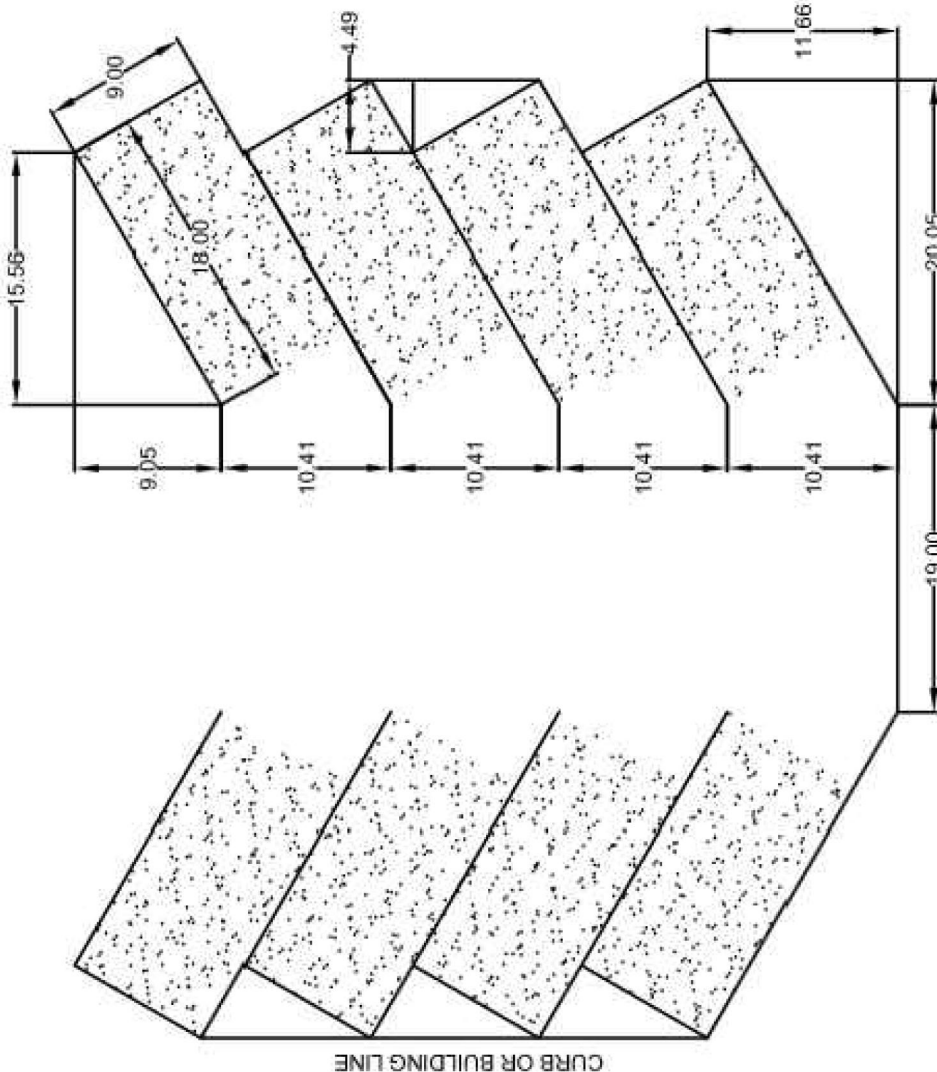
R1-6A

STOP FOR PEDESTRIANS
NOT TO SCALE



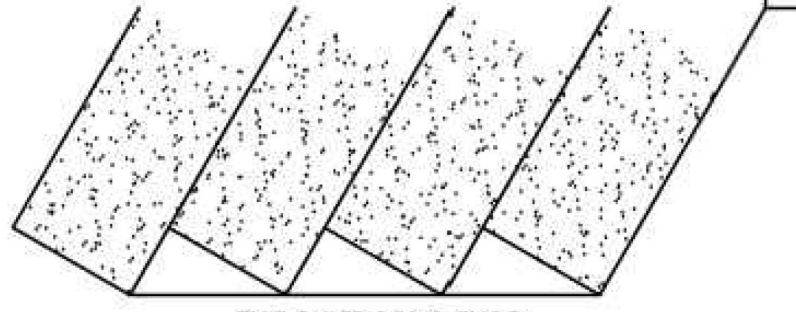
R7-201aP

TOW-AWAY ZONE
NOT TO SCALE



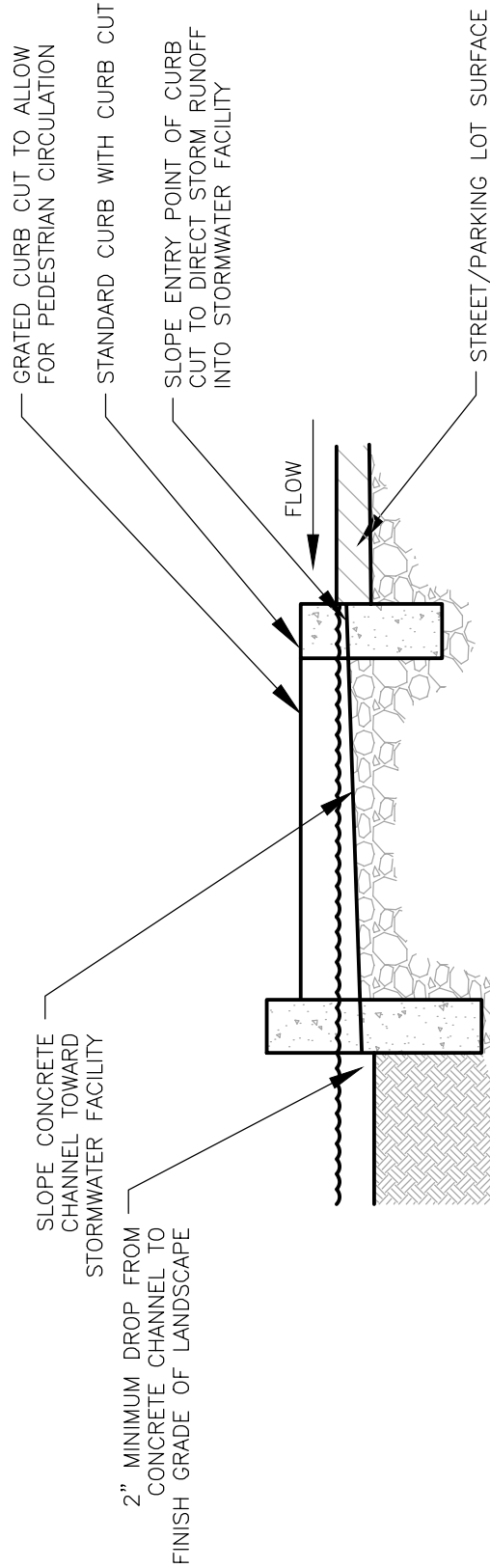
60° PARKING @ 9' x 18'

