

# Alford Street Pedestrian and Landscape Improvements Boston, Massachusetts

## Notice of Intent

**April 18, 2018**

submitted to  
**Boston Conservation Commission**

submitted by  
**Everett Property, LLC**

prepared by  
**Fort Point Associates, Inc.**

in association with  
**Bohler Engineering**  
**Lifescapes International, Inc.**







# Fort Point Associates, Inc.

*Urban Planning   Environmental Consulting   Project Permitting*

April 18, 2018

Ms. Amelia Croteau  
Boston Conservation Commission  
Boston City Hall, Room 801  
1 City Hall Square  
Boston, Massachusetts 02201

RE:    Notice of Intent (NOI)  
      Alford Street Pedestrian and Landscape Improvements  
      Alford Street, Boston, MA

Dear Ms. Croteau and Conservation Commission Members:

On behalf of Everett Property, LLC (the "Applicant"), Fort Point Associates, Inc. is pleased to submit this Notice of Intent (NOI) for the proposed construction of landscaped open space (the "Project") located at Alford Street in Boston, Massachusetts.

This NOI is submitted by the Applicant to the City of Boston Conservation Commission (the "Commission") in order to obtain approval under the Massachusetts Wetland Protection Act (WPA) for work within wetlands resource areas proposed in connection with the Project.

The activities associated with the Project will provide landscape, stormwater and pedestrian improvements to an area in a currently blighted urban environment.

This NOI seeks approval under WPA and the Massachusetts Department of Environmental Protection Wetlands Protection Regulations (310 CMR 10.00) (the "Regulations") for activities that are located within WPA jurisdiction. Due to the proximity of the Mystic River and its associated coastal wetland resources, activities will occur within Land Subject to Coastal Storm Flowage, Riverfront, and Buffer Zone to Coastal Bank. These resource areas, specific work elements, and their associated wetland resource impacts and regulatory compliance, are described in this NOI and supporting materials.

The proposed work is anticipated to commence following the issuance of an Order of Conditions by the Commission as well as a Chapter 91 Waterways License and local permits required for the Project.

Ms. Amelia Croteau  
April 18, 2018  
Page 2

Very truly yours,

A handwritten signature in black ink, appearing to read "Judith T. Kohn", followed by a long horizontal line extending to the right.

Judith T. Kohn, RLA  
Vice President  
Fort Point Associates, Inc.

Attachments: Notice of Intent, MassDEP WPA Form 3 with Attachments  
Copies of MADEP Wetlands Fee Transmittal Form and Checks  
Filing Fee

CC: Massachusetts Department of Environmental Protection, Northeast Regional Office  
Everett Property, LLC, Jacqui Krum



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Application

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FEE TRANSMITTAL FORM





Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**NOI Wetland Fee Transmittal Form**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

**Important:** When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



## A. Applicant Information

### 1. Location of Project:

<u>Alford Street</u>	<u>Boston</u>
a. Street Address	b. City/Town
<u>7073</u>	<u>\$97.50</u>
c. Check number	d. Fee amount

### 2. Applicant Mailing Address:

<u>Jacqui</u>	<u>Krum</u>	
a. First Name	b. Last Name	
<u>Everett Property, LLC</u>		
c. Organization		
<u>101 Station Landing, Suite 2200</u>		
d. Mailing Address		
<u>Medford</u>	<u>MA</u>	<u>02155</u>
e. City/Town	f. State	g. Zip Code
<u>702-770-7802</u>	<u>jacqui.krum@wynnbostonharbor.com</u>	
h. Phone Number	i. Fax Number	j. Email Address

### 3. Property Owner (if different):

<u>Theodoros</u>	<u>Ventouris</u>	
a. First Name	b. Last Name	
<u>T.E.V. Realty Trust</u>		
c. Organization		
<u>902 Commonwealth Avenue</u>		
d. Mailing Address		
<u>Newton</u>	<u>MA</u>	<u>02459</u>
e. City/Town	f. State	g. Zip Code
	<u>atventouris@verizon.net</u>	
h. Phone Number	i. Fax Number	j. Email Address

## B. Fees

Fee should be calculated using the following process & worksheet. **Please see Instructions before filling out worksheet.**

**Step 1/Type of Activity:** Describe each type of activity that will occur in wetland resource area and buffer zone.

**Step 2/Number of Activities:** Identify the number of each type of activity.

**Step 3/Individual Activity Fee:** Identify each activity fee from the six project categories listed in the instructions.

**Step 4/Subtotal Activity Fee:** Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

**Step 5/Total Project Fee:** Determine the total project fee by adding the subtotal amounts from Step 4.

**Step 6/Fee Payments:** To calculate the state share of the fee, divide the total fee in half and subtract \$12.50. To calculate the city/town share of the fee, divide the total fee in half and add \$12.50.

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).



**Massachusetts Department of Environmental Protection**  
 Bureau of Resource Protection - Wetlands  
**NOI Wetland Fee Transmittal Form**  
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

**B. Fees** (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
1b) Site work without a house	1	\$110.00	\$110.00
1d) Resource improvement	1	\$110.00	\$110.00
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
<b>Step 5/Total Project Fee:</b>			\$220.00
<b>Step 6/Fee Payments:</b>			
Total Project Fee:			\$220.00
State share of filing Fee:			\$97.50
City/Town share of filing Fee:			\$1,500.00 (Boston Fee)
			a. Total Fee from Step 5
			b. 1/2 Total Fee <b>less</b> \$12.50
			c. 1/2 Total Fee <b>plus</b> \$12.50

**C. Submittal Requirements**

- a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection  
 Box 4062  
 Boston, MA 02211

- b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

**To MassDEP Regional Office** (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

**FORT POINT ASSOCIATES, INC.**  
31 STATE STREET, 3RD FLOOR  
BOSTON, MASSACHUSETTS 02109

DATE 4.18.18

 **Checkmark Check Fraud**  
Prevention or Response  
5.7515/110

7074

PAY TO THE ORDER OF


City of Boston

\$ 1,500.00

DOLLARS

VOID AFTER 60 DAYS

FOR

 **Santander**  
Santander Bank, N.A.  
Wynn DEI

Jeanne W Fey

MP

⑈007074⑈ ⑆011075150⑆ 65900016570⑈



Security Features

Details on back

**FORT POINT ASSOCIATES, INC.**  
31 STATE STREET, 3RD FLOOR  
BOSTON, MASSACHUSETTS 02109

DATE 4.18.18

 **Checkmark Check Fraud**  
Prevention or Response  
5.7515/110

7073

PAY TO THE ORDER OF

Commonwealth of Massachusetts  
Ninety seven and 50/100

\$ 97.50

DOLLARS

VOID AFTER 60 DAYS

FOR

 **Santander**  
Santander Bank, N.A.  
Wynn DEI

Jeanne W Fey

MP

⑈007073⑈ ⑆011075150⑆ 65900016570⑈



Security Features

Details on back





Application

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WPA FORM 3





**Massachusetts Department of Environmental Protection**  
Bureau of Resource Protection - Wetlands

**WPA Form 3 – Notice of Intent**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

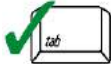
Document Transaction Number

Boston

City/Town

**Important:**

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note:  
Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

**A. General Information**

1. Project Location (**Note:** electronic filers will click on button to locate project site):

Alford Street Boston 02129  
a. Street Address b. City/Town c. Zip Code  
Latitude and Longitude: 42°23'36" 71°04'10"  
d. Latitude e. Longitude  
0201834025, 0201835000  
f. Assessors Map/Plat Number g. Parcel /Lot Number

2. Applicant:

Jacqui Krum  
a. First Name b. Last Name  
Everett Property, LLC (Owner: Parcel 0201835000)  
c. Organization  
101 Station Landing, Suite 2200  
d. Street Address  
Medford MA 02155  
e. City/Town f. State g. Zip Code  
702-770-7802 jacqui.krum@wynnbostonharbor.com  
h. Phone Number i. Fax Number j. Email Address

3. Property owner (required if different from applicant):  Check if more than one owner

Theodoros Ventouris  
a. First Name b. Last Name  
T.E.V. Realty Trust (Owner: Parcel 0201834025)  
c. Organization  
902 Commonwealth Avenue  
d. Street Address  
Newton MA 02459  
e. City/Town f. State g. Zip Code  
atventouris@verizon.net  
h. Phone Number i. Fax Number j. Email address

4. Representative (if any):

Judith Kohn  
a. First Name b. Last Name  
Fort Point Associates, Inc.  
c. Company  
31 State Street, 3rd Floor  
d. Street Address  
Boston MA 02109  
e. City/Town f. State g. Zip Code  
617-357-7044 x211 jkohn@fpa-inc.com  
h. Phone Number i. Fax Number j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

\$220.00 \$97.50 \$1,500.00  
a. Total Fee Paid b. State Fee Paid c. City/Town Fee Paid



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

**WPA Form 3 – Notice of Intent**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File Number
Document Transaction Number
Boston
City/Town

**A. General Information (continued)**

6. General Project Description:

The project includes the construction of landscape and pedestrian improvements on a previously developed area adjacent to Alford Street in Boston. This Project will support and enhance pedestrian and open-space features associated with the Wynn Boston Harbor Resort and improvements to Route 99.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

- 1.  Single Family Home
- 2.  Residential Subdivision
- 3.  Commercial/Industrial
- 4.  Dock/Pier
- 5.  Utilities
- 6.  Coastal engineering Structure
- 7.  Agriculture (e.g., cranberries, forestry)
- 8.  Transportation
- 9.  Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1.  Yes  No If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Suffolk	
a. County	b. Certificate # (if registered land)
36601	124
c. Book	d. Page Number

**B. Buffer Zone & Resource Area Impacts (temporary & permanent)**

- 1.  Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
- 2.  Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

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**B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)**

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input type="checkbox"/> Bank	1. linear feet	2. linear feet
b. <input type="checkbox"/> Bordering Vegetated Wetland	1. square feet	2. square feet
c. <input type="checkbox"/> Land Under Waterbodies and Waterways	1. square feet	2. square feet
	3. cubic yards dredged	

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. <input type="checkbox"/> Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	4. cubic feet replaced
e. <input type="checkbox"/> Isolated Land Subject to Flooding	1. square feet	
	2. cubic feet of flood storage lost	3. cubic feet replaced
f. <input checked="" type="checkbox"/> Riverfront Area	<u>Mystic River - Coastal</u>	

1. Name of Waterway (if available) - **specify coastal or inland**

2. Width of Riverfront Area (check one):

25 ft. - Designated Densely Developed Areas only

100 ft. - New agricultural projects only

200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 340 square feet

4. Proposed alteration of the Riverfront Area:

<u>340</u>	<u>N/A</u>	<u>N/A</u>
a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.

5. Has an alternatives analysis been done and is it attached to this NOI?  Yes  No
6. Was the lot where the activity is proposed created prior to August 1, 1996?  Yes  No

3.  Coastal Resource Areas: (See 310 CMR 10.25-10.35)

**Note:** for coastal riverfront areas, please complete **Section B.2.f.** above.



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**B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)**

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users:  
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. <input type="checkbox"/> Coastal Dunes	1. square feet	2. cubic yards dune nourishment

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
f. <input type="checkbox"/> Coastal Banks	1. linear feet	
g. <input type="checkbox"/> Rocky Intertidal Shores	1. square feet	
h. <input type="checkbox"/> Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. <input type="checkbox"/> Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. <input type="checkbox"/> Land Containing Shellfish	1. square feet	
k. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. <input checked="" type="checkbox"/> Land Subject to Coastal Storm Flowage	22,100 1. square feet	

4.  Restoration/Enhancement  
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW	b. square feet of Salt Marsh
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5.  Project Involves Stream Crossings

a. number of new stream crossings	b. number of replacement stream crossings
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Massachusetts Department of Environmental Protection  
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## C. Other Applicable Standards and Requirements

- This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

### Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

- Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to [http://maps.massgis.state.ma.us/PRI\\_EST\\_HAB/viewer.htm](http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm).

a.  Yes  No **If yes, include proof of mailing or hand delivery of NOI to:**

**Natural Heritage and Endangered Species Program  
Division of Fisheries and Wildlife  
1 Rabbit Hill Road  
Westborough, MA 01581**

2017 \_\_\_\_\_  
b. Date of map

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

c. Submit Supplemental Information for Endangered Species Review\*

- Percentage/acreage of property to be altered:
  - (a) within wetland Resource Area \_\_\_\_\_ percentage/acreage
  - (b) outside Resource Area \_\_\_\_\_ percentage/acreage

2.  Assessor's Map or right-of-way plan of site

- Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work \*\*
  - (a)  Project description (including description of impacts outside of wetland resource area & buffer zone)
  - (b)  Photographs representative of the site

\* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/>). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

\*\* MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

# WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
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## C. Other Applicable Standards and Requirements (cont'd)

(c)  MESA filing fee (fee information available at [http://www.mass.gov/dfwele/dfw/nhesp/regulatory\\_review/mesa/mesa\\_fee\\_schedule.htm](http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm)). Make check payable to "Commonwealth of Massachusetts - NHESP" and **mail to NHESP** at above address

*Projects altering 10 or more acres of land, also submit:*

(d)  Vegetation cover type map of site

(e)  Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1.  Project is exempt from MESA review. Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, [http://www.mass.gov/dfwele/dfw/nhesp/regulatory\\_review/mesa/mesa\\_exemptions.htm](http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm); the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2.  Separate MESA review ongoing. a. NHESP Tracking # \_\_\_\_\_ b. Date submitted to NHESP \_\_\_\_\_

3.  Separate MESA review completed. Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

a.  Not applicable – project is in inland resource area only      b.  Yes     No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -  
Southeast Marine Fisheries Station  
Attn: Environmental Reviewer  
836 South Rodney French Blvd.  
New Bedford, MA 02744  
Email: [DMF.EnvReview-South@state.ma.us](mailto:DMF.EnvReview-South@state.ma.us)

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -  
North Shore Office  
Attn: Environmental Reviewer  
30 Emerson Avenue  
Gloucester, MA 01930  
Email: [DMF.EnvReview-North@state.ma.us](mailto:DMF.EnvReview-North@state.ma.us)

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.





**Massachusetts Department of Environmental Protection**  
Bureau of Resource Protection - Wetlands

**WPA Form 3 – Notice of Intent**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

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City/Town

**C. Other Applicable Standards and Requirements (cont'd)**

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
- a.  Yes  No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.
- b. ACEC
5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
- a.  Yes  No
6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?
- a.  Yes  No
7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
- a.  Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
1.  Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
  2.  A portion of the site constitutes redevelopment
  3.  Proprietary BMPs are included in the Stormwater Management System.
- b.  No. Check why the project is exempt:
1.  Single-family house
  2.  Emergency road repair
  3.  Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

**D. Additional Information**

- This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

**Online Users:** Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1.  USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2.  Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

**Online Users:**  
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

# WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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City/Town

## D. Additional Information (cont'd)

3.  Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4.  List the titles and dates for all plans and other materials submitted with this NOI.

See Table of Contents & Attachment D

a. Plan Title

b. Prepared By

c. Signed and Stamped by

d. Final Revision Date

e. Scale

f. Additional Plan or Document Title

g. Date

5.  If there is more than one property owner, please attach a list of these property owners not listed on this form.

6.  Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7.  Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8.  Attach NOI Wetland Fee Transmittal Form

9.  Attach Stormwater Report, if needed.

## E. Fees

1.  Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

7073

2. Municipal Check Number

April 18, 2018

3. Check date

7073

4. State Check Number

April 18, 2018

5. Check date

Jamie

6. Payor name on check: First Name

Fay

7. Payor name on check: Last Name



**Massachusetts Department of Environmental Protection**  
Bureau of Resource Protection - Wetlands

**WPA Form 3 – Notice of Intent**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Boston

City/Town

**F. Signatures and Submittal Requirements**

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

	4/18/2018
1. Signature of Applicant	2. Date
	4/18/2018
3. Signature of Property Owner (if different)	4. Date
	4/18/2018
5. Signature of Representative (if any)	6. Date

**For Conservation Commission:**

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

**For MassDEP:**

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

**Other:**

If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.



Attachment A

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PROJECT NARRATIVE



# ATTACHMENT A: PROJECT NARRATIVE

## 1.1 OVERVIEW OF PROPOSED PROJECT

This Notice of Intent (NOI) is being submitted by Everett Property, LLC (the “Applicant”) to the City of Boston Conservation Commission (the “Commission”) in order to obtain approval under the Massachusetts Wetland Protection Act (WPA) for work within wetlands resource areas in association with the construction of landscaped open space on two parcels located on the Mystic River in Boston, Massachusetts (the “Project”).

The Project is being constructed in connection with the Wynn Boston Harbor (formerly named the Wynn Resort in Everett) development in Everett, which is a luxury resort with hotel, casino, retail, food and beverage outlets, event and meeting space, spa and gym, parking facilities, and a water transportation dock. Wynn Boston Harbor includes a significant financial investment in public open space, with extensive landscaping and pedestrian features along the Mystic River on the south and southwestern edge of the Wynn Boston Harbor development site.

The purpose of this NOI is to adjust the original landscape design adjacent to the Wynn Boston Harbor to include portions of two adjacent parcels, totaling approximately 6 acres (the majority of which is below Mean High Water), located in Boston (the “Project Parcels”). See Figure 1: Locus Plan.

The land portion of the Project (Boston parcels 0201835000 and 0201834025) is proposed to be substantially improved with pedestrian pathways, landscaping, stormwater improvements, and other amenities to augment the previously proposed public open space along the southern portion of the Wynn Boston Harbor development area. Activities on the Project Parcels will be confined to an area of approximately 1.4 acres (the “Project Area”).

## 1.2 EXISTING CONDITIONS

The Project Area is comprised of approximately 60,900 square feet (1.4 acres) located on Alford Street at the border of Lower Broadway in Everett (Route 99) in the lower reaches of the Mystic River, roughly 1,000 feet downstream of the Amelia Earhart Dam and 8,400 feet upstream of where the Mystic River meets the Boston Inner Harbor. The Chelsea River joins with the Mystic River about 8,000 feet downstream of the Project Area.

Project activities will take place landward of Mean High Water (MHW) in the Project Area in paved or previously disturbed areas. A one-story unoccupied retail building on parcel 0201834025 was demolished in 2016, and the Project Area currently serves as a staging area for construction activities on the Wynn Boston Harbor development. See Figure 2: Aerial

View and Existing Conditions Photographs Key Plan and Figure 3: Existing Conditions Photographs.

### **1.3 WETLAND RESOURCE AREAS**

The coastal wetland resource areas at the Project Area were delineated in accordance with criteria developed by state regulatory agencies and were determined by using elevations near and within the Project Area. Based on the definitions provided in the WPA and the regulations at 310 CMR 10.21 through 10.58, the following resource areas are present:

#### **1.3.1 RIVERFRONT AREA**

Riverfront Area is defined at 310 CMR 10.58(2) as:

*The area of land between a river's mean high water line and a parallel line measured horizontally. The riverfront area may include or overlap other resource areas or their buffer zones. The riverfront area does not have a buffer zone.*

The Riverfront Area on the Project Area is a protected zone paralleling the mean annual high-water line along the tidal Mystic River, which at the Project Area is at an elevation of 4.35' NAVD88. Within the City of Boston, the Riverfront Area extends 25 feet landward of the MHW line as defined at 310 CMR 10.58(2)3.a. Although the Mystic River at this location is estuarine, it still maintains riverine characteristics, and therefore is considered to have a Riverfront Area. Massachusetts Department of Environmental Protection (MassDEP) riverfront area maps indicate the location of the "mouth" of the Mystic River is about 8,400 feet downstream of the Project Area. Approximately 340 sf of Riverfront Area is associated with the Project Parcels. The Project is not subject to Riverfront performance standards due to the requirement to obtain a Chapter 91 License from MassDEP. See Sheet C200 Existing Conditions Plan A.

#### **1.3.2 BUFFER ZONE**

A Buffer Zone is associated with the Coastal Bank wetland resource present on the Project Area. Coastal Banks are defined in 310 CMR 10.30(2) as:

*The seaward face or side of any elevated landform, other than a coastal dune, which lies at the landward edge of a Coastal Beach, Land Subject to Tidal Action, or other wetland.*

Land within 100 feet landward of a Coastal Bank is defined under the regulations as Buffer Zone. Approximately 2,500 square feet (sf) of Buffer Zone are present within the Project Area. See Sheet C200 Existing Conditions Plan A.



### **1.3.3 LAND SUBJECT TO COASTAL STORM FLOWAGE**

Land Subject to Coastal Storm Flowage is defined in 310 CMR 10.04 as:

*Land subject to any inundation caused by coastal storms up to and including that caused by the 100-year storm, surge of record or storm of record, whichever is greater.*

The 100-year flood elevation is identified on the Flood Insurance Rate Maps (FIRM) produced by the Federal Emergency Management Agency (FEMA). According to the most recent flood map (FIRM Map No. 25025C0014J, March 16, 2016), a portion of the Project Area is within the 100-year flood zone AE 11 in the NAVD88 datum (Boston City Base Elevation (BCB) 17.5 feet). Approximately 22,100 sf is located within the AE 11 zone. See Figure 4, FEMA Flood Insurance Rate Map. Approximately 22,100 sf (1,400 cubic yards (cy)) of Land Subject to Coastal Storm Flowage will be filled. See Sheet C200 Existing Conditions Plan A, and Sheet C201 Existing Conditions Plan B.

## **1.4 DESCRIPTION OF PROPOSED WORK**

### **1.4.1 SITE DEVELOPMENT AND IMPROVEMENTS**

Approximately 1.4 acres of the Project Area will be altered for landscape and open space improvements. Landscape improvements include: the installation of pedestrian paths, trees, shrubs, site lighting, and synthetic turf as well as stormwater management devices. No buildings or structures will be constructed in the Project Area. See Sheet C300 Grading and Drainage Plan A, and Sheet C301 Grading and Drainage Plan B.

### **1.4.2 DESCRIPTION AND IMPACTS OF PROPOSED WORK IN WETLAND RESOURCE AREAS**

Project work will occur in the three resource areas described in Section 1.3. The proposed work will include the installation of pedestrian sidewalks, planting, stormwater management features, and amenities. Areas of Riverfront and Buffer Zone will not change and will be enhanced as a result of the Project. All work will comply with performance standards for the resource areas.

#### **Coastal Bank Buffer Zone**

Proposed alterations to the Coastal Bank Buffer Zone will impact 2,500 sf of the resource area. Project work will comply with the following relevant performance standards:

*When a coastal bank is determined to be significant to storm damage prevention or flood control because it supplies sediment to coastal beaches, coastal dunes or barrier beaches, 310 CMR 10.30 (3) through (5) shall apply:*

*(3) No new bulkhead, revetment, seawall, groin or other coastal engineering structure shall be permitted on such a coastal bank...*

No new bulkhead, revetment, seawall, groin, or other coastal engineering structure is proposed as part of the Project work.

*(4) Any project on a coastal bank or within 100 feet landward of the top of a coastal bank, other than a structure permitted by 310 CMR 10.30 (3), shall not have an adverse effect due to wave action on the movement of sediment from the coastal bank to coastal beaches or land subject to tidal action.*

The site improvements associated with the Project will serve to stabilize the currently exposed soils with plantings and sidewalk.

*(5) The Order of Conditions and the Certificate of Compliance for any new building within 100 feet landward of the top of coastal bank permitted by the issuing authority under MGL c.131, 40 shall contain the specific condition: 310 CMR 10.30 (30), promulgated under MGL c.131 40, requires that no coastal engineering structure, such as a bulkhead, revetment, or seawall shall be permitted on an eroding bank at any time in the future to protect the project allowed by this Order of Conditions.*

No new buildings are proposed.

*(6) Any project on such a coastal bank or within 100 feet landward of the top of such coastal bank shall have no adverse effects on the stability of the coastal bank.*

All Project work within the 100 foot buffer will consist of landscaping and pedestrian amenities. The stability of the coastal bank will not be impacted.

#### **Land Subject to Coastal Storm Flowage (LSCSF)**

Under current conditions, approximately 22,100 sf of the Project Area is located within LSCSF, based on elevation. Post-construction, the area within LSCSF will be approximately 5,600 sf due to proposed changes in elevation. These changes will only affect landscaped open space and pedestrian pathways, and will not impact buildings.

There are no performance standards associated with LSCSF.

**Riverfront**

Although the Project is not required to meet Riverfront performance standards, the proposed landscape improvements are compliant with those performance standards.

**1.5 MITIGATION MEASURES****1.5.1 CONSTRUCTION PERIOD MITIGATION**

The following are proposed mitigation measures that will be implemented during the approximately nine month construction period. Other measures and conditions imposed by the Commission will be adhered to during the construction of the Project. Construction will be managed under a National Pollutant Discharge Elimination System (NPDES) Construction General Permit and Stormwater Pollution Prevention Plan (SWPPP).

**Erosion and Sedimentation Controls**

During construction, erosion and sedimentation control measures will be implemented to minimize the transport of Project Area soils to off-site areas and Boston Water and Sewer Commission storm drain systems. The existing catch basins will be protected with filter fabric or silt sacks to remove sediment from runoff. Where necessary, temporary sedimentation basins will be constructed to prevent the transport of sediment off-site.

**Siltation Fence**

A siltation fence will be installed at the perimeter of the Project Area and at erosion-prone areas throughout the construction phase of the Project. The siltation fence will be held in place with wooden stakes.

**Dust Control**

Fugitive dust will be controlled through wetting with water, street sweeping, and other suppression techniques. Trucks hauling materials and excavate from the Project Area will be required to be covered. During appropriate phases of work, existing on-site wheel-wash stations will be utilized or newly established to control tracking of mud, dust, and other debris onto city streets.

