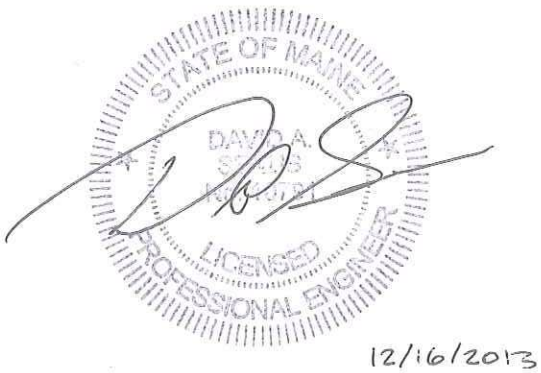
WOODARD &CURRAN

LEVEL I SITE ALTERATION APPLICATION

Rockland Avenue Outfall



12/16/2013

225672.77
City of Portland
December 2013

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

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1. APPLICATION FORM

Effective August 18, 2010

Level I – Site Alteration
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 I: Site Alteration site plan.

Level I: Site Alteration Development includes:

- Alteration of a watercourse or wetland as defined in Section 14-47 of the City Code.
- Alteration of a site. The disturbance of land areas of less than one (1) acre that are stripped, graded, grubbed, filled or excavated. The Planning Authority shall exempt from review the loam and seeding of lawns and the cumulative placement of less than fifteen (15) cubic yards of fill on any lot provided such loaming or placement does not alter a drainage course, swale, wetland or redirect water onto adjoining property and does not violate any other provision of the Portland City Code or state or federal law. "Disturbed area" does not include routine maintenance, but does include re-development and new impervious areas.
- The construction of any temporary or permanent parking area, paving of existing unpaved surface parking areas between 1,000 and 7,500 square feet, or creation of other impervious surface areas between 1,000 and 7,500 square feet.
- The rehabilitation or reconstruction, but not new construction, of piers, docks, wharves, bridges, retaining walls, and other structures located within the shoreland zone.
- A site alteration in which vehicle access is proposed from more than one (1) street;

The Land Use Code (including Article V), the Technical Manual, and the Design Manual are available on the City's web site at http://www.portlandmaine.gov/planning/default.asp or copies may be purchased at the Planning Division Office.

Planning Division
Fourth Floor, City Hall
389 Congress Street
(207) 874-8721 or (207) 874-8719

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

PROJECT NAME: Rockland Avenue Outfall

PROPOSED DEVELOPMENT ADDRESS:

Capisic Pond Park, on the north side of Capisic Street, west of Stevens Avenue, in the Rosemont Neighborhood.

PROJECT DESCRIPTION:

Improvements include the stabilization of the channel below the Rockland Avenue Outfall using natural rounded river stone and plantings consistent with previous park restoration work, and the installation of an underground in-line trash and sediment control structure uphill of the outfall in order to provide benefits to the pond and help increase the likelihood of sucess for the Capisic Pond Enhancement project.

CHART/BLOCK/LOT: 224AX001

CONTACT INFORMATION:

	Applicant's Contact for electronic plans Name: **Woodard & Curran, c/o Lauren Swett, PE** e-mail: **lswett@woodardcurran.com** work #: **207-774-2112**
Applicant – must be owner, Lessee or Buyer Name: **Doug Roncarati, Stormwater Program Coordinator** Business Name, if applicable: **City of Portland Department of Public Services, Engineering** Address: **55 Portland Street** City/State : **Portland/ME** Zip Code: **04101**	**Applicant Contact Information** Work # **207-874-8848** Home# Cell # Fax# e-mail: **dar@portlandmaine.gov**
Owner – (if different from Applicant) Name: Address: City/State : Zip Code:	**Owner Contact Information** Work # Home# Cell # Fax# e-mail:
Agent/ Representative Name: **Woodard & Curran, c/o David Senus, PE** Address: **41 Hutchins Drive** City/State : **Portland/ME** Zip Code: **04102**	**Agent/Representative Contact information** Work # **207-774-2112** Cell # e-mail: **dsenus@woodardcurran.com**
Billing Information **(Same as Applicant)** Name: Address: City/State : Zip Code:	**Billing Information** Work # Cell # Fax# e-mail:

Engineer	Engineer Contact Information
Name: **Woodard & Curran, c/o David Senus, PE**	Work # **207-774-2112**
Address: **41 Hutchins Drive**	Cell # Fax#
City/State : **Portland/ME** Zip Code: **04102**	e-mail: **dsenus@woodardcurran.com**
Surveyor	**Surveyor Contact Information**
Name: **City of Portland, Department of Public Services**	Work #
Address: **55 Portland Street**	Cell # Fax#
City/State : **Portland/ME** Zip Code: **04101**	e-mail:

APPLICATION FEES:

Check all reviews that apply. Payment may be made by Check or Cash addressed to the City of Portland.

Level I Site Alteration Site Plan Fee Waived for City Project Application Fee ($200.00) The City invoices separately for the following: • Notices ($.75 each) • Legal Ad (% of total Ad) • Planning Review ($40.00 hour) • Legal Review ($75.00 hour) Third party review is assessed separately.	**Fees Paid** (office use) ——

Performance Guarantee: A performance guarantee is required to cover all public and private site improvements.	Required
Inspection Fee: An inspection fee of 2% of the performance guarantee is due prior to the release of permits	2% of the performance guarantee

Application Check List

Refer to the application checklist for a detailed list of submittal requirements.

All site plans and written application materials must be uploaded to a website for review. At the time of application, instructions for uploading the plans will be provided to the applicant. One paper set of the plans, written materials and application fee must be submitted to the Planning Division Office to start the review process.

Portland's development review process and requirements are outlined in the Land Use Code (Chapter 14), which includes the Subdivision Ordinance (Section 14-491) and the Site Plan Ordinance (Section 14-521).

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 Site Plan review only, a Performance Guarantee, Inspection Fee, Building Permit Application and associated fees will be required prior to construction.

Signature of Applicant: (Agent on behalf of the City of Portland)	**Date:** 12/16/2013

Please refer to Article V, Site Plan of the City of Portland Land Use Code for detailed information concerning the City's site plan review process, thresholds and standards. Should you have any questions regarding the submittal requirements or any other aspect of the site plan review process, please contact the Planning Division.

PROJECT DATA

The following information is required where applicable, in order complete the application

Total Site Area	784,080	sq. ft.
Proposed Total Disturbed Area of the Site	12,600	sq. ft.
IMPERVIOUS SURFACE AREA	N/A	
• Proposed Total Paved Area		sq. ft.
• Existing Total Impervious Area		sq. ft.
• Proposed Total Impervious Area		sq. ft.
• Proposed Impervious Net Change		sq. ft.
PARKING SPACES	N/A	
• Existing Number of Parking Spaces		
• Proposed Number of Parking Spaces		
TOTAL Number of Parking Spaces		

General Submittal Requirements – Level I Site Alteration

Applicant Checklist	Planner Checklist	Number of Paper Copies	Submittal Requirement
☑	☐	1	Completed application form.
☐ N/A	☐	1	Application fees.
☑	☐	1	Written description of project.
☑	☐	1	Evidence of right, title and interest.
☑	☐	1	Copies of required state and/or federal permits.
☑	☐	1	Written assessment of proposed project's compliance with applicable zoning. requirements.
☑	☐	1	Written description of existing and proposed easements or other burdens.
☐ N/A	☐	1	Written requests for waivers from individual site plan and/or technical standards.
☑	☐	1	Evidence of financial and technical capacity.

Site Plans and Boundary Survey Requirements – Level I Site Alteration

Applicant Checklist	Planner Checklist	Number of Copies	Submittal Requirement
☑	☐	1	Boundary Survey meeting the requirements of Section 13 of the City of Portland Technical Manual.
☑	☐	1	**Site Plan Including the following:**
☑	☐		▪ *Existing structures with distance from property line (including location of proposed piers, docks or wharves if in Shoreland Zone)*
☑	☐		▪ *Location and dimension of existing and proposed paved areas.*
☑	☐		▪ *Location and details of proposed infrastructure improvements (e.g. - curb and sidewalk improvements, utility connections, roadway improvements).*
☑	☐		▪ *Identification of and proposed protection measures for any significant natural features on the site (including wetlands, ponds, watercourses, floodplains, significant wildlife habitats and fisheries or other important natural features listed in Section 14-526 (b)1. of the Land Use Code.*
☐ **N/A**	☐		▪ *Details of proposed pier rehabilitation (Shoreland areas only).*
☑	☐		▪ *Existing utilities.*
☑	☐		▪ *Existing and proposed grading and contours.*
☑	☐		▪ *Proposed stormwater management and erosion controls.*
☑	☐		▪ *Total area and limits of proposed land disturbance.*
☑	☐		▪ *Existing vegetation to be preserved and proposed site landscaping.*
☑	☐		▪ *Existing and proposed easements or public or private rights of way.*

Site Plan Standards for Review of Level I: Site Alteration

Level I: Site alteration plans shall only be subject to the following site plan standards, as applicable, as contained in section 14-526:

(a) Transportation standards:
1. Impact on surrounding street systems,
2. Access and circulation, and
4. Parking

(b) Environmental quality standards
1. Preservation of significant natural features,
2. Landscaping and landscape preservation, and
3. Water quality, stormwater management and erosion control.

(c) Public infrastructure and community safety standards.
1. Consistency with city master plans.

(d) Site design standards
5. Historic resources,
6. Exterior lighting,
8. Signage and wayfinding, and
9. Zoning related design standards.

Except as provided in article III, or to conditions imposed under section 14-526(e) only, or to those submission requirements set forth in section 14-527 as relate solely thereto.

PORTLAND FIRE DEPARTMENT
SITE REVIEW
FIRE DEPARTMENT CHECKLIST

A separate drawing[s] shall be provided to the Portland Fire Department for all site plan reviews.

1. Name, address, telephone number of applicant.
2. Name address, telephone number of architect
3. Proposed uses of any structures [NFPA and IBC classification]
4. Square footage of all structures [total and per story]
5. Elevation of all structures
6. Proposed fire protection of all structures
   - ***As of September 16, 2010 all new construction of one and two family homes are required to be sprinkled in compliance with NFPA 13D. This is required by City Code. (NFPA 101 2009 ed.)***
7. Hydrant locations

2. PROJECT DESCRIPTION

2.1 PROJECT SITE & BACKGROUND

The Rockland Avenue Outfall is located in Capisic Pond Park, which is located on the north side of Capisic Street, west of Stevens Avenue in the Rosemont neighborhood of Portland. A location map is enclosed in Appendix A. The Rockland Avenue stormwater outfall discharges surface runoff (collected via storm drains) from approximately 160-acres of highly developed residential and commercial area into Capisic Pond, which lies in the lowest portion of the Capisic Brook watershed, and drains south to the tidal Fore River. Capisic Pond is the City of Portland's largest freshwater water body and the adjacent Park is a favorite destination for area residents and bird watchers.

The stormwater runoff from the Rockland Avenue outfall carries pollution from the upstream developed areas into Capisic Pond. Erosion of the channel below the outfall has also been identified as a problem, as undermining of the outfall pipe may compromise infrastructure, and the erosion adds to sedimentation in the Pond. The following photograph shows the existing outfall:

Figure 2-1: Photograph of Rockland Avenue Outfall

In recent years, visitors to the Park have expressed concerns to the City about the visible impacts associated with the outfall, most notably the trash and sediment that collects in the channel below the outfall, erosion that occurs along the banks of the channel during high flow/high velocity storm events, and the overall "look" of the outfall pipe and associated aluminum trash rack. Park visitors and concerned citizens have also expressed concerns over what impact the stormwater discharges from this outfall have on the overall water quality of the Pond and the wildlife that relies on the habitat that the park offers. In February of 2012, project stakeholders (via a public meeting) expressed a desire to identify a stormwater quality treatment retrofit solution for the outfall which would stabilze the channel and provide trash and sediment removal.

The current stormwater quality controls for the outfall consist primarily of deep sump catch basins and Casco Traps on the outlets of many of the upstream connected catch basins. Deep sump catch basins provide limited non-floatable trash and sediment reduction, and Casco Traps provide limited control for floatable trash and oils and grease. Non-structural stormwater management in this watershed primarily consists of public education and outreach programs, catch basin cleaning programs, and street sweeping. The system is fully separated, so the primary sources of pollutants are roadways, yards, and parking lots. Pollutants in stormwater can be variable and broad ranging; however, the pollutants that are visibly present at the outfall and channel include floatable and non-floatable trash and sediment. Less visible, but common, pollutants in stormwater runoff are metals, petroleum by-products, chlorides, bacterial indicators, and nutrients.

2.2 PROJECT NEED

Over the past 15 years, the City has made significant investment in improving the Capisic Brook watershed through combined sewer overflow abatement and stormwater management and planning. With recent Capisic Pond Park habitat enhancements through the West Side Interceptor Sewer Separation project and planned improvements to watershed quality under the Capisic Brook Watershed Management Plan, there is a high level of interest in further improving water quality in Capisic Pond. The Rockland Outfall projects, along with a larger Capisic Pond Enhancement project being permitted separately, will help to address pollutant and sediment issues that have been identified.

As development has increased over the past 50-years in the Capisic Brook watershed, runoff into Capisic Pond has presumably increased, and sediments have built up in Capisic Pond. The shallow, slow-moving, and nutrient-rich water favors the growth of cattails (Typha spp.).

Cattails are aggressive colonizers when they take hold and are often able to out-compete most other wetland plant species and form large monocultures (i.e. stands of a single plant species). The cattail stands can be very dense and will slow surface water, causing additional sediments to settle, furthering the sedimentation of the pond and favoring additional cattail growth. While emergent marsh habitat (including cattails) is utilized by a variety of waterfowl species, a monoculture is not the most beneficial scenario, as it does not provide habitat for as wide of a variety of species as a diverse wetland habitat. Additionally, as the cattails expand, the percentage of the wetland system that is dominated by open water begins to shrink, as demonstrated by the figure below. This can negatively impact the pond's rating for wading bird and waterfowl habitat.

Figure 2-2: 2001 Aerial Imagery (Top) VS 2009 Aerial Imagery (Bottom)

The Maine Department of Inland Fisheries and Wildlife (MDIFW) rates Inland Waterbird and Waterfowl Habitats (IWWHs) based on five categories. For each potential habitat, points are assessed in the following categories: dominant wetland class, wetland diversity, size of the wetland, interspersion of different wetland types, and percentage of open water. All points are tallied, and a score is given to the habitat to determine its ranking as a low-, moderate-, or high-value. Capisic Pond is currently ranked as moderate value, but is trending quickly towards a low-value rating. Cattail encroachment is causing a loss of open water habitat, and is slowly leading to a degradation of the IWWH habitat and a reduction of the scenic and recreational aspects of the pond. With cattail encroachment, the pond is losing its ranking points for percent open water.

The proposed Rockland Avenue Outfall project will help to reduce the amount of pollution and sediment being discharged into Capisic Pond. This will help to ensure the success of future Capisic Pond enhancement projects that aim to increase the open water area of the pond and diversify the pond's wetland species. In addition, the project will address structural pipe issues by resetting and structurally securing displaced sections of pipe near the outfall end and will provide a means of channel stabilization to remediate the existing scour and erosion that is occurring within the drainage channel.

2.3 PROPOSED PROJECT

The Rockland Avenue Outfall work will help increase the likelihood of the success of the Capisic Pond Enhancement project by helping to manage pollutants and sediment discharged to the pond from a large drainage area. Improvements planned for the outfall include stabilization of the channel below the Rockland Avenue outfall using natural rounded river stone and plantings consistent with previous park restoration work.

An underground, in-line trash and sediment control structure will also be installed near the park entrance at Rockland Avenue, uphill of the outfall. This system will require quarterly inspections in the first year to monitor sediment and debris loading, followed by at minimum annual cleaning via vac-truck thereafter. The damaged end of the existing 60-inch reinforced concrete outfall pipe will be repaired, reset and structurally secured. All areas within the project limit of work will be temporarily impacted and restored.

This project is part of the overall enhancement plan for Capisic Pond, and that a Preliminary Level III Site Plan Application for additional work for the Capisic Pond Enhancement project is being submitted concurrently and under separate cover.

2.4 LEVEL I SITE ALTERATION APPLICATION

Due to the size of the proposed land disturbance (less than one acre, including stripping, grading, grubbing, filling, and excavation), the project qualifies for review under a Level I Site Alteration. The following Report is presented in conformance with the requirements of a Level I Site Alteration Application. Attachments are included with the Report in support of various sections. Civil and landscaping plan sheets showing the proposed design of the project have been attached for your reference.