60° ANGLED PARKING LAYOUT
NOT TO SCALE

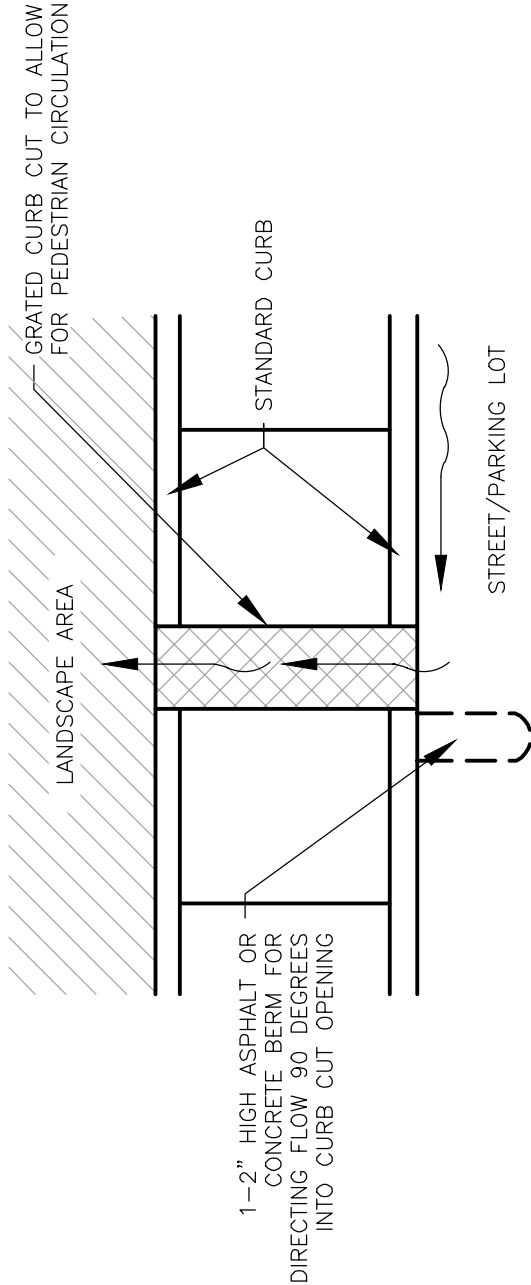


60° PARKING @ 8' x 15'

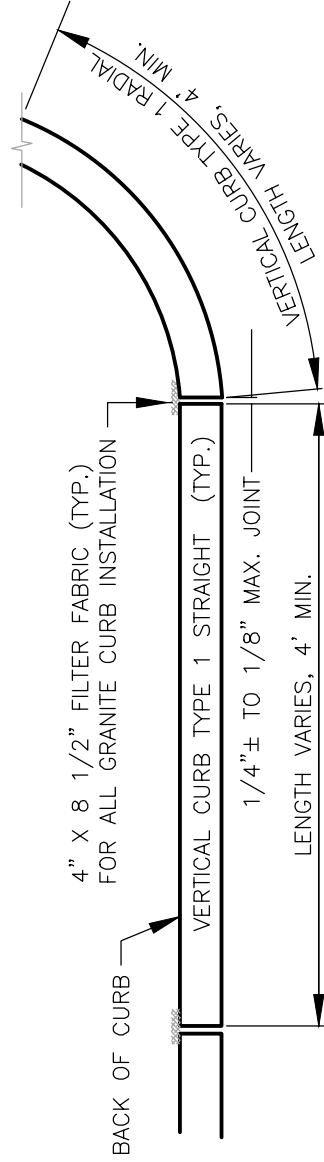
60° ANGLED COMPACT PARKING LAYOUT
NOT TO SCALE



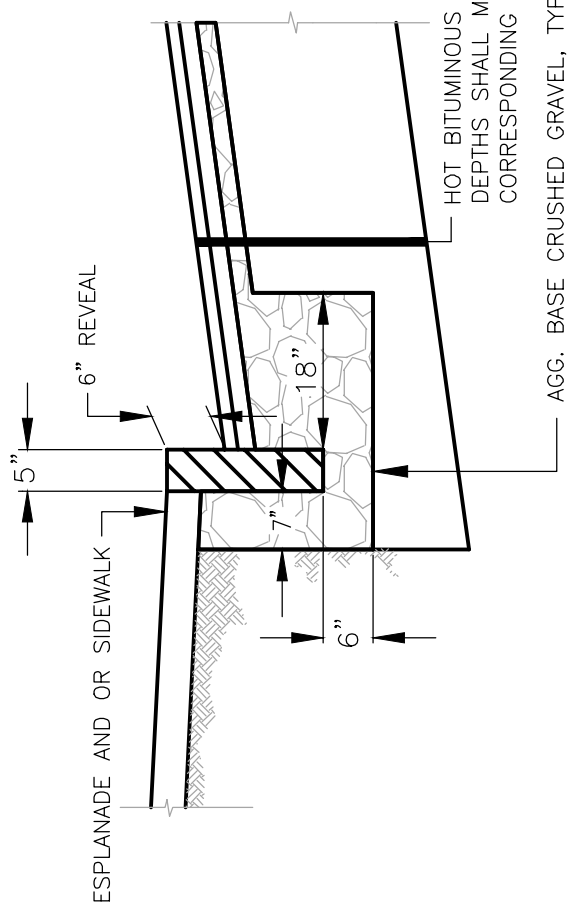
GRADED CURB CUT SECTION VIEW
NOT TO SCALE



STANDARD CURB CUT PLAN VIEW
NOT TO SCALE



VERTICAL GRANITE CURB PLAN VIEW

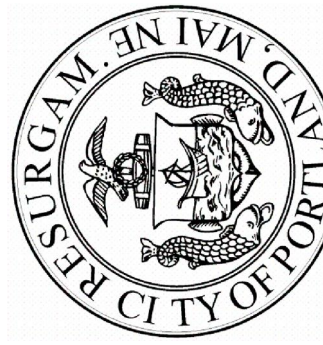


VERTICAL GRANITE CURB CROSS SECTION

VERTICAL GRANITE CURB
FULL DEPTH STREET CONSTRUCTION
NOT TO SCALE

LLM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
CONSTRUCTION DETAILS

CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION

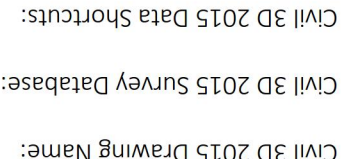


SHEET # 11 OF 14
PLAN NUMBER C-12

REFERENCES:
CIVIL 3D 2015 Survey Database:
CIVIL 3D 2015 Data Shortcuts:

DESIGNED BY: MRL
DRAWN BY: MRL
CHECKED BY: DAB
AS NOTED: 11-21-17
DATE: 11-21-17





REFERENCES:
REVISIONS:
PERMITTING SUBMISSION



LLM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
CONSTRUCTION DETAILS

CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION



SHEET #	12 OF 14
PLAN NUMBER	C-13

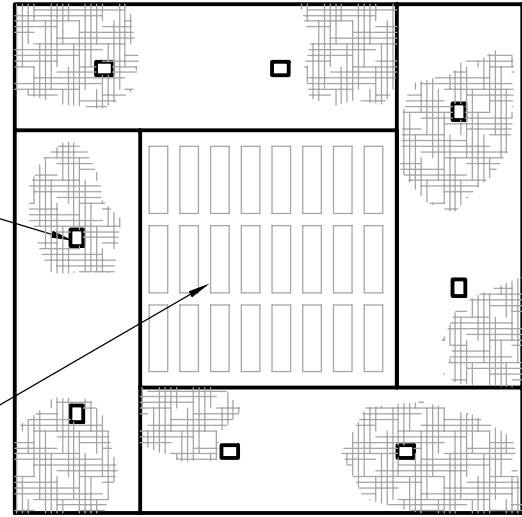
PROFILE

The diagram shows a cross-section of a ditch. Point A is at the bottom of the ditch, and point B is at the top of the ditch. A vertical line segment labeled 'L' connects points A and B. The ditch is filled with a stippled pattern. The labels 'BOTTOM OF DITCH' and 'TOP OF DITCH' are placed near points A and B respectively.