**Pavement Sweeping**

If necessary, the roads in the vicinity of the Project Area will be swept. Sweeping will occur as necessary on paved areas within the Project Area.

**Dewatering Protocol**

Construction dewatering and runoff will either be managed under a National Pollutant Discharge Elimination System Remediation General Permit or will be recharged onsite in accordance with the Massachusetts Contingency Plan (310 CMR 40.0045).

**Site Maintenance**

The Project Area will be maintained in a clean and orderly manner. Chain-link fencing will be erected during construction around the perimeter of the edge of the Project Area to control access and minimize transport of windblown debris off-site.

**1.5.2 LONG-TERM MITIGATION****Permanent Stormwater Improvements**

The proposed design will collect, treat, store, and infiltrate stormwater runoff generated from developed pervious and impervious areas within the Project Area to the greatest extent practicable. The Project will meet or reduce the existing peak rate of stormwater discharge and volumes of stormwater runoff from the Project Area and promote runoff recharge for the one-inch storm event.

**Sea Level Rise and Climate Change Resiliency**

In December 2016, the Boston Planning & Development Agency released *Climate Ready Boston*, a comprehensive study report detailing climate projections, a vulnerability assessment, focus areas for future action, and climate resilience initiatives for the City of Boston. The Boston Planning and Development Agency (BPDA) has identified elevations of future flood impact above the FEMA FIRM maps. The Project Area is identified on map 2B/2C as having a future flood elevation of 19.3 BCB, equivalent to elevation 12.84 NAVD88.

In order to account for current and future flooding, the Project Area will be regraded to raise the overall elevation of the open space area. Proposed elevations will range from El 8.7 NAVD88 to match existing off-site grades, to a high point of El 14.0 NAVD88. Proposed grades, as well as stabilization of the soil, will add to the resiliency of the Project Area.

Green infrastructure, particularly large shade trees, will also have a mitigating effect on flooding. No buildings or structures are proposed in the Project.

### 1.5.3 COMPLIANCE WITH MASSDEP STORMWATER MANAGEMENT STANDARDS

The Project will meet or exceed the MassDEP Stormwater Management Standards as described below. See Sheets C300 and C301, Grading and Drainage Plans, and Appendix C, Stormwater Report.

## 1.6 NOI PLAN LIST

Title	Number	Date	Signed and Stamped
Overall Site Plan	C100	April 18, 2018	Stephen P. Martorano
Existing Conditions Plans A & B	C200/C201	April 18, 2018	Stephen P. Martorano
Grading and Drainage Plans A & B	C300/C301	April 18, 2018	Stephen P. Martorano
Erosion and Sediment Control Plans A & B	C400/C401	April 18, 2018	Stephen P. Martorano
Soil Erosion Control Notes and Detail Sheet	C402	April 18, 2018	Stephen P. Martorano
Construction Detail Sheet	C500	April 18, 2018	Stephen P. Martorano
Landscape Planting Legend and Notes	L100	April 18, 2018	Daniel B. Trust
Landscape Planting Plans	L200/L201	April 18, 2018	Daniel B. Trust



















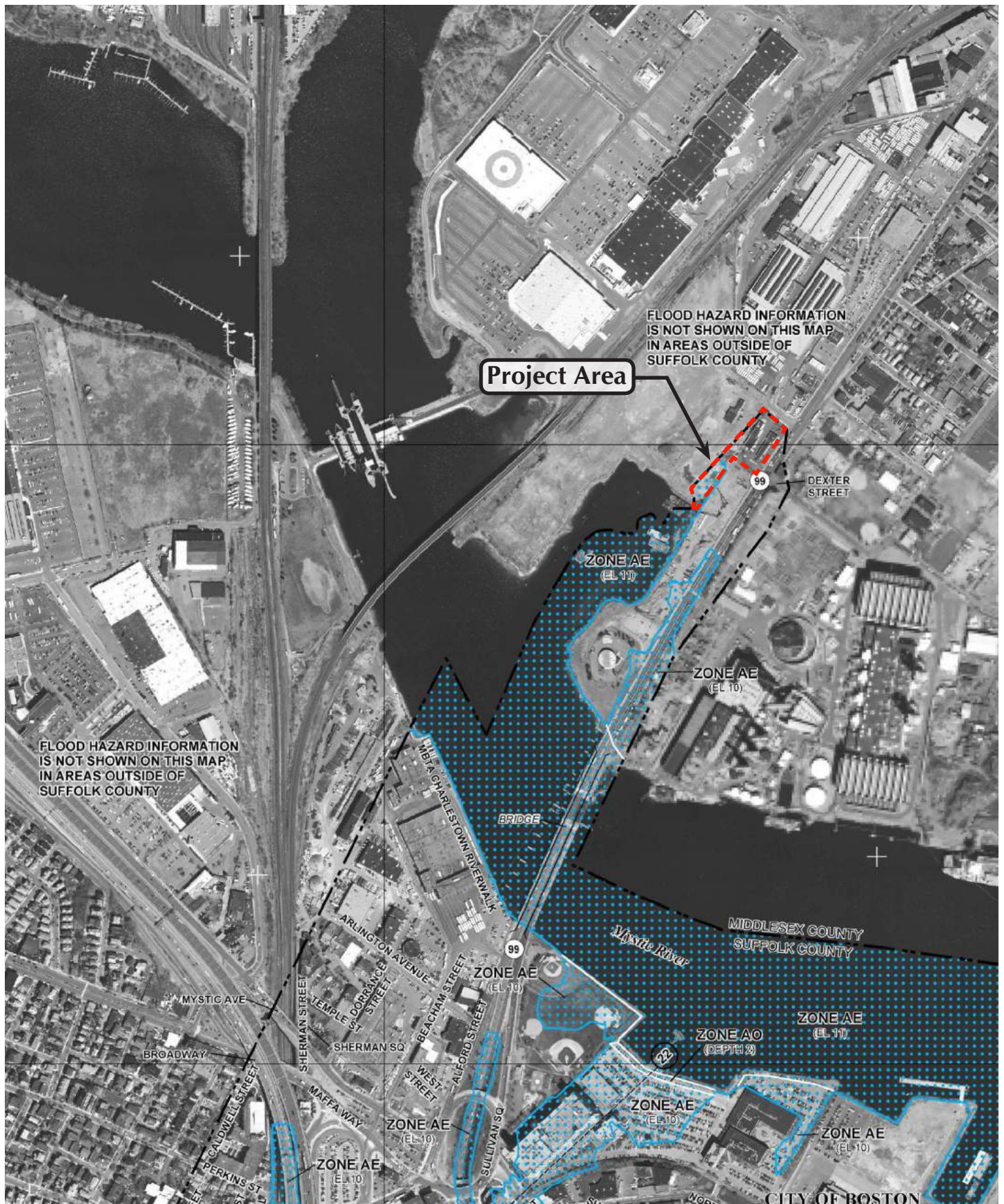
















## Attachment B

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# NOTIFICATION INFORMATION



## ATTACHMENT B: NOTIFICATION INFORMATION

The following table outlines abutters of the Project within 100 feet of the property line as gathered from the City of Boston Assessing Department.

<b>Property</b>	<b>Owner Name</b>	<b>Owner Address</b>	<b>Parcel ID</b>
Alford Street Charlestown, Ma 02129	Mass Water Resources Authority	100 First Avenue Charlestown, MA 02129	201834120
Alford Street Charlestown, Ma 02129	Boston Water & Sewer Commission	980 Harrison Ave Roxbury, MA 02119	201834050
173 Alford Street Charlestown, Ma 02129	Constellation Mystic Power C/o Constellation Energy Resources	100 Constellation Way Suite 500c Baltimore, MD 21202	201832000
215 Alford Street Charlestown, Ma 02129	Joseph Marchese Holding Co	221 Beach Street Revere, MA 02151	201833000

**Notification to Abutters Under the  
Massachusetts Wetlands Protection Act**

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, you are hereby notified of the following:

- A. The name of the applicant is **Everett Property, LLC**. The applicant has filed a Notice of Intent with the Conservation Commission for the municipality of **Boston** seeking permission to remove, till, dredge, or alter an Area Subject to Protection under the Wetlands Protection Act (General Laws Chapter 131, section 40).
- B. The address of the lot where the activity is proposed is **Alford Street, Boston, MA 02129**.
- C. Copies of the notice of Intent may be examined at **Boston City Hall** between the hours of **9 AM and 5 PM** on the following days of the weeks: **Monday through Friday**. For more information, call Boston City Hall at **(617) 635-4500**.
- D. Copies of the Notice of Intent may be obtained from the applicant's representative by calling this telephone number **(617) 357-7044 x211** between the hours of **9 AM and 5 PM** on the following days of the week: **Monday through Friday**.
- E. Information regarding the date, time, and place of the public hearing may be obtained from **Boston Conservation Commission** by calling this telephone number: **(617) 635-3850** between the hours of and on the following days of the week: **9 AM to 5 PM, Monday through Friday**

NOTE: Notice of the public hearing, including its date, time, and place, will be published at least five (5) days in advance in the **Boston Herald**

*NOTE: Notice of the public hearing, including its date, time, and place, will be posted in the City or Town Hall not less than forty-eight (48) hours in advance.*

*NOTE: You also may contact your local Conservation Commission or the nearest Department of Environmental Protection Regional Office for more information about this application or the Wetlands Protection Act. To contact DEP, call: the Northeast Region: (978) 694-3200.*

Attachment C

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STORMWATER REPORT



# ***STORMWATER DRAINAGE REPORT***

*for*

***EVERETT PROPERTY, LLC***

***City of Boston, Massachusetts  
Suffolk County***

Prepared for:  
EVERETT PROPERTY, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Prepared by:  
BOHLER ENGINEERING  
45 Franklin Street, 5<sup>th</sup> Floor  
Boston, MA 02110  
(617) 849-8040



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Stephen Martorano, P.E.  
Massachusetts P.E. License #45942

April 18, 2018

M181002

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## **I. EXECUTIVE SUMMARY**

The purpose of this report is to summarize the stormwater drainage conditions that will occur as a result of the landscape and pedestrian improvements in Boston, MA as part of the Wynn Boston Harbor development. Everett Property, LLC is proposing to construct open space amenity areas consisting of walkways and landscaping. The site is bounded to the northwest and northeast by the Wynn Boston Harbor property in Everett, Alford Street/Broadway to the southeast, a Boston Water & Sewer Commission (BWSC) property to the southwest, and the Mystic River to the southwest.

This report provides a summary of how the proposed project meets or exceeds the MassDEP Stormwater Management Guidelines and addresses the requirements of the Boston Water & Sewer Commission. This report will provide calculations documenting the design of the proposed stormwater management system as illustrated within the accompanying Site Development Plans prepared by Bohler Engineering. The project will also detail erosion and sedimentation controls to be implemented during the demolition and construction periods, as well as long term stabilization and pollution prevention of the Site.

## **II. EXISTING SITE CONDITIONS**

The Project Site comprises approximately 1.4± acres (60,886± SF) including portions of parcels 0201834025 and 0201835000. At the time of the survey, the Project Site included a 13,000± SF 1-story commercial brick building with associated impervious sidewalks and gravel parking area. The Project Site also consisted of areas of asphalt pavement, broken asphalt, and gravel.

The commercial building has been demolished to make way for this project and construction staging activities currently occurring onsite. The drainage analysis is based on the original conditions of the site prior to the demolition of the building.

Due to the proximity of the Mystic River and its associated coastal wetland resources, portions of the Project's on-site development will occur within WPA regulated areas. Based on the definitions provided in the WPA and the Regulations of 310 CMR 10.21 through 10.37, the following resource areas are present at the Project Site: Land Subject to Coastal Storm Flowage (the 100-year floodplain), Riverfront Area, and Coastal Bank Buffer Zone. According to the FEMA Flood Insurance Rate Map for Suffolk County, Map Number 25025C0014J, the portion of the site in LSCSF is designated as a Zone AE with a Base Flood Elevation of 11 feet, NAVD 1988, which is the equivalent of 17.46 feet Boston City Base.

The soils at the site are mapped as "Urban Land" and Udorthents with wet substratum as classified by the Natural Resource Conservation Service (NRCS). See Appendix B for the Soils Map. The USDA defines Urban Land as a miscellaneous area that has been so altered or obscured by urban works and structures that identification of soils is not practical; onsite investigations are necessary to determine the potentials and limitations for any proposed use.

Udorthents are areas of poorly drained and very poorly drained soils that have been filled in with various soil material, rubble, and refuse. Borings and test pits conducted for the Wynn Boston Harbor project between December, 2012 and June, 2013 revealed that the subsurface conditions were generally fill underlain by organic soil, sand, and clay. Based on geotechnical data, the on-site soils have been assigned a HSG classification of C. The Rawls Rate for HSG “C”, which is 0.27 inches per hour, was utilized as an infiltration rate in this analysis.

The pre-development conditions stormwater evaluation models the site as two (2) sub-catchments draining to two (2) Design Points (see Existing Drainage Area Map in Appendix E). Design Point #1 is the Mystic River and Design Point #2 is the BWSC storm drain system in Alford St/Broadway. The BWSC storm drain system flows south down Alford Street where runoff ultimately discharges to the Mystic River.

Subcatchment E1 is 0.67 acres in the western portion of the site abutting the city line and contains mostly gravel and concrete. The Curve Numbers (CN) for this area is 91 and the time of concentration is six (6) minutes.

Subarea E2 contains 0.73 acres in the northeastern portion of the site adjacent to Broadway. This area also contains primarily a gravel surface with areas of impervious roof and areas of pavement. The CNs for this area is 94 and the time of concentration is six (6) minutes.

### **III. PROPOSED SITE CONDITIONS**

The proposed project involves the construction of open space that will serve as an access and amenity area adjacent to the proposed resort. Associated improvements include the introduction of walkways, landscaped areas and synthetic turf. These improvements will reduce peak flows when compared to the previously developed condition and will not produce total suspended solids usually associated with parking areas, roadways and drive aisles. Since the Project site is within land subject to coastal storm flowage, the requirement to provide peak rate attenuation is waived. The stormwater management system for the project will be designed to provide the required water quality volume of 1” times the impervious area, which is consistent with the requirements of discharges to Areas of Critical Environmental Concern (ACEC) and the requirements of BWSC.

Under post construction conditions, the site will continue to drain to the same two design points as under existing conditions; to the Mystic River and to Alford St/Broadway. Area P1 drains to Design Point #1 at the Mystic River, and Area P2 drains to Design Point #2 in Alford St/Broadway. Please refer to the Proposed Drainage Area Map in Appendix E for a graphical depiction of the drainage subareas described below.

Drainage area P1 is 0.35 acres in the southwestern portion of the site and contains primarily paved walkways and landscaped areas, with a small portion of synthetic turf. For this drainage analysis, the synthetic turf has been conservatively modeled as a compacted gravel surface. The

weighted CN for P1 is 84 and a minimum time of concentration of six (6) minutes has been utilized for this analysis.

Drainage area P2 is 1.05 acres in the northeastern portion of the site and contains paved walkways, landscaped areas and synthetic turf areas. The weighted CN for P2 is 86 and the time of concentration is six (6) minutes.

### Storm Sewer System

Perforated landscape drainage pipes will intercept runoff from the walkway areas and at the project boundary. A 1.5'x1.5' stone trench underneath these perforated pipes will provide the required 1" of storage and infiltration for the impervious coverage. In drainage area P1, the perforated landscape drainage system will overflow to the Mystic River. In drainage area P2, the perforated landscape drainage system will flow into a solid pipe system that discharges into the BWSC storm system in Alford St/Broadway.

### Resource Area Impacts

The size of proposed alteration to Land Subject to Coastal Storm Flowage is 22,100 SF. The size of proposed alteration to the Riverfront Area is 340 SF. The size of proposed alteration to the Coastal Bank Buffer Zone is 2,500 SF. There is no proposed impact to the Coastal Bank or adjacent ACEC.

### Water Quality

The entire project site is covered by walkways, landscaped areas and synthetic turf which will not produce total suspended solids usually associated with parking areas, roadways and drive aisles. This is a significant improvement over the pre-development conditions which included approximately 16,000 s.f. of parking lot.

## **IV. MassDEP STORMWATER MANAGEMENT GUIDELINES**

The proposed project meets or exceeds the MassDEP Stormwater Management Guidelines based on the following information:

**Standard #1: No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.**

There are no new untreated discharges associated with this project.

**Standard #2: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.**

Due to decrease in impervious surface coverage and increase in proposed infiltration, post-development peak rates of runoff are equal to or less than pre-development conditions for the 2-, 10-, 25- and 100-year storm events, and there will not be any increase in off-site flooding during the 100-year 24-hour storm. Additionally, this standard is waived for discharges to land subject to coastal storm flowage.

**Standard #3: Loss of annual recharge to ground water shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance.**

The project is a redevelopment and is required to meet Standard 3 to the maximum extent practicable. Since there is not a proposed increase in impervious area, post-development infiltration and groundwater recharge will emulate existing conditions. Furthermore, the project will meet both the Stormwater Handbook and the Boston Water & Sewer Commission (BWSC) requirement to provide 1” of storage and infiltration for the impervious cover on the site.

**Standard #4: Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS)**

The entire project site is covered by lawn area and walkways which will not produce total suspended solids usually associated with parking areas, roadways and drive aisles. Therefore, required TSS removal is not applicable.

**Standard #5: For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.**

The project does not come into contact with an area or activity that generates a higher pollutant load. Therefore, this standard is not applicable.

**Standard #6: Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook.**

Portions of the intertidal and subtidal areas adjacent to the Project Site are theoretically capable of supporting shellfish, but appear not to do so currently. In addition, the Wynn Boston Harbor project site along with surrounding portions of the Mystic River is currently classified as a prohibited shellfish growing area, meaning the area is closed to harvesting of

shellfish. Nevertheless, the Proponent has elected to consider the Project area a potential shellfish resource for purposes of stormwater management compliance.

The stormwater management system for the project will be designed to provide the required water quality volume of 1" times the impervious area, which is consistent with the requirements of discharges to Critical Area waters that include shellfish growing areas. The entire project site is covered by walkways, landscaped areas and synthetic turf which will not produce total suspended solids usually associated with parking areas, roadways and drive aisles. Therefore, pretreatment is not applicable.

**Standard #7: A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable.**

As described above, the Project is being developed within a previously developed area and results in a reduction in impervious surfaces, and is therefore considered a redevelopment under the Stormwater Management Standards.

**Standard #8: A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.**

The proposed project will provide construction period erosion and sedimentation controls as indicated within the site plan set provided for this project. This includes erosion control barriers, protection for stormwater inlets, and various other techniques.

**Standard #9: A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.**

An Operation and Maintenance (O&M) Plan for the proposed BMPs has been developed for this project, and is included in Appendix G. The O&M plan will be implemented for the Project's stormwater management system and provides for the inspection and maintenance of BMPs.

**Standard #10: All illicit discharges to the stormwater management system are prohibited.**

The proposed stormwater system will only convey allowable non-stormwater discharges. To the Engineer's knowledge, there are no known or designed illicit non-stormwater discharges that are or will be connected to any portion of the stormwater collection system that would convey pollutants directly to groundwater or surface waters.

## V. METHODOLOGY

Methodology utilized to design the stormwater management system associated with this project includes compliance with the guidelines set forth in the latest edition of MassDEP Stormwater Handbook. Although exempt, the proposed stormwater management design will provide a decrease in peak stormwater runoff rates from the proposed facility for the 2-, 10-, 25- and 100-year design storm events utilizing the SCS TR-20 and TR-55 Urban Hydrology for Small Watersheds methods. Specifically, the proposed stormwater management design results in “net decreases” in stormwater peak runoff rates directed toward downstream properties and water bodies. The assessment of existing and proposed stormwater flows was performed using HydroCAD©. HydroCAD© input and output data is included in Appendices D.

Times of concentration (Tc) utilized in the preparation of this report were generated utilizing the SCS TR-55 Urban Hydrology for Small Watersheds method. Runoff coefficients for the pre- and post-development conditions were calculated using widely accepted, and often utilized runoff coefficients and have been documented within the Appendices of this report. Rainfall data for the storm events was obtained from NOAA Atlas 14 Volume 10 Precipitation Frequency Data Server for the project location. The following rainfall data was used in the calculations:

<b>Frequency</b>	<b>2-year</b>	<b>10-year</b>	<b>25-year</b>	<b>100-year</b>
<b>Rainfall (Inches)</b>	3.26	5.15	6.33	8.15

## VI. SUMMARY

In summary, the proposed stormwater management system design, described in the above report and illustrated within the Site Development Plans prepared by Bohler Engineering results in a “net decrease” in stormwater peak runoff rates from the subject site when compared to pre-development conditions for the 2-, 10-, 25- and 100-year storm frequencies for flows directed toward surrounding properties and water bodies. In addition, the project site is covered entirely by lawn area and walkways, thus improving the water quality of the runoff over existing conditions. As a result, the project meets or exceeds the requirements of the Massachusetts Department of Environmental Protection Stormwater Management Guidelines as required. The pre-development versus post-development peak discharge rates comparisons are contained within the tables below, in cubic-feet per second (cfs):

**Summary of Peak Runoff Rates to DP-1**

<b>Storm Event (years)</b>	<b>2</b>	<b>10</b>	<b>25</b>	<b>100</b>
<b>Existing Flow, CFS</b>	1.71	3.02	3.83	5.06
<b>Proposed Flow, CFS</b>	0.33	1.35	1.78	2.43
<b>Change, CFS</b>	-1.38	-1.67	-2.05	-2.63

**Summary of Peak Runoff Rates to DP-2**

<b>Storm Event (years)</b>	<b>2</b>	<b>10</b>	<b>25</b>	<b>100</b>
<b>Existing Flow, CFS</b>	2.14	3.55	4.42	5.76
<b>Proposed Flow, CFS</b>	0.97	1.00	2.09	4.52
<b>Change, CFS</b>	-1.17	-2.55	-2.33	-1.24

**APPENDIX A**  
**USGS MAP**





SCALE: 1"=1000'

PROJECT:

USGS MAP  
FOR  
WYNN DESIGN & DEVELOPMENT  
98 HORIZON WAY  
EVERETT, MIDDLESEX COUNTY, MASSACHUSETTS



**BOHLER**<sup>TM</sup>  
**ENGINEERING**

LAND SURVEYING	SITE CIVIL AND CONSULTING ENGINEERING	LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN	PROGRAM MANAGEMENT	TRANSPORTATION SERVICES
	PERMITTING SERVICES	

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◆ NEW ENGLAND	◆ PHILADELPHIA, PA	◆ SOUTHERN MARYLAND	◆ ATLANTA, GA
◆ BOSTON, MA	◆ PITTSBURGH, PA	◆ NORTHERN VIRGINIA	◆ TAMPA, FL
◆ NEW YORK, NY	◆ LEHIGH VALLEY, PA	◆ CENTRAL VIRGINIA	◆ SOUTH FLORIDA
◆ NEW YORK METRO	◆ SOUTHEASTERN, PA	◆ RALEIGH, NC	◆ DALLAS, TX
◆ NORTHERN NEW JERSEY	◆ REHOBOTH BEACH, DE	◆ WASHINGTON, DC	

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**APPENDIX B**  
**NRCS SOIL MAP**



Soil Map—Middlesex County, Massachusetts, and Norfolk and Suffolk Counties, Massachusetts  
(M181002 - Soil Survey)




Map Scale: 1:1,410 if printed on B landscape (17" x 11") sheet.  
0 20 40 80 120 Meters  
0 50 100 200 300 Feet  
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84






## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts

Survey Area Data: Version 17, Oct 6, 2017

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts

Survey Area Data: Version 13, Oct 6, 2017

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 10, 2014—Aug 25, 2014



## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	0.7	3.0%
603	Urban land, wet substratum	8.9	37.6%
655	Udorthents, wet substratum	9.5	40.2%
<b>Subtotals for Soil Survey Area</b>		<b>19.2</b>	<b>80.8%</b>
<b>Totals for Area of Interest</b>		<b>23.7</b>	<b>100.0%</b>

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	0.4	1.5%
603	Urban land, wet substratum, 0 to 3 percent slopes	1.8	7.5%
655	Udorthents, wet substratum	2.4	10.1%
<b>Subtotals for Soil Survey Area</b>		<b>4.6</b>	<b>19.2%</b>
<b>Totals for Area of Interest</b>		<b>23.7</b>	<b>100.0%</b>

**APPENDIX C**  
**FEMA FIRMETTE**



# National Flood Hazard Layer FIRMette



## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Regulatory Floodway Zone AE, AO, AH, VE, AR

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Coastal Transect Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

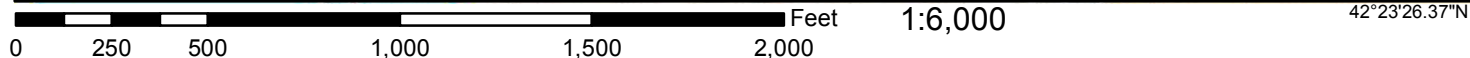


This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The base map shown complies with FEMA's base map accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/26/2018 at 11:16:01 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: base map imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

42°23'52.94"N



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

71°34'53.31"W



**APPENDIX D**  
**WATER QUALITY VOLUME CALCULATIONS**

**Water Quality Volume:**

Water Quality Volume (WQV) = 1" x Contributing Impervious Area

Total Impervious Area (into BMP) = 18,999 SF

WQV = 1,583 CF

Volume provided = 1,647 CF

1,647 CF > 1,583 CF → **OK**

**Drawdown Time:**

**Gravel Infiltration System**

Infiltration rate = 0.27 inch/hour (Rawls Rate for HSG "C")

Depth of water to be infiltrated = 1.5 feet = 18 inches

18 inches / 0.27 inch per hour = drawdown time of 67 hours

**APPENDIX E**  
**PRE AND POST-DEVELOPMENT WATERSHED MAPS**





Consultants:



45 FRANKLIN STREET, 5TH FLOOR  
BOSTON, MA 02110  
Phone: (617) 849-8040  
Fax: (617) 849-8040  
www.BohlerEngineering.com

Seals:

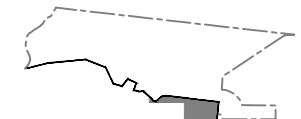
Project Title:

**Alford Street Pedestrian and  
Landscape Improvements  
Boston, MA**

Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Key Plan:



Project No.: Jacobs #L1009100, Bohler #M181002

Copyright: 2016 Jacobs Engineering Group

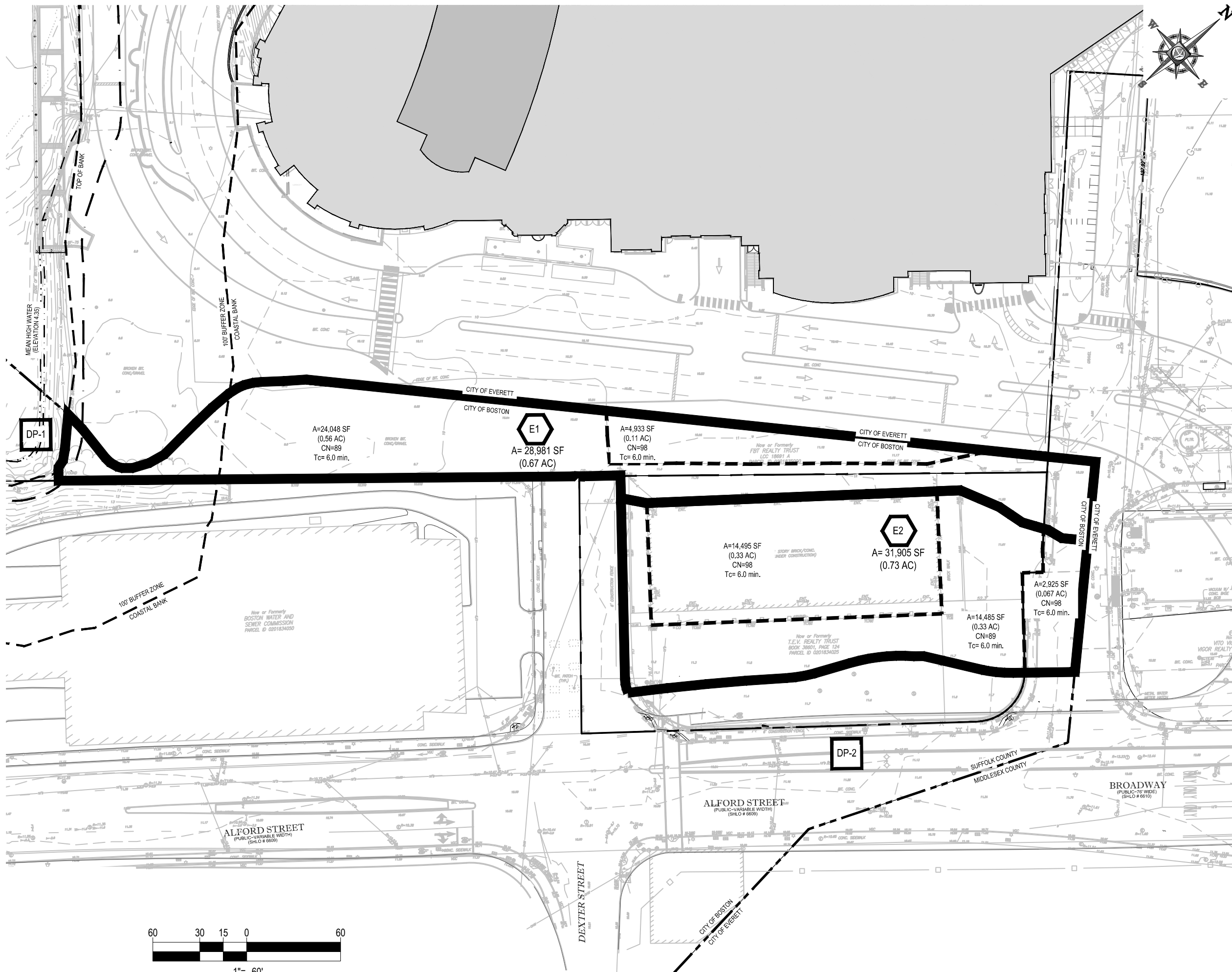
2018 Bohler Engineering

Date: 04/18/2018

Drawing Sheet Title:

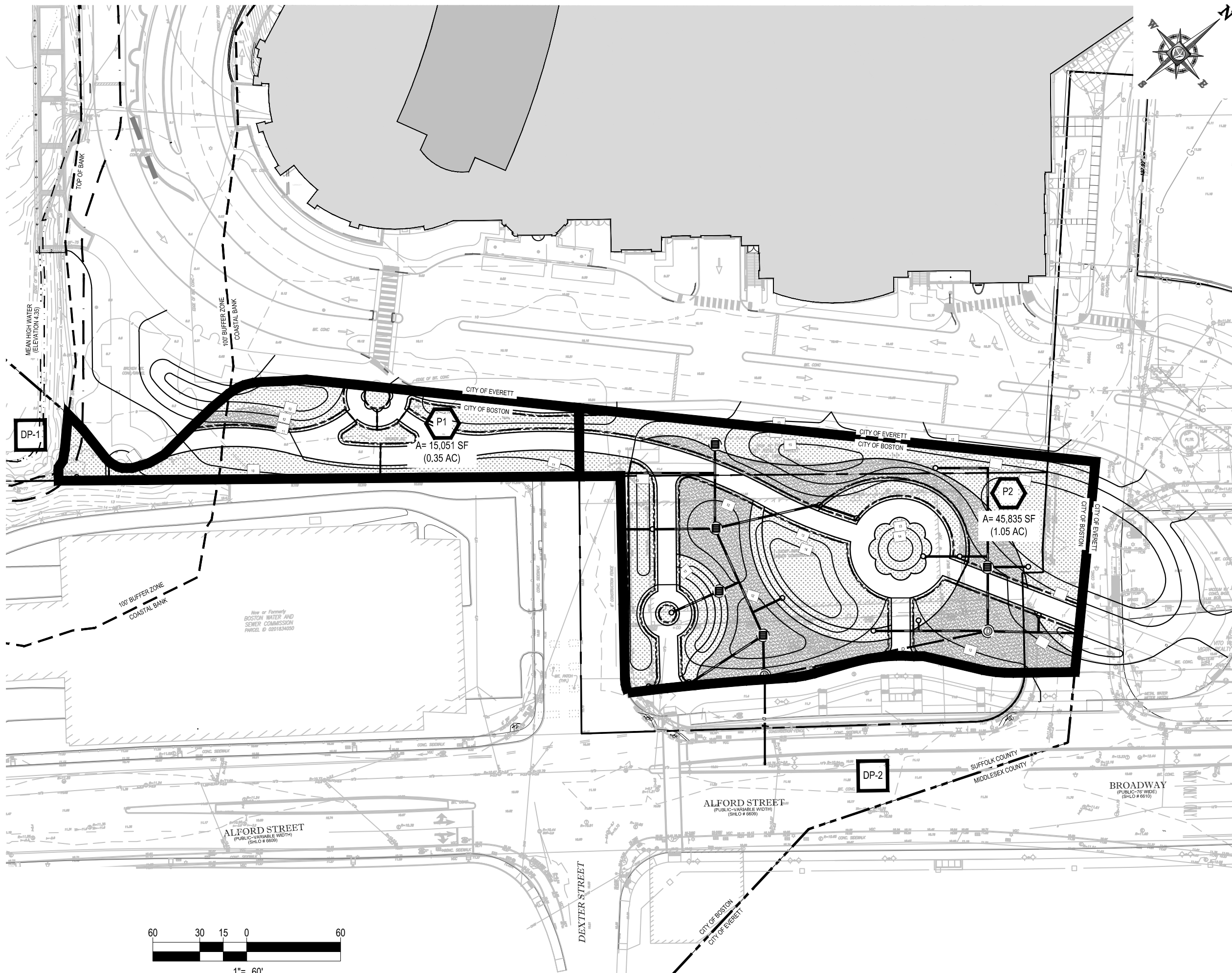
**EXISTING DRAINAGE AREA  
MAP**

Drawing Sheet Number:









Consultants:



45 FRANKLIN STREET, 5TH FLOOR  
BOSTON, MA 02110  
Phone: (617) 849-8040  
Fax: (617) 849-8040  
www.BohlerEngineering.com

Seals:

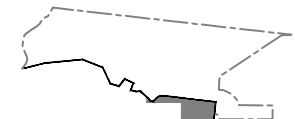
Project Title:

**Alford Street Pedestrian and  
Landscape Improvements  
Boston, MA**

Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Key Plan:



Project No.: Jacobs #L1009100, Bohler #M181002

Copyright: 2016 Jacobs Engineering Group

2018 Bohler Engineering

Date: 04/18/2018

Drawing Sheet Title:

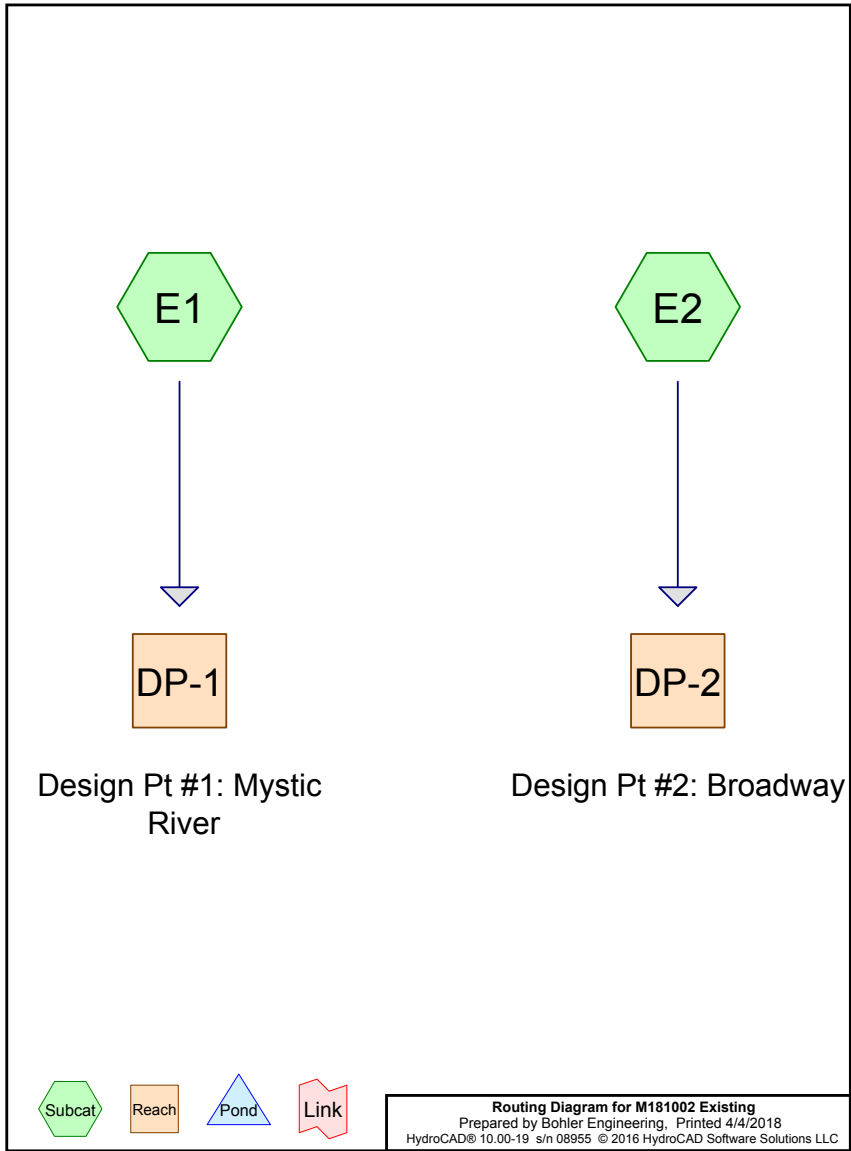
**PROPOSED DRAINAGE  
AREA MAP**

Drawing Sheet Number:



**APPENDIX F**  
**PRE AND POST DEVELOPMENT HYDROLOGIC CALCULATIONS**





**M181002 Existing**

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Page 2

**Area Listing (all nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
0.885	89	Gravel roads, HSG C (E1, E2)
0.333	98	Roofs, HSG C (E2)
0.180	98	Unconnected pavement, HSG C (E1, E2)
<b>1.398</b>	<b>92</b>	<b>TOTAL AREA</b>

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Page 3

**Soil Listing (all nodes)**

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.398	HSG C	E1, E2
0.000	HSG D	
0.000	Other	
<b>1.398</b>		<b>TOTAL AREA</b>

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**Ground Covers (all nodes)**

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.885	0.000	0.000	0.885	Gravel roads	E1, E2
0.000	0.000	0.333	0.000	0.000	0.333	Roofs	E2
0.000	0.000	0.180	0.000	0.000	0.180	Unconnected pavement	E1, E2
<b>0.000</b>	<b>0.000</b>	<b>1.398</b>	<b>0.000</b>	<b>0.000</b>	<b>1.398</b>	<b>TOTAL AREA</b>	

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Type III 24-hr 2-Year Rainfall=3.26"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**SubcatchmentE1:**Runoff Area=28,981 sf 17.02% Impervious Runoff Depth=2.22"  
Tc=6.0 min UI Adjusted CN=90 Runoff=1.71 cfs 0.123 af**SubcatchmentE2:**Runoff Area=31,905 sf 54.60% Impervious Runoff Depth=2.60"  
Flow Length=317' Tc=6.0 min CN=94 Runoff=2.14 cfs 0.159 af**Reach DP-1: Design Pt #1: Mystic River**

Inflow=1.71 cfs 0.123 af

Outflow=1.71 cfs 0.123 af

**Reach DP-2: Design Pt #2: Broadway**

Inflow=2.14 cfs 0.159 af

Outflow=2.14 cfs 0.159 af

**Total Runoff Area = 1.398 ac Runoff Volume = 0.282 af Average Runoff Depth = 2.42"**  
**63.29% Pervious = 0.885 ac 36.71% Impervious = 0.513 ac****M181002 Existing**

Prepared by Bohler Engineering

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Type III 24-hr 2-Year Rainfall=3.26"

Printed 4/4/2018

Page 6

**Summary for Subcatchment E1:**

Runoff = 1.71 cfs @ 12.09 hrs, Volume= 0.123 af, Depth= 2.22"

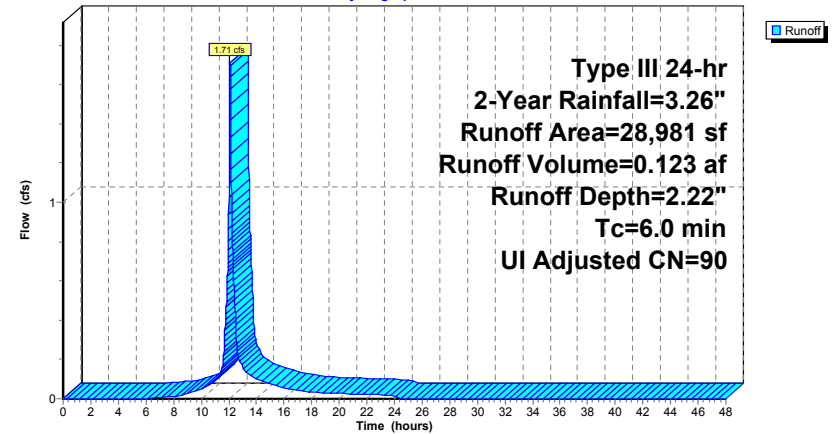
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.26"

Area (sf)	CN	Adj	Description
4,933	98		Unconnected pavement, HSG C
24,048	89		Gravel roads, HSG C
28,981	91	90	Weighted Average, UI Adjusted
24,048			82.98% Pervious Area
4,933			17.02% Impervious Area
4,933			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment E1:**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.26"

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**Summary for Subcatchment E2:**

Runoff = 2.14 cfs @ 12.08 hrs, Volume= 0.159 af, Depth= 2.60"

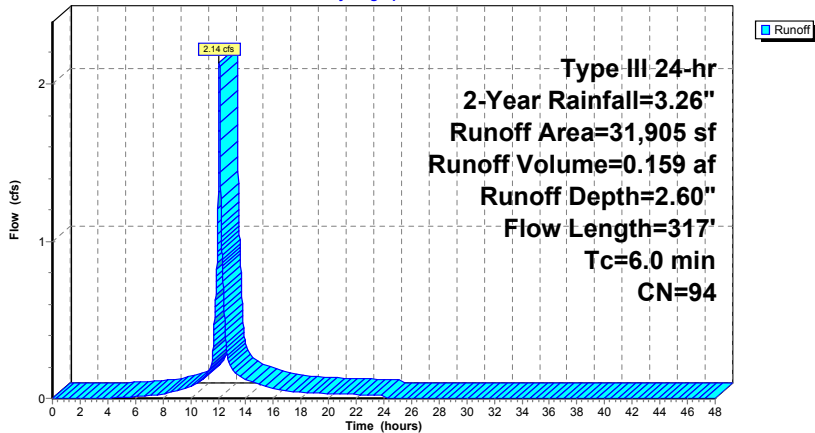
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.26"

Area (sf)	CN	Description
14,495	98	Roofs, HSG C
14,485	89	Gravel roads, HSG C
2,925	98	Unconnected pavement, HSG C
31,905	94	Weighted Average
14,485		45.40% Pervious Area
17,420		54.60% Impervious Area
2,925		16.79% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0080	0.94		Sheet Flow, Sheet flow over gravel Smooth surfaces n= 0.011 P2= 3.10"
1.8	217	0.0160	2.04		Shallow Concentrated Flow, Remainder to DA boundary Unpaved Kv= 16.1 fps
2.4					Direct Entry, To make min. allowable (0.1 hr)
6.0	317	Total			

**Subcatchment E2:**

Hydrograph



**M181002 Existing**

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Type III 24-hr 2-Year Rainfall=3.26"

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**Summary for Reach DP-1: Design Pt #1: Mystic River**

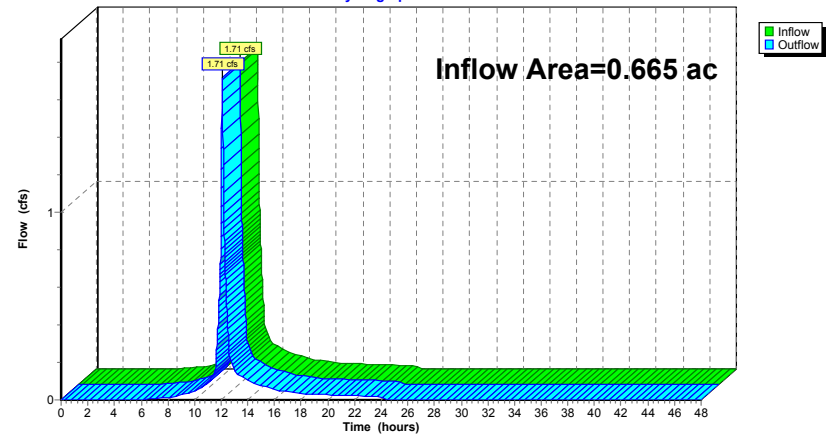
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.665 ac, 17.02% Impervious, Inflow Depth = 2.22" for 2-Year event  
Inflow = 1.71 cfs @ 12.09 hrs, Volume= 0.123 af  
Outflow = 1.71 cfs @ 12.09 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-1: Design Pt #1: Mystic River**

Hydrograph





**M181002 Existing**

Prepared by Bohler Engineering

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Type III 24-hr 2-Year Rainfall=3.26"

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**Summary for Reach DP-2: Design Pt #2: Broadway**

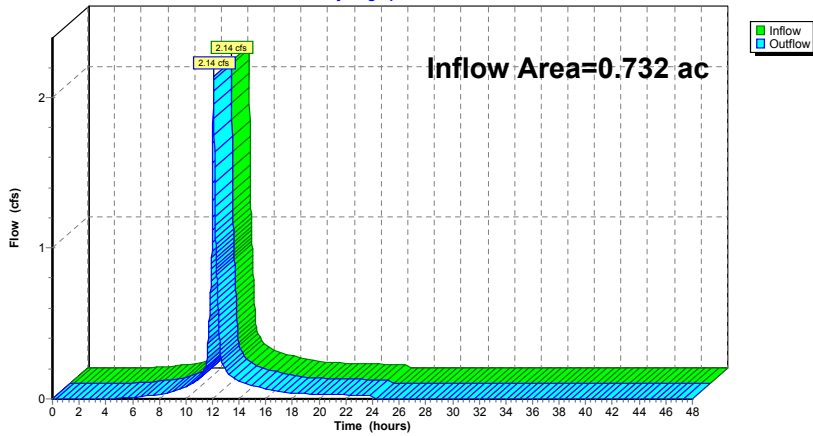
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.732 ac, 54.60% Impervious, Inflow Depth = 2.60" for 2-Year event  
Inflow = 2.14 cfs @ 12.08 hrs, Volume= 0.159 af  
Outflow = 2.14 cfs @ 12.08 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-2: Design Pt #2: Broadway**

Hydrograph



**M181002 Existing**

Prepared by Bohler Engineering

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Type III 24-hr 10-Year Rainfall=5.15"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**SubcatchmentE1:** Runoff Area=28,981 sf 17.02% Impervious Runoff Depth=4.02"  
Tc=6.0 min UI Adjusted CN=90 Runoff=3.02 cfs 0.223 af

**SubcatchmentE2:** Runoff Area=31,905 sf 54.60% Impervious Runoff Depth=4.46"  
Flow Length=317' Tc=6.0 min CN=94 Runoff=3.55 cfs 0.272 af

**Reach DP-1: Design Pt #1: Mystic River** Inflow=3.02 cfs 0.223 af  
Outflow=3.02 cfs 0.223 af

**Reach DP-2: Design Pt #2: Broadway** Inflow=3.55 cfs 0.272 af  
Outflow=3.55 cfs 0.272 af

**Total Runoff Area = 1.398 ac Runoff Volume = 0.495 af Average Runoff Depth = 4.25"**  
**63.29% Pervious = 0.885 ac 36.71% Impervious = 0.513 ac**

**M181002 Existing**

Prepared by Bohler Engineering

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Type III 24-hr 10-Year Rainfall=5.15"

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**Summary for Subcatchment E1:**

Runoff = 3.02 cfs @ 12.08 hrs, Volume= 0.223 af, Depth= 4.02"

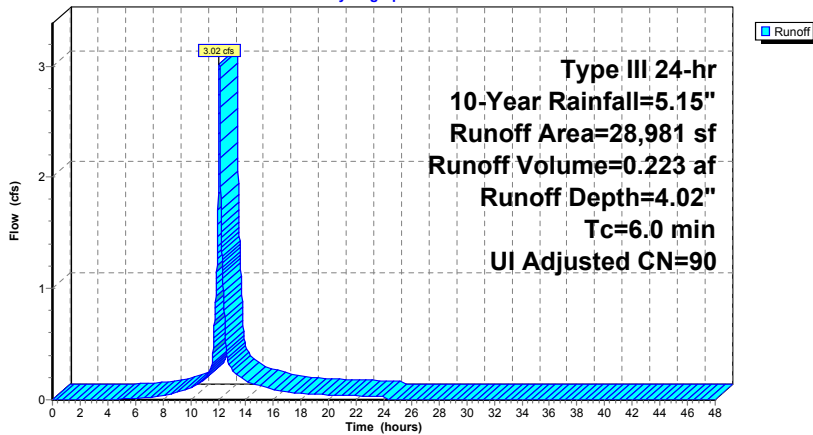
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=5.15"

Area (sf)	CN	Adj	Description
4,933	98		Unconnected pavement, HSG C
24,048	89		Gravel roads, HSG C
28,981	91	90	Weighted Average, UI Adjusted
24,048			82.98% Pervious Area
4,933			17.02% Impervious Area
4,933			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment E1:**

Hydrograph



**M181002 Existing**

Prepared by Bohler Engineering

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Type III 24-hr 10-Year Rainfall=5.15"

Printed 4/4/2018

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**Summary for Subcatchment E2:**

Runoff = 3.55 cfs @ 12.08 hrs, Volume= 0.272 af, Depth= 4.46"

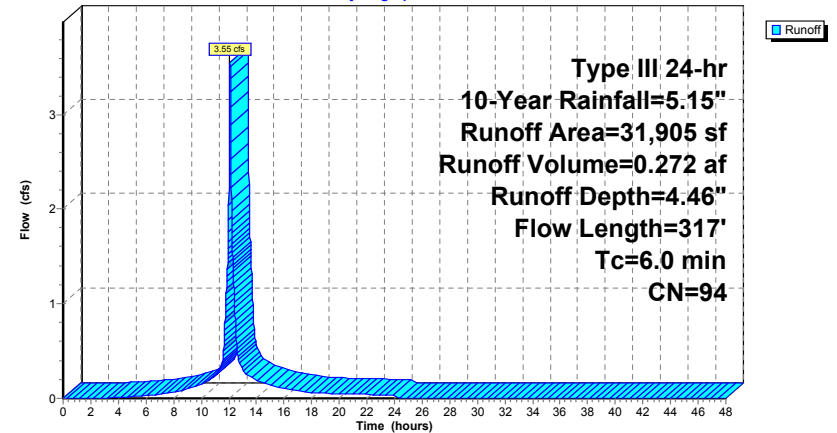
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=5.15"