3. EVIDENCE OF RIGHT, TITLE, AND INTEREST

The Rockland Avenue Outfall is located in Capisic Pond Park, on the north side of Capisic Street, west of Stevens Avenue. The project site is located entirely on public land owned by the City of Portland (parcel located at chart, block, lot 224A X001).

3.1 BOUNDARY SURVEY

Enclosed in Appendix B are two plan sheets entitled "Plan of City Property at Capisic Pond" prepared by the City of Portland, Maine Parks and Public Works Department, Engineering Division in September 1993. The City of Portland Department of Public Services is currently working on preparing a new "boundary page" to verify and update the 1993 Plan for the areas associated with and adjacent to the work. The updated boundary page will be forwarded to the Planning staff when it becomes available.

4. EVIDENCE OF STATE AND/OR FEDERAL APPROVALS

Woodard & Curran and the City of Portland have engaged the Maine Department of Environmental Protection (MaineDEP), the U.S. Army Corps of Engineers (USACOE), and the Maine Department of Inland Fisheries and Wildlife (MDIFW) throughout the preliminary design phases of this project. The proposed project will require the following state and federal approvals:

- Natural Resource Protection Act (NRPA) Permit-By-Rule – The project is anticipated to qualify for a NRPA Permit By Rule (PBR) under MaineDEP Chapter 305 rules. The project must meet the requirements of three sections of the PBR requirements.
    - Section 7 – Outfall pipes
    - Section 13 – Habitat creation or enhancement and water quality improvement activities
    - Section 20 – Activities located in, on or over high or moderate value inland waterfowl and wading bird habitat, or shorebird nesting, feeding, and staging areas
- USACOE – It is anticipated that the project will qualify for Category 1 approval under the USACOE General Permit for Maine.

The City will be notified of any change in permitting requirements for the project. Copies of permits or notification forms will be provided to the City under separate cover as they become available.

5. EVIDENCE OF FINANCIAL AND TECHNICAL CAPACITY

5.1 FINANCIAL CAPACITY

A cost estimate has been completed for the Rockland Avenue Outfall project. The estimated cost of permitting, design, construction, and construction administration is approximately $300,000. The project is included in the City of Portland's approved 2014 Capital Improvement Plan and $315,000 has been allocated for this project through the City's sewer fund.

5.2 TECHNICAL CAPACITY

On behalf of the City of Portland, Woodard & Curran is preparing this site plan application for the Rockland Avenue Outfall project. Woodard & Curran has extensive experience with these types of projects and resumes can be made available upon request. Woodard & Curran is an over 800 person Portland based firm that has provided engineering services to the public sector for more than 30 years, including permitting, civil/site engineering, stormwater, and construction management services.

Woodard & Curran is supported in this project by Regina S. Leonard, R.L.A. for landscape architecture and Boyle Associates Environmental Consultants for wetland biology.

6. ASSESSMENT OF ZONING

The project is located within the City of Portland Recreation and Open Space Zone (R-OS), and the Stream Protection Overlay Zone, and will be designed to comply with the standards and intent of Divisions 8.5 and 26.7 of the Land Use regulations, respectively. The proposed activities will not result in any changes to the site's existing use.

6.1 RECREATION AND OPEN SPACE ZONE (LAND USE CODE DIVISION 8.5)

The project consists of enhancements to an existing municipal park. In accordance with Division 8.5 of the Land Use Code, municipal parks are a permitted use within the R-OS zone.

6.1.1 Space and Bulk Requirements (Land Use Code Section 14-157)

No building or structure of a permanent nature will be erected, altered, enlarged, rebuilt, or used as part of the proposed project. This section of the Land Use Code is not applicable.

6.1.2 Development Standards for Recreation and Open Space Zone (Land Use Code Section 14-158)

The proposed project is not a new development, and no buildings or parking areas will be constructed or modified as part of this project. The work will be enhancement of an existing municipal park through improvements to an existing outfall and stream. The project shall comply with the development standards outlined in Section 14-158 of the Land Use Code. Per the City's standards, vegetated areas not left in their natural state will be suitably landscaped, and natural features will be preserved to the greatest possible extent. A landscaping plan for the area has been provided as part of the plan set.

6.1.3 Shoreland and Flood Plain Management Regulations (Land Use Code Section 14-159)

The proposed project is located in a flood hazard zone, and shall comply with the requirements of Division 26.5, as discussed below.

6.2 FLOOD PLAIN MANAGEMENT REGULATIONS (LAND USE CODE DIVISION 26.5)

The project is required to comply with the flood plain management regulations because the proposed work will be taking place within an area of special flood hazard (14-450.3). Areas of special flood hazard are defined as "the land in the flood plain having a one (1) percent or greater chance of flooding in any given year as specifically identified in the Flood Insurance Study" (14-450.5). The attached FEMA FIRM map shows that a portion of the project area is located within the AE Zone.

The requirements of a flood hazard area development permit shall be met as required for this project (14-450.6). The project will conform to the following standards of the flood plain management regulations (14-450.8):

- No new development is proposed as part of this project (14-450.8(a)).
- There are no new or existing public water supplies associated with the proposed project (14-450.8(b)).
- There are no new or existing public sanitary sewage systems associated with the proposed project (14-450.8(c)).

- No new on-site waste disposal systems are proposed as part of this project (14-450.8(d)).
- No reduction in the flood carrying capacity of Capisic Brook will occur as a result of this project (14-450.8(e)).
- No residential structures will be constructed as part of this project (14-450.8(f)).
- No non-residential structures will be constructed as part of this project (14-450.8(g)).
- The project will not include any manufactured homes (14-450.8(h)).
- The project will not include any recreational vehicles (14-450.8(i)).
- The project will not include any accessory structures (14-450.8(j)).
- The project will not result in any increase in flood levels within the community during the occurrence of the base flood discharge (14-450.8(k)).
- No structures will be constructed as part of this project (14-450.8(l)).
- No new bridges will be constructed as part of this project (14-450.8(m)).
- No new containment walls will be constructed as part of this project (14-450.8(n)).
- No new wharves, piers, or docks will be constructed as part of this project (14-450.8(o)).
- The project is located within Zone AE, and will conform to all applicable local, state, and federal regulations (14-450.8(p)). Information on the project's other permit applications is included in Section 4.

6.3 STREAM PROTECTION REGULATIONS (LAND USE CODE DIVISION 26.7)

The project is required to comply with the stream protection regulations because the proposed work will be taking place within a stream protection zone (14-452). The stream protection zone includes all land areas within 75 feet, horizontal distance, of the normal high water line of a stream, as shown on the City of Portland Zoning Map.

6.3.1 Development Standards (Land Use Code Section 14-453)

No building or structure of a permanent nature will be erected, altered, enlarged, rebuilt, or used as part of the project (14-453 (a)), and no parking is proposed as part of this project (14-453(c)). Regrading will take place within the Stream Protection Zone. This permit application fulfills the Site Plan permitting requirements of Section 14-453(b).

7. CONFORMANCE WITH SITE PLAN STANDARDS

Section 14-524 of the City of Portland's Land Use Code outlines the site plan standards that must be met by Level I Site Alteration projects. These standards are defined in Section 14-526 of the Code. Level I Site Alteration plans shall only be subject to the following site plan standards, as applicable:

7.1 TRANSPORTATION STANDARDS

In general, there are no proposed changes to transportation systems. Construction access to the site will be managed to minimize impact to local streets and parking.

7.1.1 Impact on Surrounding Street Systems

No alterations to vehicular and pedestrian circulation are proposed as part of this project. No impacts to surrounding street systems are anticipated as a result of this project.

7.1.2 Access and Circulation

No changes to site access and circulation are proposed as part of this project.

7.1.3 Parking

No new parking, or alterations to existing parking, is proposed or required as part of this project.

7.2 ENVIRONMENTAL QUALITY STANDARDS

7.2.1 Preservation of Significant Natural Features

Significant natural features shall be preserved and protected, such that all areas within the project limit of work will be temporarily impacted and restored to existing conditions to the maximum extent practicable. Further information is provided in Section 8 of this report.

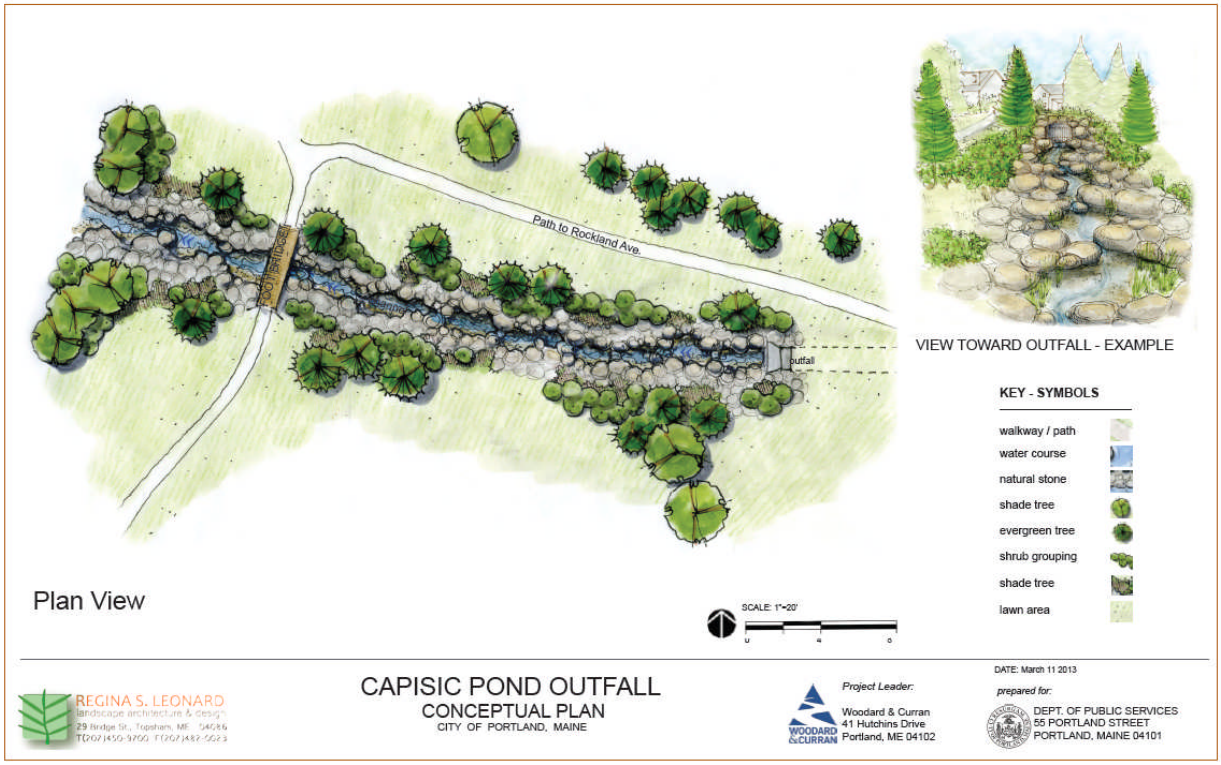
7.2.2 Landscaping and Landscape Preservation

Disturbance and removal of existing trees and other vegetation shall be limited to the maximum extent practicable, as necessary to accomplish the stabilization of the stream channel. A landscaping plan is included in the plan set to show proposed plantings along the stream channel. The figure on the following page shows a conceptual rendering of the area.

7.2.3 Water Quality, Stormwater Management, and Erosion Control

The proposed project will not alter existing stormwater drainage patterns. A negligible amount of impervious area will be created through the widening of a short section of existing gravel pathway to provide for maintenance access to the proposed water quality treatment unit. Approximately 150 square feet of additional gravel surface will be added. It is not anticipated that there will be an increase in peak stormwater flows at the site. The project will comply with the standards of Section 5 of the City of Portland Technical Manual, as discussed in Section 9 of this Report. Groundwater contamination is not anticipated to occur as a result of this project.

Figure 7-1 Rockland Avenue Outfall Conceptual Rendering



7.3 PUBLIC INFRASTRUCTURE AND COMMUNITY SAFETY STANDARDS

7.3.1 Consistency with City Master Plans

The City has made significant investment over the past 15 years in improving the Capisic Brook watershed through combined sewer overflow abatement and stormwater management and planning. With recent Capisic Pond Park habitat enhancements through the West Side Interceptor Sewer Separation project and planned improvements to watershed quality under the Capisic Brook Watershed Management Plan, the proposed work will ensure that the value and benefit of this work to the Capisic Pond is not diminished. The Rockland Avenue Outfall project will provide benefits to the pond and help increase the likelihood of success for the pond enhancement project, the permit application for which is being submitted concurrently and under separate cover.

7.4 SITE DESIGN STANDARDS

7.4.1 Historic Resources

The Rockland Avenue Outfall was installed in 2001. The proposed project will not impact any known archaeological resources or designated landmarks within designated historic districts or historic landscape districts.

7.4.2 Exterior Lighting

No exterior lighting is proposed as part of this project.

7.4.3 Signage and Wayfinding

No new signage is proposed as part of this project.

7.4.4 Zoning Related Design Standards

Narrative regarding how the proposed project will comply with zoning related design standards has been provided in Section 6 of this Report.

8. SIGNIFICANT NATURAL FEATURES

Capisic Pond is the largest fresh water body in the City of Portland, and the pond and surrounding areas make up a significant natural resource. The purpose of the proposed Rockland Avenue Outfall improvements is to reduce pollution and sedimentation to help provide improvements to the natural resource.

8.1 NATURAL RESOURCE IDENTIFICATION

A wetland delineation and functional assessment study was completed for the project area. The delineation and assessment was carried out by Boyle Associates in the summer and fall of 2012, and a final report was completed in September, 2012; this report describes the wetland areas in greater detail and has been attached as Appendix D for your reference.

An unnamed perennial stream was identified beginning at the Rockland Avenue Outfall, and flowing into Capisic Pond. The stream is fed by stormwater flows from the outfall with a low level of base flow that likely originates from surface water inlets (inflow) and groundwater (infiltration) that is collected in the closed drainage system. The area draining to the 60-inch outfall pipe is significant, and as a result, stream flows and velocities are very high during certain storm events, resulting in significant erosion to the stream channel. The proposed work will repair the eroded stream channel and will include measures to help prevent future erosion.

8.2 WILDLIFE HABITAT

The pond and surrounding areas, including the Rockland Avenue Outfall are currently mapped by the Maine Department of Inland Fisheries and Wildlife (MDIFW) as moderate-value Inland Wading Bird and Waterfowl Habitat (IWWH). Moderate value IWWHs are considered Significant Wildlife Habitat (SWH) under state law. This law provides additional protection for most land within 250-feet of the edge of the pond.

The project team has been working in conjunction with MaineDEP, MDIFW, and ACOE during conceptual design to ensure that wildlife habitat impacts are adequately considered as part of both the Rockland Avenue Outfall project and the separate Capisic Pond Enhancement project.

8.3 PROPOSED IMPACTS

All areas within the project limit of work will be temporarily impacted and restored as part of construction. The limit of work includes both upland and wetlands areas. Existing and proposed wetland areas are equivalent. The following table summarizes the anticipated temporary impacts:

Table 8-1: Rockland Avenue Outfall Improvement Areas of Impact

	Existing/Proposed
Total Wetland	1,400 SF
Total Upland	11,200 SF
Total Limit of Work Area	12,600 SF

The proposed work includes the creation of only a negligible amount of new impervious area (approximately 150 square feet) for the creation of a maintenance access path to the proposed water quality treatment unit.

9. STORMWATER MANAGEMENT

The proposed project must comply with the water quality, stormwater management, and erosion control standards identified by the City of Portland in the Land Use chapter of the Code of Ordinance. While the City's Technical Manual does not identify Level I Site Alteration projects on the list of projects requiring compliance with manual's Section 5 on stormwater management, Section 14-524 of the Code of Ordinance requires that the stormwater standards must be met for this level of permit submission.

9.1 EXISTING CONDITIONS

The site is located in the existing Capisic Pond Park. The park consists of open water, open space, and landscaped areas. The existing site runoff flows over the surface of vegetated areas and either infiltrates into the ground or directly to the nearby channel and Pond, and ultimately discharges to the tidal Fore River.

9.2 PROPOSED DEVELOPMENT

The proposed project consists of improvements to the existing Rockland Avenue Outfall, as described in Section 2.3. Only a negligible amount of impervious area (approximately 150 square feet of gravel surface) will be created as part of this project. Site runoff will continue to flow as it does in the existing condition.