STONE CHECK DAM DETAIL
NOT TO SCALE

CB INLET GATE

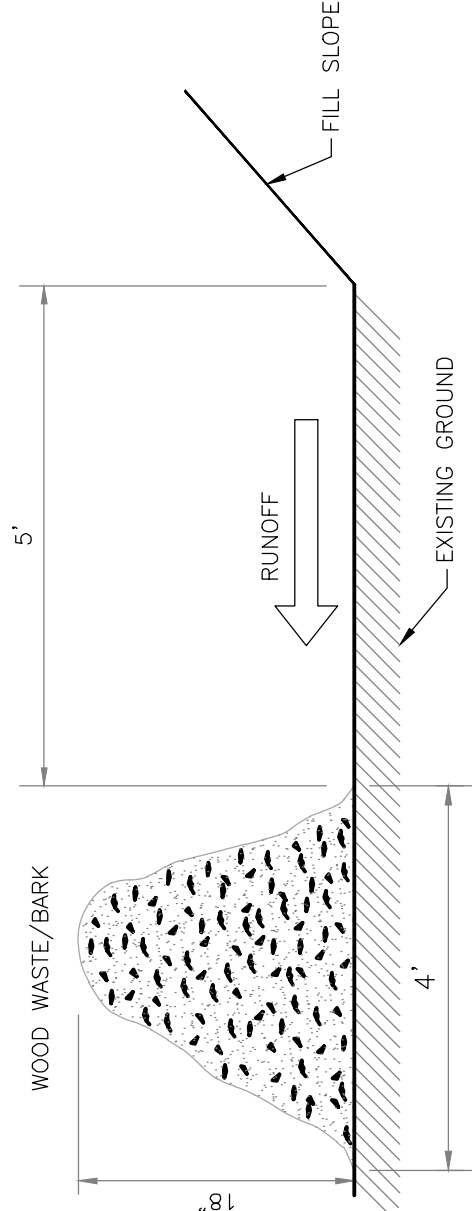
STAKE HAY BALES AS PER
DETAIL



NOTE.
EMBED HAYBALES MINIMUM OF 4".