Area (sf)	CN	Description
14,495	98	Roofs, HSG C
14,485	89	Gravel roads, HSG C
2,925	98	Unconnected pavement, HSG C
31,905	94	Weighted Average
14,485		45.40% Pervious Area
17,420		54.60% Impervious Area
2,925		16.79% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0080	0.94		Sheet Flow, Sheet flow over gravel Smooth surfaces n= 0.011 P2= 3.10"
1.8	217	0.0160	2.04		Shallow Concentrated Flow, Remainder to DA boundary Unpaved Kv= 16.1 fps
2.4					Direct Entry, To make min. allowable (0.1 hr)
6.0	317				Total

**Subcatchment E2:**

Hydrograph



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Type III 24-hr 10-Year Rainfall=5.15"

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**Summary for Reach DP-1: Design Pt #1: Mystic River**

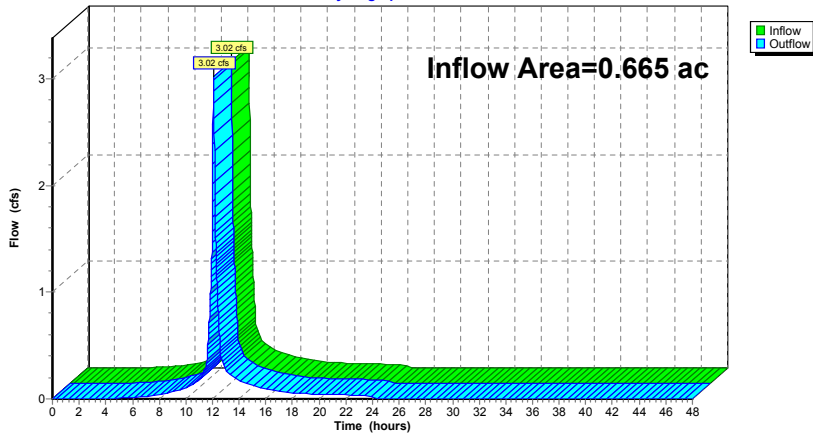
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.665 ac, 17.02% Impervious, Inflow Depth = 4.02" for 10-Year event  
Inflow = 3.02 cfs @ 12.08 hrs, Volume= 0.223 af  
Outflow = 3.02 cfs @ 12.08 hrs, Volume= 0.223 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-1: Design Pt #1: Mystic River**

Hydrograph



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**Summary for Reach DP-2: Design Pt #2: Broadway**

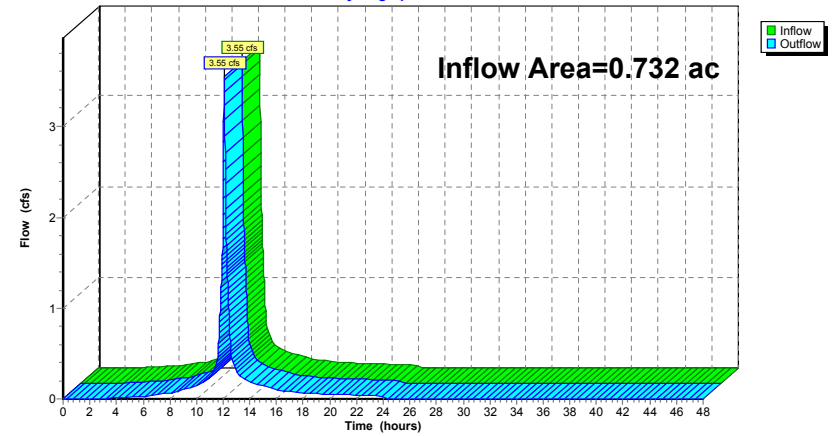
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.732 ac, 54.60% Impervious, Inflow Depth = 4.46" for 10-Year event  
Inflow = 3.55 cfs @ 12.08 hrs, Volume= 0.272 af  
Outflow = 3.55 cfs @ 12.08 hrs, Volume= 0.272 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-2: Design Pt #2: Broadway**

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.33"

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Page 15Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method**SubcatchmentE1:** Runoff Area=28,981 sf 17.02% Impervious Runoff Depth=5.17"  
Tc=6.0 min UI Adjusted CN=90 Runoff=3.83 cfs 0.287 af**SubcatchmentE2:** Runoff Area=31,905 sf 54.60% Impervious Runoff Depth=5.62"  
Flow Length=317' Tc=6.0 min CN=94 Runoff=4.42 cfs 0.343 af**Reach DP-1: Design Pt #1: Mystic River** Inflow=3.83 cfs 0.287 af  
Outflow=3.83 cfs 0.287 af**Reach DP-2: Design Pt #2: Broadway** Inflow=4.42 cfs 0.343 af  
Outflow=4.42 cfs 0.343 af**Total Runoff Area = 1.398 ac Runoff Volume = 0.630 af Average Runoff Depth = 5.41"**  
**63.29% Pervious = 0.885 ac 36.71% Impervious = 0.513 ac****M181002 Existing**Prepared by Bohler Engineering  
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Type III 24-hr 25-Year Rainfall=6.33"

Printed 4/4/2018  
Page 16**Summary for Subcatchment E1:**

Runoff = 3.83 cfs @ 12.08 hrs, Volume= 0.287 af, Depth= 5.17"

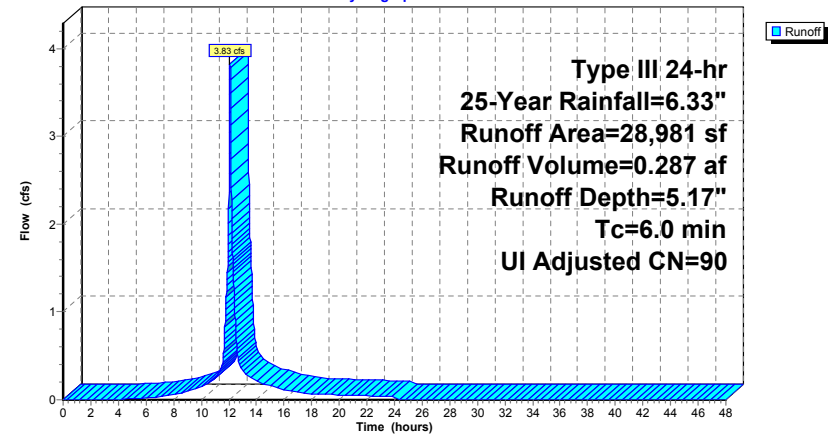
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Adj	Description
4,933	98		Unconnected pavement, HSG C
24,048	89		Gravel roads, HSG C
28,981	91	90	Weighted Average, UI Adjusted
24,048			82.98% Pervious Area
4,933			17.02% Impervious Area
4,933			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment E1:**

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.33"

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**Summary for Subcatchment E2:**

Runoff = 4.42 cfs @ 12.08 hrs, Volume= 0.343 af, Depth= 5.62"

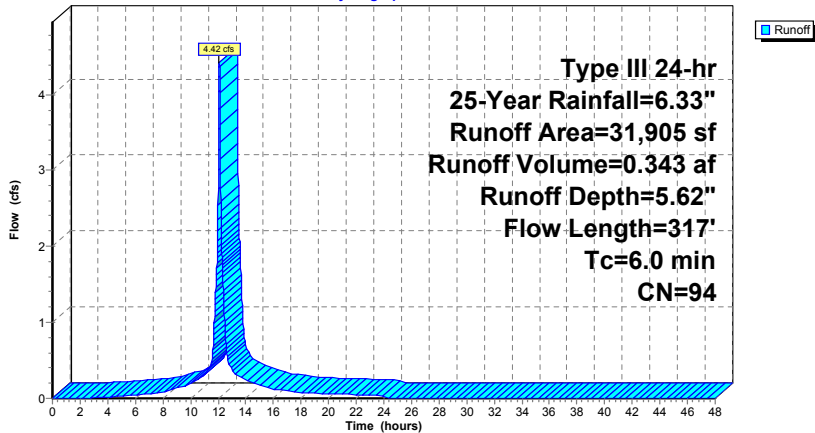
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
14,495	98	Roofs, HSG C
14,485	89	Gravel roads, HSG C
2,925	98	Unconnected pavement, HSG C
31,905	94	Weighted Average
14,485		45.40% Pervious Area
17,420		54.60% Impervious Area
2,925		16.79% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0080	0.94		Sheet Flow, Sheet flow over gravel Smooth surfaces n= 0.011 P2= 3.10"
1.8	217	0.0160	2.04		Shallow Concentrated Flow, Remainder to DA boundary Unpaved Kv= 16.1 fps
2.4					Direct Entry, To make min. allowable (0.1 hr)
6.0	317	Total			

**Subcatchment E2:**

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.33"

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**Summary for Reach DP-1: Design Pt #1: Mystic River**

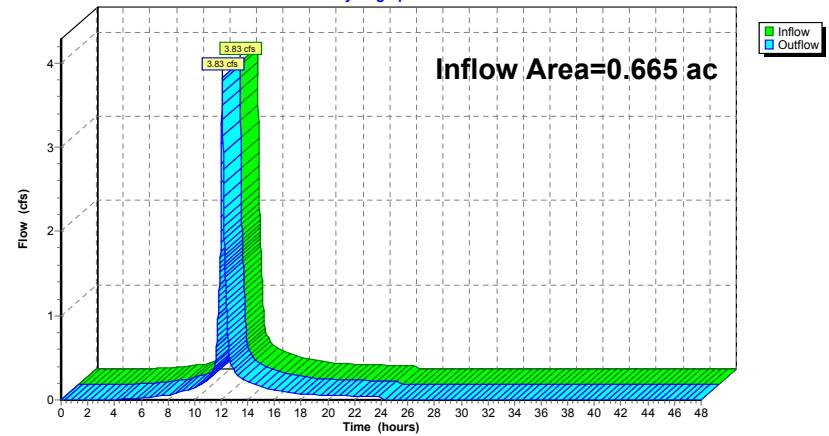
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.665 ac, 17.02% Impervious, Inflow Depth = 5.17" for 25-Year event  
Inflow = 3.83 cfs @ 12.08 hrs, Volume= 0.287 af  
Outflow = 3.83 cfs @ 12.08 hrs, Volume= 0.287 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-1: Design Pt #1: Mystic River**

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.33"

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**Summary for Reach DP-2: Design Pt #2: Broadway**

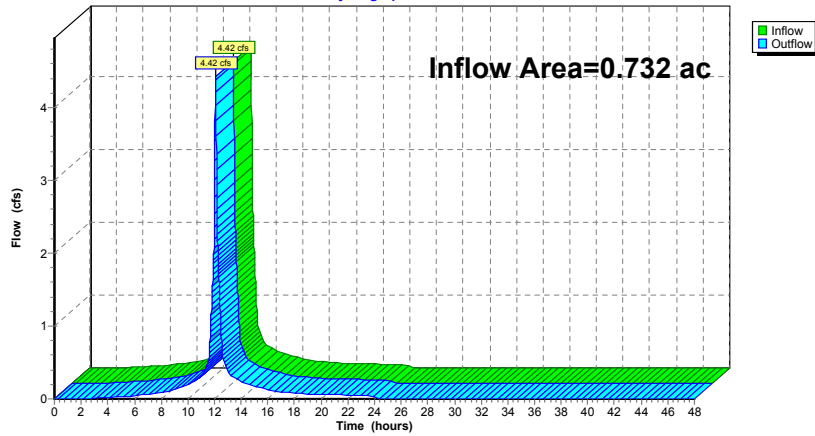
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.732 ac, 54.60% Impervious, Inflow Depth = 5.62" for 25-Year event  
Inflow = 4.42 cfs @ 12.08 hrs, Volume= 0.343 af  
Outflow = 4.42 cfs @ 12.08 hrs, Volume= 0.343 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-2: Design Pt #2: Broadway**

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.15"

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**SubcatchmentE1:** Runoff Area=28,981 sf 17.02% Impervious Runoff Depth=6.95"  
Tc=6.0 min UI Adjusted CN=90 Runoff=5.06 cfs 0.386 af

**SubcatchmentE2:** Runoff Area=31,905 sf 54.60% Impervious Runoff Depth=7.43"  
Flow Length=317' Tc=6.0 min CN=94 Runoff=5.76 cfs 0.454 af

**Reach DP-1: Design Pt #1: Mystic River** Inflow=5.06 cfs 0.386 af  
Outflow=5.06 cfs 0.386 af

**Reach DP-2: Design Pt #2: Broadway** Inflow=5.76 cfs 0.454 af  
Outflow=5.76 cfs 0.454 af

**Total Runoff Area = 1.398 ac Runoff Volume = 0.839 af Average Runoff Depth = 7.20"**  
**63.29% Pervious = 0.885 ac 36.71% Impervious = 0.513 ac**

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**Summary for Subcatchment E1:**

Runoff = 5.06 cfs @ 12.08 hrs, Volume= 0.386 af, Depth= 6.95"

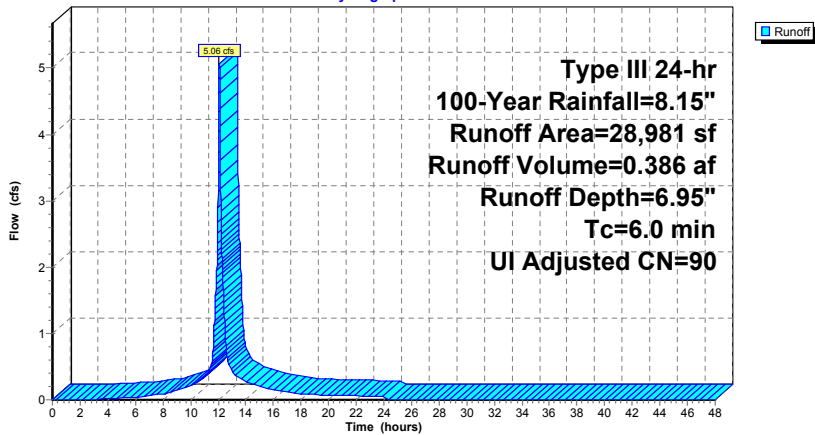
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=8.15"

Area (sf)	CN	Adj	Description
4,933	98		Unconnected pavement, HSG C
24,048	89		Gravel roads, HSG C
28,981	91	90	Weighted Average, UI Adjusted
24,048			82.98% Pervious Area
4,933			17.02% Impervious Area
4,933			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment E1:**

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.15"

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**Summary for Subcatchment E2:**

Runoff = 5.76 cfs @ 12.08 hrs, Volume= 0.454 af, Depth= 7.43"

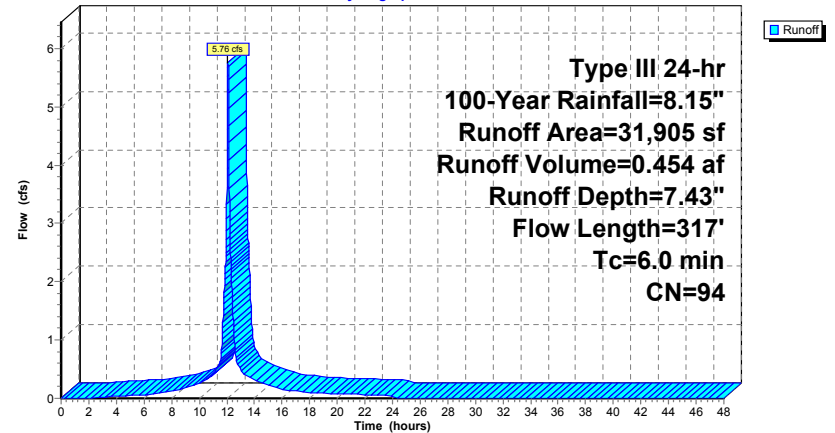
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=8.15"

Area (sf)	CN	Description
14,495	98	Roofs, HSG C
14,485	89	Gravel roads, HSG C
2,925	98	Unconnected pavement, HSG C
31,905	94	Weighted Average
14,485		45.40% Pervious Area
17,420		54.60% Impervious Area
2,925		16.79% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	100	0.0080	0.94		Sheet Flow, Sheet flow over gravel Smooth surfaces n= 0.011 P2= 3.10"
1.8	217	0.0160	2.04		Shallow Concentrated Flow, Remainder to DA boundary Unpaved Kv= 16.1 fps
2.4					Direct Entry, To make min. allowable (0.1 hr)
6.0	317				Total

**Subcatchment E2:**

Hydrograph





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**Summary for Reach DP-1: Design Pt #1: Mystic River**

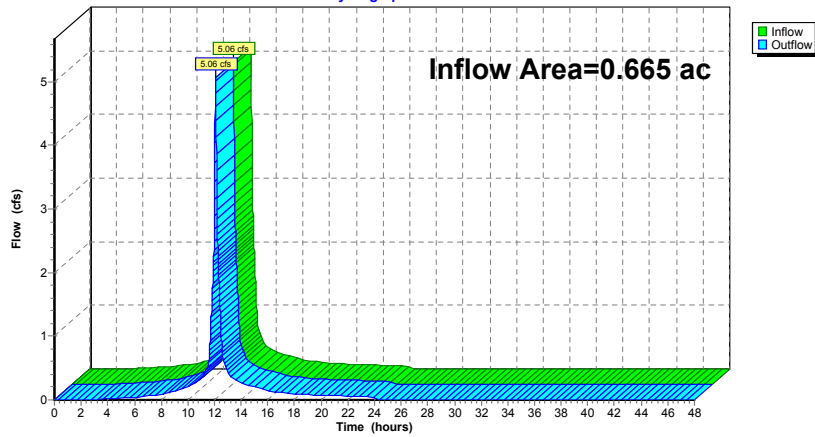
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.665 ac, 17.02% Impervious, Inflow Depth = 6.95" for 100-Year event  
Inflow = 5.06 cfs @ 12.08 hrs, Volume= 0.386 af  
Outflow = 5.06 cfs @ 12.08 hrs, Volume= 0.386 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-1: Design Pt #1: Mystic River**

Hydrograph



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**Summary for Reach DP-2: Design Pt #2: Broadway**

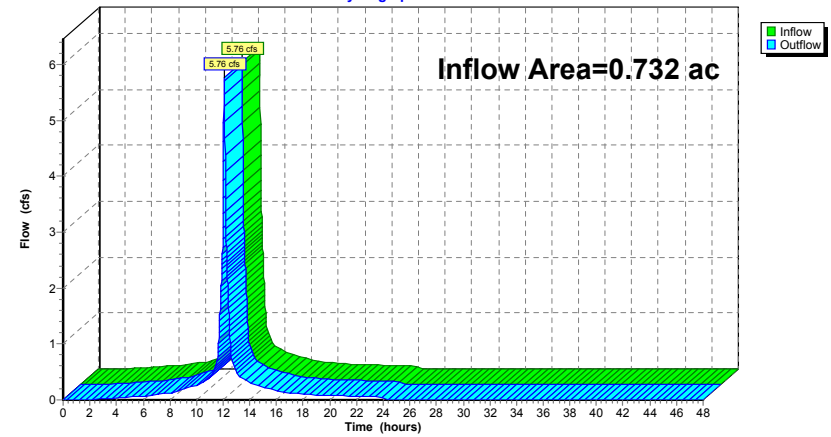
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.732 ac, 54.60% Impervious, Inflow Depth = 7.43" for 100-Year event  
Inflow = 5.76 cfs @ 12.08 hrs, Volume= 0.454 af  
Outflow = 5.76 cfs @ 12.08 hrs, Volume= 0.454 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-2: Design Pt #2: Broadway**

Hydrograph



**M181002 Proposed**

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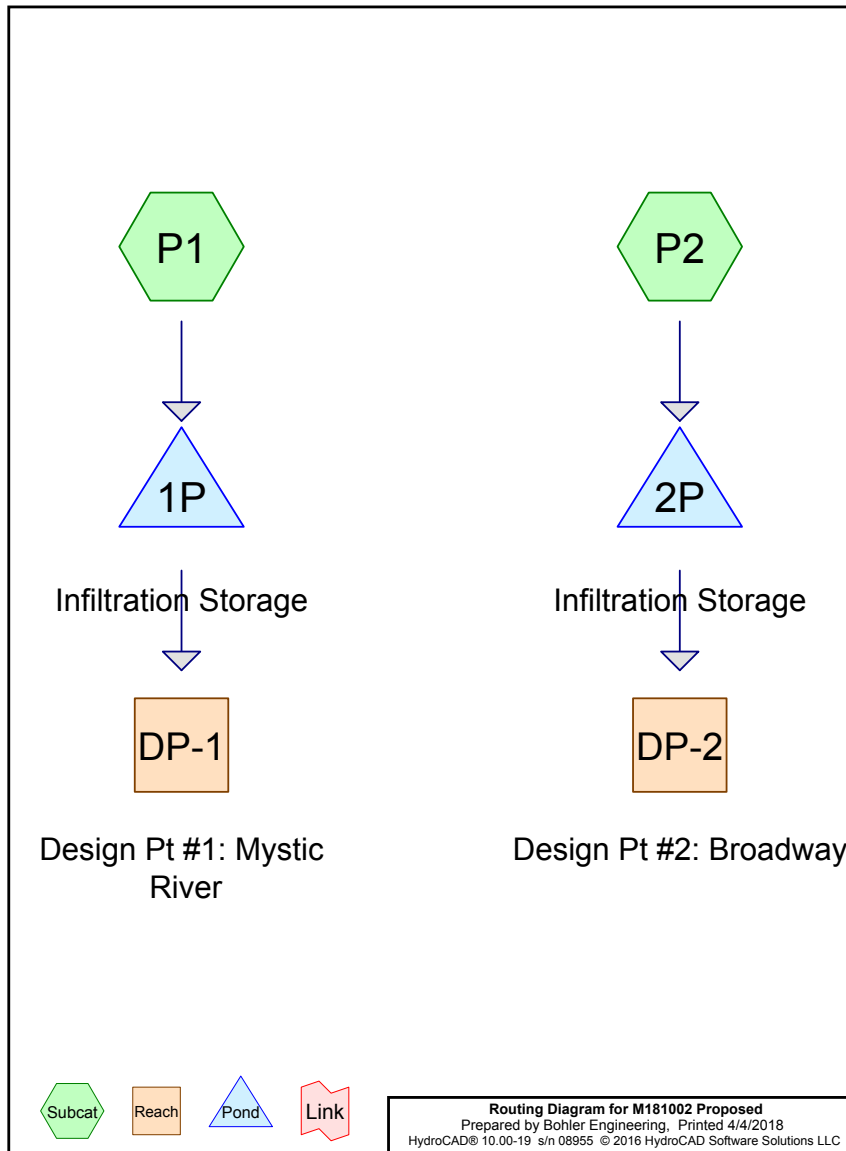
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**Area Listing (all nodes)**

Area (acres)	CN	Description (subcatchment-numbers)
0.603	74	>75% Grass cover, Good, HSG C (P1, P2)
0.436	98	Paved Sidewalk, HSG C (P1, P2)
0.359	89	Synthetic turf w/ underdrain, HSG C (P1, P2)
<b>1.398</b>	<b>85</b>	<b>TOTAL AREA</b>



**Routing Diagram for M181002 Proposed**  
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**Soil Listing (all nodes)**

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.398	HSG C	P1, P2
0.000	HSG D	
0.000	Other	
<b>1.398</b>		<b>TOTAL AREA</b>

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**Ground Covers (all nodes)**

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.603	0.000	0.000	0.603	>75% Grass cover, Good	P1, P2
0.000	0.000	0.436	0.000	0.000	0.436	Paved Sidewalk	P1, P2
0.000	0.000	0.359	0.000	0.000	0.359	Synthetic turf w/ underdrain	P1, P2
<b>0.000</b>	<b>0.000</b>	<b>1.398</b>	<b>0.000</b>	<b>0.000</b>	<b>1.398</b>	<b>TOTAL AREA</b>	

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**Pipe Listing (all nodes)**

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	10.00	4.00	100.0	0.0600	0.130	8.0	0.0	0.0
2	2P	10.00	4.00	100.0	0.0600	0.130	12.0	0.0	0.0

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**SubcatchmentP1:** Runoff Area=15,051 sf 40.09% Impervious Runoff Depth=1.73"  
Tc=6.0 min CN=84 Runoff=0.70 cfs 0.050 af

**SubcatchmentP2:** Runoff Area=45,835 sf 28.29% Impervious Runoff Depth=1.89"  
Tc=6.0 min CN=86 Runoff=2.33 cfs 0.165 af

**Reach DP-1: Design Pt #1: Mystic River** Inflow=0.33 cfs 0.026 af  
Outflow=0.33 cfs 0.026 af

**Reach DP-2: Design Pt #2: Broadway** Inflow=0.97 cfs 0.119 af  
Outflow=0.97 cfs 0.119 af

**Pond 1P: Infiltration Storage** Peak Elev=12.30' Storage=713 cf Inflow=0.70 cfs 0.050 af  
Discarded=0.01 cfs 0.023 af Primary=0.33 cfs 0.026 af Outflow=0.34 cfs 0.049 af

**Pond 2P: Infiltration Storage** Peak Elev=12.47' Storage=1,918 cf Inflow=2.33 cfs 0.165 af  
Discarded=0.03 cfs 0.045 af Primary=0.97 cfs 0.119 af Outflow=1.00 cfs 0.164 af

**Total Runoff Area = 1.398 ac Runoff Volume = 0.215 af Average Runoff Depth = 1.85"**  
**68.80% Pervious = 0.962 ac 31.20% Impervious = 0.436 ac**

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**Summary for Subcatchment P1:**

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 0.050 af, Depth= 1.73"