9.2.1 Hydrologic Analysis

As the project will not result in new developed area, a new stormwater model was not generated for the project. The stormwater model initially developed for the outfall's design in 2000 was reevaluated and updated to account for additional areas that have been separated from the City's sewer system and added to the Rockland Avenue Outfall catchment area since the outfall's construction in 2001.

The hydrologic model of the Rockland Avenue Outfall was created using the HydroCAD® Stormwater Modeling System by Applied Microcomputer Systems. HydroCAD® uses TR20 runoff calculation methodology. The runoff curve numbers (CN) for the subcatchments have been computed using the TR55 methodology and are included in the HydroCAD® model. The subcatchments were divided based on land use, and area measurements were used to compute a weighted (composite) CN. The CN values were calculated using hydrologic soil group data provided by the City of Portland GIS database. Time of Concentration (TC) computation for the most hydrologically remote point in each subcatchment was developed from runoff time calculations based on length, slope, and surface runoff characteristics of sheet flow, shallow concentrated flow, channel flow, and direct entry flow; a minimum TC value for any subcatchment of five minutes was utilized.

The original HydroCAD® stormwater model was prepared by DeLuca-Hoffman Associates, Inc. as part of a Design Report for the City of Portland's Rockland Avenue Sewer Separation Project, dated October, 2000. In order to account for the additional areas that were not included in the hydrologic model prepared by DeLuca-Hoffman, additional data was obtained from the City's Geographic Information System (GIS) database, such as soil types, topography, and land use.

For this project, the 25-year return frequency storm of 24-hour duration was analyzed to verify pipe stormwater conveyance capacity, and the 1-inch storm was analyzed to determine an appropriate sized system for possible water quality treatment. A Type-III rainfall distribution was applied to these storms. To best model the interconnected impervious and developed areas of the watershed, an Antecedent Moisture Condition of III was utilized when modeling different storm events (representing saturated soils). The 25-year 24-hour precipitation measurement for Cumberland County, Maine (5.5 inches) was

taken from Appendix D of the November 1995 revision of Stormwater Management for Maine: Best Management Practices, prepared by the Maine Department of Environmental Protection.

The HydroCAD model has not been included with this application, but can be provided as desired. The design team has been working directly with the City of Portland Department of Public Services, and a summary of the hydrologic evaluation has been previously provided.

9.3 STORMWATER STANDARDS

The project will comply with the stormwater standards as outlined in the City of Portland's Technical Manual Section 5 and the Maine DEP's Chapter 500 Stormwater Management Rules.

9.3.1 Basic Standards

In accordance with Section 5 of the City of Portland Technical Standards, the project is required to meet the Basic Standards of the Maine DEP Chapter 500 rules. Erosion and sedimentation control measures will be utilized during construction to ensure that the work will not result in contamination of any natural resources.

Details for all proposed erosion and sedimentation control measures are included in the engineering plan set submitted with this application. The drawings also include a narrative describing the plan for all temporary and permanent erosion control techniques to be utilized on this project in accordance with MaineDEP Erosion Control Best Management Practices.

9.3.2 General Standards

The project will result in only a negligible increase in impervious area (approximately 150 square feet), and stormwater treatment is not required; however, the sole focus of the project is water quality improvement and habitat enhancement through the installation of a water quality treatment system and channel stabilization. The project is not required to meet the General Standards, and the treatment system selected to handle the existing flow-rates and reduce pollutants in the stormwater flow is not a MaineDEP approved BMP. However, in support of the MaineDEP NRPA permitting efforts, the MaineDEP Watershed Management Unit is acting as a supervising public natural resource agency for the project and is supportive of the design approach.

A "Nutrient Separating Baffle Box" by Suntree Technologies, Inc. has been proposed. The design team has worked directly with Suntree Technologies, Inc. to select and design a system, and a detail is provided in the plan set. The 10'x16' box system will be installed in-line with the existing 60-inch outfall pipe.

The proposed stormwater quality improvement retrofit has been adequately sized to provide water quality treatment for a storm with one inch of rainfall in 24 hours, a common storm event, while also accommodating high flow from large or high intensity storm events.

An operations and maintenance plan for the system is included in Appendix F. The proposed stormwater treatment system is not regulated by local or state regulations, and as such, is not required to be operated and maintained in accordance with Chapter 32 of the City of Portland Code; the proposed system will be managed as part of the City Department of Public Services program.

9.3.3 Flooding Standard

With only a negligible amount of new impervious area proposed, the project will not result in a change in flow. The hydrologic evaluation of the site described previously in this section was used to verify the adequacy of the existing outfall pipe. A copy of a Storm Drain Pipe Capacity Calculation spreadsheet is included as part of Appendix E of this report. This spreadsheet uses Manning's equation to determine the adequacy of the existing 60-inch pipe to handle the 25-year storm event peak flow, as calculated by the HydroCAD model. This calculation sheet indicates that the pipe will only be 50% full at the anticipated peak flow.

9.3.4 Urban Impaired Stream Standard

The project is located within the watershed of Capisic Brook, which is classified as an urban impaired stream; however, the proposed project will create only a negligible amount of new impervious surface (approximately 150 square feet of gravel surface) and no new development, and is therefore not required to provide compensation or mitigation in accordance with the Urban Impaired Stream Standard.

10. SOLID WASTE

10.1 MUNICIPAL SOLID WASTE MANAGEMENT

The proposed project will not result in any changes to solid waste management at the park.

10.2 CONSTRUCTION AND DEMOLITION DEBRIS

As with any construction project, the proposed construction will generate construction waste and demolition debris (CDD). The construction contractor(s) will be responsible for hauling the CDD, or contracting with a waste management service to haul the CDD, from the project site. The contractor(s) will be fully responsible for handling, managing, and disposing of all waste generated by construction in accordance with Maine Solid Waste Management Regulations – 06-096 CMR 400-409. The contractor(s) will be bound by contract to dispose of all materials in full accordance with all applicable local state and federal regulations. The contractor will measure the actual waste volumes at the time of construction.

11. UTILITIES

No new utilities are proposed as part of this project, and existing utilities that are located on the project site will be protected. At this time, impacts to public and private utilities from the construction of this project are not anticipated; however, advancement of the design plans may reveal utility conflicts. If utility impacts are identified, we will contact the impacted utility company to inform them of the planned work and incorporate any necessary requirements.

12. CONSTRUCTION MANAGEMENT PLAN

The Capisic Pond site will be managed during construction to minimize impacts to the surrounding area and natural resources. Security fencing will be utilized and may be adjusted to accommodate the construction activities for the project. Traffic controls will consist of temporary signage to manage pedestrian traffic.

Construction access to the outfall will be from the intersection of Rockland Avenue and Machigonne Street, and all access and parking will be maintained within the City of Portland right-of-way, unless the contractor obtains approval to utilize non-City-owned property. The Capisic Book Trail begins at this intersection and runs along the outfall pipe and drainage channel. The existing trail will be temporarily re-routed around the project area to allow for safe pedestrian access to Capisic Pond during construction. The contractor will be required to provide a construction management plan for the project, subject to the review and approval of the City and Engineer.

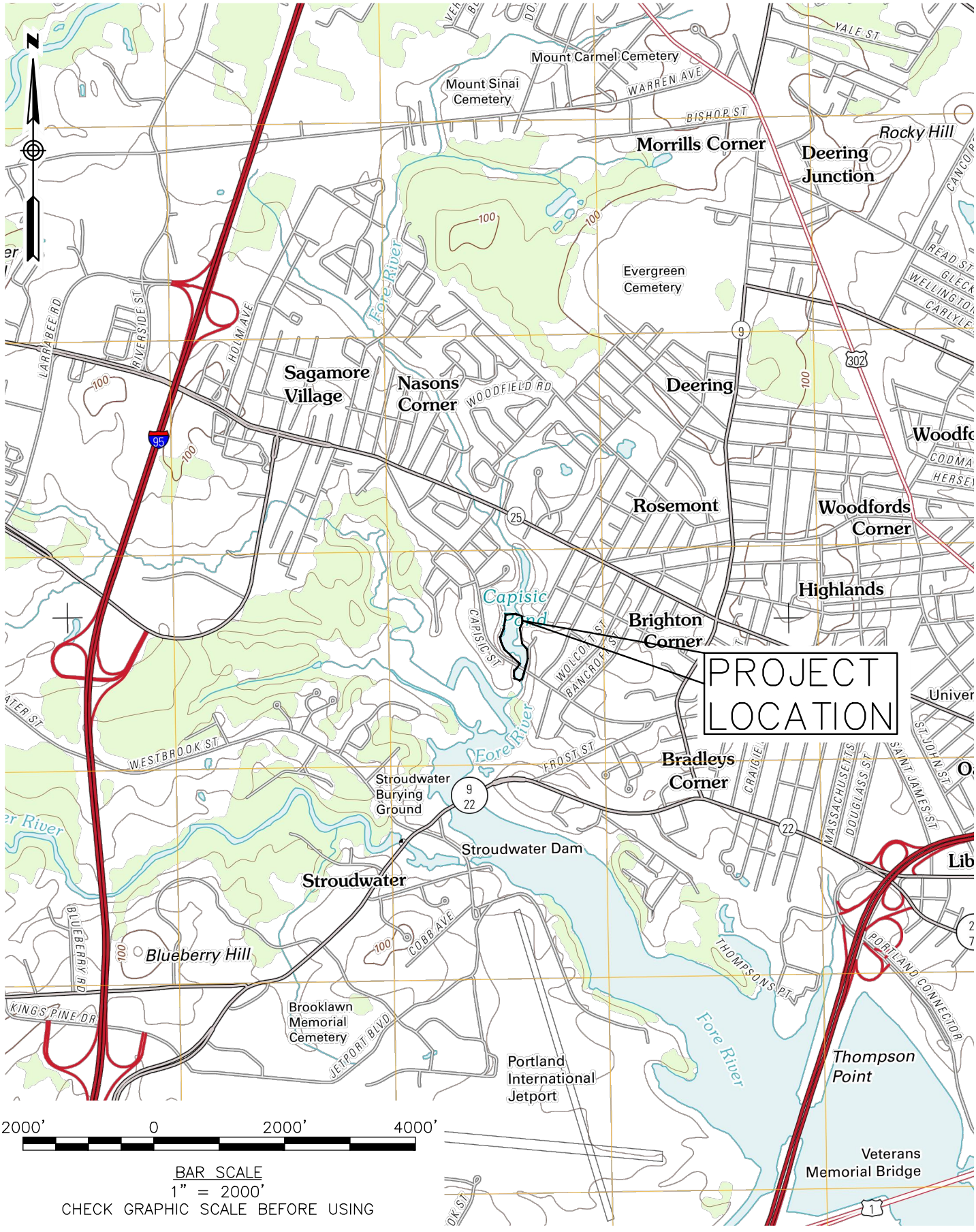
The construction of a reinforced maintenance access from Machigonne Street to the proposed stormwater quality improvement retrofit will be necessary. The system will have three 36-inch diameter access portals, and will be located near the intersection of Rockland Avenue and Machigonne Street; however, it will need to be placed approximately 30-feet away from Machigonne Street to avoid conflicts with existing utilities. This maintenance access will be located along a portion of the Capisic Brook Trail system that connects to Machigonne Street, and has been designed such that access improvement aesthetics are consistent with the existing trail system.

Temporary erosion and sedimentation control measures will be established prior to the start of construction and removed after construction has been completed and the site has been stabilized. Erosion and sedimentation control measures will include temporary construction access and sedimentation barriers. The locations of these erosion and sedimentation control measures will be specified on the construction plans.

13. FIRE DEPARTMENT REVIEW

The project will not result in the construction or modification of any structures, and no fire protection systems or hydrants will be required. We anticipate that review by the Fire Department will not be required for this project.

APPENDIX A: LOCATION MAP



2000' 0 2000' 4000'

BAR SCALE
1" = 2000'
CHECK GRAPHIC SCALE BEFORE USING

WOODARD &CURRAN
41 Hutchins Drive
Portland, Maine 04102
800.426.4262 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

PROJECT LOCATION MAP

DESIGNED BY: N/A	CHECKED BY: LJS
DRAWN BY: BCM	225672.77 SITE LOCATION*.dwg

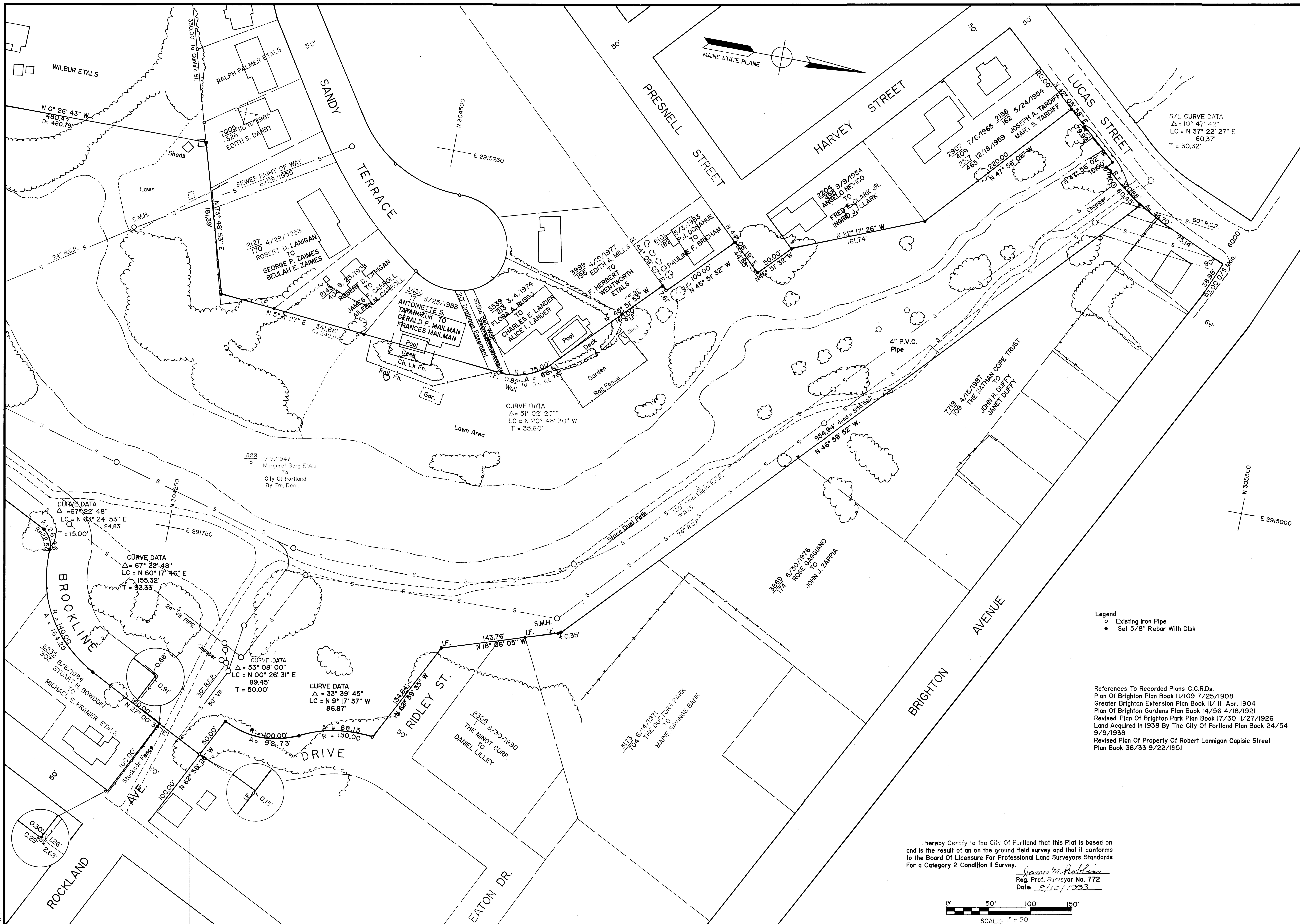
CITY OF PORTLAND
PORTLAND, MAINE

CAPISIC POND ENHANCEMENTS

JOB NO: 225672.77
DATE: NOVEMBER 2013
SCALE: 1"=2000'