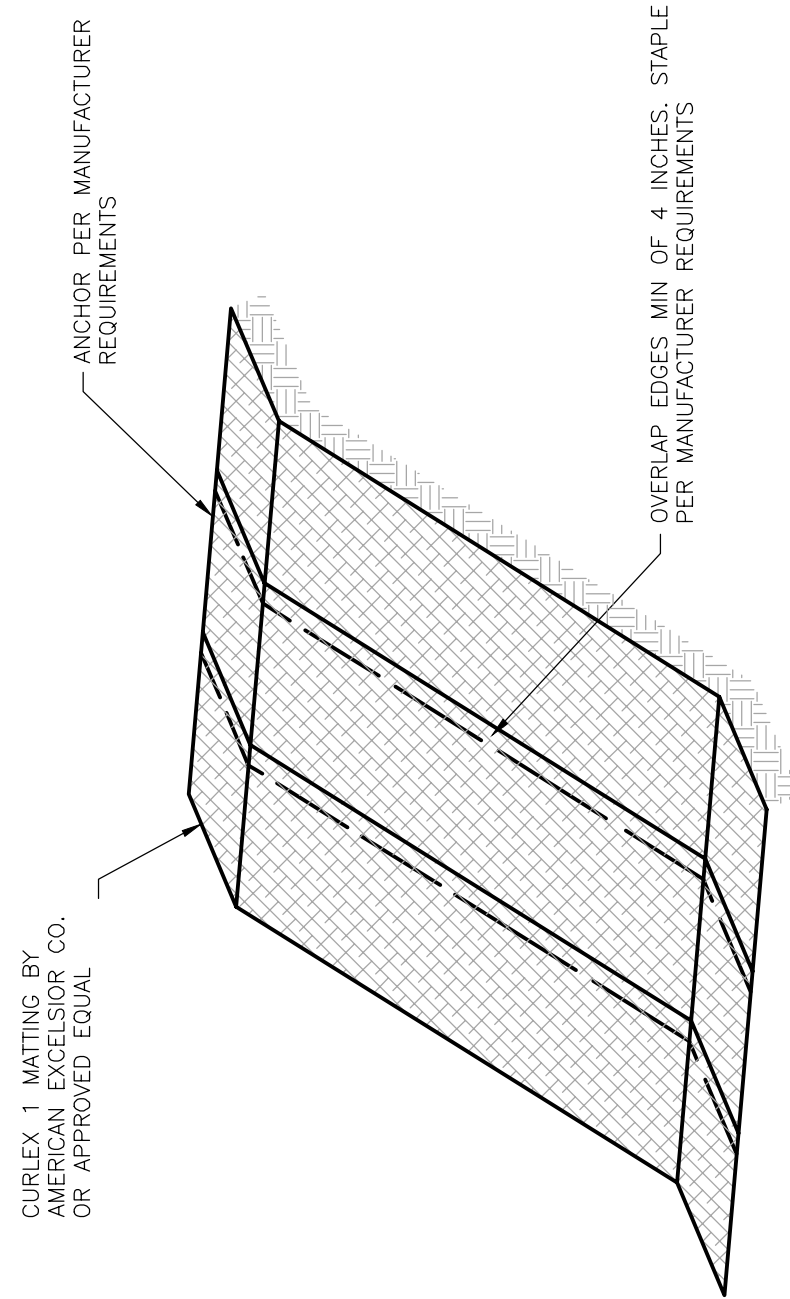
HAY BALE CB INLET PROTECTION

NOT TO SCALE



WOOD WASTE/BARK FILTER BERM

NOT TO SCALE



SILT SACK CATCH BASIN INLET

NOT TO SCALE

EROSION CONTROL MATTING-SLOPES

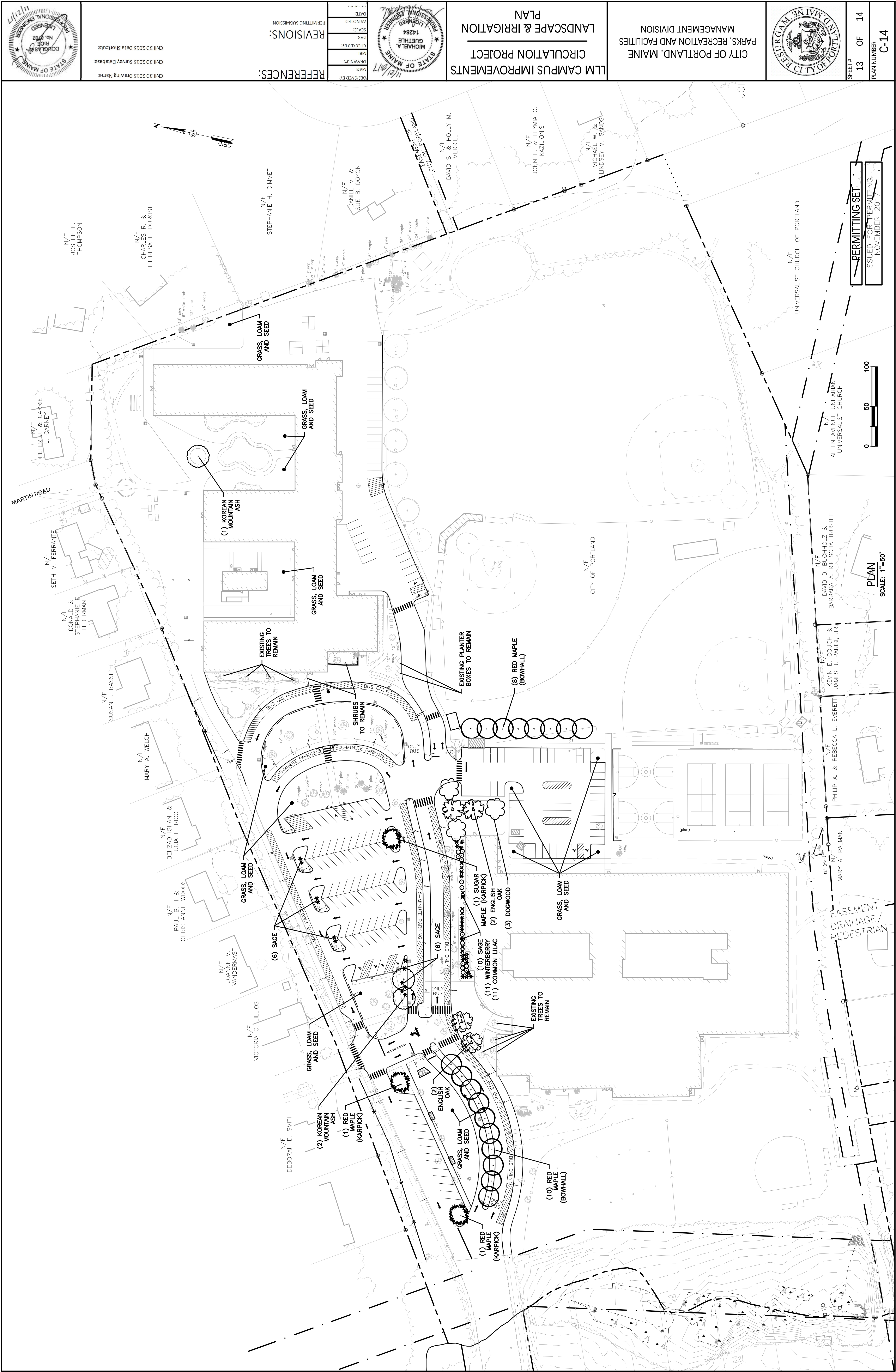
NOT TO SCALE

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

PERMITTING SET

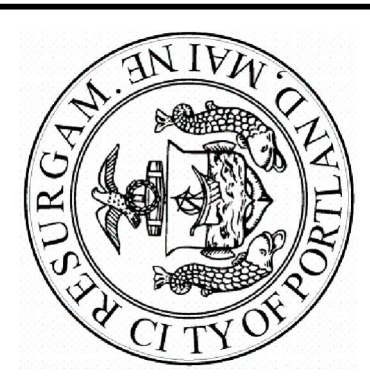
ISSUED FOR PERMITTING
NOVEMBER 2017



PERMITTING SET
ISSUED FOR PERMITTING
NOVEMBER 2017

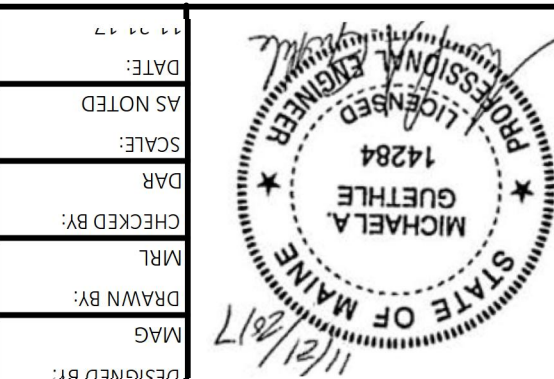


PLAN
SCALE: 1"=50'



CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION

LLM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
LANDSCAPE & IRRIGATION
PLAN



DESIGNED BY:	MAAG
DRAWN BY:	BRAYN BV
CHECKED BY:	MAAG
DATE:	11/21/17
AS NOTED:	
SCALE:	
DATE:	

REFERENCES:
CIVIL 3D 2015 Drawing Name:
CIVIL 3D 2015 Survey Database:
CIVIL 3D 2015 Data Shortcuts:

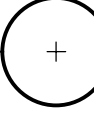
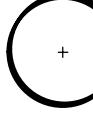
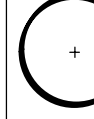
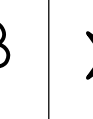
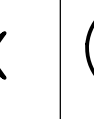


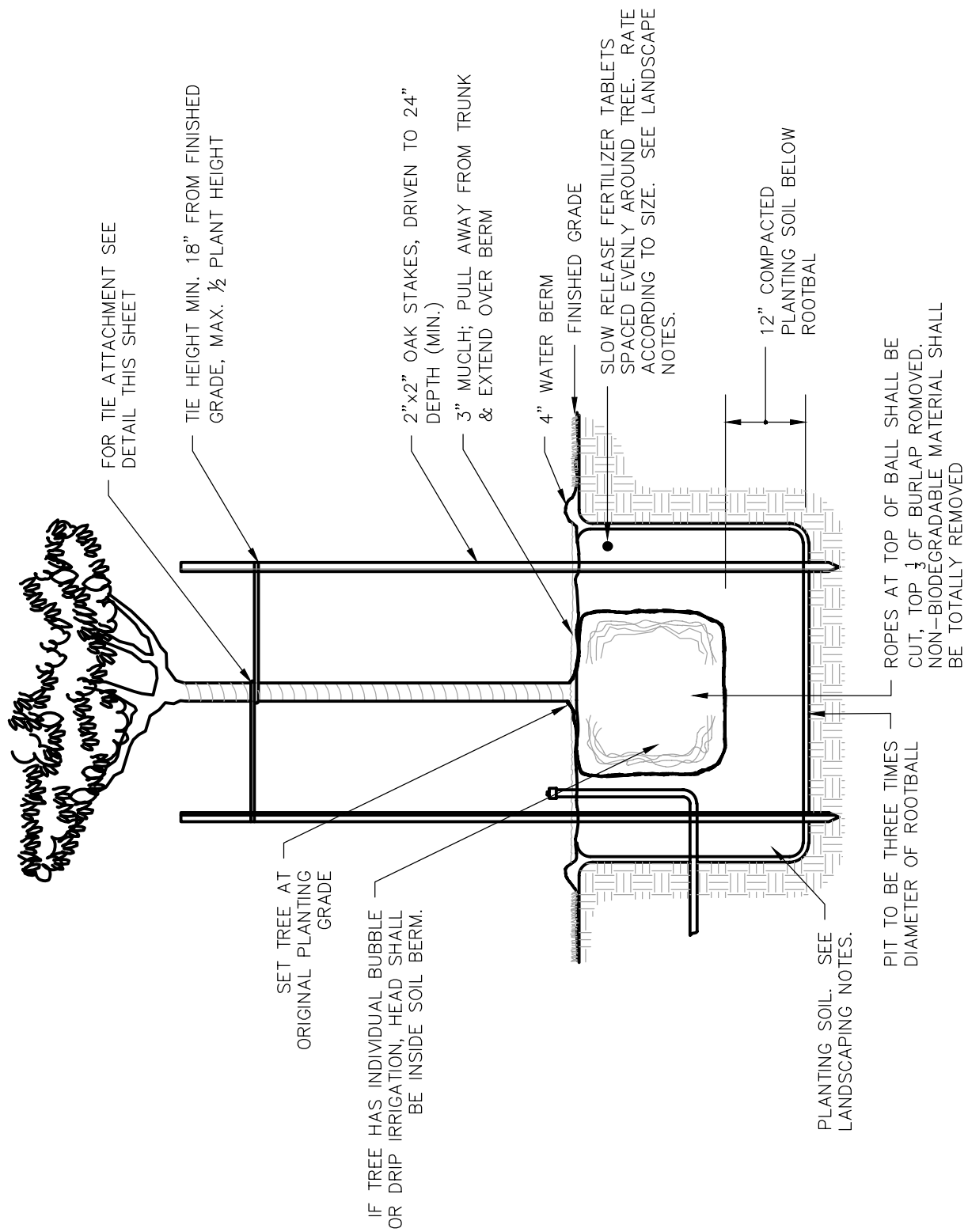
SHEET # 13 OF 14
PLAN NUMBER C-14

TEMPORARY SEED MIXTURE		
SEED	LBS./ACRE	LBS./1000S.F. RECOMMENDED SEEDING DATE
WINTER RYE	112	2.6 8/15 THRU 10/1
OATS	80	1.8 4/1 THRU 7/1 8/15 THRU 10/1
ANNUAL RYEGRASS	40	0.9 4/1 THRU 7/1
SUDANGRASS	40	0.9 5/15 THRU 8/15
PERENNIAL	40	0.9 8/15 THRU 9/15