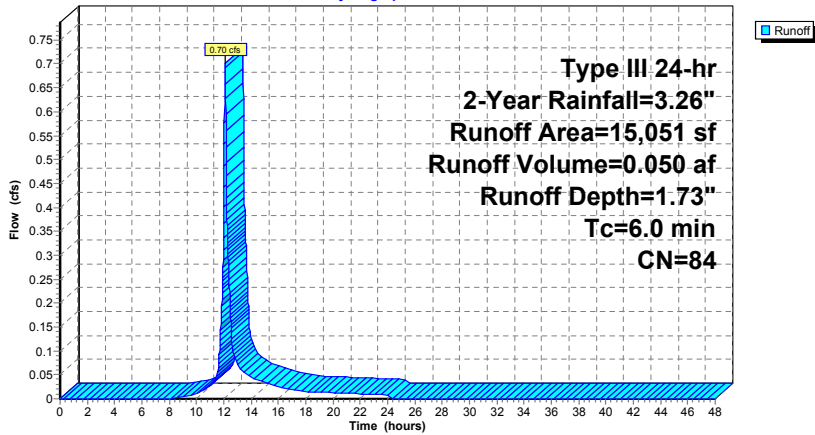
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.26"

Area (sf)	CN	Description
* 6,034	98	Paved Sidewalk, HSG C
* 741	89	Synthetic turf w/ underdrain, HSG C
8,276	74	>75% Grass cover, Good, HSG C
15,051	84	Weighted Average
9,017		59.91% Pervious Area
6,034		40.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment P1:**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.26"

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**Summary for Subcatchment P2:**

Runoff = 2.33 cfs @ 12.09 hrs, Volume= 0.165 af, Depth= 1.89"

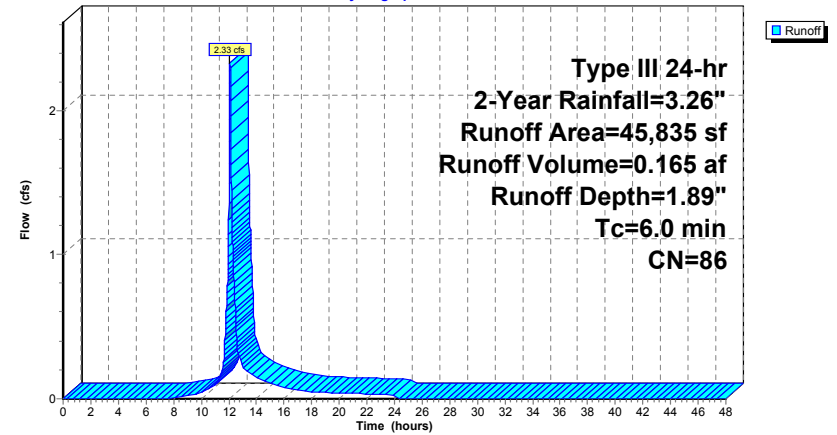
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 2-Year Rainfall=3.26"

Area (sf)	CN	Description
* 12,965	98	Paved Sidewalk, HSG C
* 14,898	89	Synthetic turf w/ underdrain, HSG C
17,972	74	>75% Grass cover, Good, HSG C
45,835	86	Weighted Average
32,870		71.71% Pervious Area
12,965		28.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment P2:**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.26"

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**Summary for Reach DP-1: Design Pt #1: Mystic River**

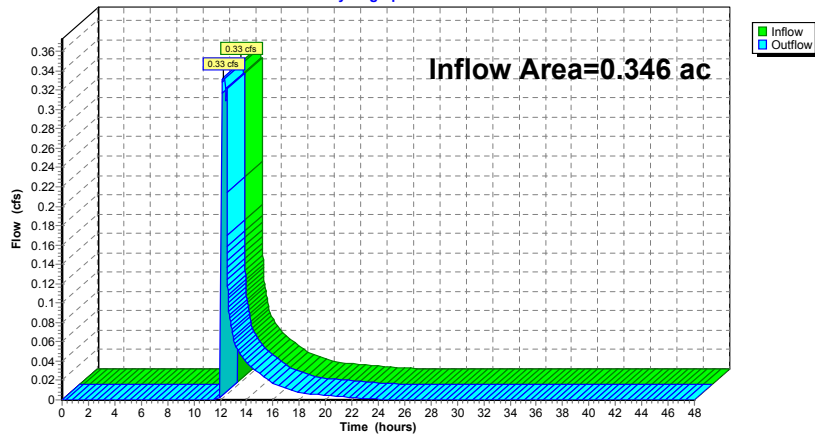
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.346 ac, 40.09% Impervious, Inflow Depth = 0.91" for 2-Year event  
Inflow = 0.33 cfs @ 12.26 hrs, Volume= 0.026 af  
Outflow = 0.33 cfs @ 12.26 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-1: Design Pt #1: Mystic River**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.26"

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**Summary for Reach DP-2: Design Pt #2: Broadway**

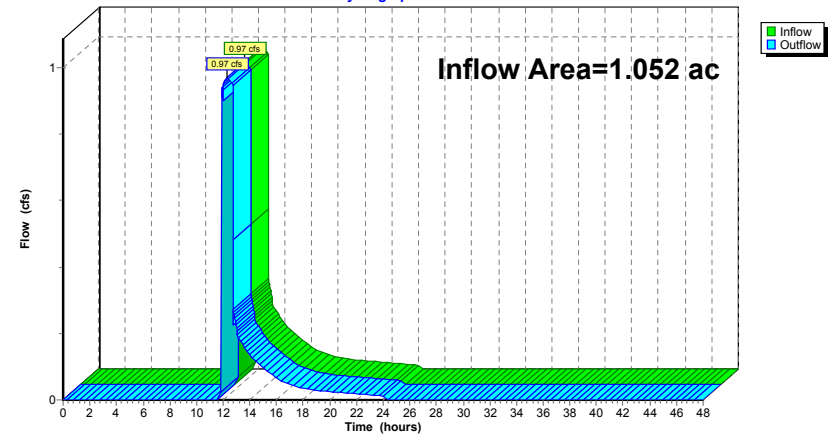
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.052 ac, 28.29% Impervious, Inflow Depth = 1.36" for 2-Year event  
Inflow = 0.97 cfs @ 12.30 hrs, Volume= 0.119 af  
Outflow = 0.97 cfs @ 12.30 hrs, Volume= 0.119 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-2: Design Pt #2: Broadway**

Hydrograph



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Type III 24-hr 2-Year Rainfall=3.26"

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**Summary for Pond 1P: Infiltration Storage**

Inflow Area = 0.346 ac, 40.09% Impervious, Inflow Depth = 1.73" for 2-Year event  
 Inflow = 0.70 cfs @ 12.09 hrs, Volume= 0.050 af  
 Outflow = 0.34 cfs @ 12.26 hrs, Volume= 0.049 af, Atten= 51%, Lag= 10.3 min  
 Discarded = 0.01 cfs @ 12.26 hrs, Volume= 0.023 af  
 Primary = 0.33 cfs @ 12.26 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
 Peak Elev= 12.30' @ 12.26 hrs Surf.Area= 1,562 sf Storage= 713 cf

Plug-Flow detention time= 400.3 min calculated for 0.049 af (98% of inflow)  
 Center-of-Mass det. time= 387.3 min ( 1,216.0 - 828.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	567 cf	<b>1.50'W x 840.00'L x 1.50'H Prismatic</b> 1,890 cf Overall x 30.0% Voids
#2	4.00'	101 cf	<b>4.00'D x 8.00'H Vertical Cone/Cylinder</b> Impervious
#3	12.00'	283 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
		950 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.00	5	0	0
12.50	500	126	126
12.75	750	156	283

Device	Routing	Invert	Outlet Devices
#1	Primary	10.00'	<b>8.0" Round Culvert</b> L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 10.00' / 4.00' S= 0.0600'/' Cc= 0.900 n= 0.130, Flow Area= 0.35 sf
#2	Discarded	8.00'	<b>0.270 in/hr Exfiltration over Surface area</b>
#3	Primary	12.50'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Discarded OutFlow** Max=0.01 cfs @ 12.26 hrs HW=12.30' (Free Discharge)  
 ↳2=Exfiltration (Exfiltration Controls 0.01 cfs)

**Primary OutFlow** Max=0.33 cfs @ 12.26 hrs HW=12.30' (Free Discharge)  
 ↳1=Culvert (Barrel Controls 0.33 cfs @ 0.95 fps)  
 ↳3=Broad-Crested Rectangular Weir ( Controls 0.00 cfs)

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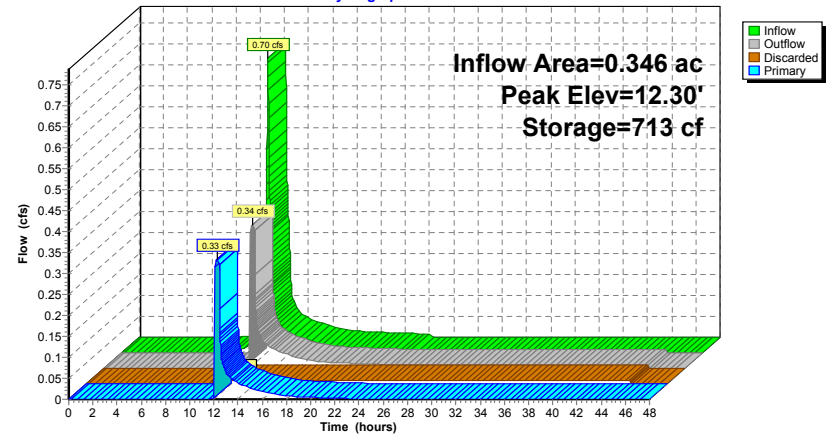
Type III 24-hr 2-Year Rainfall=3.26"

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**Pond 1P: Infiltration Storage**

Hydrograph





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**Summary for Pond 2P: Infiltration Storage**

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 1.052 ac, 28.29% Impervious, Inflow Depth = 1.89" for 2-Year event  
 Inflow = 2.33 cfs @ 12.09 hrs, Volume= 0.165 af  
 Outflow = 1.00 cfs @ 12.30 hrs, Volume= 0.164 af, Atten= 57%, Lag= 12.8 min  
 Discarded = 0.03 cfs @ 12.30 hrs, Volume= 0.045 af  
 Primary = 0.97 cfs @ 12.30 hrs, Volume= 0.119 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
 Peak Elev= 12.47' @ 12.30 hrs Surf.Area= 5,560 sf Storage= 1,918 cf

Plug-Flow detention time= 222.9 min calculated for 0.164 af (99% of inflow)  
 Center-of-Mass det. time= 218.7 min ( 1,040.4 - 821.7 )

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	1,080 cf	<b>1.50'W x 1,600.00'L x 1.50'H Prismaoid</b> 3,600 cf Overall x 30.0% Voids
#2	4.00'	101 cf	<b>4.00'D x 8.00'H Vertical Cone/Cylinder</b> Impervious
#3	12.00'	5,237 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
		6,417 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.00	5	0	0
13.00	6,775	3,390	3,390
13.25	8,000	1,847	5,237

Device	Routing	Invert	Outlet Devices
#1	Primary	10.00'	<b>12.0" Round Culvert</b> L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 10.00' / 4.00' S= 0.0600 '/ Cc= 0.900 n= 0.130, Flow Area= 0.79 sf
#2	Discarded	8.00'	<b>0.270 in/hr Exfiltration over Surface area</b>
#3	Primary	13.00'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Discarded OutFlow** Max=0.03 cfs @ 12.30 hrs HW=12.47' (Free Discharge)  
 ↳ **2=Exfiltration** (Exfiltration Controls 0.03 cfs)

**Primary OutFlow** Max=0.97 cfs @ 12.30 hrs HW=12.47' (Free Discharge)  
 ↳ **1=Culvert** (Barrel Controls 0.97 cfs @ 1.23 fps)  
 ↳ **3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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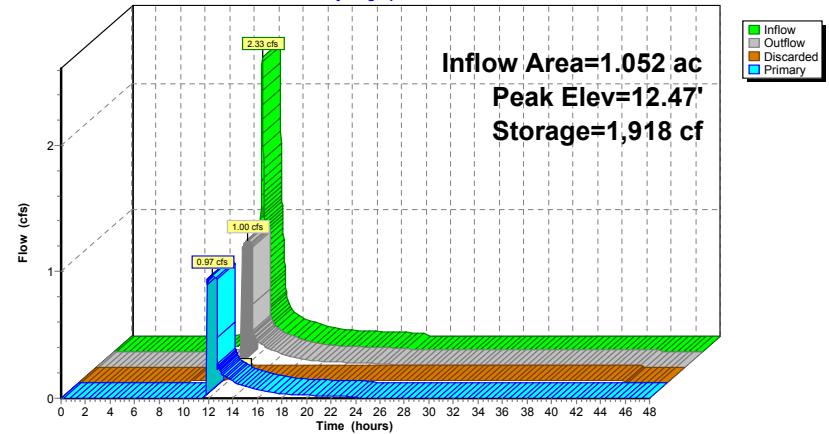
Type III 24-hr 2-Year Rainfall=3.26"

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**Pond 2P: Infiltration Storage**

Hydrograph



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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**SubcatchmentP1:** Runoff Area=15,051 sf 40.09% Impervious Runoff Depth=3.41"  
Tc=6.0 min CN=84 Runoff=1.37 cfs 0.098 af

**SubcatchmentP2:** Runoff Area=45,835 sf 28.29% Impervious Runoff Depth=3.61"  
Tc=6.0 min CN=86 Runoff=4.38 cfs 0.316 af

**Reach DP-1: Design Pt #1: Mystic River** Inflow=1.35 cfs 0.073 af  
Outflow=1.35 cfs 0.073 af

**Reach DP-2: Design Pt #2: Broadway** Inflow=1.00 cfs 0.264 af  
Outflow=1.00 cfs 0.264 af

**Pond 1P: Infiltration Storage** Peak Elev=12.57' Storage=833 cf Inflow=1.37 cfs 0.098 af  
Discarded=0.01 cfs 0.024 af Primary=1.35 cfs 0.073 af Outflow=1.36 cfs 0.097 af

**Pond 2P: Infiltration Storage** Peak Elev=12.94' Storage=4,170 cf Inflow=4.38 cfs 0.316 af  
Discarded=0.05 cfs 0.051 af Primary=1.00 cfs 0.264 af Outflow=1.05 cfs 0.315 af

**Total Runoff Area = 1.398 ac Runoff Volume = 0.414 af Average Runoff Depth = 3.56"**  
**68.80% Pervious = 0.962 ac 31.20% Impervious = 0.436 ac**

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Type III 24-hr 10-Year Rainfall=5.15"

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**Summary for Subcatchment P1:**

Runoff = 1.37 cfs @ 12.09 hrs, Volume= 0.098 af, Depth= 3.41"

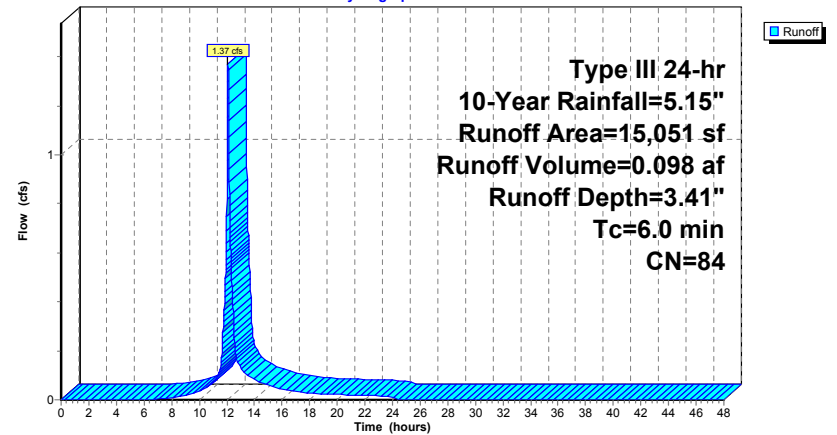
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=5.15"

Area (sf)	CN	Description
6,034	98	Paved Sidewalk, HSG C
741	89	Synthetic turf w/ underdrain, HSG C
8,276	74	>75% Grass cover, Good, HSG C
15,051	84	Weighted Average
9,017		59.91% Pervious Area
6,034		40.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment P1:**

Hydrograph



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**Summary for Subcatchment P2:**

Runoff = 4.38 cfs @ 12.09 hrs, Volume= 0.316 af, Depth= 3.61"

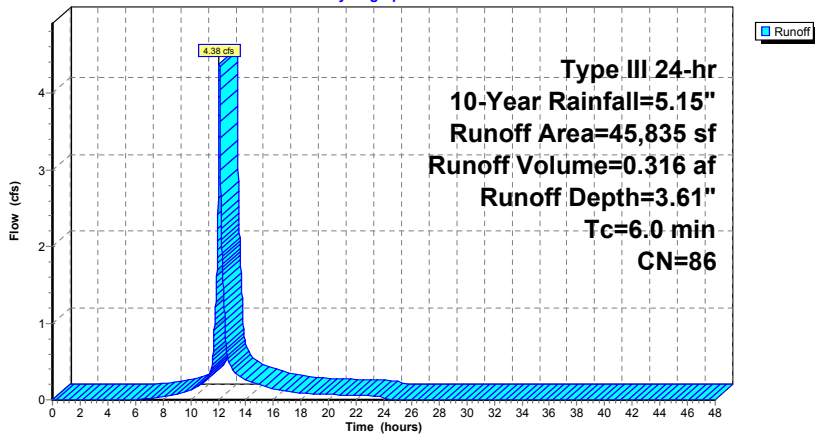
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 10-Year Rainfall=5.15"

Area (sf)	CN	Description
* 12,965	98	Paved Sidewalk, HSG C
* 14,898	89	Synthetic turf w/ underdrain, HSG C
17,972	74	>75% Grass cover, Good, HSG C
45,835	86	Weighted Average
32,870		71.71% Pervious Area
12,965		28.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment P2:**

Hydrograph



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**Summary for Reach DP-1: Design Pt #1: Mystic River**

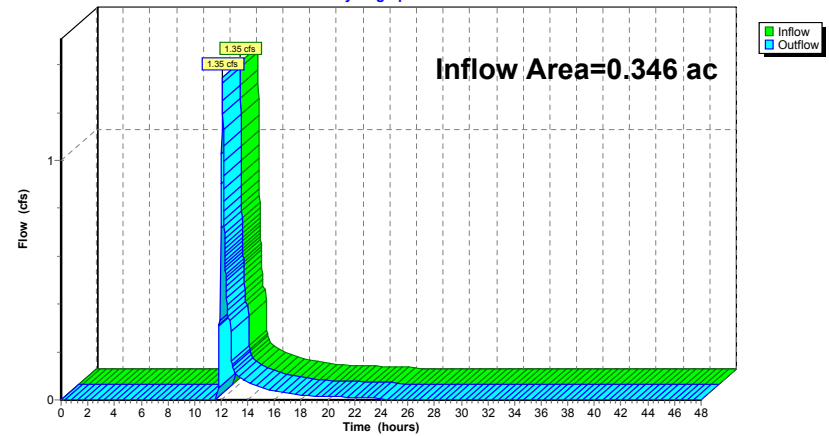
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.346 ac, 40.09% Impervious, Inflow Depth = 2.54" for 10-Year event  
Inflow = 1.35 cfs @ 12.10 hrs, Volume= 0.073 af  
Outflow = 1.35 cfs @ 12.10 hrs, Volume= 0.073 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-1: Design Pt #1: Mystic River**

Hydrograph



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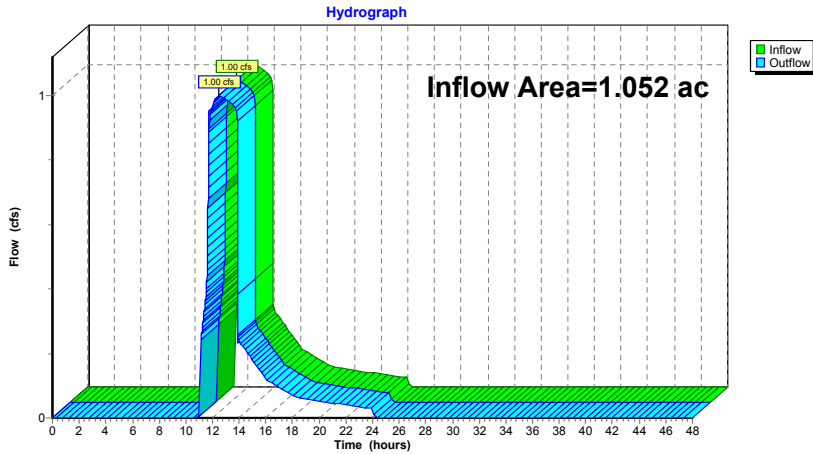
**Summary for Reach DP-2: Design Pt #2: Broadway**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.052 ac, 28.29% Impervious, Inflow Depth = 3.01" for 10-Year event  
 Inflow = 1.00 cfs @ 12.48 hrs, Volume= 0.264 af  
 Outflow = 1.00 cfs @ 12.48 hrs, Volume= 0.264 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-2: Design Pt #2: Broadway**



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**Summary for Pond 1P: Infiltration Storage**

Inflow Area = 0.346 ac, 40.09% Impervious, Inflow Depth = 3.41" for 10-Year event  
 Inflow = 1.37 cfs @ 12.09 hrs, Volume= 0.098 af  
 Outflow = 1.36 cfs @ 12.10 hrs, Volume= 0.097 af, Atten= 1%, Lag= 0.6 min  
 Discarded = 0.01 cfs @ 12.10 hrs, Volume= 0.024 af  
 Primary = 1.35 cfs @ 12.10 hrs, Volume= 0.073 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
 Peak Elev= 12.57' @ 12.10 hrs Surf.Area= 1,832 sf Storage= 833 cf

Plug-Flow detention time= 211.4 min calculated for 0.097 af (99% of inflow)  
 Center-of-Mass det. time= 204.5 min ( 1,013.9 - 809.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	567 cf	<b>1.50'W x 840.00'L x 1.50'H Prismatic</b> 1,890 cf Overall x 30.0% Voids
#2	4.00'	101 cf	<b>4.00'D x 8.00'H Vertical Cone/Cylinder</b> Impervious
#3	12.00'	283 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
		950 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.00	5	0	0
12.50	500	126	126
12.75	750	156	283

Device	Routing	Invert	Outlet Devices
#1	Primary	10.00'	<b>8.0" Round Culvert</b> L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 10.00' / 4.00' S= 0.0600 ' / Cc= 0.900 n= 0.130, Flow Area= 0.35 sf
#2	Discarded	8.00'	<b>0.270 in/hr Exfiltration over Surface area</b>
#3	Primary	12.50'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Discarded OutFlow** Max=0.01 cfs @ 12.10 hrs HW=12.57' (Free Discharge)  
 ↳2=Exfiltration (Exfiltration Controls 0.01 cfs)

**Primary OutFlow** Max=1.33 cfs @ 12.10 hrs HW=12.57' (Free Discharge)  
 ↳1=Culvert (Barrel Controls 0.34 cfs @ 0.97 fps)  
 ↳3=Broad-Crested Rectangular Weir (Weir Controls 0.99 cfs @ 0.68 fps)

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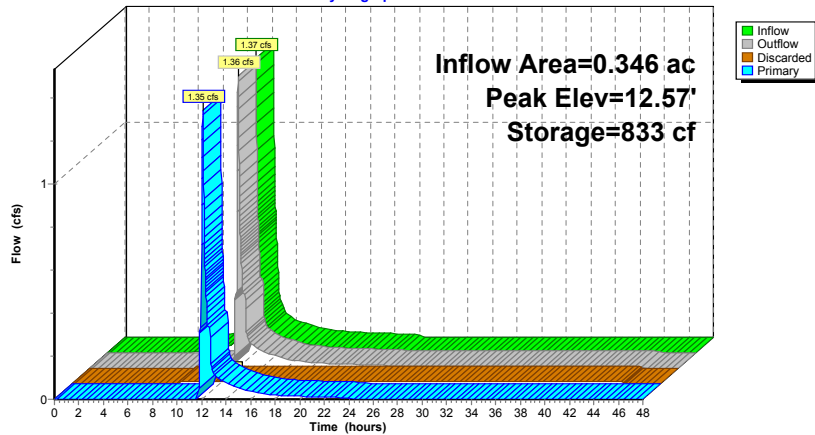
Type III 24-hr 10-Year Rainfall=5.15"

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**Pond 1P: Infiltration Storage**

Hydrograph



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**Summary for Pond 2P: Infiltration Storage**

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 1.052 ac, 28.29% Impervious, Inflow Depth = 3.61" for 10-Year event  
 Inflow = 4.38 cfs @ 12.09 hrs, Volume= 0.316 af  
 Outflow = 1.05 cfs @ 12.48 hrs, Volume= 0.315 af, Atten= 76%, Lag= 23.6 min  
 Discarded = 0.05 cfs @ 12.48 hrs, Volume= 0.051 af  
 Primary = 1.00 cfs @ 12.48 hrs, Volume= 0.264 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
 Peak Elev= 12.94' @ 12.48 hrs Surf.Area= 8,762 sf Storage= 4,170 cf

Plug-Flow detention time= 136.8 min calculated for 0.315 af (100% of inflow)  
 Center-of-Mass det. time= 134.5 min ( 937.8 - 803.3 )

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	1,080 cf	<b>1.50'W x 1,600.00'L x 1.50'H Prismatic</b> 3,600 cf Overall x 30.0% Voids
#2	4.00'	101 cf	<b>4.00'D x 8.00'H Vertical Cone/Cylinder</b> Impervious
#3	12.00'	5,237 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
		6,417 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.00	5	0	0
13.00	6,775	3,390	3,390
13.25	8,000	1,847	5,237