FIG. 1

APPENDIX B: SURVEY



REFERENCES	DESCRIPTION	DATE

PROJECT NO	DESIGNED BY
DATE SEPT. 10, 1993	DRAWN BY J.M. ROBBINS
SCALE AS NOTED 1"=50'	CHECKED BY

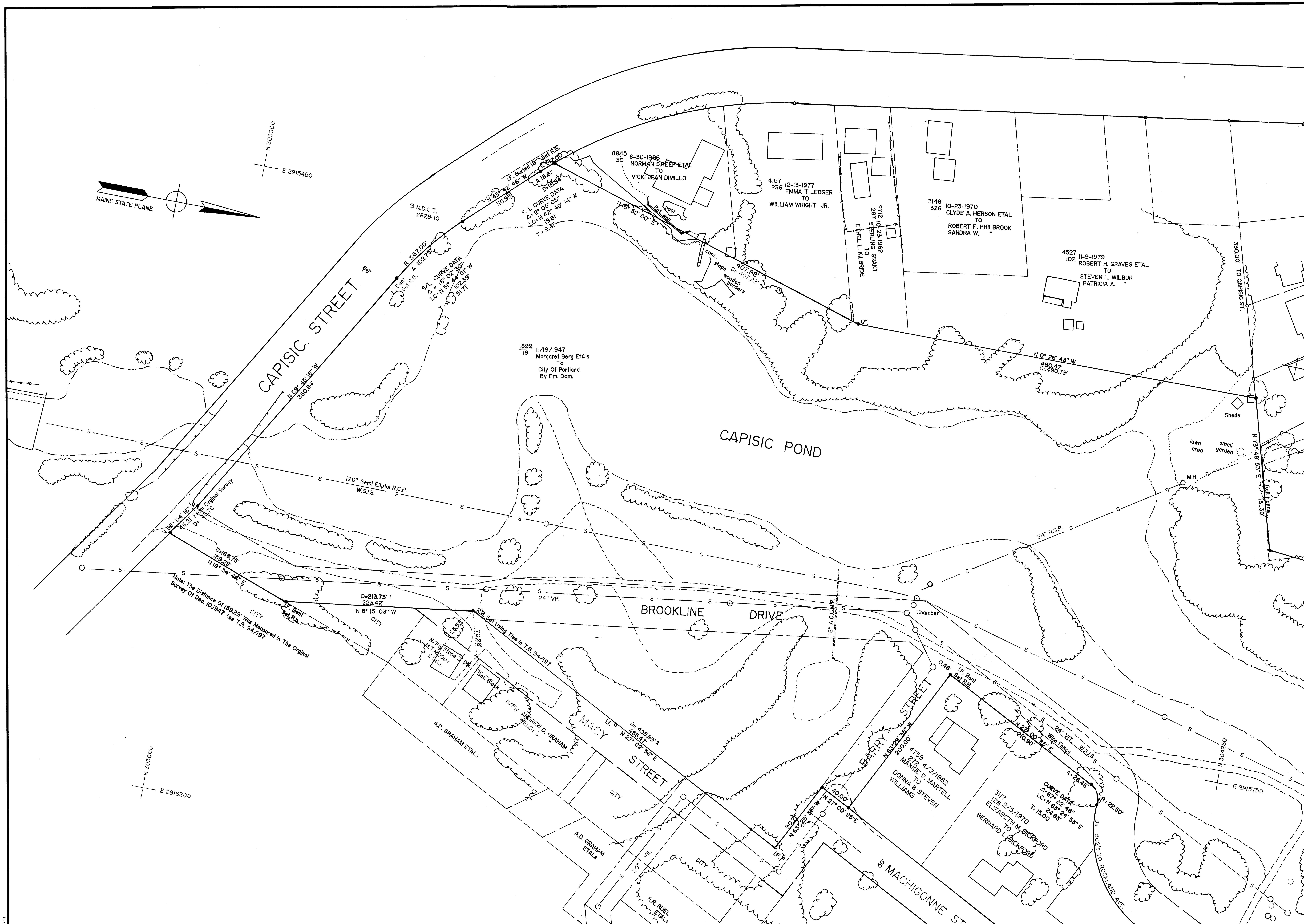
PLAN OF CITY PROPERTY AT CAPISIC POND

CITY OF PORTLAND, MAINE
PARKS AND PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

APPROVED — DIRECTOR OF ENGINEERING

SHEET 1 OF 2

947/3



MAINE STATE PLANE
N 303000
E 2915450
CAPISIC STREET
CAPISIC POND
BROOKLINE DRIVE
MACY STREET
BARRY STREET
MACHIGONNE ST.
1899 11/19/1947 Margaret Berg EtAls To City Of Portland By Em. Dom.
8845 6-30-1986 NORMAN S.REEF ETAL TO VICKI JEAN DIMILLO
4157 12-13-1977 EMMA T LEDGER TO WILLIAM WRIGHT JR.
2712 10-23-1962 STERLING GRANT TO ETHEL L. KILBRIDE
3148 10-23-1970 CLYDE A. HERSON ETAL TO ROBERT F. PHILBROOK SANDRA W.
4527 11-9-1979 ROBERT H. GRAVES ETAL TO STEVEN L. WILBUR PATRICIA A.
4759 272 4/2/1982 MAXINE B. MARTELL TO DONNA & STEVEN WILLIAMS
3117 128 2/5/1970 ELIZABETH M. BICKFORD TO BERNARD L. BICKFORD
A.D. GRAHAM ETALs
R.R. RUEL ETALs
CITY
120" Semi Elliptical R.C.P. W.S.I.S.
24" R.C.P.
24" Vit.
Note: The Distance Of 159.29' Was Measured In The Orginal Survey Of Dec. 10,1947 See T.B. 94/197
Sheds
N 303000
E 2916200
N 304250
E 2915750
PROFESSIONAL GRAPHICS DPD-3D

REFERENCES	DESCRIPTION	DATE

DESIGNED BY
DRAWN BY J.M.ROBBINS
CHECKED BY
PROJECT NO
DATE SEPT. 10, 1993
SCALE AS NOTED 1" = 50'

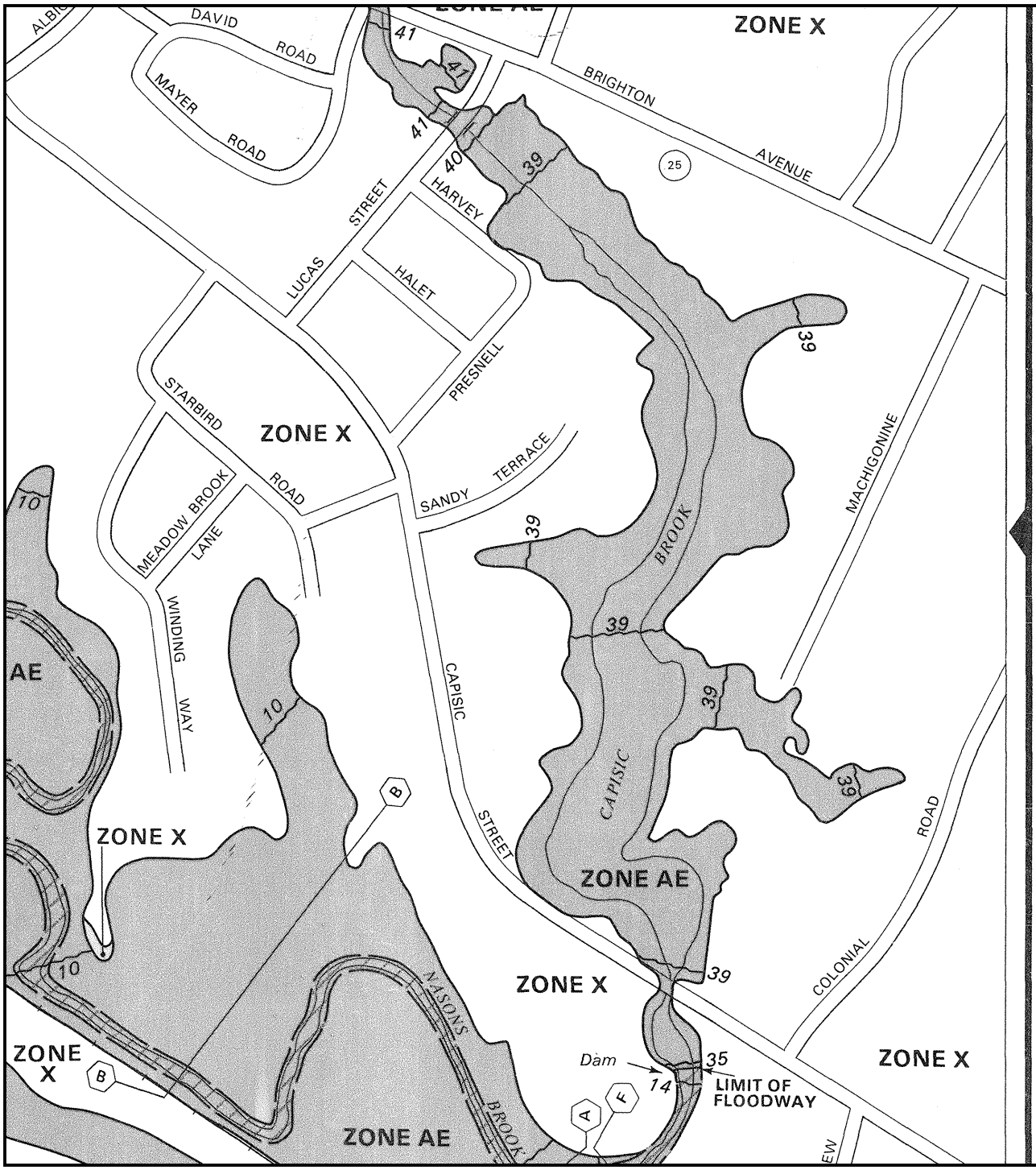
PLAN OF CITY PROPERTY AT CAPISIC POND.

CITY OF PORTLAND, MAINE
PARKS AND PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

APPROVED
DIRECTOR OF ENGINEERING

SHEET 2 OF 2

APPENDIX C: FEMA FIRMETTE



APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CITY OF
PORTLAND,
MAINE
CUMBERLAND COUNTY

PANEL 12 OF 17
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
230051 0012 C

MAP REVISED:
DECEMBER 8, 1998

Federal Emergency Management Agency

APPENDIX D: WETLAND DELINEATION REPORT & FUNCTIONAL ASSESSMENT

Capisic Pond Park - Portland, Maine
Wetland Delineation Report & Functional Assessment
September 2012

Boyle Associates, Environmental Consultants
Mailing Address: 25 Dundee Road
Gorham, Maine 04038
(207) 591-5220
www.boyleassociates.net

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LIST OF FIGURES

1. INTRODUCTION

Capisic Pond Park is an approximately 18-acre, city-owned property located in a suburban area of Portland, Maine (Figure 1). Capisic Pond Park is bounded by Capisic Street to the south and west, Lucas Street to the north and Machigonne Street to the east, with several of the property boundaries consisting of residential home lots. The park consists of emergent marsh and mixed forested, shrubby and grassy uplands and wetlands surrounding Capisic Pond. Within the park, a gravel footpath traverses the east side of the pond, generally following over a Portland Water District sewer line. The path runs from a small parking area on the corner of Capisic Street and Macy Street north to a small gravel lot on Lucas Street. There is a small side path that connects to Rockland Avenue. Several mowed trails veer from the main path, allowing access to additional viewpoints of the pond and surrounding habitats. The park is a popular destination for local residents and visitors who use the park primarily for hiking, walking, biking, and nature watching. Uplands within and around the site consist of small areas of woodlands, shrublands and grasslands surrounded by suburban development. Woodlands consist mainly of large tree species such as white pine (*Pinus strobus*) with a shrubby understory of invasive plant species such as honeysuckle (*Lonicera spp.*) and buckthorn (*Frangula* and *Rhamnus spp.*). Residential homes and yards surround most of the site. There are some larger house lots on the western side of the pond. Many areas along the pond are being maintained as lawn up to or very near the edge of the pond.

The park's main visual and habitat feature is Capisic Pond and its surrounding wetlands and riparian habitats. Capisic Pond roughly bisects the property. Fed primarily by Capisic Brook, the pond flows (slowly) from the north to south. Capisic Pond is an approximately 8-acre, manmade freshwater pond. A concrete dam just south of Capisic Street regulates water levels in the pond. Below the dam, Capisic Brook flows south into the Fore River and then to Casco Bay (Figure 2).

Current and past land uses of the park and the upstream and surrounding area have led to significant changes within the pond and its surrounding habitats. The water level in Capisic Pond has decreased due to an increase in sedimentation from upstream sources and to an intentional lowering of the pond to alleviate upgradient stormwater flooding. The lack of depth and increased inflow of nutrients has allowed a flourish of aggressively colonizing cattails (*Typha latifolia* and *T. angustifolia).* The cattails and sediments are changing the pond, making it shallower and reducing the amount of open water habitat. The pond receives inflow from Capisic Brook. Capisic Brook is listed by the Maine Department of Environmental Protection (MDEP) as an Urban-Impaired Stream (Chapter 502 of the Maine Stormwater Management Law). In an effort to improve water quality in Capisic Brook, the City of Portland has initiated several stormwater upgrades, habitat improvements and public outreach campaigns throughout the Capisic Brook watershed. Part of the overall strategy for watershed improvement includes a plan to enhance the wildlife habitats, water quality and land use qualities of Capisic Pond Park. Boyle Associates is working with the City's Engineering and Project Design consultant - Woodard & Curran, to provide wetland and wildlife ecology expertise on portions of the Capisic Pond Park habitat improvement plan. This report provides findings from Boyle Associates investigation of wetland boundaries and functions and values conducted in August, 2012.

1.1 STUDY AREA

The study area includes Capisic Pond Park and a 0.5-acre area south of Capisic Street on which the dam and a portion of the pond are located (see Figures 1 and 2). There is no public access to the portion of the study area south of Capisic Street.

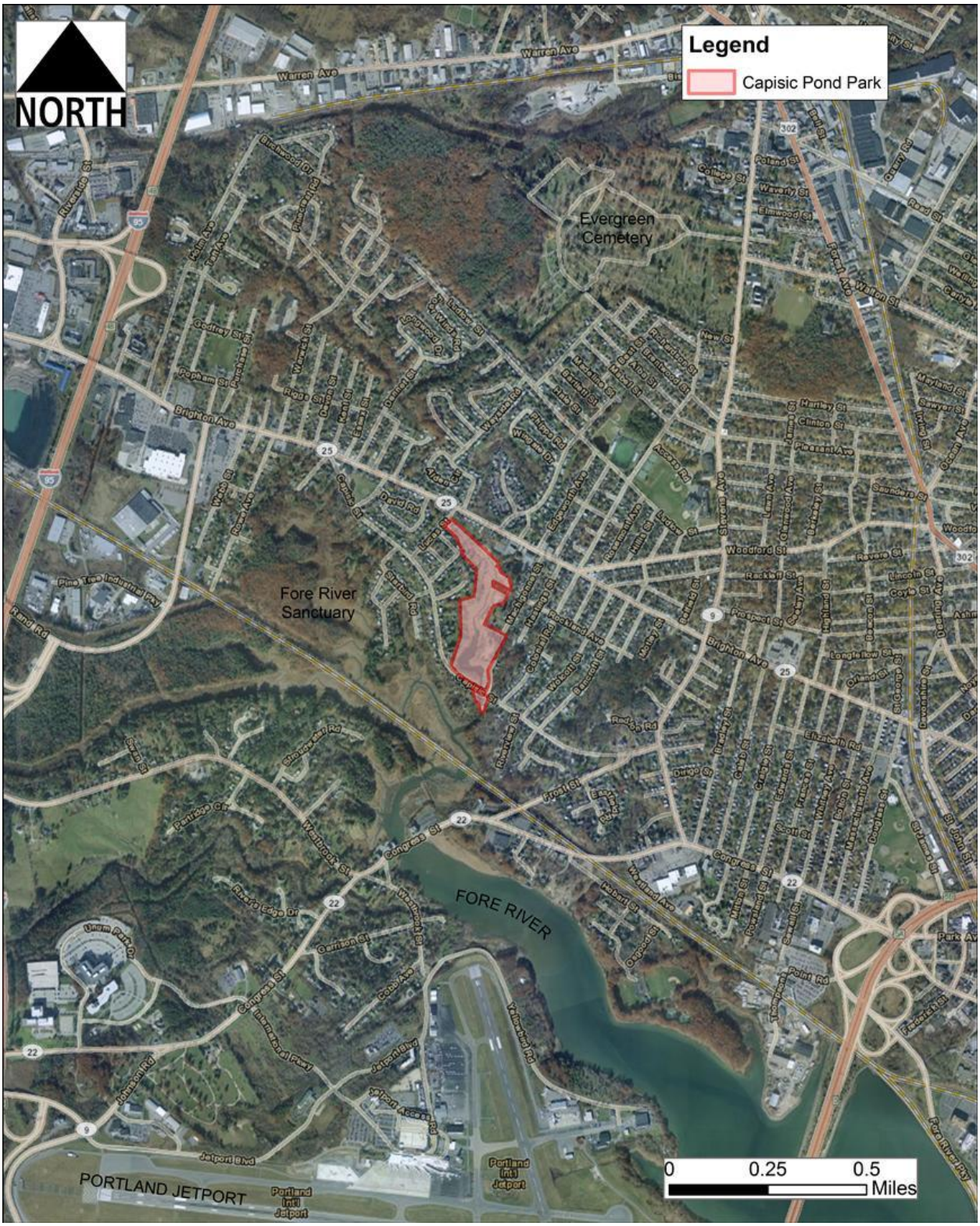

Figure 1. Capisic Pond Park location map (*Oct. 2009 aerial photo – ESRI*).