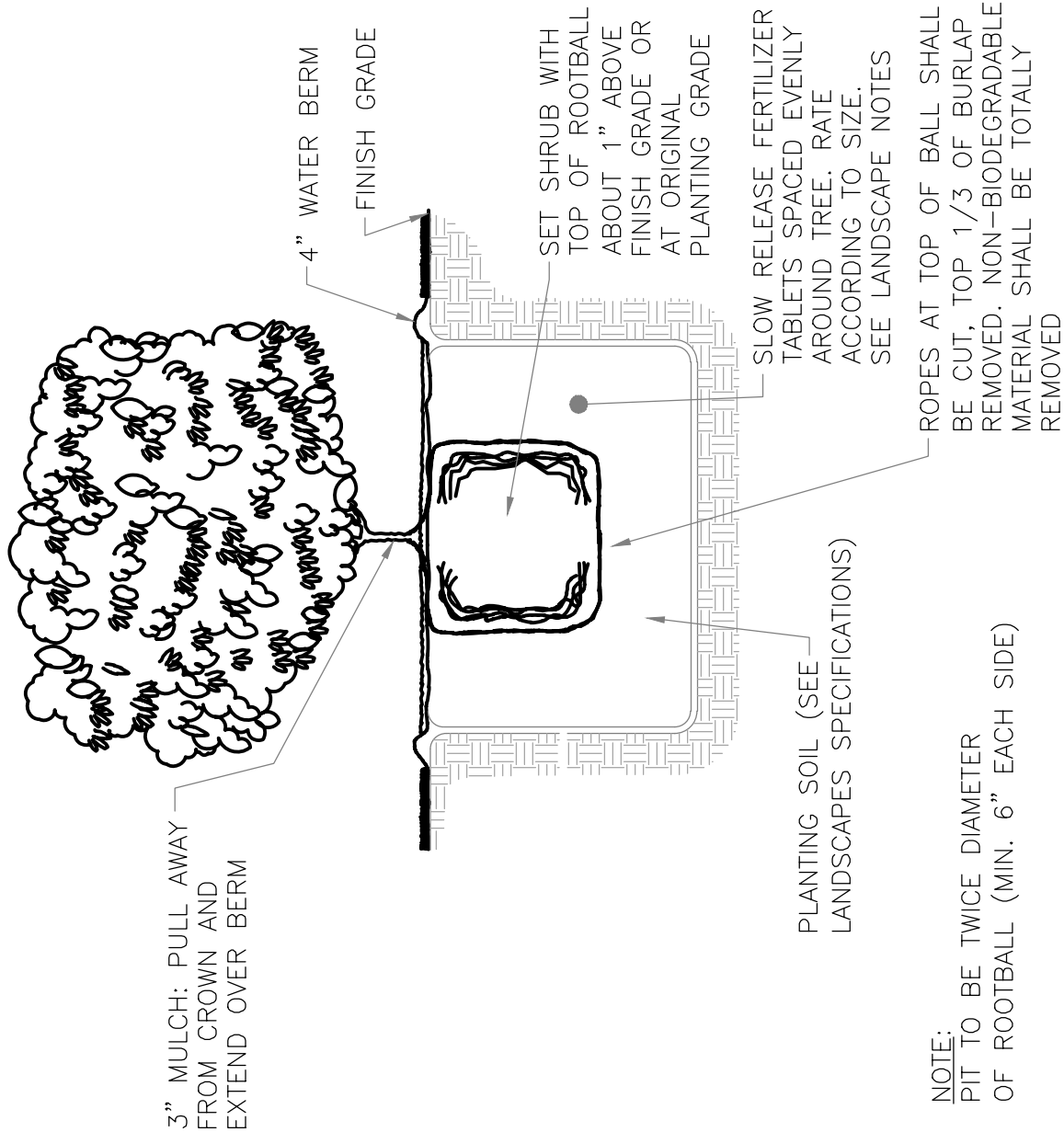
ATHLETIC FIELDS — PERMANENT SEED MIXTURE	
SEED TYPE	APPLICATION RATE
KENTUCKY BLUE GRASS	2.5 LBS/1,000S.F. (110 LBS./ACRE)

STANDARD — PERMANENT SEED MIXTURE	
SEED TYPE	APPLICATION RATE
CREeping RED FESCUE	0.46 LBS/1,000S.F. (20 LBS./ACRE)
RED TOP	0.05 LBS/1,000S.F. (2 LBS./ACRE)
TALL FESCUE	0.46 LBS/1,000S.F. (20 LBS./ACRE)
TOTAL	0.97 LBS/1,000S.F. (42 LBS./ACRE)

PLANT SCHEDULE				
SYMBOL	QUANTITY	COMMON NAME	SCIENTIFIC NAME	NOTES
	1	SUGAR MAPLE	ACER SACCHARUM	1.75"—2" CALIPER, SPACING=50' O.C., 5' MIN. HEIGHT, 5 GALLON POT
	3	RED MAPLE (KARPICK)	ACER RUBRUM (KARPICK)	1.75"—2" CALIPER, SPACING=50' O.C., 5' MIN. HEIGHT, 5 GALLON POT
	18	RED MAPLE (BOWHALL)	ACER RUBRUM (BOWHALL)	1.75"—2" CALIPER, SPACING=50' O.C., 5' MIN. HEIGHT, 5 GALLON POT
	3	KOREAN MOUNTAIN ASH	SORBUS ALNIFOLIA	1.75"—2" CALIPER, SPACING=50' O.C., 5' MIN. HEIGHT, 5 GALLON POT
	4	ENGLISH OAK	QUERCUS ROBUR (REGAL PRINCE)	2" CALIPER, SPACING=50' O.C., 5' MIN. HEIGHT, 5 GALLON POT
	3	DOGWOOD	COMUS KOUSA	1.75" CALIPER, SPACING=40'
	22	RUSSIAN SAGE	PEROVSKIA ATRIPICIFOLIA	SPACING 5' O.C., 1 GALLON POT
	11	WINTERBERRY	ILEX VERTICILLATA (WINTER RED)	3 GALLON POT, HEIGHT=18", SPACING=5'
	11	COMMON LILAC	SYRINGA VULGARIS (MISS KIM)	3 GALLON POT, HEIGHT=18", SPACING=5'



TREE INSTALLATION: UNDER 10'
NOT TO SCALE



PLANTING/SHRUB INSTALLATION
SCALE: NTS

REFERENCES:
CIVIL 3D 2015 Drawing Name:
CIVIL 3D 2015 Survey Database:
CIVIL 3D 2015 Data Shortcuts:

DESIGNED BY: 1/21/2017

DATE: 11-21-17

AS NOTED

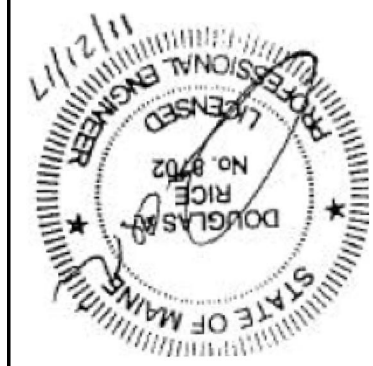
SCALE:

DRAWN BY:

CHECKED BY:

DATE:

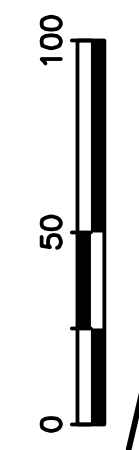
11-21-17



LLM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
LANDSCAPE DETAILS

CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION





PLAN
SCALE: 1"=50'

FIG-1

PLAN NUMBER

SHEET #

1 OF 1

CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION

LLM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
CIRCULATION PLAN

DESIGNED BY: 11/21/17
DRAWN BY: 11/21/17
CHECKED BY: 11/21/17
DATE: 11/21/17
AS NOTED: 11/21/17
SCALE: 1"=50'
DWA: 11/21/17
MRL: 11/21/17
MAE: 11/21/17