Device	Routing	Invert	Outlet Devices
#1	Primary	10.00'	<b>12.0" Round Culvert</b> L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 10.00' / 4.00' S= 0.0600 ' / ' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf
#2	Discarded	8.00'	<b>0.270 in/hr Exfiltration over Surface area</b>
#3	Primary	13.00'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Discarded OutFlow** Max=0.05 cfs @ 12.48 hrs HW=12.94' (Free Discharge)  
 ↳ **2=Exfiltration** (Exfiltration Controls 0.05 cfs)

**Primary OutFlow** Max=1.00 cfs @ 12.48 hrs HW=12.94' (Free Discharge)  
 ↳ **1=Culvert** (Barrel Controls 1.00 cfs @ 1.27 fps)  
 ↳ **3=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

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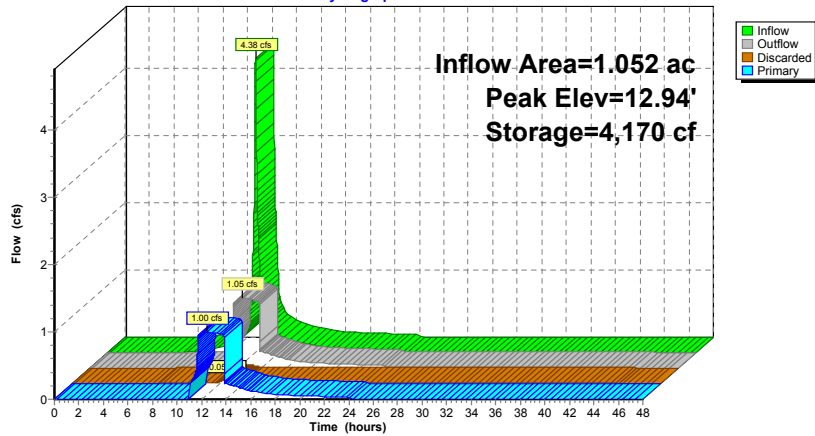
Type III 24-hr 10-Year Rainfall=5.15"

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**Pond 2P: Infiltration Storage**

Hydrograph



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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points  
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN  
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<b>SubcatchmentP1:</b>	Runoff Area=15,051 sf 40.09% Impervious Runoff Depth=4.51" Tc=6.0 min CN=84 Runoff=1.79 cfs 0.130 af
<b>SubcatchmentP2:</b>	Runoff Area=45,835 sf 28.29% Impervious Runoff Depth=4.72" Tc=6.0 min CN=86 Runoff=5.67 cfs 0.414 af
<b>Reach DP-1: Design Pt #1: Mystic River</b>	Inflow=1.78 cfs 0.104 af Outflow=1.78 cfs 0.104 af
<b>Reach DP-2: Design Pt #2: Broadway</b>	Inflow=2.09 cfs 0.359 af Outflow=2.09 cfs 0.359 af
<b>Pond 1P: Infiltration Storage</b>	Peak Elev=12.59' Storage=843 cf Inflow=1.79 cfs 0.130 af Discarded=0.01 cfs 0.024 af Primary=1.78 cfs 0.104 af Outflow=1.79 cfs 0.129 af
<b>Pond 2P: Infiltration Storage</b>	Peak Elev=13.07' Storage=5,089 cf Inflow=5.67 cfs 0.414 af Discarded=0.06 cfs 0.054 af Primary=2.09 cfs 0.359 af Outflow=2.15 cfs 0.413 af

**Total Runoff Area = 1.398 ac Runoff Volume = 0.544 af Average Runoff Depth = 4.67"**  
**68.80% Pervious = 0.962 ac 31.20% Impervious = 0.436 ac**

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Type III 24-hr 25-Year Rainfall=6.33"

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**Summary for Subcatchment P1:**

Runoff = 1.79 cfs @ 12.09 hrs, Volume= 0.130 af, Depth= 4.51"

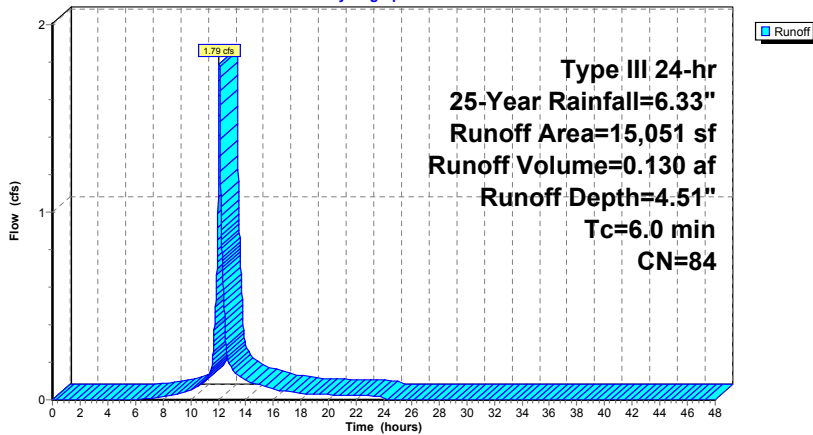
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
* 6,034	98	Paved Sidewalk, HSG C
* 741	89	Synthetic turf w/ underdrain, HSG C
8,276	74	>75% Grass cover, Good, HSG C
15,051	84	Weighted Average
9,017		59.91% Pervious Area
6,034		40.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment P1:**

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.33"

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**Summary for Subcatchment P2:**

Runoff = 5.67 cfs @ 12.09 hrs, Volume= 0.414 af, Depth= 4.72"

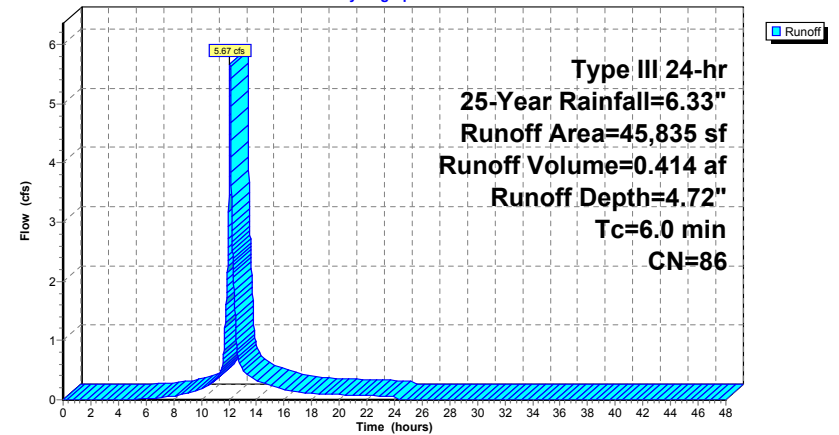
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 25-Year Rainfall=6.33"

Area (sf)	CN	Description
* 12,965	98	Paved Sidewalk, HSG C
* 14,898	89	Synthetic turf w/ underdrain, HSG C
17,972	74	>75% Grass cover, Good, HSG C
45,835	86	Weighted Average
32,870		71.71% Pervious Area
12,965		28.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment P2:**

Hydrograph



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**Summary for Reach DP-1: Design Pt #1: Mystic River**

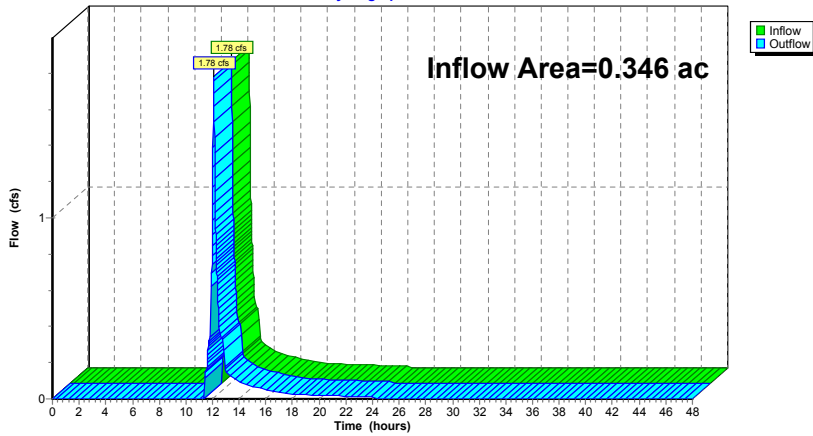
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.346 ac, 40.09% Impervious, Inflow Depth = 3.62" for 25-Year event  
Inflow = 1.78 cfs @ 12.09 hrs, Volume= 0.104 af  
Outflow = 1.78 cfs @ 12.09 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-1: Design Pt #1: Mystic River**

Hydrograph



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Type III 24-hr 25-Year Rainfall=6.33"

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**Summary for Reach DP-2: Design Pt #2: Broadway**

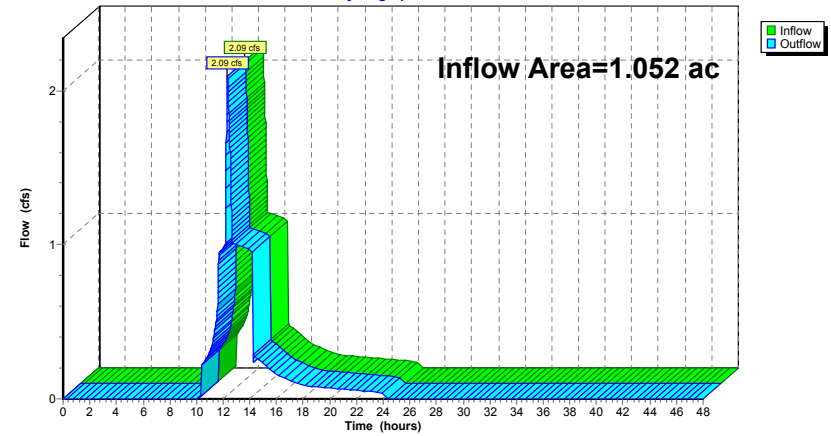
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.052 ac, 28.29% Impervious, Inflow Depth = 4.10" for 25-Year event  
Inflow = 2.09 cfs @ 12.33 hrs, Volume= 0.359 af  
Outflow = 2.09 cfs @ 12.33 hrs, Volume= 0.359 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-2: Design Pt #2: Broadway**

Hydrograph





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**Summary for Pond 1P: Infiltration Storage**

Inflow Area = 0.346 ac, 40.09% Impervious, Inflow Depth = 4.51" for 25-Year event  
 Inflow = 1.79 cfs @ 12.09 hrs, Volume= 0.130 af  
 Outflow = 1.79 cfs @ 12.09 hrs, Volume= 0.129 af, Atten= 0%, Lag= 0.4 min  
 Discarded = 0.01 cfs @ 12.09 hrs, Volume= 0.024 af  
 Primary = 1.78 cfs @ 12.09 hrs, Volume= 0.104 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
 Peak Elev= 12.59' @ 12.09 hrs Surf.Area= 1,850 sf Storage= 843 cf

Plug-Flow detention time= 164.4 min calculated for 0.129 af (99% of inflow)  
 Center-of-Mass det. time= 159.2 min ( 960.6 - 801.5 )

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	567 cf	<b>1.50'W x 840.00'L x 1.50'H Prismatic</b> 1,890 cf Overall x 30.0% Voids
#2	4.00'	101 cf	<b>4.00'D x 8.00'H Vertical Cone/CylinderImpervious</b>
#3	12.00'	283 cf	<b>Custom Stage Data (Prismatic) Listed below (Recalc)</b>
		950 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.00	5	0	0
12.50	500	126	126
12.75	750	156	283

Device	Routing	Invert	Outlet Devices
#1	Primary	10.00'	<b>8.0" Round Culvert</b> L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 10.00' / 4.00' S= 0.0600'/' Cc= 0.900 n= 0.130, Flow Area= 0.35 sf
#2	Discarded	8.00'	<b>0.270 in/hr Exfiltration over Surface area</b>
#3	Primary	12.50'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Discarded OutFlow** Max=0.01 cfs @ 12.09 hrs HW=12.59' (Free Discharge)  
 ↳2=Exfiltration (Exfiltration Controls 0.01 cfs)

**Primary OutFlow** Max=1.71 cfs @ 12.09 hrs HW=12.59' (Free Discharge)  
 ↳1=Culvert (Barrel Controls 0.34 cfs @ 0.97 fps)  
 ↳3=Broad-Crested Rectangular Weir (Weir Controls 1.37 cfs @ 0.76 fps)

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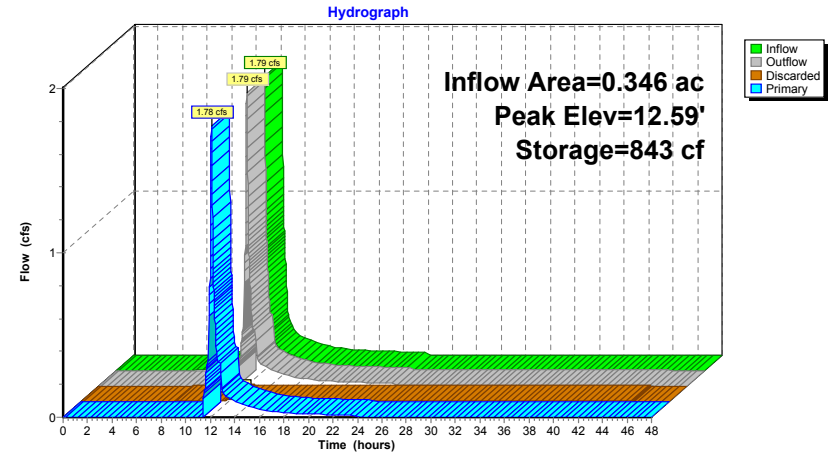
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**Pond 1P: Infiltration Storage**



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**Summary for Pond 2P: Infiltration Storage**

Inflow Area = 1.052 ac, 28.29% Impervious, Inflow Depth = 4.72" for 25-Year event  
 Inflow = 5.67 cfs @ 12.09 hrs, Volume= 0.414 af  
 Outflow = 2.15 cfs @ 12.33 hrs, Volume= 0.413 af, Atten= 62%, Lag= 14.7 min  
 Discarded = 0.06 cfs @ 12.33 hrs, Volume= 0.054 af  
 Primary = 2.09 cfs @ 12.33 hrs, Volume= 0.359 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
 Peak Elev= 13.07' @ 12.33 hrs Surf.Area= 9,540 sf Storage= 5,089 cf

Plug-Flow detention time= 113.6 min calculated for 0.413 af (100% of inflow)  
 Center-of-Mass det. time= 111.8 min ( 907.6 - 795.8 )

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	1,080 cf	<b>1.50'W x 1,600.00'L x 1.50'H Prismatic</b> 3,600 cf Overall x 30.0% Voids
#2	4.00'	101 cf	<b>4.00'D x 8.00'H Vertical Cone/Cylinder</b> Impervious
#3	12.00'	5,237 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
		6,417 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.00	5	0	0
13.00	6,775	3,390	3,390
13.25	8,000	1,847	5,237

Device	Routing	Invert	Outlet Devices
#1	Primary	10.00'	<b>12.0" Round Culvert</b> L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 10.00' / 4.00' S= 0.0600'/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf
#2	Discarded	8.00'	<b>0.270 in/hr Exfiltration over Surface area</b>
#3	Primary	13.00'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Discarded OutFlow** Max=0.06 cfs @ 12.33 hrs HW=13.07' (Free Discharge)  
 ↳2=Exfiltration (Exfiltration Controls 0.06 cfs)

**Primary OutFlow** Max=2.04 cfs @ 12.33 hrs HW=13.07' (Free Discharge)  
 ↳1=Culvert (Barrel Controls 1.01 cfs @ 1.28 fps)  
 ↳3=Broad-Crested Rectangular Weir (Weir Controls 1.03 cfs @ 0.69 fps)

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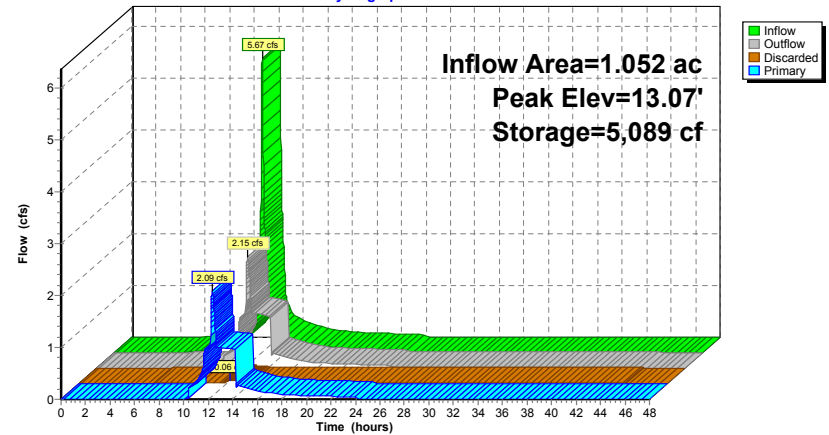
Type III 24-hr 25-Year Rainfall=6.33"

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**Pond 2P: Infiltration Storage**

Hydrograph



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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

**SubcatchmentP1:**Runoff Area=15,051 sf 40.09% Impervious Runoff Depth=6.24"  
Tc=6.0 min CN=84 Runoff=2.45 cfs 0.180 af**SubcatchmentP2:**Runoff Area=45,835 sf 28.29% Impervious Runoff Depth=6.48"  
Tc=6.0 min CN=86 Runoff=7.65 cfs 0.568 af**Reach DP-1: Design Pt #1: Mystic River**

Inflow=2.43 cfs 0.153 af

Outflow=2.43 cfs 0.153 af

**Reach DP-2: Design Pt #2: Broadway**

Inflow=4.52 cfs 0.510 af

Outflow=4.52 cfs 0.510 af

**Pond 1P: Infiltration Storage**

Peak Elev=12.61' Storage=858 cf Inflow=2.45 cfs 0.180 af

Discarded=0.01 cfs 0.025 af Primary=2.43 cfs 0.153 af Outflow=2.44 cfs 0.179 af

**Pond 2P: Infiltration Storage**

Peak Elev=13.17' Storage=5,769 cf Inflow=7.65 cfs 0.568 af

Discarded=0.06 cfs 0.057 af Primary=4.52 cfs 0.510 af Outflow=4.58 cfs 0.567 af

**Total Runoff Area = 1.398 ac Runoff Volume = 0.748 af Average Runoff Depth = 6.42"****68.80% Pervious = 0.962 ac 31.20% Impervious = 0.436 ac****M181002 Proposed**

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**Summary for Subcatchment P1:**

Runoff = 2.45 cfs @ 12.09 hrs, Volume= 0.180 af, Depth= 6.24"

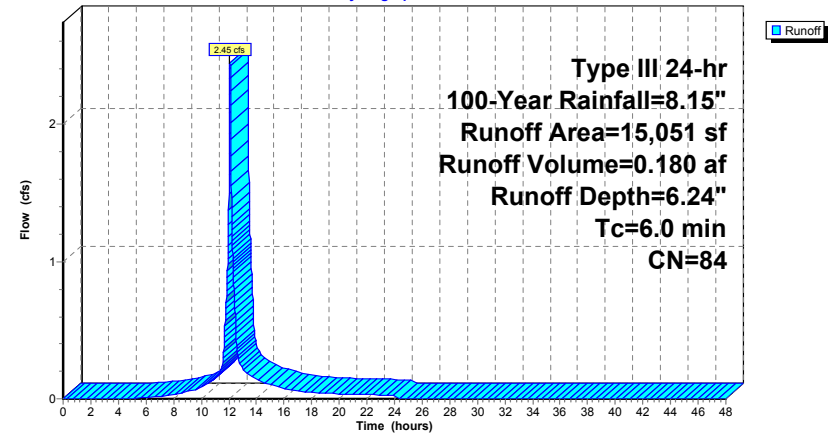
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=8.15"

	Area (sf)	CN	Description
*	6,034	98	Paved Sidewalk, HSG C
*	741	89	Synthetic turf w/ underdrain, HSG C
	8,276	74	>75% Grass cover, Good, HSG C
	15,051	84	Weighted Average
	9,017		59.91% Pervious Area
	6,034		40.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment P1:**

Hydrograph



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**Summary for Subcatchment P2:**

Runoff = 7.65 cfs @ 12.08 hrs, Volume= 0.568 af, Depth= 6.48"

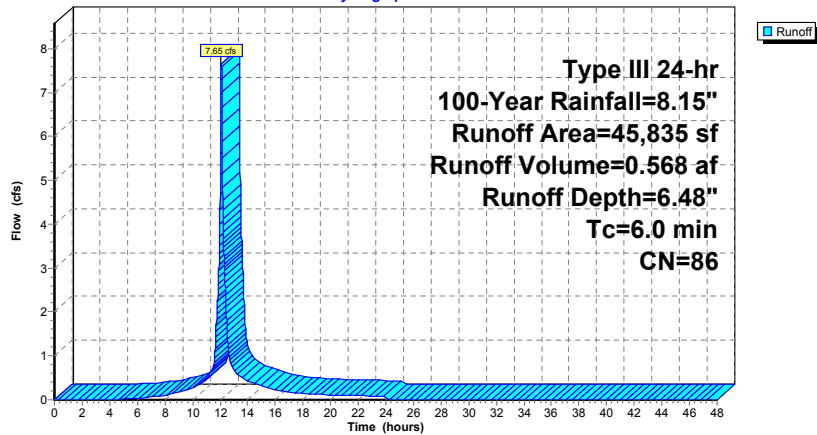
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
Type III 24-hr 100-Year Rainfall=8.15"

Area (sf)	CN	Description
* 12,965	98	Paved Sidewalk, HSG C
* 14,898	89	Synthetic turf w/ underdrain, HSG C
17,972	74	>75% Grass cover, Good, HSG C
45,835	86	Weighted Average
32,870		71.71% Pervious Area
12,965		28.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Min. allowable (0.1 hr)

**Subcatchment P2:**

Hydrograph



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**Summary for Reach DP-1: Design Pt #1: Mystic River**

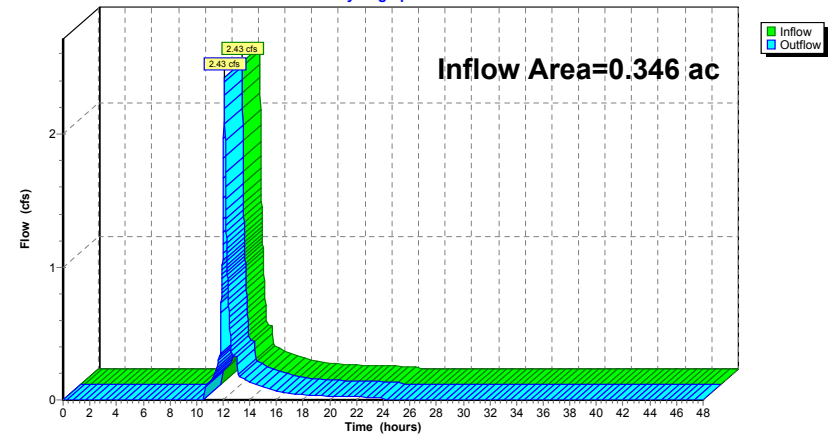
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.346 ac, 40.09% Impervious, Inflow Depth = 5.32" for 100-Year event  
Inflow = 2.43 cfs @ 12.09 hrs, Volume= 0.153 af  
Outflow = 2.43 cfs @ 12.09 hrs, Volume= 0.153 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-1: Design Pt #1: Mystic River**

Hydrograph



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Type III 24-hr 100-Year Rainfall=8.15"

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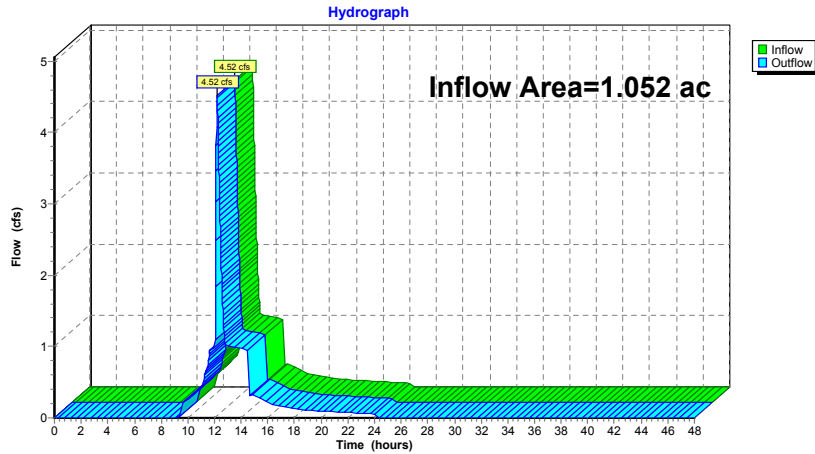
**Summary for Reach DP-2: Design Pt #2: Broadway**

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.052 ac, 28.29% Impervious, Inflow Depth = 5.82" for 100-Year event  
 Inflow = 4.52 cfs @ 12.19 hrs, Volume= 0.510 af  
 Outflow = 4.52 cfs @ 12.19 hrs, Volume= 0.510 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

**Reach DP-2: Design Pt #2: Broadway**



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Type III 24-hr 100-Year Rainfall=8.15"

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**Summary for Pond 1P: Infiltration Storage**

Inflow Area = 0.346 ac, 40.09% Impervious, Inflow Depth = 6.24" for 100-Year event  
 Inflow = 2.45 cfs @ 12.09 hrs, Volume= 0.180 af  
 Outflow = 2.44 cfs @ 12.09 hrs, Volume= 0.179 af, Atten= 0%, Lag= 0.4 min  
 Discarded = 0.01 cfs @ 12.09 hrs, Volume= 0.025 af  
 Primary = 2.43 cfs @ 12.09 hrs, Volume= 0.153 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
 Peak Elev= 12.61' @ 12.09 hrs Surf.Area= 1,875 sf Storage= 858 cf