Figure 2. Capisic Pond Park Wetland Delineation and Functional Assessment Study Area (*Oct. 2009 aerial photo – ESRI*).

2. METHODS

2.1 WETLAND DELINEATION

2.1.1 Selection of Delineation Methodology

Based on current state and United States Army Corps of Engineers (USACE) policy for identifying jurisdictional wetlands, wetland boundaries were determined using the methods described in the *1987 USACE Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineer's Wetland Delineation Manual: Northcentral and Northeast Region, v2.0*. These methods use a three factor approach for identifying wetlands. The three factors are evidence of hydrology, a dominance of hydrophytic vegetation and the presence hydric soils.

2.1.2 Background Research

Prior to conducting fieldwork, Boyle Associates conducted a thorough review of existing site information including the following:

- United States Geologic Survey (USGS) 7.5-minute (24K) series topographic quadrangle map;
- Cumberland County soil survey from the United States Department of Agriculture/Soil Conservation Service (USDA/SCS, 1974) to determine presence and extent of hydric and upland soils;
- National Wetlands Inventory (NWI) 7.5-minute series quadrangle map from the United States Fish and Wildlife Service (USFWS) to determine the presence of mapped, federally-designated wetlands;
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) of Cumberland County, Maine; and,
- Historical records, indexes, reports, and maps (aerial and topographic) of the park and surrounding region – (see Section 4.0 for more information).

2.1.3 Onsite Wetland Boundary Determination

Following a review of the background information, Wetland Scientists from Boyle Associates performed systematic field surveys of the study area. The surveys were initiated with a walk-over inspection of the entire site to identify topographic, drainage and vegetation features that would indicate the presence of wetlands. Next, sample plots were analyzed along transects in order to determine the wetland boundary. Specific methods for sampling, characterizing and evaluating the soils, vegetation, and hydrologic indicators were based on the manual mentioned in Section 2.1.1.

2.1.4 Wetland Vegetation Covertype Mapping

Vegetative covertypes within each wetland were mapped using a combination of GPS location, field sketches and aerial photo interpretation. Each wetland covertype was classified using the *Classification of Wetlands and Deepwater Habitats of the United States* (1979) created by the U.S. Fish and Wildlife Service (also known as the *Cowardin Classification System*). This classification "*is intended to describe*

ecological taxa, arrange them in a system useful to resource managers, furnish units for mapping, and provide uniformity of concepts and terms." Systems form the highest level of classification hierarchy; these are Marine, Estuarine, Riverine, Lacustrine, and Palustrine. Each system is then further defined using subsystems and classes based on substrate material, hydrologic regime, and vegetative composition. Several modifiers can also be used to further describe each subsystem or class. For example, a freshwater wetland dominated by a forested or woody overstory with mixed deciduous and evergreen vegetation greater than 20 feet tall and seasonally flooded/saturated would be described under Cowardin as: *PFO 1/4E*. The appropriate classification based upon Cowardin system was determined and assigned for each wetland.

2.2 MAPPING

Data collected on the site were mapped using a mapping-grade Global Positioning System (GPS) unit (Trimble GeoXH). A minimum of 30 epochs were collected at each point and data were differentially corrected against fixed data from a commercial base station to ensure sub-meter accuracy. Data were exported to the following coordinate system and datum: NAD 1983, State Plane, Zone Maine West, 1802.

2.3 WETLAND FUNCTIONAL ASSESSMENT

A wetland functional assessment was performed pursuant to the approach described by the Army Corps Highway Methodology Workbook Supplement: Wetland Functions and Values. In this "Descriptive Approach" to functional assessment, the evaluators first determine if particular functions and values are *present* and why, followed by a determination of what functions and values are *principal* and why. Functions and values can be considered "principal" if they are an important physical component of a wetland ecosystem (function only), and/or are considered of special value to society, from a local, regional, and/or national perspective. When making determinations on the wetland, evaluators are encouraged to determine whether the wetland has the *potential* to serve the functions and values as well.

Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and that result from both living and non-living components of a specific wetland resource. These include all processes necessary for the self-maintenance of the wetland ecosystem such as primary productivity and nutrient cycling, among others. Therefore, functions relate to the ecological significance of wetland properties without regard to subjective human values.

Values are benefits that derive from one or more functions and the physical characteristics associated with a wetland. Most wetlands have corresponding societal value. The value of a particular wetland function, or combination of functions, is based on human judgment of the worth, merit, quality or importance attributed to those functions.

Groundwater Recharge/Discharge: This function considers the potential for the wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.

Floodwater Alteration (Storage & Desynchronization): This function considers the effectiveness of the wetland in reducing flood damage by attenuation of floodwaters for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecosystem or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

Fish and Shellfish Habitat: This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in providing fish and shellfish habitat.

Sediment/Toxicant/Pathogen Retention: This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens in runoff water from surrounding uplands, or upstream erosive wetland areas.

Nutrient Removal/Retention/Transformation: This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.

Production Export: This function evaluates the effectiveness of the wetland to produce food or usable products for man or other living organisms.

Sediment/Shoreline Stabilization: This function considers the effectiveness of the wetland in stabilizing stream banks and shorelines against erosion.

Wildlife Habitat: This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and migrating species are considered.

Recreation: This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting and other active or passive recreational activities.

Educational/Scientific Value: This value considers the suitability of the wetland as a site for an "outdoor classroom" or as a location for scientific study or research.

Uniqueness/Heritage: This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values, including archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, or its relative importance as a typical wetland class for the geographic location.

Visual Quality/Aesthetics: This value considers the visual and aesthetic quality or usefulness of the wetland.

Endangered Species Habitat: This value considers suitability of the wetland to support threatened or endangered species.

3. RESULTS

3.1 WATERSHED

The survey area is located within the Presumpscot River and Casco Bay watershed (HUC 8: 01060001) and within the Fore River subwatershed (HUC: 0106000105).

3.2 INVASIVE SPECIES

Invasive species include introduced or non-native species brought to a location by man or some other vector, which adversely affect the natural habitat of a region that they invade economically, environmentally, and/or ecologically. Such species may be either plants or animals and may disrupt ecosystems due to the lack of the natural controls that exist in their native habitats. Typical vectors for invasive species include: water (i.e. seeds or plant fragments floating down a river or stream); wind; animals (either by eating fruits and spreading seeds or by unknowingly transporting seeds on fur and feathers); and transplanting seeds, plant fragments or contaminated soils on equipment, boots, tires, soil, mulch, or other human vectors. Invasive plants may provide some food and habitat value, but they tend to outcompete and crowd out native plants upon which the native animals and insects rely.

Several species and a high-density of invasive plants are found within Capisic Pond Park (see Appendix B for a complete list). Every wetland on the site contains the flowering invasive plant, purple loosestrife (*Lythrum salicaria*). Other invasive plants found within uplands or along wetland boundaries include: bush honeysuckle, glossy buckthorn (*Frangula alnus*), common buckthorn (*Rhamnus cathartica*), multiflora rose (*Rosa multiflora*), Japanese knotweed (*Fallopia japonica*), narrow-leaved cattail (*Typha angustifolia),* and oriental bittersweet (*Celastrus orbiculatus*) – see Appendix B for more information.

Notably absent from the site are the tenacious and common invasive plants common reed (*Phragmites australis*) and autumn olive (*Elaeagnus umbellata*). These plants can be found nearby the site (*e.g*. within the adjacent Fore River Sanctuary and along Capisic Brook), so their absence in the park is surprising. Future planning and work at the site should include provisions and strategies long-term management of these and all invasive species.

3.3 VERNAL POOLS

No areas within our study were identified as meeting the State of Maine Natural Resources Protection Act (NRPA) or Army Corps of Engineer's Maine General Permit (GP) definition of a vernal pool.

3.4 WETLANDS & STREAMS

Six wetlands and two streams were identified within the park. The following section includes wetland classifications and descriptions, and a listing of the functions and values determined for each wetland. Table 1 provides a list of wetlands with a brief description; Table 2 provides a list of the streams identified. While each wetland has the potential to provide a variety of functions and values, it should

be noted that impacts and development, both current and historic, have reduced the area's overall ability to provide habitat and value. All wetlands on the site display some sign of impacts and degradation, including draining, trash (including residential yard debris), grading, filling, excavation, and invasive species. Photographs are included in Appendix A.

Table 1. Wetland Survey Results

ID	Type	Classification[1]	WSS[2]	Brief Description
A	Scrub-shrub/ Emergent	PSS1E, PEM1E	Yes	Wetland complex draining from outside the eastern boundary into the park. Hydrology from the wetland flows to west and into Capisic Pond via a small culvert under the walking trail. The walking trail appears to be partially impounding flow in the wetland.
B	Emergent	PEM2/1E, PFO1E	No	Mostly herbaceous wet meadow adjacent to the trailhead along Macy Street. Flow tends generally to the southwest and into a culvert. The culvert appears to flow toward the pond, but the downslope outlet could not be located.
C	Emergent	PEM2/1E	No	A small, isolated wet meadow located on a knoll on the eastern side of the property. Hydrology within the wetland did not appear to flow in any particular direction. Ponding was evident post rainfall. The wetland appears to be the result of a historic excavation and provides minor functions or values.
D	Emergent / Scrub-shrub	PEM2/1E, PSS1E	Yes	Wetland complex draining from the eastern boundary and flowing to a shallow basin along the walking trail. Disturbance and fill along the walking trail appear to be impounding the lower elevations within the wetland. Ponding is evident within the wetland post rainfall and water can be seen flowing into the walking trail toward the pond.
E	Emergent / Scrub-shrub	PEM2/1E, PSS1E	Yes	Wetland complex along the eastern parcel boundary. Very little of this resource is within the survey area. The wetland drains from northwest and onto the site. Water is being impounded within the lower elevations of the wetland along the walking trail. A culvert was found draining from wetland E into the pond (wetland F).
F	Emergent / Open Water	PEM1J, PUB3	Yes	Large wetland/pond complex fed by Capisic Brook. The pond is impounded by a weir dam on the south side of Capisic Street and contains large areas of open water habitat interspersed with cattail marsh.

[1] Per **Cowardin** *et al*. 1979.
[2] Wetland of Special Significance

Table 2. Stream Survey Results

ID	Stream Type	Width	Depth	Substrate	Comments
1	Perennial	3-15’	18”	Boulder, cobble, gravel, sand, mud	Stream 1 (unnamed) begins at the Rockland Avenue outfall and flows for a short distance before entering Capisic Pond on the west side of the gravel trail. Stream is eroded and receives strong, concentrated stormwater flows post heavy rain events.
2	Perennial	15-20’	12-24”	Cobble, sand, mud	Within the survey area, stream 2 (Capisic Brook) flows south under Lucas Street through shady shrub habitat toward Capisic Pond. Directly south of Lucas Street the brook is shallow, fast moving, and rocky. As the stream approaches the pond, the habitat opens to emergent marsh and becomes deeper and meandering with slower water velocities before becoming open water and emergent marsh (*i.e.* Capisic Pond); the stream reforms as a fast-moving rocky-bottom stream below the dam south of Capisic Street (outside of study area).

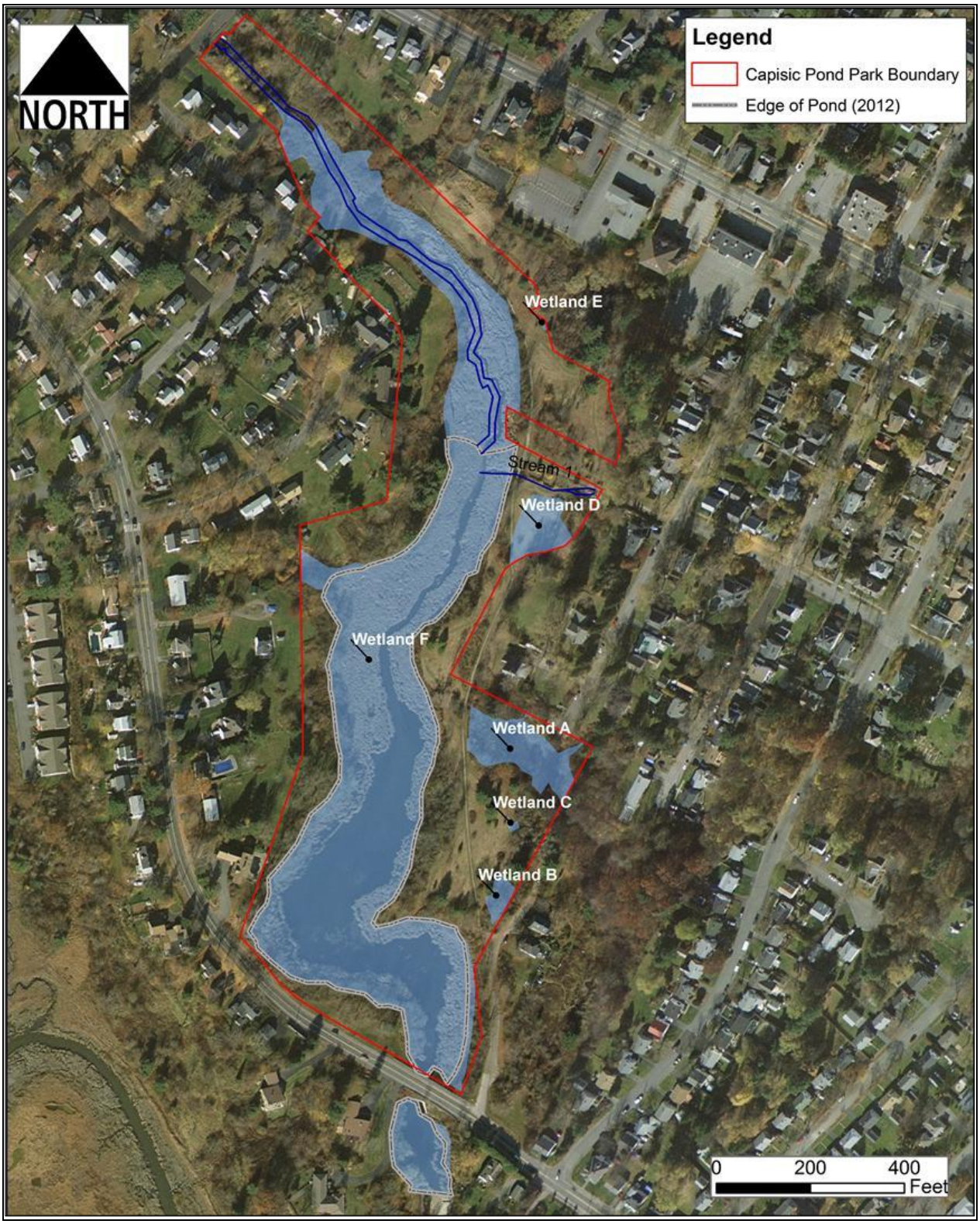

Figure 3. Capisic Pond Park Wetland Map

Figure 4. Wetland Covertypes

3.4.1 Wetland A

Cowardin Classification: Dominant class: PSS1E – Palustrine scrub-shrub, broad-leaved deciduous, seasonally saturated/flooded.

Other classes present: PEM1/2E – Palustrine emergent, seasonally saturated/flooded.