PROFESSIONAL ENGINEER
MICHAEL A. GUETHLE
14284
STATE OF MAINE

REFERENCES:
CIVIL 3D 2015 Drawing Name:
CIVIL 3D 2015 Survey Database:
CIVIL 3D 2015 Data Shortcuts:

REVISIONS:
PERMITTING SUBMISSION

STATE OF MAINE
PROFESSIONAL ENGINEER
DOUGLAS A. RICE
11/21/17

PERMITTING SET
ISSUED FOR PERMITTING
NOVEMBER 2017

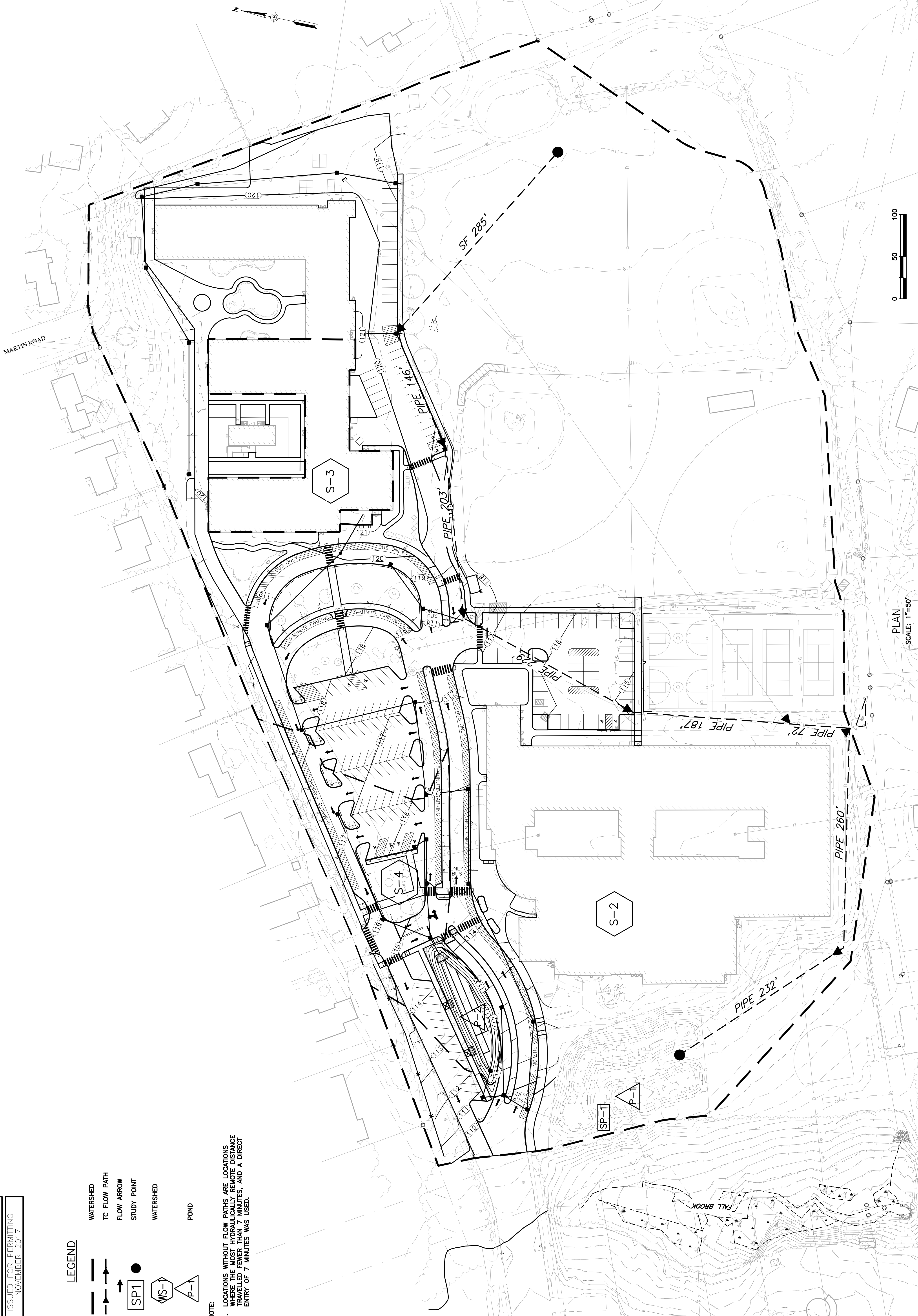
PERMITTING SET
ISSUED FOR PERMITTING
NOVEMBER 2017

LEGEND

- WATERSHED
TC FLOW PATH
FLOW ARROW
STUDY POINT
WATERSHED
POND
- SP-1
WS-1
P-1

NOTE:

1. LOCATIONS WITHOUT FLOW PATHS ARE LOCATIONS WHERE THE MOST HYDRAULICALLY REMOTE DISTANCE TRAVELLED FEWER THAN 7 MINUTES, AND A DIRECT ENTRY OF 7 MINUTES WAS USED.



PLAN
SCALE: 1"=50'



CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION

LLM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
POST DEVELOPMENT
DRAINAGE PLAN



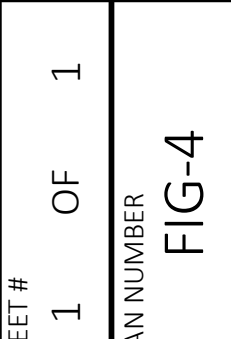
DESIGNED BY:
DRAWN BY:
CHECKED BY:
SCALE:
DATE: 11-21-17

REFERENCES:
REVISONS:
PERMITTING SUBMISSION

Civil 3D 2015 Drawing Name:
Civil 3D 2015 Survey Database:
Civil 3D 2015 Data Shortcuts:



SHEET #
2 OF 2
PLAN NUMBER
FIG-3

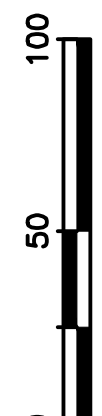
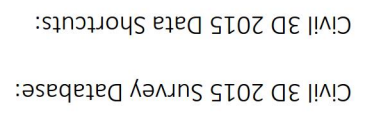


LLM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
PHASING PLAN

REVISIONS:
PERMITTING SUBMISSION

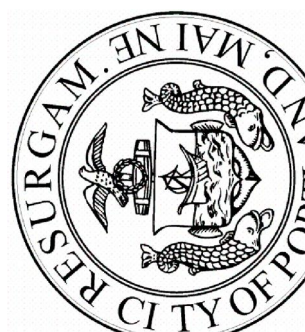
11-21-17
DATE:
AS NOTED
SCALE:
DAR
CHECKED BY:
MRL
DRAWN BY:
IMAG

Michael A. Gueffle
PROFESSIONAL ENGINEER
LICENSED
14284
MICHAEL A.
GUEFFLE
STATE OF MAINE
1/12



PLAN
SCALE: 1"=50'

PERMITTING SET
ISSUED FOR PERMITTING
NOVEMBER 2017



CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION

LM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
CIRCULATION PLAN - FIRETRUCK



REVISIONS:

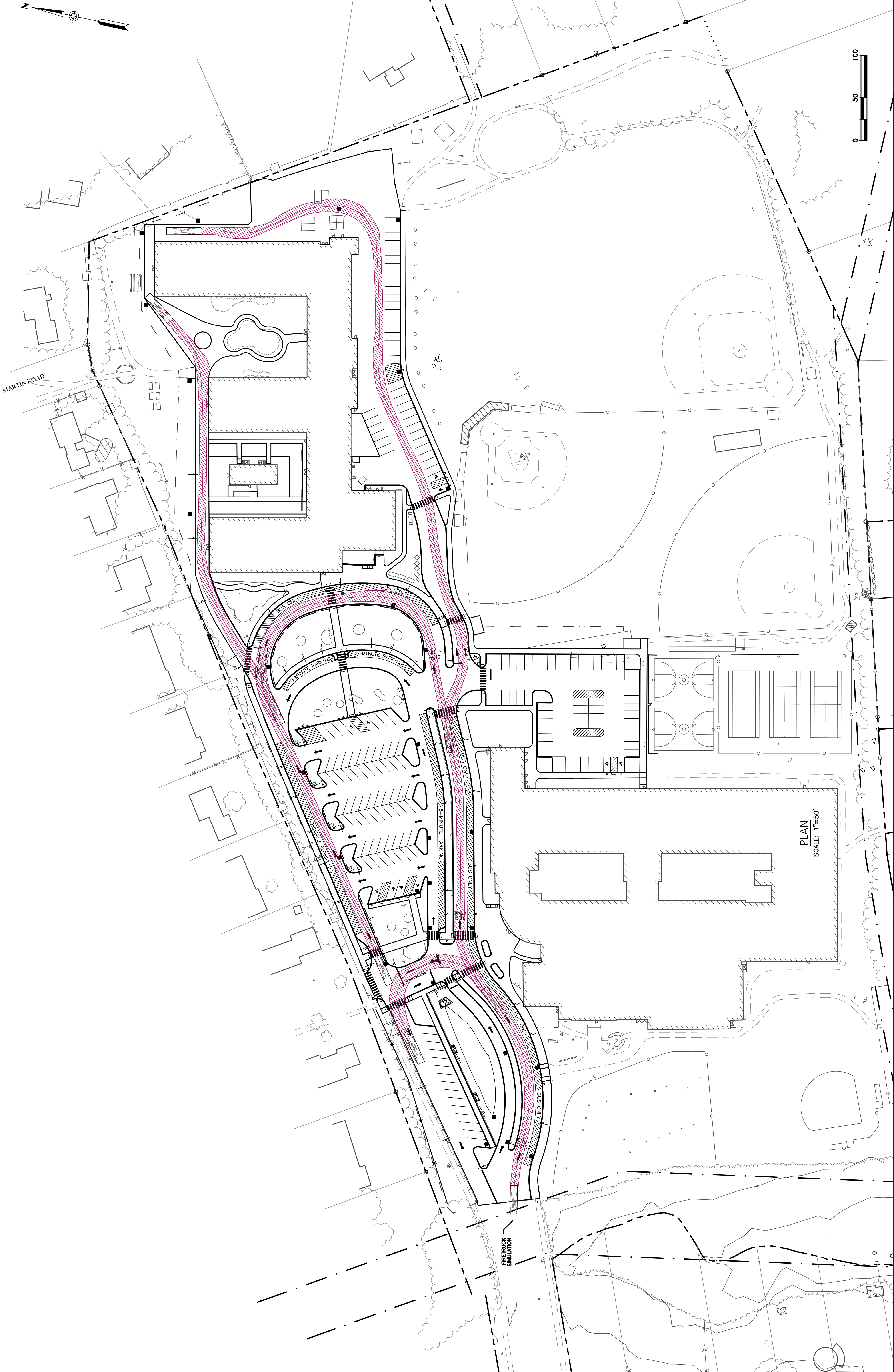
PERMITTING SUBMISSION

REFERENCES:

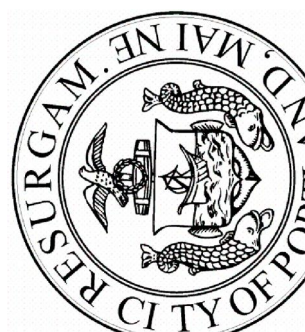
Civil 3D 2015 Drawing Name:
Civil 3D 2015 Survey Database:
Civil 3D 2015 Data Shortcuts:



PLAN
SCALE: 1"=50'



PERMITTING SET
ISSUED FOR PERMITTING
NOVEMBER 2017



CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION

LM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
CIRCULATION PLAN - BUS



REVISIONS:

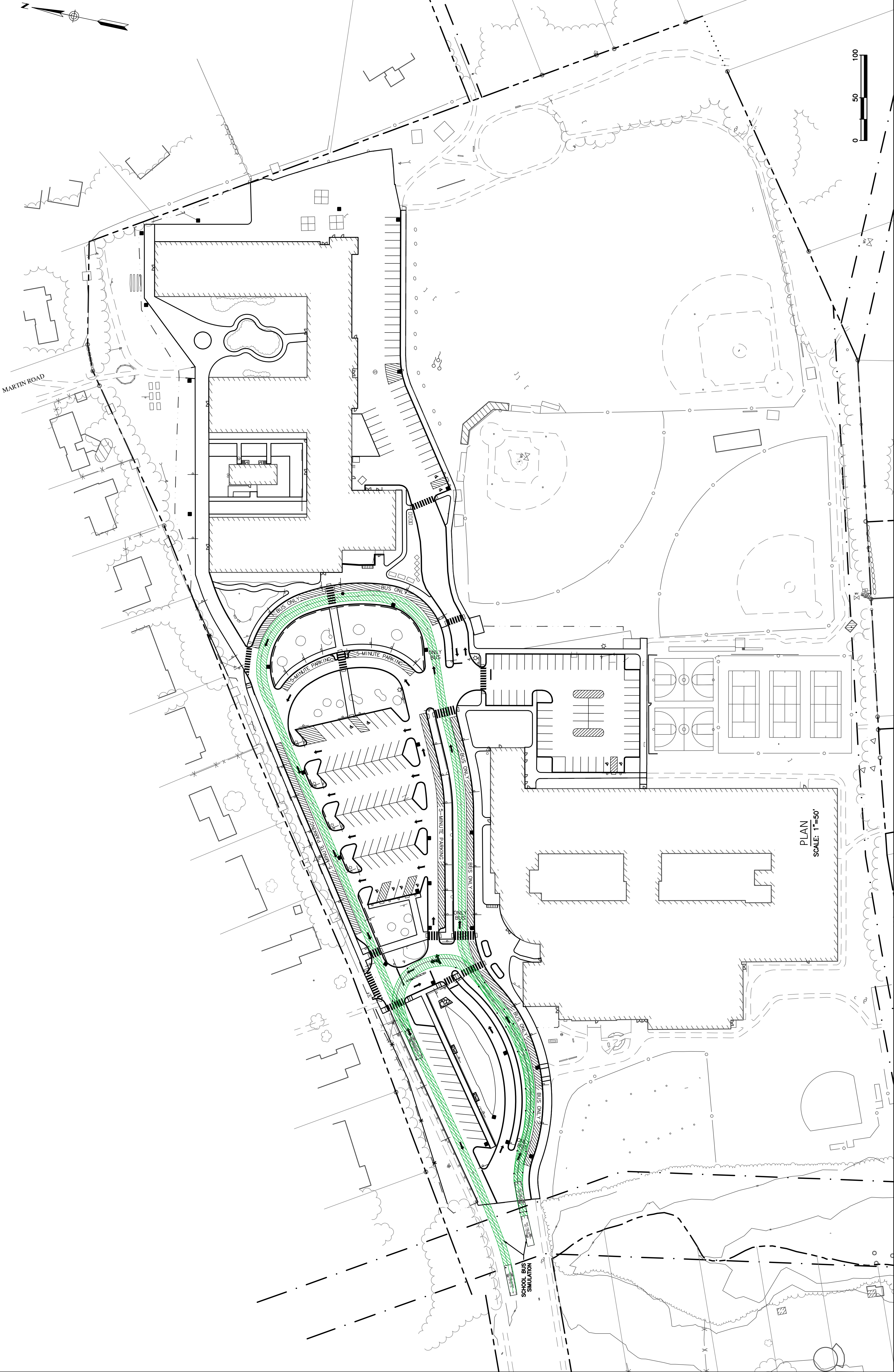
DATE: 11-21-17
AS NOTED
SCALE:
DAR
CHECKED BY:
MRL
DRAWN BY:
MAG