Plug-Flow detention time= 123.8 min calculated for 0.179 af (99% of inflow)  
 Center-of-Mass det. time= 119.7 min ( 912.2 - 792.4 )

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	567 cf	<b>1.50'W x 840.00'L x 1.50'H Prismatic</b> 1,890 cf Overall x 30.0% Voids
#2	4.00'	101 cf	<b>4.00'D x 8.00'H Vertical Cone/Cylinder</b> Impervious
#3	12.00'	283 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
		950 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.00	5	0	0
12.50	500	126	126
12.75	750	156	283

Device	Routing	Invert	Outlet Devices
#1	Primary	10.00'	<b>8.0" Round Culvert</b> L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 10.00' / 4.00' S= 0.0600 ' / Cc= 0.900 n= 0.130, Flow Area= 0.35 sf
#2	Discarded	8.00'	<b>0.270 in/hr Exfiltration over Surface area</b>
#3	Primary	12.50'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Discarded OutFlow** Max=0.01 cfs @ 12.09 hrs HW=12.61' (Free Discharge)  
 ↳2=Exfiltration (Exfiltration Controls 0.01 cfs)

**Primary OutFlow** Max=2.32 cfs @ 12.09 hrs HW=12.61' (Free Discharge)  
 ↳1=Culvert (Barrel Controls 0.34 cfs @ 0.97 fps)  
 ↳3=Broad-Crested Rectangular Weir (Weir Controls 1.98 cfs @ 0.86 fps)

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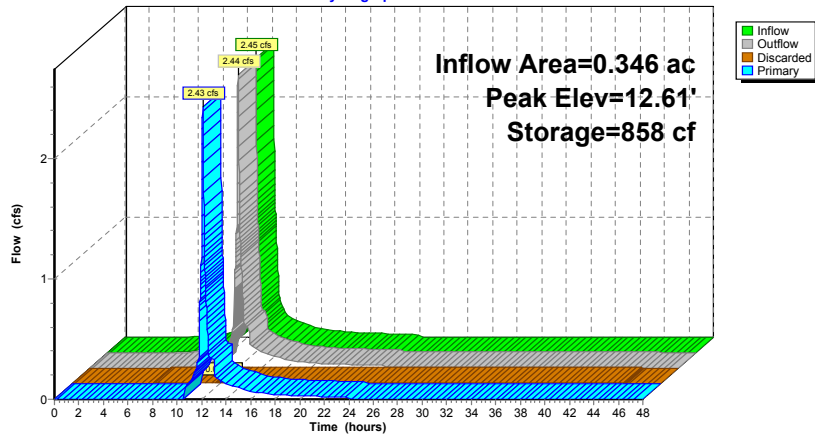
Type III 24-hr 100-Year Rainfall=8.15"

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**Pond 1P: Infiltration Storage**

Hydrograph



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**Summary for Pond 2P: Infiltration Storage**

Inflow Area = 1.052 ac, 28.29% Impervious, Inflow Depth = 6.48" for 100-Year event  
 Inflow = 7.65 cfs @ 12.08 hrs, Volume= 0.568 af  
 Outflow = 4.58 cfs @ 12.19 hrs, Volume= 0.567 af, Atten= 40%, Lag= 6.3 min  
 Discarded = 0.06 cfs @ 12.19 hrs, Volume= 0.057 af  
 Primary = 4.52 cfs @ 12.19 hrs, Volume= 0.510 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs  
 Peak Elev= 13.17' @ 12.19 hrs Surf.Area= 9,993 sf Storage= 5,769 cf

Plug-Flow detention time= 89.2 min calculated for 0.567 af (100% of inflow)  
 Center-of-Mass det. time= 87.9 min ( 875.1 - 787.2 )

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	1,080 cf	<b>1.50'W x 1,600.00'L x 1.50'H Prismatic</b> 3,600 cf Overall x 30.0% Voids
#2	4.00'	101 cf	<b>4.00'D x 8.00'H Vertical Cone/Cylinder</b> Impervious
#3	12.00'	5,237 cf	<b>Custom Stage Data (Prismatic)</b> Listed below (Recalc)
		6,417 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.00	5	0	0
13.00	6,775	3,390	3,390
13.25	8,000	1,847	5,237

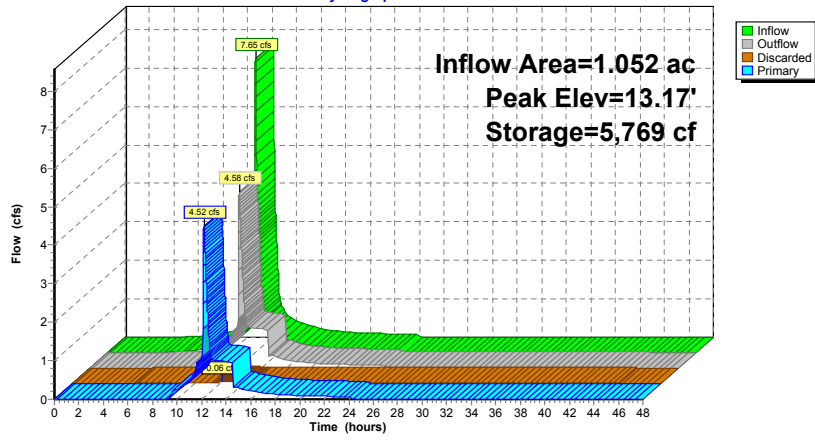
Device	Routing	Invert	Outlet Devices
#1	Primary	10.00'	<b>12.0" Round Culvert</b> L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 10.00' / 4.00' S= 0.0600 1' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf
#2	Discarded	8.00'	<b>0.270 in/hr Exfiltration over Surface area</b>
#3	Primary	13.00'	<b>20.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b> Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

**Discarded OutFlow** Max=0.06 cfs @ 12.19 hrs HW=13.17' (Free Discharge)  
 ↳2=Exfiltration (Exfiltration Controls 0.06 cfs)

**Primary OutFlow** Max=4.48 cfs @ 12.19 hrs HW=13.17' (Free Discharge)  
 ↳1=Culvert (Barrel Controls 1.01 cfs @ 1.29 fps)  
 ↳3=Broad-Crested Rectangular Weir(Weir Controls 3.46 cfs @ 1.04 fps)

**Pond 2P: Infiltration Storage**

Hydrograph







**APPENDIX G**  
**LONG-TERM POLLUTION PREVENTION AND STORMWATER OPERATION &**  
**MAINTENANCE PLAN**

***LONG-TERM POLLUTION PREVENTION &  
STORMWATER OPERATION & MAINTENANCE PLAN***

***FOR***

***EVERETT PROPERTY, LLC***

***City of Boston, Massachusetts  
Suffolk County***

Prepared for:

EVERETT PROPERTY, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Prepared by:

BOHLER ENGINEERING  
45 Franklin Street, 5th Floor  
Boston, MA 02110  
Tel: (617) 849-8040

Dated: April 18, 2018

Job # M181002

## **I. INTRODUCTION**

Under the proposed program, the existing site will be razed and replaced with open space amenity areas consisting of walkways and landscaping adjacent to the proposed Wynn Boston Harbor site. The proposed project also includes the installation of a new stormwater management system designed in accordance with current Massachusetts Department of Environmental Protection (MassDEP) Guidelines.

This manual is designed to help responsible parties become aware of non-point pollution problems and to provide detailed information about operating and maintaining stormwater management practices. The success of the Best Management Practices (BMP's) is dependent on their continued operations and maintenance.

## **II. RESPONSIBLE PARTY**

The ongoing responsibility for the maintenance of the site and on-site stormwater management facilities is the Applicant, Everett Property, LLC, its successors and assigns. Contact information is below:

EVERETT PROPERTY, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155  
Jacqui Krum  
(857)770-7000

### **III. STORMWATER MAINTENANCE ACTIVITIES & SCHEDULE:**

**COMPONENT:** Area Drains and Catch Basins

**RESPONSIBILITY:**

During Construction: General Contractor

Post Construction: Owner

**ACTION:** Cleaning (Sediment removal / sump cleaning) and Inspection

**FREQUENCY:**

1. Inspection – Two times per year
2. Cleaning – Once per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom invert of the lowest pipe in the basin.

**DESCRIPTION:** Basins are to be cleaned on an annual basis or when the depth of deposits is greater than or equal to one half the depth from the bottom of the sump to the invert of the lowest pipe in the basin. The Owner will inspect sumps post construction a minimum of twice per year. Precautions shall be taken to maintain the integrity of the trap hoods during cleaning. The hoods shall be inspected and repaired as necessary. Accumulated hydrocarbons shall be collected separately from accumulated sediment. All material shall be disposed of in accordance with DEP regulations.

Inspections:

- Frame and Grate
- Inlet and Outlet condition
- Cracks and settlement
- Joint failure
- Leaking
- Sediment Accumulation
- Oil/Gas Sheen in water
- Condition of trap hood
- General inspection of structure

**BUDGET:** Inspection/cleaning- \$1,000/ yr per catch basin for semi-annual inspections and annual cleaning.

#### **IV. LONG-TERM POLLUTION PREVENTION PLAN:**

The Long Term Pollution Prevention Plan (LTPPP) that follows is a guideline for source control and pollution prevention to help maintain stormwater quality. In general, this facility is not expected to generate significant amounts of hazardous waste, if any, nor will there be outdoor storage of any petroleum products, chemicals, etc. The following LTPPP provides for these conditions in the event that they occur.

##### **STORING MATERIALS AND WASTE PRODUCTS INSIDE OR UNDER COVER**

###### **Waste Materials**

All waste materials shall be collected and stored in a manner that will prevent materials from entering watercourses, wetlands, or other offsite areas. Material shall be regularly collected and disposed of offsite in a manner consistent with all federal, state and local regulations.

###### **Hazardous Waste:**

Hazardous or toxic wastes including paints, solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids shall be separated from domestic waste and stored in sealed containers constructed of suitable materials to prevent leakage and corrosion and labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other federal, state, tribal, and local requirements. Containers shall be stored under cover or within appropriately sized secondary containment and spill kits shall be readily available. Comply with the manufacturer's recommended disposal method and all federal, state, tribal, and local disposal requirements. Spills shall be cleaned up immediately in accordance with the Spill Prevention and Response Procedures in this Long Term Pollution Prevention Plan.

###### **Sanitary Waste:**

The facility will not be connected to the municipal sewer system.

###### **Diesel Fuel, Oil, Hydraulic Fluids, Petroleum Products, and Other Chemicals:**

Fuel, oil, and chemicals are not expected to be stored outside after construction of this facility. However, if present, they shall be stored in water-tight containers, which shall be covered by plastic sheeting, temporary roofs, or other suitable means to prevent the products from being contacted by rainwater. If cover is not provided, then secondary containment (e.g., spill berms, decks, spill containment pallets) shall be used, and spill kits shall be readily accessible. Spills shall be cleaned up immediately in accordance with the Spill Prevention and Response Procedures of this Long Term Pollution Prevention Plan.

##### **VEHICLE WASHING**

No outdoor maintenance or washing of vehicles allowed.

##### **ROUTINE INSPECTION AND MAINTENANCE OF STORMWATER BMPS**

Regular inspections and maintenance of Stormwater Management System as noted in the "O&M Plan".

## MAINTENANCE OF LAWNS, GARDENS, AND OTHER LANDSCAPED AREAS

Maintenance of lawns, gardens, landscaped areas and synthetic turf will be completed by Everett Property, LLC in accordance with their standard policies and schedules.

Management of fertilizers, herbicides, and pesticides will follow the guidelines set forth in the section below. Integrated Pest Management (IPM) will be utilized.

## STORAGE AND USE OF FERTILIZERS, HERBICIDES, AND PESTICIDES

Fertilizers, herbicides, and pesticides should be stored indoors or under cover. Partially used bags of fertilizers should be stored in sealable plastic bins. Application and disposal of such materials will be completed in accordance with manufacturer's instructions.

Discharges of fertilizers containing nitrogen or phosphorus to watercourses, wetlands, or other offsite areas shall be minimized as follows:

- Apply at a rate and in amounts consistent with manufacturers' specifications,
- Apply at the appropriate time of year for the site's location and to coincide as closely as possible to the period of maximum vegetation uptake and growth,
- Avoid applying before heavy rains that could wash away the fertilizer,
- Never apply to frozen ground,
- Never apply to stormwater conveyance channels that contain flowing water, and
- Follow all federal, state, tribal, and local requirements regarding fertilizer application.

## PET WASTE MANAGEMENT

The proposed open space/amenities will be open to the public; thus, there is the potential that pets will be present on the property. Pet waste will be collected and contained in plastic bags or other containers, and disposed as solid waste.

## PROVISIONS FOR SOLID WASTE MANAGEMENT

Solid waste and recyclables will be collected onsite and be removed by a licensed contractor on a regular basis. All trash receptacles will be covered.

## PROPER MANAGEMENT OF DEICING CHEMICALS AND SNOW

Snow removal service will adhere to the MassDEP Snow Removal Guidance document (attached). It is not anticipated that sand piles will be maintained on the property. However, should sand piles be maintained on the property, they will be contained and stabilized to prevent the discharge of sand to wetlands or waterbodies, and covered, where feasible. Deicing chemicals should be stored indoors or under cover. The amount of road salt or deicing chemicals applied should be limited to that required to maintain safety by the use of spreaders equipped with calibration devices.

## ILLICIT DISCHARGE STATEMENT

Certain types of non-stormwater discharges listed below are allowed under the U.S. Environmental Protection Agency Construction General Permit. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures which have been outlined previously in this LTPPP will be strictly followed to ensure that no contamination of these non-storm water discharges takes place. Any existing illicit discharges, if discovered during the course of the work, will be reported to MassDEP and the local DPW, or other officials as applicable, to be addressed in accordance with their respective policies. No illicit discharges will be allowed in conjunction with the proposed improvements.

<b>Type of Allowable Non-Stormwater Discharge</b>	<b>Likely to be Present at Your Site?</b>	
Discharges from emergency fire-fighting activities	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Fire hydrant flushings	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Landscape irrigation	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Waters used to wash vehicles and equipment	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Water used to control dust	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Potable water including uncontaminated water line flushings	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Routine external building wash down	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Pavement wash waters	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
Uncontaminated air conditioning or compressor condensate	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Uncontaminated, non-turbid discharges of ground water or spring water	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Foundation or footing drains	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
Construction dewatering water	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO



## **SPILL PREVENTION AND RESPONSE PROCEDURES (POST-CONSTRUCTION)**

In order to prevent or minimize the potential for a spill of Hazardous Substances or Oil or come into contact with stormwater, the following steps will be implemented:

1. All Hazardous Substances or Oil (such as pesticides, petroleum products, fertilizers, detergents, acids, paints, paint solvents, cleaning solvents, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.
2. The minimum practical quantity of all such materials will be kept on site.
3. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided on site.
4. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.
5. It is the OWNER's responsibility to ensure that all Hazardous Waste on site is disposed of properly by a licensed hazardous material disposal company. The OWNER is responsible for not exceeding Hazardous Waste storage requirements mandated by the EPA or state and local authorities.

In the event of a spill of Hazardous Substances or Oil, the following procedures should be followed:

1. All measures should be taken to contain and abate the spill and to prevent the discharge of the Hazardous Substance or Oil to stormwater or off-site. (The spill area should be kept well ventilated and personnel should wear appropriate protective clothing to prevent injury from contact with the Hazardous Substances.)
2. For spills of less than five (5) gallons of material, proceed with source control and containment, clean-up with absorbent materials or other applicable means unless an imminent hazard or other circumstances dictate that the spill should be treated by a professional emergency response contractor.
3. For spills greater than five (5) gallons of material immediately contact the MADEP at the toll-free 24-hour statewide emergency number: **1-888-304-1133**, the local fire department (**9-1-1**) and an approved emergency response contractor. Provide information on the type of material spilled, the location of the spill, the quantity spilled, and the time of the spill to the emergency response contractor or coordinator, and proceed with prevention, containment and/or clean-up if so desired. (Use the form provided, or similar).
4. If there is a Reportable Quantity (RQ) release, then the National Response Center should be notified immediately at (800) 424-8802; within 14 days a report should be submitted to the EPA regional office describing the release, the date and circumstances of the release and the steps taken to prevent another release. This Pollution Prevention Plan should be updated to reflect any such steps or actions taken and measures to prevent the same from reoccurring.



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## Snow Disposal Guidance

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Effective Date: March 8, 2001

Guideline No. BRPG01-01

Applicability: Applies to all federal, state, regional and local agencies, as well as to private businesses.

Supersedes: BRP Snow Disposal Guideline BRPG97-1 issued 12/19/97, and all previous snow disposal guidance

Approved by: Glenn Haas, Assistant Commissioner for Resource Protection

**PURPOSE:** To provide guidelines to all government agencies and private businesses regarding snow disposal site selection, site preparation and maintenance, and emergency snow disposal options that are acceptable to the Department of Environmental Protection, Bureau of Resource Protection.

**APPLICABILITY:** These Guidelines are issued by the Bureau of Resource Protection on behalf of all Bureau Programs (including Drinking Water Supply, Wetlands and Waterways, Wastewater Management, and Watershed Planning and Permitting). They apply to public agencies and private businesses disposing of snow in the Commonwealth of Massachusetts.

### INTRODUCTION

Finding a place to dispose of collected snow poses a challenge to municipalities and businesses as they clear roads, parking lots, bridges, and sidewalks. While we are all aware of the threats to public safety caused by snow, collected snow that is contaminated with road salt, sand, litter, and automotive pollutants such as oil also threatens public health and the environment.

As snow melts, road salt, sand, litter, and other pollutants are transported into surface water or through the soil where they may eventually reach the groundwater. Road salt and other pollutants can contaminate water supplies and are toxic to aquatic life at certain levels. Sand washed into waterbodies can create sand bars or fill in wetlands and ponds, impacting aquatic life, causing flooding, and affecting our use of these resources.

There are several steps that communities can take to minimize the impacts of snow disposal on public health and the environment. These steps will help communities avoid the costs of a contaminated water supply, degraded waterbodies, and flooding. Everything we do on the land has the potential to impact our water resources. Given the authority of local government over the use of the land, municipal officials and staff have a critically important role to play in protecting our water resources.

The purpose of these guidelines is to help municipalities and businesses select, prepare, and maintain appropriate snow disposal sites before the snow begins to accumulate through the winter.

### RECOMMENDED GUIDELINES

These snow disposal guidelines address: (1) site selection; (2) site preparation and maintenance; and (3) emergency snow disposal.

#### 1. SITE SELECTION

The key to selecting effective snow disposal sites is to locate them adjacent to or on pervious surfaces in upland areas away from water resources and wells. At these locations, the snow meltwater can filter in to the soil, leaving behind sand and debris which can be removed in the springtime. The following areas should be avoided:

- Avoid dumping of snow into any waterbody, including rivers, the ocean, reservoirs, ponds, or wetlands. In addition to water quality impacts and flooding, snow disposed of in open water can cause navigational hazards when it freezes into ice blocks.
- Do not dump snow within a Zone II or Interim Wellhead Protection Area (IWPA) of a public water supply well or within 75 feet of a private well, where road salt may contaminate water supplies.

- Avoid dumping snow on MassDEP-designated high and medium-yield aquifers where it may contaminate groundwater (see the next page for information on ordering maps from MassGIS showing the locations of aquifers, Zone II's, and IWPA's in your community).
- Avoid dumping snow in sanitary landfills and gravel pits. Snow meltwater will create more contaminated leachate in landfills posing a greater risk to groundwater, and in gravel pits, there is little opportunity for pollutants to be filtered out of the meltwater because groundwater is close to the land surface.
- Avoid disposing of snow on top of storm drain catch basins or in stormwater drainage swales or ditches. Snow combined with sand and debris may block a storm drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.

#### Site Selection Procedures

- a. It is important that the municipal Department of Public Works or Highway Department, Conservation Commission, and Board of Health work together to select appropriate snow disposal sites. The following steps should be taken:
- b. Estimate how much snow disposal capacity is needed for the season so that an adequate number of disposal sites can be selected and prepared.
- c. Identify sites that could potentially be used for snow disposal such as municipal open space (e.g., parking lots or parks).
- d. Sites located in upland locations that are not likely to impact sensitive environmental resources should be selected first.
- e. If more storage space is still needed, prioritize the sites with the least environmental impact (using the site selection criteria, and local or MassGIS maps as a guide).

#### MassGIS Maps of Open Space and Water Resources

If local maps do not show the information you need to select appropriate snow disposal sites, you may order maps from MassGIS (Massachusetts Geographic Information System) which show publicly owned open spaces and approximate locations of sensitive environmental resources (locations should be field-verified where possible). Different coverages or map themes depicting sensitive environmental resources are available from MassGIS on the map you order. At a minimum, you should order the Priority Resources Map. The Priority Resources Map includes aquifers, public water supplies, MassDEP-approved Zone II's, Interim Wellhead Protection Areas, Wetlands, Open Space, Areas of Critical Environmental Concern, NHESP Wetlands Habitats, MassDEP Permitted Solid Waste facilities, Surface Water Protection areas (Zone A's) and base map features. The cost of this map is \$25.00. Other coverages or map themes you may consider, depending on the location of your city or town, include Outstanding Resource Waters and MassDEP Eelgrass Resources. These are available at \$25.00 each, with each map theme being depicted on a separate map. Maps should be ordered from MassGIS via the Internet at <http://www.mass.gov/mgis>. Maps may also be ordered by fax at (617) 626-1249 (order form available from the MassGIS web site) or mail. For further information, contact MassGIS at (617) 626-1189.

## 2. SITE PREPARATION AND MAINTENANCE

In addition to carefully selecting disposal sites before the winter begins, it is important to prepare and maintain these sites to maximize their effectiveness. The following maintenance measures should be undertaken for all snow disposal sites:

- A silt fence or equivalent barrier should be placed securely on the downgradient side of the snow disposal site.
- To filter pollutants out of the meltwater, a 50-foot vegetative buffer strip should be maintained during the growth season between the disposal site and adjacent waterbodies.
- Debris should be cleared from the site prior to using the site for snow disposal.
- Debris should be cleared from the site and properly disposed of at the end of the snow season and no later than May 15.

## 3. EMERGENCY SNOW DISPOSAL

As mentioned earlier, it is important to estimate the amount of snow disposal capacity you will need so that an adequate number of upland disposal sites can be selected and prepared.

If despite your planning, upland disposal sites have been exhausted, snow may be disposed of near waterbodies. A vegetated buffer of at least 50 feet should still be maintained between

the site and the waterbody in these situations. Furthermore, it is essential that the other guidelines for preparing and maintaining snow disposal sites be followed to minimize the threat to adjacent waterbodies.

Under extraordinary conditions, when all land-based snow disposal options are exhausted, disposal of snow that is not obviously contaminated with road salt, sand, and other pollutants may be allowed in certain waterbodies under certain conditions. In these dire situations, notify your Conservation Commission and the appropriate MassDEP Regional Service Center before disposing of snow in a waterbody.

Use the following guidelines in these emergency situations:

- Dispose of snow in open water with adequate flow and mixing to prevent ice dams from forming.
- Do not dispose of snow in saltmarshes, vegetated wetlands, certified vernal pools, shellfish beds, mudflats, drinking water reservoirs and their tributaries, Zone IIs or IWPAAs of public water supply wells, Outstanding Resource Waters, or Areas of Critical Environmental Concern.
- Do not dispose of snow where trucks may cause shoreline damage or erosion.
- Consult with the municipal Conservation Commission to ensure that snow disposal in open water complies with local ordinances and bylaws.

#### FOR MORE INFORMATION

If you need more information, contact one of MassDEP's Regional Service Centers:

Northeast Regional Office, Wilmington, 978-694-3200  
Southeast Regional Office, Lakeville, 508-946-2714  
Central Regional Office, Worcester, 508-792-7683  
Western Regional Office, Springfield, 413-755-2214

or

Call Thomas Maguire of DEP's Bureau of Resource Protection in Boston at 617-292-5602.