General Description: Wetland A is located in a narrow valley between the gravel walking trail and eastern parcel boundary. The margins of the wetland are comprised of a thick shrubby tangle of invasive and native shrubs. Evidence of historic and current filling along the wetland boundary is apparent. Due to the dense shrub growth and past land disturbances, the boundary between wetland and upland has been partially obscured. Hydrology within the wetland flows generally to the west toward Capisic Pond. A culvert located on the downslope side of the wetland along the walking trail appears to channel hydrology from wetland A into Capisic Pond (known herein as wetland F). Water was observed impounded against the fill extensions from the gravel trail.

Dominant Vegetation: Trees: Black willow (*Salix nigra*)

Shrubs: Speckled alder (*Alnus incana var. rugosa*), silky dogwood (*Cornus amomum*), withe-rod (*Viburnum nudum* var. *cassinoides*), and bush honeysuckle.

Herbs: Broadleaf cattail (*Typha latifolia*), woolgrass (*Scirpus cyperinus*), broadleaf arrowhead (*Sagittaria latifolia*), purple loosestrife, and white turtlehead (*Chelone glabra*).

Soils and Hydrology: Indicators of wetland hydrology are ponded surface water (flooded to approximately 6" in August 2012), saturation of the soil to the surface, water-stained leaves within the shrub-dominated portions of the wetland, and drainage patterns throughout the wetland.

Soils within wetland A are lacking an A-horizon (*i.e.* topsoil). This layer may have been removed during dredging or other site work in the past. The B-horizon (subsoil) consists of a gleyed matrix with redoximorphic features. Gleyed matrices are soils with a blue-green color and are indicative of prolonged saturation.

Wetlands of Special Significance: This wetland meets the Maine NRPA definition of a Wetland of Special Significance (WSS) due to the fact that is located entirely within a FEMA 100-year floodzone and contains Significant Wildlife Habitat (IWWH).

Functional Assessment: Wetland A provides or has the potential to provide the following functions and values: groundwater recharge/discharge, floodflow alteration, sediment/toxicant retention, nutrient removal, production export, sediment and shoreline stabilization and wildlife habitat. The capacity for the resource to provide these functions has been reduced due to its position within a developed landscape.

The principal function served by wetland A is floodflow alteration. Wetland A is found within in a narrow valley, it has a constricted outlet, it has dense shrub and herbaceous vegetation, and it has a broad, flat

topography; these features enable the wetland to store significant amounts of floodwater and runoff from the surrounding landscape. Additionally, much of the surrounding area near wetland A consists of impervious and semi-impervious surfaces (roads, houses, yards, driveways, etc.). During rain events, large amounts of runoff flow into the wetland, both overland and from stormwater outlets. The makeup of wetland A allows it to slow floodwaters, giving them time to infiltrate into the soil.

3.4.2 Wetland B

Cowardin Classification: Dominant class: PEM2/1E (Palustrine emergent, seasonally saturated/flooded).

Other classes present: PFO1E (Palustrine forested, broad-leaved deciduous, seasonally saturated/flooded).

General Description: Wetland B is located along the east side of the trail near the trailhead abutting Macy Street. Flow within the wetland tends to the south toward a culvert. The culvert appears to flow toward the pond, but an outlet could not be found (the culvert may drain into the City's stormwater conveyance system that runs under the park trail).

Dominant Vegetation: Trees: Red maple (*Acer rubrum*).

Shrubs: White meadowsweet (*Spiraea alba var. latifolia*).

Herbs: Flat-top goldentop (*Euthamia graminifolia*), jewelweed (*Impatiens capensis*), woolgrass, multiflora rose (*Rosa multiflora*), sensitive fern (*Onoclea sensibilis*), swamp rose (*Rosa palustris*), parasol whitetop (*Doellingeria umbellata*), and giant goldenrod (*Solidago gigantea*).

Soils and Hydrology: Soils within wetland B consist of a thick, dark, A-horizon underlain by a B-horizon with a depleted matrix within 10 inches of the mineral soil surface. Hydrology observed at the time of delineation was limited, but included water-stained leaves and drainage patterns. An inlet culvert was noted in the lowest portion of the wetland, near the park trailhead. An outlet into the pond could not be found. It is possible that the wetland is being drained into the stormwater system that runs along the park trail.

Wetlands of Special Significance: Based on field observations and office review of existing data, this wetland does meet any of the Maine NRPA criteria to be defined as a WSS.

Functional Assessment: Wetland B provides or has the potential to provide the following functions and values: groundwater recharge/discharge, floodflow alteration, sediment/toxicant retention, nutrient removal, and wildlife habitat. While the wetland has the capacity to provide the above-listed functions, none of these functions can be considered principal, as the resource's ability to provide these functions is limited by the size of the wetland and by development of the wetland and the surrounding landscape.

3.4.3 Wetland C

Cowardin Classification: Dominant class: PEM2/1E – Palustrine emergent, seasonally saturated/flooded.

General Description: Wetland C is a small, isolated wetland located along a grassy side trail of the park near the eastern property boundary and slightly south of wetland A. Wetland C appears to have been created by disturbance. Over time, the compaction of the soil in the small depression has caused extended periods of surface water ponding, saturating the soil and favoring hydrophytic vegetation to colonize the small basin.

Vegetation: Trees: None observed

Shrubs: None observed

Herbs: Flat-top goldentop (*Euthamia graminifolia*), purple loosestrife, woolgrass, and New York aster (*Symphyotrichum novi-belgii*).

Soils and Hydrology: Soils in wetland C consist of a thick, dark A-horizon with redoximorphic features underlain by a B-horizon with a depleted matrix. The A-horizon was very compact and overlies a dense, impervious layer of silty-clay. Evidence of hydrology consists of standing water (approximately three inches deep at the time of survey) and saturation to the soil surface.

Wetlands of Special Significance: This wetland is a small, isolated and potentially manmade feature, but due to the fact that it is contains Significant Wildlife Habitat (IWWH,) the wetland is considered WSS.

Functional Assessment: Wetland C provides or has the potential to provide the following functions and values: groundwater recharge/discharge and wildlife habitat. However, due to its small size and location next to the trail, no principal functions or values were identified for the resource.

3.4.4 Wetland D

Cowardin Classification: Dominant class: PEM2/1E – Palustrine emergent, seasonally saturated/flooded.

Other classes present: PSS1E – Palustrine scrub-shrub, broad-leaved deciduous, seasonally saturated/flooded.

General Description: Wetland D is a mixed herbaceous and shrub wetland located along the eastern boundary of the site, just south of Rockland Avenue. The wetland is located just south of Stream 1, that begins at the Rockland Avenue stormwater discharge site.

Vegetation: Trees: None observed

Shrubs: Silky dogwood, withe-rod and tamarack (*Larix laricina*).

Herbs: Common rush (*Juncus effusus*), giant goldenrod, parasol whitetop, flat-top goldentop, purple loosestrife, woolgrass, and Pennsylvania smartweed (*Polygonum pennsylvanicum*).

Soils and Hydrology: Soils within wetland D have a dark A-horizon made of gravelly fill material. Below the A-horizon, a hardpan, impervious B-horizon with mixed loamy-silty-clay B-horizon was observed. The B-horizon has a depleted matrix and many redoximorphic features.

Water flowing into the wetland from the northwest tends to back up against the Capisic Pond Park trail, adding to the small wetland's hydrology. Hydrologic indicators include periodic standing water in some of the lower areas of the wetland and a generally high water table (presumably perched on the hard silty-clay horizon). Additional indicators of wetness include sediment deposits from previous flooding events and surface soil cracks along the park trail.

Wetlands of Special Significance: Wetland D meets the Maine NRPA definition of WSS due to the fact that is located entirely within a FEMA 100-year floodplain and contains Significant Wildlife Habitat (IWWH).

Functional Assessment: Wetland D provides or has the potential to provide the following functions and values: groundwater recharge/discharge, floodflow alteration, sediment/toxicant retention, nutrient removal, production export, and sediment and shoreline stabilization. Several of the functions and values are being provided, but the capacity for the resource to provide those functions is limited due to its size, location and the surrounding, developed landscape. While the wetland has the capacity to provide the above-listed functions, the principal function served by wetland D is floodflow alteration.

Wetland D slopes gradually toward Capisic Pond, and slows and holds some stormwater runoff prior to it entering the pond. Additionally, the wetland appears to receive some overflow from the Rockland Avenue outfall during periods of high runoff. During these events, large amounts of runoff flow into the wetland, both overland and from the stormwater outlet. The makeup of wetland A allows it to slow floodwaters, giving them time to infiltrate the topsoil.

3.4.5 Wetland E

Cowardin Classification: Dominant class: PEM1/2E – Palustrine emergent, seasonally saturated/flooded.

Other classes present: PSS1E – Palustrine scrub-shrub, broad-leaved deciduous, seasonally saturated/flooded.

General Description: Wetland E is located in a narrow valley on the east side of the trail – only a small portion of the wetland is located within the study area. Wetland E is very similar to Wetland A. Drainage patterns were noted throughout the wetland and water is being impounded along the park trail. A culvert was observed along the trail; the culvert appears to drain floodwater water from wetland E and outlets into the wetland associated with Capisic Pond (Wetland F).

Vegetation: *Trees:* None observed

Shrubs: Black willow

Herbs: Purple loosestrife, jewelweed, swamp rose, common rush, beggar's tick (*Bidens frondosa*), fringed sedge (*Carex crinita*), New York aster, and New England aster (*Symphyotrichum novae-angliae*).

Soils and Hydrology: The topsoil in wetland E consists of a thin, silt-loam A-horizon underlain by a silty-clay B-horizon with a depleted matrix and redoximorphic features. Evidence of hydrology includes surface water and soil saturation to the surface.

Wetlands of Special Significance: Wetland E meets the Maine NRPA definition of a WSS because it is located entirely within a FEMA 100-year floodplain and contains Significant Wildlife Habitat (IWWH).

Functional Assessment: Wetland E provides or has the potential to provide the following functions and values: groundwater recharge/discharge, floodflow alteration, sediment/toxicant retention, nutrient removal, production export, sediment and shoreline stabilization and wildlife habitat. Several of the functions and values are being provided, but the capacity for the resource to provide those functions is limited due to its small size, its location and its developed surroundings. The principal function served by wetland E is floodflow alteration.

Wetland E is in a similar landscape position as Wetland A. It is has a broad basin located adjacent to the gravel trail. Water is impounded along the trail. The standing water slowly infiltrates the soil, attenuating runoff during periods of heavy storm flows.

3.4.6 Wetland F

Cowardin Classification: Dominant class: PEM1/2E – Palustrine emergent, seasonally saturated/flooded.

Other classes present: PUB – Palustrine unconsolidated bottom; PSS1E – Palustrine scrub-shrub, broad-leaved deciduous, seasonally saturated/flooded.

General Description: Wetland F includes Capisic Pond and its associated riparian wetlands. It covers approximately 10 acres of the study area. In general, Wetland F consists of a dammed, freshwater pond immediately bordered by treed uplands and emergent floodplain wetlands. A few shrubby wetland swales drain into the pond from the west. The wetland is bordered by some of the cleared grasslands and trails of the park to the east and suburban homes and lawns to the west. Wetland F is fed by Capisic Brook from the northwest. Capisic Brook has a narrow, mostly herbaceous floodplain near the northwestern end of the park before it drains into the pond.

The original Capisic Pond dam was constructed on Capisic Brook in the 1600s to power a grist and saw mill. Eventually, in the middle of the 20th century, the City of Portland began managing the dam as a component of its combined sewer/stormwater system. The City rebuilt the dam in its current location on the south side of Capisic Street in 1954. The most recent dam reconstructions, in 1996 and again in 2001, lowered the outlet in order to reduce stormwater flooding issues upstream in the Capisic Brook watershed.

Capisic Pond was last dredged in the 1950s. Over the years, as expansion of impervious surface from development has increased runoff into Capisic Brook, sediments have built up in the pond. The sedimentation, combined with the lower water elevation afforded by the dam lowering efforts of 1996 and 2001, has reduced the water level in the pond. The shallow, turbid water favors the growth of cattails, which outcompete most other species in these types of habitats. A review of historic aerial

photographs has shown a decrease in the open water component of the park over the last few decades, with the largest cattail expansion taking place within the last 10-15 years (see Figure 5) .

Figure 5. 2001 aerial imagery (top) compared with a 2009 image (bottom) indicates expansive growth of cattails around the pond margins and interior.

Vegetation: *Trees:* American elm *(Ulmus americana).*

Shrubs: Withe-rod, bush honeysuckle and silky dogwood.

Herbs: broadleaf cattail, narrowleaf cattail (*Typha angustifolia*), jewelweed, common duckweed (*Lemna minor*), broadleaf arrowhead, wild cucumber (*Echinocystis lobata*), variegated yellow pond-lily (*Nuphar lutea*), American white waterlily (*Nymphaea odorata*), pickerelweed (*Pontederia cordata*), floating pondweed (*Potamogeton natans*), and coontail species (*Ceratophyllum sp.*).

Soils and Hydrology: Soil within the open water portion of Wetland F consists of deep mucky silt and clay. Soil within the herbaceous plant-dominated portions of Wetland F consist a thick organic soils (also known as histosols).

Evidence of hydrology in Wetland F include surface water approximately four inches in depth, a high water table, saturation to the soil surface, sediment deposits, drift deposits ("wrack"), water-stained leaves, and drainage patterns.

Wetlands of Special Significance: Wetland F meets the criteria of a WSS due to the fact that is located entirely within a FEMA 100-year floodplain, contains greater than 20,000 square feet of open water or

emergent marsh vegetation, and contains significant wildlife habitat (moderate value IWWH as described in the NRPA). Additionally, all wetlands located within 25-feet of Capisic Brook are considered WSS.

Functional Assessment: Wetland F contains Capisic Brook and Capisic Pond. Historic alteration of the surrounding land has significantly altered the natural stream and surrounding wetland resources (*e.g.* creating the pond, clearing the riparian forests, sedimentation, *etc.*). One recent (*i.e.* within the last decade) but major change has been the growth of a cattail monoculture along the pond margins and into the pond center. The expansion of cattails has affected the functionality of the pond, effectively reducing the open water component and increasing the emergent wetland area. However, Capisic Pond and its surrounding wetland are still large, diverse and unique enough to provide important functions and values within the surrounding watershed. Wetland F provides or has the potential to provide the following functions and values: groundwater recharge/discharge, floodflow alteration, fish and shellfish habitat, sediment/toxicant retention, nutrient removal, production export, sediment and shoreline stabilization, wildlife habitat, recreation, educational/scientific value, uniqueness/heritage, and visual quality/aesthetics. Principal functions and values served by wetland F include sediment/toxicant retention, wildlife habitat, recreation, and uniqueness/heritage. These functions and values will be discussed below.

Sediment/Toxicant Retention: Sediment runs to the pond from stormwater outfalls and in runoff from surrounding developed and impervious surfaces. The pond can receive sediment and other pollutants from surface runoff and retain the materials in thick emergent marsh vegetation and allow materials to precipitate in the slow moving water of the pond.

Wildlife Habitat: The pond and its surrounding wetlands provide an important habitat island within an otherwise developed landscape. The wetland provides food, shelter, refugia, and breeding habitat for a variety of wildlife (see Appendix C).

Recreational Value: The pond is bordered on the east by a half-mile hiking trail and is encompassed by city-owned lands designating the area as a park. The trails provide access through the habitats within the park and are used for hiking, biking, bird-watching, dog walking, and “morning strolls”. The trails are included within a large, citywide trail system and are managed by Portland Trails (www.trails.org). Additionally, the pond itself has been traditionally used for ice skating.

Uniqueness/Heritage Value: The pond’s long history and relevance to Portland’s early development is well-documented. Historic use of the pond dates back as far as the late 1600s. The dam site was originally used as a gristmill and sawmill built at the falls of Capisic Brook (near the existing dam structure). Of more recent uniqueness value, Capisic Pond remains the largest freshwater pond in the city.

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APPENDIX A

PHOTOGRAPHIC RECORD

(All photos taken July-August, 2012 by Boyle Associates.)

	**Description:** Looking north-northwest from Capisic Street bridge at Capisic Pond (**Wetland F**).
	**Description**: Looking southeast from park trail at herbaceous-dominated, lower elevations of **Wetland A**.
	**Description**: Looking south across PFO/PEM area of **Wetland B** near trailhead by Macy Street.

	**Description**: Looking east at isolated emergent plant-dominated **Wetland C** from grassy side trail.
	**Description**: Looking east at **Wetland D** from main trail.
	**Description**: Looking southeast at **Wetland D** from main trail near bridge over Rockland Avenue outfall.