REFERENCES:

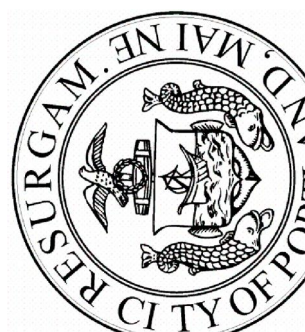
Civil 3D 2015 Drawing Name:
Civil 3D 2015 Survey Database:
Civil 3D 2015 Data Shortcuts:



PLAN
SCALE: 1"=50'



PERMITTING SET
ISSUED FOR PERMITTING
NOVEMBER 2017

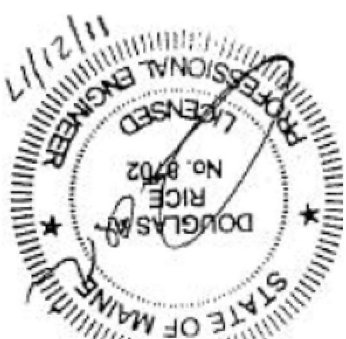


CITY OF PORTLAND, MAINE
PARKS, RECREATION AND FACILITIES
MANAGEMENT DIVISION

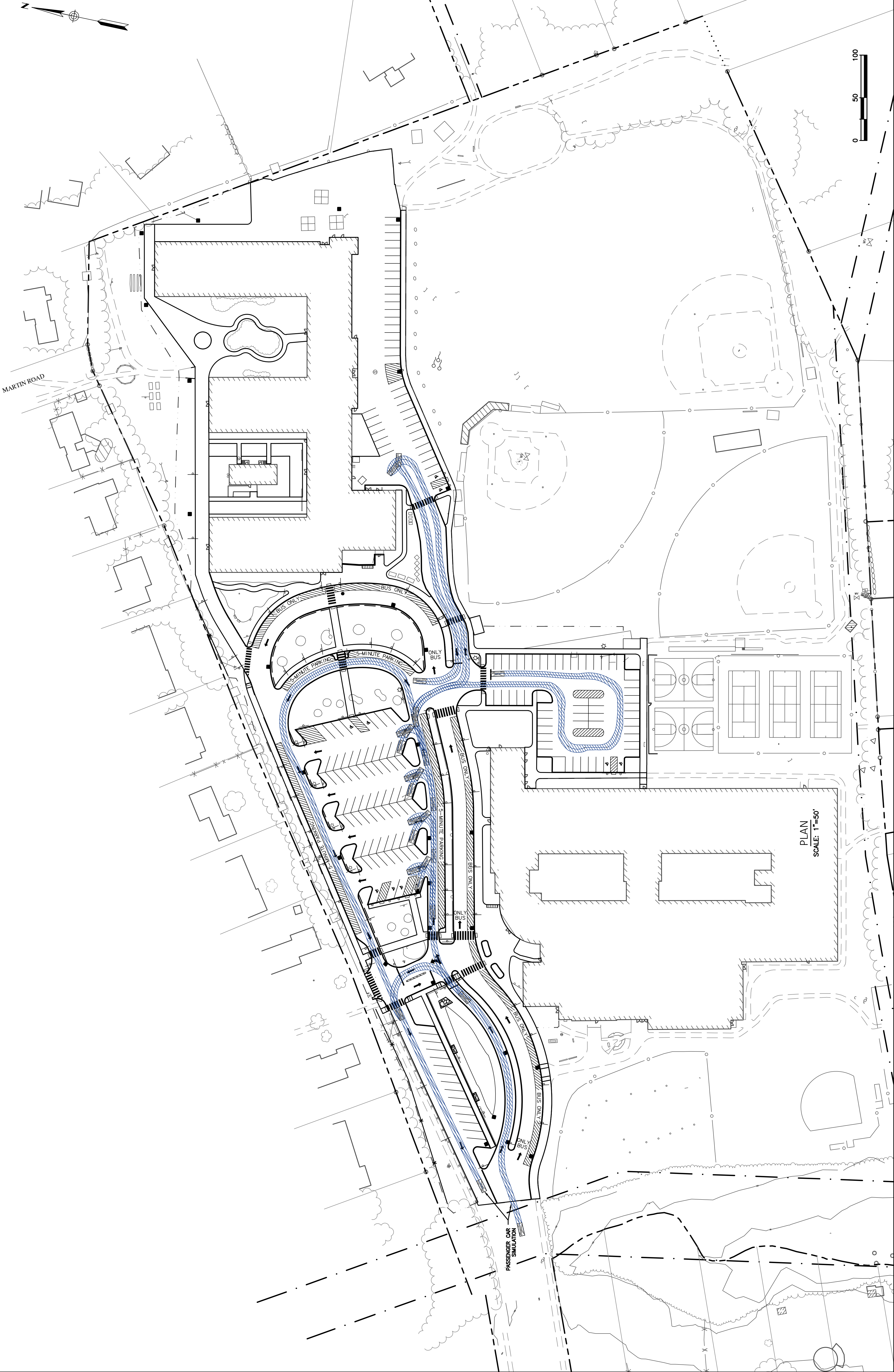
LM CAMPUS IMPROVEMENTS
CIRCULATION PROJECT
CIRCULATION PLAN -
PASSENGER CAR



REFERENCES:
CIVIL 3D 2015 Drawing Name:
CIVIL 3D 2015 Survey Database:
CIVIL 3D 2015 Data Shortcuts:
REVISIONS:
PERMITTING SUBMISSION



PLAN
SCALE: 1"=50'



PERMITTING SET
ISSUED FOR PERMITTING
NOVEMBER 2017

Portland Public Schools

Assuring that all students are learning for their future

Harrison Lyseth Elementary School

Administration

Lenore M. Williams, Principal

Peter McCormack, Asst. Principal

175 Auburn St., Portland, Maine 04103

(207) 874-8215

December 4, 2017

Dear Chair Boepple and Members of the Portland Planning Board:

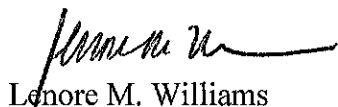
It is with great enthusiasm that I support the proposal you have before you for Project #2017-202, 171 Auburn Street. Traffic flow and parking have been an on going concern on the Moore-Lyseth campus. Also a concern is the increase we have seen in both vehicle and pedestrian traffic on both campus' over recent years. Community members can and do access the campus from a various locations, most notably traffic enters from the main entrance on Auburn Street but also enters on Bartley Avenue and Junior Street. This scenario always presents challenges and safety concerns during our morning arrivals and afternoon dismissals.

Improvements to circulation and parking will dramatically decrease the likelihood of an incident where student (pedestrian) traffic is in conflict with buses and cars. Having clearly designated traffic loops (one for buses-nearest the school) and a second loop for passenger cars will substantially improve safety for both pedestrians and motorists.

I was particularly encouraged that thought and consideration has been given to improve crosswalks (Junior Street and Washington Ave. Ext.) and to increase crossing guard support at Allen Avenue and Bramblewood/Virginia. In my nearly 11 years as Principal of Lyseth Elementary School, I have lost count of the number of times I have received calls from concerned parents and community members regarding safety issues for students centered around the need for better delineated/defined crosswalks and sidewalks in addition to more crossing guard staff at key points/locations.

I am most appreciative of the time and effort that has been put into this plan by Mr. Onos and Consultants Rice and Guethle. The need is great and the time is now for the recommended improvements.

Sincerely,



Lenore M. Williams

Principal, Lyseth Elementary School



Portland Public Schools

Learning to Succeed

Equal Opportunity Employer