	**Description**: Looking east at **Wetland E** from main trail.
	**Description**: Looking northwest at **Wetland F** from southern, open water portion of Capisic Pond.
	**Description**: Looking northeast over cattail-dominated section of **Wetland F** from large blown down white pine on west side of pond.

	**Description**: Looking south across **Wetland F** from blown down pine on west side of pond.
	**Description**: Looking east at Rockland Avenue outfall and start of **Stream 1**.
	**Description**: Looking west at **Stream 1** from timber bridge along gravel trail.

	**Description**: Looking south along Capisic Brook (**Stream 2**) from the north-central portion of **Wetland F**.
	**Description**: Looking northwest at Capisic Brook (**Stream 2**) under Lucas Street.
	**Description**: Looking south at Capisic Brook **(Stream 2)** near Lucas Street.

	**Description**: Look north at the weir dam on the south side of Capisic Street.
	**Description**: Capisic Brook, below the weir dam, spills over granite outcrops and into a deep-walled granite valley.
	**Description**: Concrete diversion chamber below weir dam.

	**Description**: Looking north within former pond area of **Wetland F**. Near complete cattail encroachment has occurred through the central portion of pond.
	**Description**: Capisic Pond Park trailhead.
	**Description**: Young snapping turtle found crossing Macy Street.

APPENDIX B

LIST OF PLANT SPECIES OBSERVED (2012)

Family	Scientific name	Common Name	Noxious or invasive
Aceraceae	*Acer rubrum*	red maple	
Aceraceae	*Acer negundo*	boxelder	
Aceraceae	*Acer saccharinum*	silver maple	
Aceraceae	*Acer platanoides*	Norway maple	X
Adoxaceae	*Sambucus nigra*	black elderberry	
Alismataceae	*Sagittaria latifolia*	common arrowhead	
Anacardiaceae	*Rhus typhina*	staghorn sumac	
Apiaceae	*Daucus carota*	Queen Anne's lace	
Asclepiadaceae	*Asclepias syriaca*	common milkweed	
Asteraceae	*Symphyotrichum novae-angliae*	New England aster	
Asteraceae	*Euthamia graminifolia*	flat-top goldenrod	
Asteraceae	*Solidago gigantea*	giant goldenrod	
Asteraceae	*Solidago rugosa*	wrinkleleaf goldenrod	
Asteraceae	*Doellingeria umbellata*	parasol whitetop	
Asteraceae	*Hieracium sp.*	hawkweed	
Asteraceae	*Achillea millefolium*	yarrow	
Asteraceae	*Arctium sp.*	burdock	
Asteraceae	*Bidens frondosa*	devil's beggartick	
Asteraceae	*Helianthus tuberosa*	Jerusalum artichoke	
Asteraceae	*Ambrosia sp.*	ragweed	
Asteraceae	*Rudbeckia hirta*	blackeyed Susan	
Asteraceae	*Cirsium vulgare*	bull thistle	
Asteraceae	*Cirsium arvense*	Canada thistle	X
Asteraceae	*Taraxacum officinale*	dandelion	
Asteraceae	*Cichorium intybus*	chicory	
Asteraceae	*Centaurea sp.*	knapweed	
Balsaminaceae	*Impatiens capensis*	jewelweed	
Balsaminaceae	*Impatiens glandulifera*	ornamental jewelweed	X
Betulaceae	*Alnus incana var. rugosa*	speckled alder	
Campanulaceae	*Campanula rotundifolia*	bluebell bellflower	
Caprifoliaceae	*Viburnum nudum var. cassinoides*	withe-rod	
Caprifoliaceae	*Viburnum dentatum*	southern arrowwood	
Caprifoliaceae	*Viburnum opulus var. americanum*	highbush cranberry	
Caprifoliaceae	*Lonicera sp.*	honeysuckle	X
Celastraceae	*Celastrus orbiculatus*	Oriental bittersweet	X
Celastraceae	*Euonymus alatus*	burningbush	X
Ceratophyllaceae	*Ceratophyllum demersum*	coon’s tail	
Cornaceae	*Cornus amomum*	silky dogwood	
Cornaceae	*Cornus racemosa*	gray dogwood	

Family	Scientific name	Common Name	Noxious or invasive
Cucurbitaceae	*Echinocystis lobata*	wild cucumber	
Cupressaceae	*Juniperus communis*	common juniper	
Cyperaceae	*Scirpus cyperinus*	woolgrass	
Dryopteridaceae	*Onoclea sensibilis*	sensitive fern	
Fabaceae	*Lupinus sp.*	lupine	
Fabaceae	*Lotus corniculatus*	bird's-foot trefoil	X
Fabaceae	*Robinia pseudoacacia*	black locust	X
Fabaceae	*Vicia cracca*	cow vetch	
Fabaceae	*Securigera varia*	crown vetch	X
Fabaceae	*Trifolium pratense*	red clover	
Fabaceae	*Trifolium repens*	white clover	
Fagaceae	*Quercus rubra*	northern red oak	
Juncaceae	*Juncus effusus*	common rush	
Lamiaceae	*Monarda fistulosa*	wild bergamot	
Liliaceae	*Asparagus officinalis*	asparagus	X
Lythraceae	*Lythrum salicaria*	purple loosestrife	X
Onagraceae	*Oenothera sp.*	evening primrose	
Pinaceae	*Picea pungens*	blue spruce	
Pinaceae	*Pinus sylvestris*	Scots pine	
Pinaceae	*Picea rubens*	red spruce	
Pinaceae	*Pinus strobus*	white pine	
Pinaceae	*Larix laricina*	larch	
Plantaginaceae	*Plantago major*	plantain	
Poaceae	*Digitaria sp.*	crabgrass	
Poaceae	*Panicum virgatum*	switchgrass	
Poaceae	*Dactylis glomeratus*	orchard grass	
Poaceae	*Schizachyrium scoparium*	little bluestem	
Poaceae	*Lolium perenne*	perennial ryegrass	
Poaceae	*Echinochloa sp.*	barnyard grass	
Poaceae	*Phleum pratense*	timothy	
Poaceae	*Elymus viginicus*	Virginia wild rye	
Poaceae	*Dichanthelium clandestinum*	Deertongue grass	
Poaceae	*Phalaris arundinacea*	reedcanary grass	X
Polygonaceae	*Polygonum sagittatum*	arrowleaf tearthumb	
Polygonaceae	*Rumex crispus*	curly dock	
Polygonaceae	*Polygonum cuspidatum*	Japanese knotweed	
Polygonaceae	*Polygonum pennsylvanicum*	Pennsylvania smartweed	
Primulaceae	*Lysimachia terrestris*	swamp candle	
Ranunculaceae	*Ranunculus sp.*	buttercup	

Family	Scientific name	Common Name	Noxious or invasive
Ranunculaceae	*Thalictrum sp.*	meadow-rue	
Rhamnaceae	*Rhamnus cathartica*	common buckthorn	X
Rhamnaceae	*Rhamnus frangula*	glossy buckthorn	X
Rosaceae	*Rosa palustris*	swamp rose	
Rosaceae	*Amelanchier canadensis*	Canadian serviceberry	
Rosaceae	*Photinia melanocarpa*	black chokeberry	
Rosaceae	*Prunus nigra*	Canadian plum	
Rosaceae	*Crataegus sp.*	hawthorn	
Rosaceae	*Rosa multiflora*	multiflora rose	X
Rosaceae	*Rubus hispidus*	bristly dewberry	
Rosaceae	*Rubus allegheniensis*	Allegheny blackberry	
Rosaceae	*Malus sp.*	crabapple	
Rubiaceae	*Cephalanthus occidentalis*	common buttonbush	
Salicaceae	*Salix discolor*	pussy willow	
Salicaceae	*Salix nigra*	black willow	
Salicaceae	*Populus tremuloides*	quaking aspen	
Scrophulariaceae	*Chelone glabra*	white turtlehead	
Tiliaceae	*Tilia americana*	basswood	
Typhaceae	*Typha latifolia*	broadleaf cattail	X
Typhaceae	*Typha angustifolia*	narrowleaf cattail	X
Ulmaceae	*Ulmus americana*	American elm	
Verbenaceae	*Verbena hastata*	Swamp verbena	
Vitaceae	*Vitis sp.*	wild grape vine	

APPENDIX C

ANIMAL SPECIES LIST

BIRDS			
Common name	**Species name**	**Field observed**	**E-bird sighting***
Alder flycatcher	*Empidonax alnorum*		X
American black duck	*Anas rubripes*	X	X
American coot	*Fulica americana*		X
American crow	*Corvus brachyhychos*	X	X
American goldfinch	*Spinus tristis*	X	X
American kestrel	*Falco sparverius*		X
American redstart	*Setophaga ruticilla*	X	X
American robin	*Turdus migratorius*	X	X
American tree sparrow	*Spizella arborea*		X
American wigeon	*Anas americana*		X
American woodcock	*Scolopax minor*	X	X
Baltimore oriole	*Icterus galbula*		X
Bank swallow	*Riparia riparia*		X
Barn swallow	*Hirundo rustica*		X
Belted kingfisher	*Magaceryle alcyon*	X	X
Black-and-white warbler	*Mniotilta varia*		X
Blackburnian warbler	*Dendroica fusca*		X
Black-capped chickadee	*Poecile atricapillus*	X	X
Black-crowned night heron	*Nyticorax nyticorax*	X	X
Blackpoll warbler	*Dendroica striata*		X
Black-throated blue warbler	*Drendroica caerulescens*		X
Black-throated green warbler	*Dendroica virens*		X
Blue Jay	*Cyanocitta cristata*	X	X
Blue-gray gnatcatcher	*Polioptila caerulea*		X
Blue-headed vireo	*Vireo solitarius*		X
Bobolink	*Dolichonyx oryzivorus*		X
Bohemian waxwing	*Bombycilla garrulus*		X
Broad-winged hawk	*Buteo platypterus*	X	X
Brown thrasher	*Toxostoma rufum*		X
Brown-headed cowbird	*Molothrus ater*		X
Canada goose	*Branta canadensis*		X
Canada warbler	*Wilsonia canadensis*		X
Cape May warbler	*Dendroica tigrina*		X
Northern cardinal	*Cardinalis cardinalis*	X	X
Carolina wren	*Thryothorus ludovicianus*		X
Cedar waxwing	*Bombycilla cedrorum*	X	X
Chestnut-sided warbler	*Dendroica pensylvanica*	X	X
Chimney swift	*Chaetura pelagica*		X

BIRDS			
Common name	**Species name**	**Field observed**	**E-bird sighting***
Chipping sparrow	*Spizella passerina*		X
Cliff swallow	*Petrochelidon pyrrhonota*		X
Common grackle	*Quiscalus quiscalus*	X	X
Common loon	*Gavia immer*		X
Common yellowthroat	*Geothlypis trichas*	X	X
Cooper's hawk	*Accipiter cooperii*		X
Dark-eyed junco	*Junco hyemalis*		X
Double-crested cormorant	*Phalacrocorax auritus*	X	X
Downy woodpecker	*Picoides pubescens*		X
Eastern bluebird	*Sialis sialis*		X
Eastern kingbird	*Tyrannus tyrannus*		X
Eastern phoebe	*Sayornis phoebe*		X
Eastern towhee	*Pipilo erythrophthalmus*		X
Eastern wood-pewee	*Contopus virens*		X
European starling	*Sturnus vulgaris*	X	X
Gadwall	*Anas strepera*		X
Gray catbird	*Dumetella carolinensis*	X	X
Great black-backed gull	*Larus marinus*		X
Great blue heron	*Ardea herodias*	X	X
Great crested flycatcher	*Myiarchus crinitus*		X
Great egret	*Ardea alba*	X	X
Greater yellowlegs	*Tringa melanoleuca*		X
Green heron	*Butorides virescens*	X	X
Hairy woodpecker	*Picoides villosus*		X
Hermit thrush	*Catharus guttatus*		X
Herring gull	*Larus argentatus*	X	X
Hooded merganser	*Lophodytes cucullatus*		X
House finch	*Carpodacus mexicanus*	X	X
House sparrow	*Passer domesticus*		X
House wren	*Troglodytes aedon*		X
Lark sparrow	*Chondestes grammacus*		X
Least flycatcher	*Empidonax minimus*		X
Least sandpiper	*Calidris minutilla*		X
Lincoln's sparrow	*Melospiza lincolnii*		X
Magnolia warbler	*Dendroica magnolia*		X
Mallard	*Anas platyrhynchos*	X	X
Merlin	*Falco columbarius*		X
Mourning dove	*Zenaida macroura*	X	X

BIRDS			
Common name	**Species name**	**Field observed**	**E-bird sighting***
Mourning warbler	*Oporornis philadelphia*		X
Nashville warbler	*Oreothlypis ruficapilla*		X
Northern flicker	*Colaptes auratus*		X
Northern mockingbird	*Mimus polyglottos*		X
Northern parula	*Parula americana*	X	X
Northern rough-winged swallow	*Stelgidopteryx serripennis*		X
Northern waterthrush	*Parkesia noveboracensis*		X
Orchard oriole	*Icterus spurius*		X
Osprey	*Pandion haliaetus*		X
Ovenbird	*Seiurus aurocapilla*		X
Palm warbler	*Dendroica palmarum*		X
Pied-billed grebe	*Podilymbus podiceps*		X
Pileated woodpecker	*Dryocopus pileatus*		X
Pine siskin	*Spinus pinus*		X
Pine warbler	*Dendroica pinus*		X
Prairie warbler	*Dendroica discolor*		X
Purple finch	*Carpodacus purpureus*		X
Red-bellied woodpecker	*Melanerpes carolinus*		X
Red-breasted nuthatch	*Sitta canadensis*		X
Red-eyed vireo	*Vireo olivaceus*		X
Redhead	*Aythya americana*		X
Red-tailed hawk	*Buteo jamaicensis*	X	X
Red-winged blackbird	*Agelaius phoeniceus*	X	X
Ring-billed gull	*Larus delawarensis*		X
Ring-necked duck	*Aythya collaris*		X
Rock pigeon	*Columba livia*	X	X
Rose-breasted grosbeak	*Pheucticus ludovicianus*		X
Ruby-crowned kinglet	*Regulus calendula*	X	X
Ruby-throated hummingbird	*Archilochus colubris*	X	X
Ruddy duck	*Oxyura jamaicensis*		X
Rusty blackbird	*Euphagus carolinus*		X
Savannah sparrow	*Passerculus sandwichensis*		X
Scarlet tanager	*Piranga olivacea*		X
Sharp-shinned hawk	*Accipiter striatus*		X
Solitary sandpiper	*Tringa solitaria*	X	X
Song sparrow	*Melospiza melodia*	X	X
Sora	*Porzana carolina*		X
Spotted sandpiper	*Actitis macularius*		X

BIRDS			
Common name	**Species name**	**Field observed**	**E-bird sighting***
Swamp sparrow	*Melospiza georgiana*		X
Tennessee warbler	*Oreothlypis peregrina*		X
Tree swallow	*Tachycineata bicolor*		X
Tufted titmouse	*Baeolophus bicolor*		X
Turkey vulture	*Cathartes aura*	X	X
Veery	*Catharus fuscescens*		X
Virginia rail	*Rallus limicola*		X
Warbling vireo	*Vireo gilvus*		X
White-breasted nuthatch	*Sitta carolinensis*	X	X
White-crowned sparrow	*Zonotrichia leucophrys*		X
White-throated sparrow	*Zonotrichia albicollis*		X
Willow flycatcher	*Empidonax traillii*		X
Wilson's snipe	*Gallinago delicata*		X
Wilson's warbler	*Wilsonia pusilla*		X
Wood duck	*Aix sponsa*	X	X
Wood thrush	*Hylocichla mustelina*		X
Yellow warbler	*Dendroica petechia*		X
Yellow-bellied flycatcher	*Empidonax flaviventris*		X
Yellow-rumped warbler	*Dendroica coronata*		X

*Source: eBird. 2012. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org. (Accessed: September 16th, 2012). Search Criteria: first sightings Capisic Pond, 1997-2012

OTHER WILDLIFE	
Common name	**Species name**
American red squirrel	*Tamiasciurus hudsonicus*
Eastern gray squirrel	*Sciurus griseus*
Eastern chipmunk	*Tamias striatus*
White-tailed deer	*Odocoileus virginianus*
Coyote	*Canis latrans*
Common raccoon	*Procyon lotor*
Green frog	*Rana clamitans*
Bull frog	*Rana catasbeiana*
Common snapping turtle	*Chelydra serpentina*
Painted turtle	*Chrysemys picta*
fish	multiple (un-id'ed)
Chinese mystery snail	*Bellamya chinensis*
White-footed mouse	*Peromyscus leucopus*
Common garter snake	*Thamnophis sirtalis*

APPENDIX E: STORMWATER CALCULATIONS

COMMITMENT & INTEGRITY
DRIVE RESULTS
WOODARD &CURRAN
41 HUTCHINS DRIVE
PORTLAND, MAINE 04102
TEL.(207)774-2112

CLIENT	CITY OF PORTLAND		
PROJECT	ROCKLAND AVE OUTFALL		
	DISCHARGE ESTIMATE		
DESIGNED BY	AEA	DATE	10/11/2012
CHECKED BY		DATE	
PROJECT NO.	225672.15	SHEET NO.	1

Storm Drain Pipe Capacity Calculation

Percent Full	Flow Rate (gpd)	Flow Rate (cfs)	Velocity (fps)	Wetted Perimeter	Hydraulic Radius (feet)	Flow Area (sq. ft.)
0	0	0	0	0	0	0
1	53,082	0.082	2.470	1.002	0.033	0.033
2	236,864	0.366	3.909	1.419	0.066	0.094
3	566,670	0.876	5.106	1.741	0.099	0.172
4	1,050,299	1.624	6.166	2.014	0.131	0.263
5	1,692,574	2.618	7.132	2.255	0.163	0.367
10	7,358,705	11.381	11.138	3.218	0.318	1.022
15	17,133,105	26.499	14.348	3.977	0.464	1.847
20	30,865,844	47.739	17.076	4.636	0.603	2.796
25	48,281,323	74.674	19.453	5.236	0.733	3.839
30	69,023,684	106.755	21.548	5.796	0.855	4.954
35	92,677,151	143.339	23.404	6.331	0.967	6.125
40	118,776,470	183.705	25.048	6.847	1.071	7.334
45	146,812,201	227.067	26.497	7.353	1.165	8.570
50	176,232,614	272.570	27.764	7.854	1.250	9.817
55	206,442,735	319.294	28.855	8.355	1.324	11.065
60	236,800,310	366.246	29.774	8.861	1.388	12.301
65	266,607,667	412.348	30.521	9.377	1.441	13.510
70	295,097,162	456.411	31.089	9.912	1.481	14.681
75	321,405,177	497.100	31.469	10.472	1.508	15.796
80	344,523,088	532.856	31.643	11.071	1.521	16.839
85	363,194,419	561.734	31.579	11.731	1.516	17.788
90	375,656,504	581.008	31.215	12.490	1.490	18.613
95	378,729,015	585.760	30.401	13.453	1.432	19.268
100	352,465,701	545.140	27.764	15.708	1.250	19.635

25-yr Storm Flow (CFS)	241
Diam. (in)	60
Manning n	0.011
Slope(ft/ft)	0.0312

APPENDIX F: NUTRIENT SEPARATING BAFFLE BOX OPERATION & MAINTENANCE PLAN

NUTRIENT SEPARATING BAFFLE BOX OPERATION & MAINTENANCE PLAN

Rockland Avenue Outfall

225672.77
City of Portland
December 2013

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

TABLE OF CONTENTS

APPENDICES

INTRODUCTION

This Nutrient Separating Baffle Box (NSBB) Operations & Maintenance Plan (the Plan) outlines measures that are essential for maintaining an effective stormwater filtration system at the Rockland Avenue Outfall project located in Capisic Pond Park in Portland, Maine. An underground, in-line trash and sediment control structure will be installed near the park entrance at Rockland Avenue, uphill of the outfall.

Periodic and scheduled inspections and maintenance measures are recommended to prevent deficiencies and to ensure proper performance of the system. Failure to complete the recommended maintenance can reduce the hydraulic capacity and the pollutant removal efficiency of the system, resulting in a poor quality of stormwater runoff discharging from the outfall and into Capisic Brook, which is identified as an Urban Impaired Stream by the MaineDEP.

The proposed NSBB system is not regulated by local or state regulations, and as such, is not required to be operated and maintained in accordance with Chapter 32 of the City of Portland Code; the proposed system will be managed as part of the City Department of Public Services program.

MAINTENANCE MEASURES

Proposed infrastructure consists of the stormwater filtration system, the NSBB. Appendix A provides figures which show the various components of the system and Appendix B provides an inspection checklist and maintenance guidance, which have been provided by the manufacturer, Suntree Technologies, Inc. ®. Additional information on typical inspection procedures is provided below.

Inspection Information

Upon completion of construction, the NSBB system should be inspected after every rain event for the first month; thereafter, the system will require quarterly inspections in the first year to monitor sediment and debris loading, followed by, at minimum, annual cleaning via vac-truck thereafter. Sediment should be removed when it has accumulated to 50% (see section below for sediment removal procedure). A typical inspection procedure, as recommended by Suntree Technologies, Inc. ®, is as follows:

1. Visually inspect the unit from the surface for broken or missing hinges or handles.
2. Open access points (i.e. Manhole covers or hatches) and secure properly.
3. A visual inspection should be made of the basket screen system to determine the remaining capacity for debris, and to check for cracks, or damages.
4. A visual inspection should be made of the StormBoom; check for missing or broken parts.
5. A visual inspection should be done of the sediment chambers; this may require opening the bottom doors of the screen system (if possible).
6. A visual inspection should be made of the overall condition of the vault, typically joint areas, as well as inflow and outflow pipe grout areas.

Service Information

Service activities include the removal of accumulated sediment and debris. A typical service procedure, as recommended by Suntree Technologies, Inc. ®, is as follows:

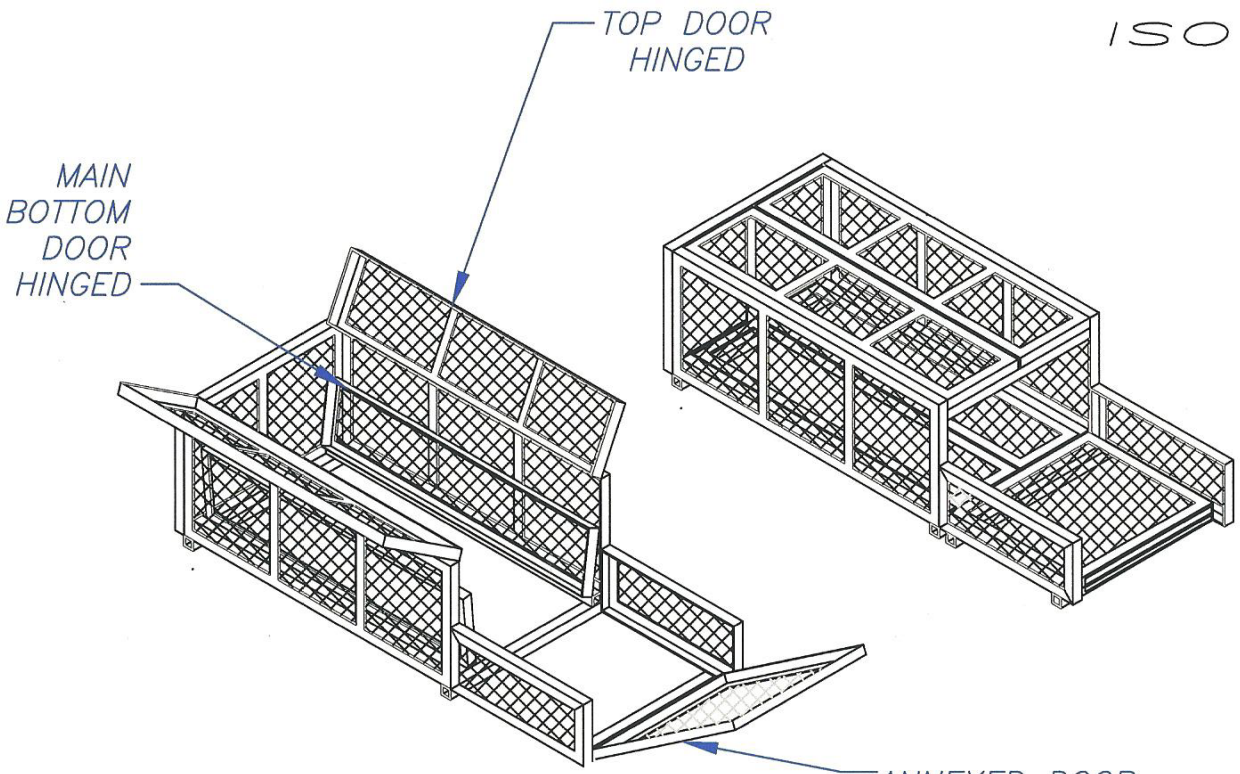
1. Open the access openings on top of the Baffle Box; these openings are typically manhole covers, hatches, or grates.

2. Vacuum the debris captured by the screen system to expose the sediment collection chambers.
3. Open the bottom doors to the basket system to expose the sediment collection chambers; these doors are provided with eyebolts to attach a hook to lift open the doors, which will hinge off to the side.
4. Vacuum each of the lower sediment chambers until they are empty.
5. After cleaning the sediment chambers, close the bottom screen doors of the screen system, and lower/slide the top doors and assure they lock correctly (if equipped with SunGlide Lids).
6. Visually inspect the StormBoom in the skimmer system for oil accumulation. Change the StormBoom if it is significantly discolored or if it is close to one year of service. The StormBoom has ropes attached to each end, which are fastened to eyelets adjacent to the access cover; these ropes act as a leash to prevent the bottom from washing away, and to allow the bottom to be easily pulled out of the containment bracket system on the face of the skimmer. Attach a rope on the end of the new boom to a rope on the end of the old boom. As the old boom is pulled out, it will pull the new boom into position, and the booms will trade places. Attach the rope ends of the new boom to the eyelets adjacent to the access cover.
7. When all maintenance work is completed, close the access covers.

APPENDIX A: SYSTEM FIGURES

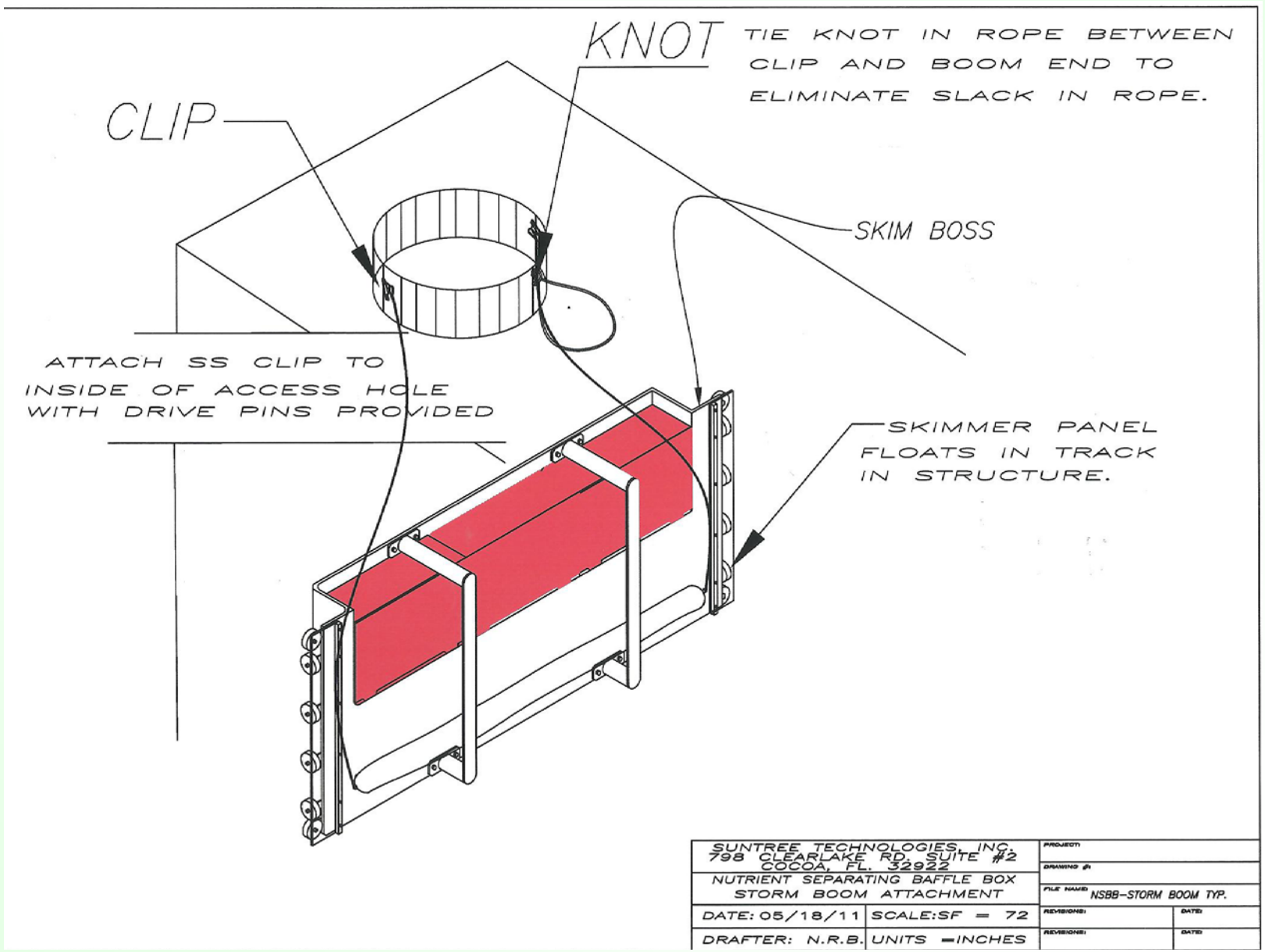
SUNTREE TECHNOLOGIES LIDDED BASKET—TYP

ISO VIEW



NOTE: SIZE MAY VARY DUE TO STRUCTURE.

SUNTREE TECHNOLOGIES, INC. 798 CLEARLAKE RD. SUITE #2 COCOA, FL. 32922		PROJECT: SUNTREE TECHNOLOGIES SPEC.
NUTRIENT SEPARATING BAFFLE BOX BAFFLE BOX LIDDED BASKET		REVISIONS: BASKET SYSTEM / DATE: 07/19/04
DATE: 07/19/04	SCALE:SF = 72	REVISIONS: / DATE:
DRAFTER: N.R.B.	UNITS =INCHES	REVISIONS: / DATE:


KNOT
TIE KNOT IN ROPE BETWEEN CLIP AND BOOM END TO ELIMINATE SLACK IN ROPE.
CLIP
SKIM BOSS
ATTACH SS CLIP TO INSIDE OF ACCESS HOLE WITH DRIVE PINS PROVIDED
SKIMMER PANEL FLOATS IN TRACK IN STRUCTURE.
SUNTREE TECHNOLOGIES, INC.
798 CLEARLAKE RD. SUITE #2
COCOA, FL. 32922
NUTRIENT SEPARATING BAFFLE BOX
STORM BOOM ATTACHMENT
DATE: 05/18/11
SCALE:SF = 72
DRAFTER: N.R.B.
UNITS =INCHES
PROJECT:
DRAWING #:
FILE NAME: NSBB-STORM BOOM TYP.
REVISIONS:
DATE:
REVISIONS:
DATE:

APPENDIX B: INSPECTION CHECKLIST & MAINTENANCE GUIDANCE

2.2 Inspection Checklist and Maintenance Guidance

Nutrient Separating Baffle Box

(To be completed at time of inspection or maintenance)

Location: _____

Owner Name: _____

Address: _____

Phone: _____

Date_____ **Time** _____ **Site Conditions** _____

Inspection Items	Condition	Recommended Interval	Comments
1. Access Openings		Quarterly	
2. Screen System		Quarterly	
3. Rear Skimmer and Storm Boom		Quarterly	
4. Sediment Chambers		Quarterly	
5. Vault Condition		Quarterly	

1. Inspection items are to determine accessibility into Nutrient Separating Baffle Box.
2. Visually inspect screen system for volume of debris and broken or missing parts.
3. Visually inspect skimmer for missing or broken parts & storm boom for discoloration.
4. Visually inspect sediment chambers for estimated quantity.
5. Visually inspect general condition of vault for any clogged areas.

Maintenance Items	Approximate Volume Collected	Date	Comments
1. Screen System			
2. Sediment Chambers			
3. Skimmer Storm Boom	Replaced Y / N		

1. After opening access vacuum out screen system—estimate volume collected.
2. After cleaning screen system—open bottom doors and vacuum out sediment chambers—estimate volume collected.
3. Replace storm boom if completely blackened.

NOTES