**APPENDIX H**  
**STORMWATER CHECKLIST**



# Checklist for Stormwater Report

## A. Introduction

**Important:** When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.<sup>1</sup> This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8<sup>2</sup>
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

<sup>1</sup> The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

<sup>2</sup> For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



# Checklist for Stormwater Report

## B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

*Note:* Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

### Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



*Stephen P. Martorano* 4/18/2018  
Signature and Date

## Checklist

**Project Type:** Is the application for new development, redevelopment, or a mix of new and redevelopment?

- New development
- Redevelopment
- Mix of New Development and Redevelopment





# Checklist for Stormwater Report

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## Checklist (continued)

**LID Measures:** Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- No disturbance to any Wetland Resource Areas
- Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- Reduced Impervious Area (Redevelopment Only)
- Minimizing disturbance to existing trees and shrubs
- LID Site Design Credit Requested:
  - Credit 1
  - Credit 2
  - Credit 3
- Use of "country drainage" versus curb and gutter conveyance and pipe
- Bioretention Cells (includes Rain Gardens)
- Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- Treebox Filter
- Water Quality Swale
- Grass Channel
- Green Roof
- Other (describe): Infiltration Trenches

### Standard 1: No New Untreated Discharges

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

### Standard 3: Recharge

- Soil Analysis provided.
- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.
  - Static
  - Simple Dynamic
  - Dynamic Field<sup>1</sup>
- Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
  - Site is comprised solely of C and D soils and/or bedrock at the land surface
  - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
  - Solid Waste Landfill pursuant to 310 CMR 19.000
  - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

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<sup>1</sup> 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

### Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
  - Provisions for storing materials and waste products inside or under cover;
  - Vehicle washing controls;
  - Requirements for routine inspections and maintenance of stormwater BMPs;
  - Spill prevention and response plans;
  - Provisions for maintenance of lawns, gardens, and other landscaped areas;
  - Requirements for storage and use of fertilizers, herbicides, and pesticides;
  - Pet waste management provisions;
  - Provisions for operation and management of septic systems;
  - Provisions for solid waste management;
  - Snow disposal and plowing plans relative to Wetland Resource Areas;
  - Winter Road Salt and/or Sand Use and Storage restrictions;
  - Street sweeping schedules;
  - Provisions for prevention of illicit discharges to the stormwater management system;
  - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
  - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
  - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
  - Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
    - is within the Zone II or Interim Wellhead Protection Area
    - is near or to other critical areas
    - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
    - involves runoff from land uses with higher potential pollutant loads.
  - The Required Water Quality Volume is reduced through use of the LID site Design Credits.
  - Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
  - The ½" or 1" Water Quality Volume or
  - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

### Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does **not** cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

### Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
  - Limited Project
  - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
  - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
  - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
  - Bike Path and/or Foot Path
  - Redevelopment Project
  - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
  - Construction Period Operation and Maintenance Plan;
  - Names of Persons or Entity Responsible for Plan Compliance;
  - Construction Period Pollution Prevention Measures;
  - Erosion and Sedimentation Control Plan Drawings;
  - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
  - Vegetation Planning;
  - Site Development Plan;
  - Construction Sequencing Plan;
  - Sequencing of Erosion and Sedimentation Controls;
  - Operation and Maintenance of Erosion and Sedimentation Controls;
  - Inspection Schedule;
  - Maintenance Schedule;
  - Inspection and Maintenance Log Form.
- A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



# Checklist for Stormwater Report

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## Checklist (continued)

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- The project is **not** covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

### Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
  - Name of the stormwater management system owners;
  - Party responsible for operation and maintenance;
  - Schedule for implementation of routine and non-routine maintenance tasks;
  - Plan showing the location of all stormwater BMPs maintenance access areas;
  - Description and delineation of public safety features;
  - Estimated operation and maintenance budget; and
  - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
  - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
  - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

### Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.



2016 00045523

Bk: 56181 Pg: 215 Page: 1 of 6

Recorded: 05/27/2016 09:24 AM

ATTEST: Thomas M Ryan, Temp Register  
Suffolk County Registry of Deeds

PREPARED BY AND RETURN TO:

**MEMORANDUM OF LEASE**

This Memorandum of Lease (this "Memorandum") is entered into as of May 1, 2016 by and by and between Theodoros Ventouris, as Trustee of T.E.V. Realty Trust under Declaration of Trust dated March 4, 2005, recorded with the Suffolk County Registry of Deeds in Book 36601, Page 117 ("Landlord"), and Everett Property, LLC, a Massachusetts limited liability company ("Tenant"). It is the desire of the parties hereto to enter into this Memorandum for the purpose of recording the same and giving notice of the existence of the Lease as more particularly described in this Memorandum.

Parties to Lease Agreement

**Landlord:** Theodoros Ventouris, as Trustee of T.E.V. Realty Trust, under Declaration of Trust dated March 4, 2005, recorded with the Suffolk County Registry of Deeds in Book 36601, Page 117  
902 Commonwealth Avenue  
Newton, MA 02459  
Facsimile: 617-964-8227  
E-mail: Atventouris@verizon.net

**Tenant:** Everett Property, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Date of Lease

May 1, 2016

Description of Property

The property known as 150 Alford Street, Boston, MA, as more particularly described on Exhibit A attached hereto (the "Property")

Term

Seventy-five (75) years commencing May 1, 2016 and expiring April 30, 2091

Purpose of Memorandum

This Memorandum is executed for the purpose of giving record notice of the fact of execution of the above described Lease in lieu of recording the Lease itself and is not intended to modify, limit or otherwise alter the terms, conditions and provisions of the Lease

This Memorandum shall extend to and be binding upon the parties hereto and their legal representatives, heirs, successors and assigns.

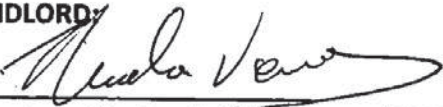
(SIGNATURES APPEAR ON NEXT PAGE)

Please return to: Natalie E. Robb  
Fidelity National Title Ins. Co.  
133 Federal Street, 3<sup>rd</sup> Floor  
Boston, MA 02110 15-0353fNR-FN

150 Alford St., Boston

Executed as a sealed instrument as of the date first above written.

**LANDLORD:**

By: 

Theodoros Ventouris, as Trustee of T.E.V. Realty Trust,  
as aforesaid, hereunto duly authorized

Date: 3/31/14

**TENANT:**

Everett Property, LLC

By: \_\_\_\_\_

Name:

Title:

Date:



Executed as a sealed instrument as of the date first above written.

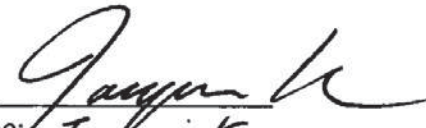
**LANDLORD:**

By: \_\_\_\_\_

Theodoros Ventouris, as Trustee of T.E.V. Realty Trust,  
as aforesaid, hereunto duly authorized

**TENANT:**

**Everett Property, LLC**

By:   
Name: *Jacquie Krum*  
Title: *Authorized Signer*

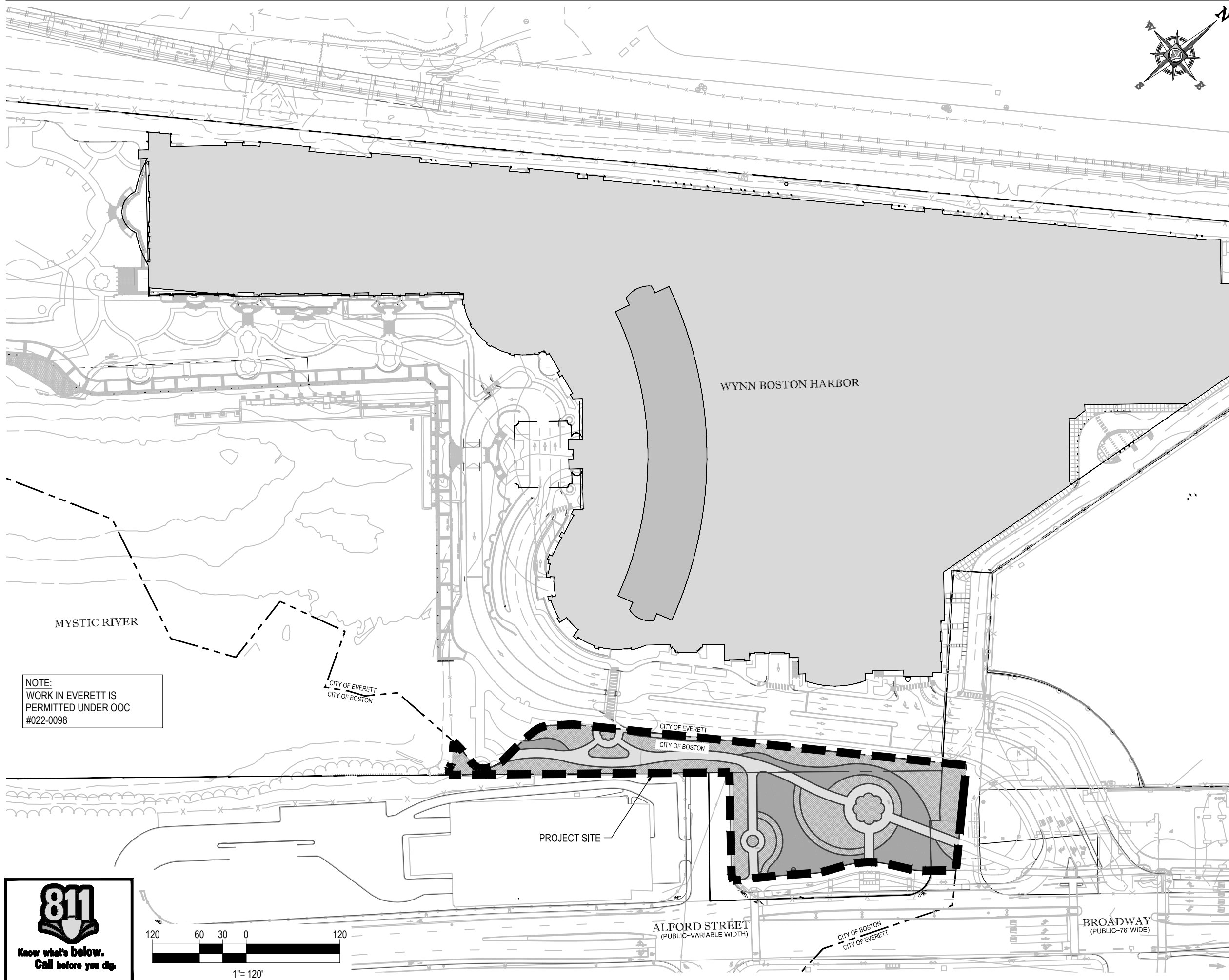


Attachment D

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NOI PLANS



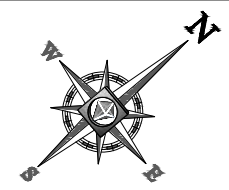
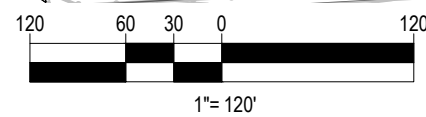


NOTE:  
WORK IN EVERETT IS  
PERMITTED UNDER OOC  
#022-0098

CITY OF EVERETT  
CITY OF BOSTON

CITY OF EVERETT  
CITY OF BOSTON

CITY OF BOSTON  
CITY OF EVERETT



**JACOBS**

One Broadway  
Cambridge, Massachusetts  
02142  
P 617.491.6450  
F 617.491.7104  
W www.Jacobs.com

Consultants:



45 FRANKLIN STREET, 5TH FLOOR  
BOSTON, MA 02110  
Phone: (617) 849-8040  
Fax: (617) 849-8040  
www.BohlerEngineering.com

Seals:



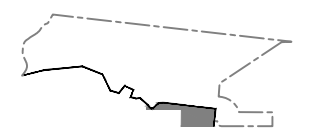
Project Title:

**Alford Street Pedestrian and  
Landscape Improvements  
Boston, MA**

Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Key Plan:



Project No.: Jacobs #L1009100, Bohler #M181002

Copyright: 2016 Jacobs Engineering Group

2018 Bohler Engineering

Date: 04/18/2018

Drawing Sheet Title:

**OVERALL SITE PLAN**

Drawing Sheet Number:

**C100**

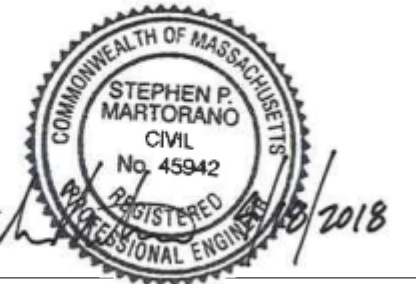


Consultants:



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BOSTON, MA 02110  
Phone: (617) 849-8040  
Fax: (617) 849-8040  
www.BohlerEngineering.com

Seals:



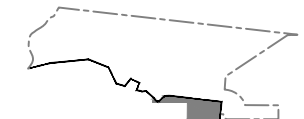
Project Title:

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Landscape Improvements  
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Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Key Plan:



Project No.: Jacobs #L1009100, Bohler #M181002

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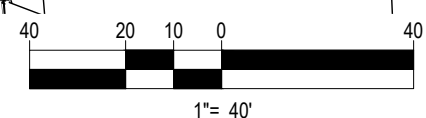
Date: 04/18/2018

Drawing Sheet Title:

**EXISTING CONDITIONS  
PLAN A**

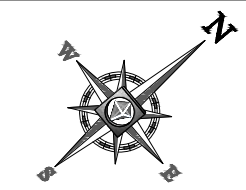
Drawing Sheet Number:

**C200**







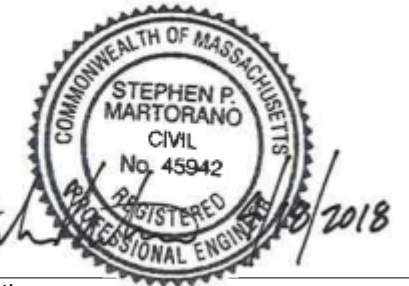


Consultants:



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BOSTON, MA 02110  
Phone: (617) 849-8040  
Fax: (617) 849-8040  
www.BohlerEngineering.com

Seals:



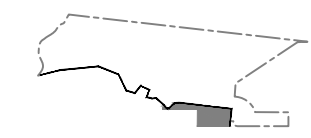
Project Title:

**Alford Street Pedestrian and  
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Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Key Plan:



Project No.: Jacobs #L1009100, Bohler #M181002

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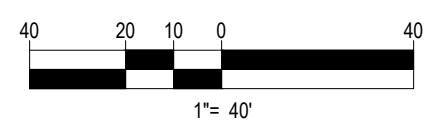
Date: 04/18/2018

Drawing Sheet Title:

**EXISTING CONDITIONS  
PLAN B**

Drawing Sheet Number:

**C201**



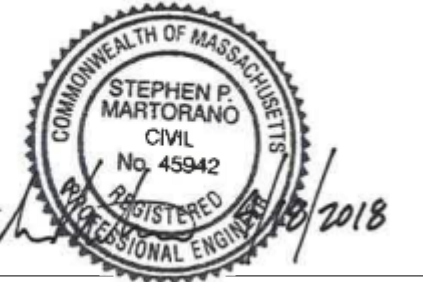


Consultants:



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BOSTON, MA 02110  
Phone: (617) 849-8040  
Fax: (617) 849-8040  
www.BohlerEngineering.com

Seals:



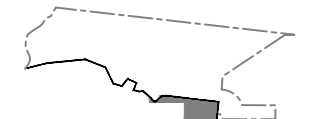
Project Title:

**Alford Street Pedestrian and  
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Boston, MA**

Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Key Plan:



Project No.: Jacobs #L1009100, Bohler #M181002

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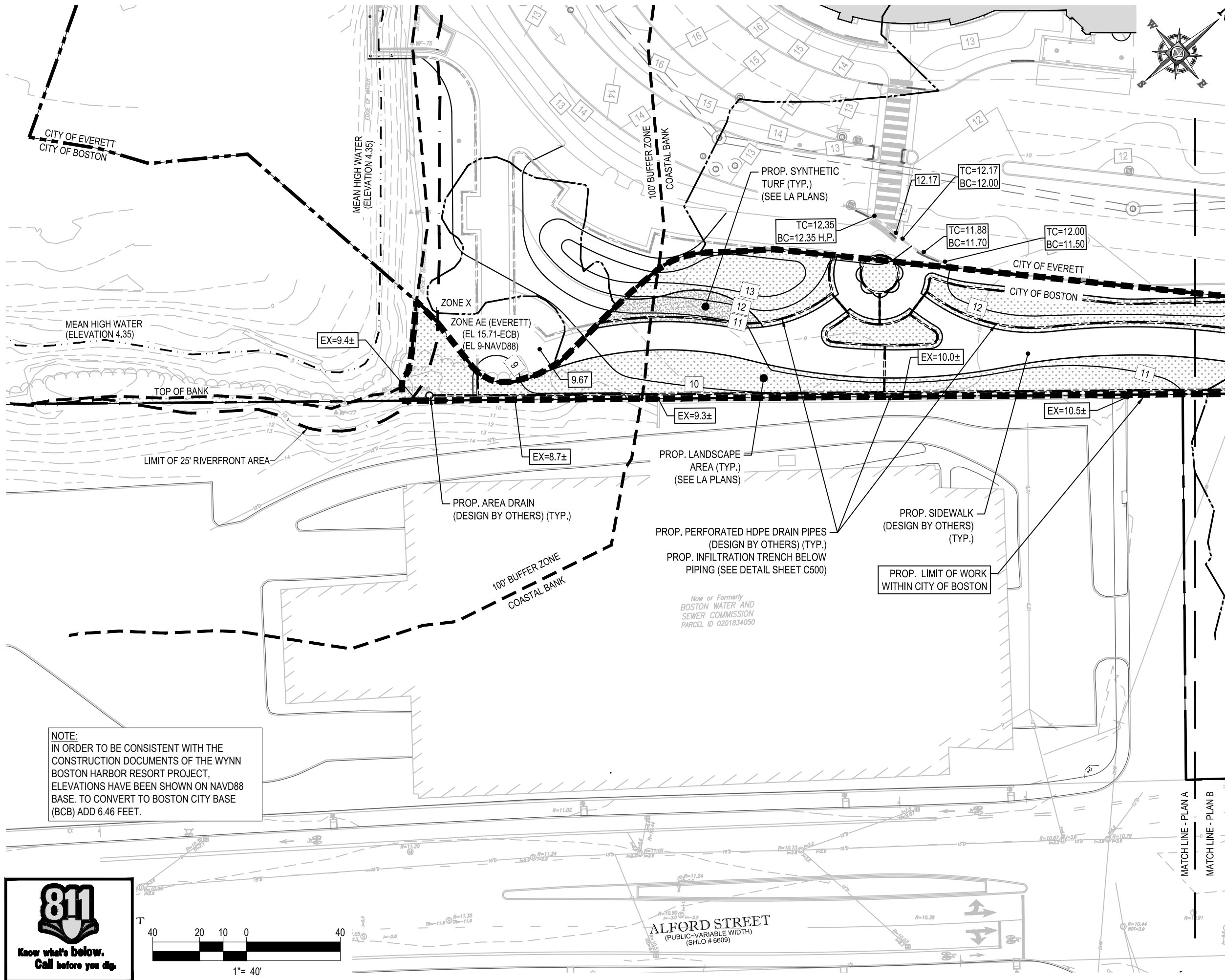
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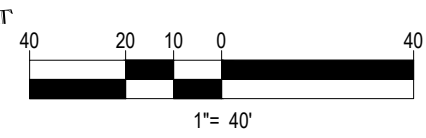
**GRADING & DRAINAGE  
PLAN A**

Drawing Sheet Number:

**C300**



NOTE:  
IN ORDER TO BE CONSISTENT WITH THE  
CONSTRUCTION DOCUMENTS OF THE WYNN  
BOSTON HARBOR RESORT PROJECT,  
ELEVATIONS HAVE BEEN SHOWN ON NAVD88  
BASE. TO CONVERT TO BOSTON CITY BASE  
(BCB) ADD 6.46 FEET.



ALFORD STREET  
(PUBLIC-VARIABLE WIDTH)  
(SHLO # 6603)

MATCH LINE - PLAN A  
MATCH LINE - PLAN B



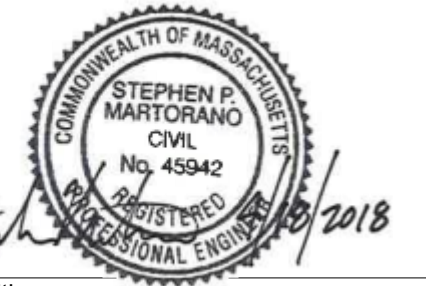


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BOSTON, MA 02110  
Phone: (617) 849-8040  
Fax: (617) 849-8040  
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Seals:



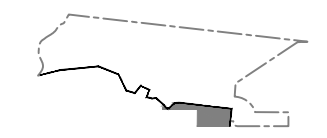
Project Title:

**Alford Street Pedestrian and  
Landscape Improvements  
Boston, MA**

Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Key Plan:



Project No.: Jacobs #L1009100, Bohler #M181002

Copyright: 2016 Jacobs Engineering Group

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Date: 04/18/2018

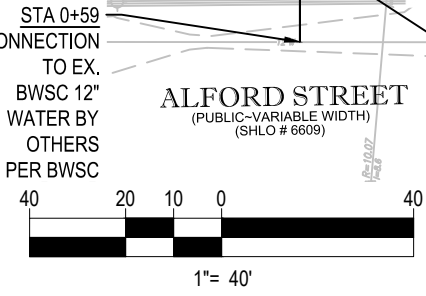
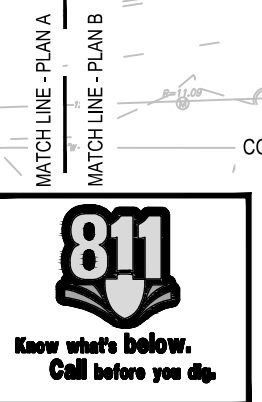
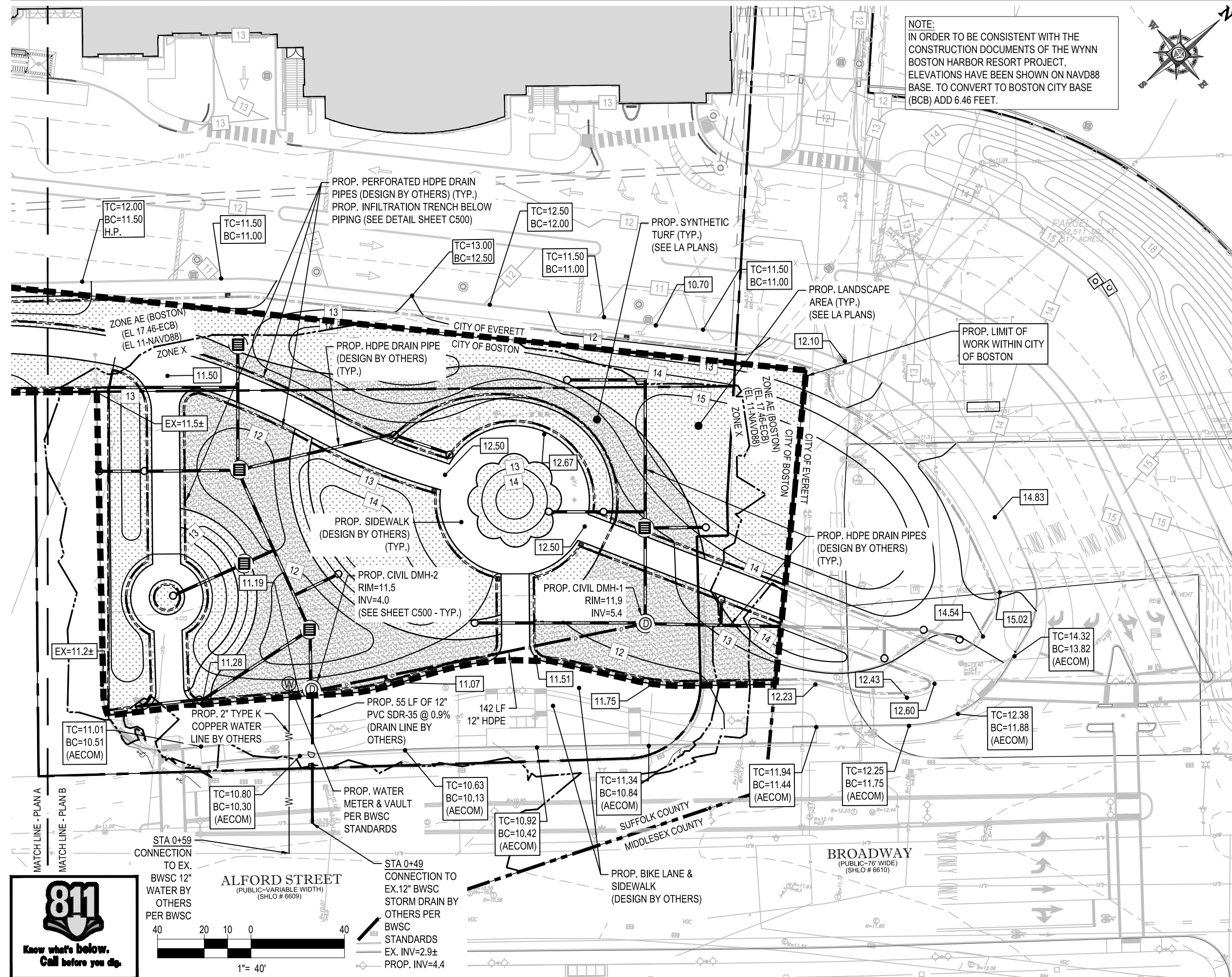
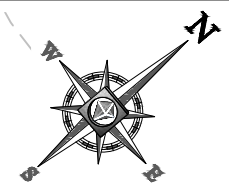
Drawing Sheet Title:

**GRADING & DRAINAGE  
PLAN B**

Drawing Sheet Number:

**C301**

NOTE:  
IN ORDER TO BE CONSISTENT WITH THE  
CONSTRUCTION DOCUMENTS OF THE WYNN  
BOSTON HARBOR RESORT PROJECT,  
ELEVATIONS HAVE BEEN SHOWN ON NAVD88  
BASE. TO CONVERT TO BOSTON CITY BASE  
(BCB) ADD 6.46 FEET.



STA 0+49  
CONNECTION TO  
EX. 12" BWSC  
STORM DRAIN BY  
OTHERS PER  
BWSC  
STANDARDS  
EX. INV.=2.9±  
PROP. INV.=4.4

ALFORD STREET  
(PUBLIC-VARIABLE WIDTH)  
(SHLO # 6609)

STA 0+59  
CONNECTION  
TO EX.  
BWSC 12"  
WATER BY  
OTHERS  
PER BWSC

PROP. WATER  
METER & VAULT  
PER BWSC  
STANDARDS

PROP. 2" TYPE K  
COPPER WATER  
LINE BY OTHERS

PROP. 55 LF OF 12"  
PVC SDR-35 @ 0.9%  
(DRAIN LINE BY  
OTHERS)

142 LF  
12" HDPE

PROP. CIVIL DMH-2  
RIM=11.5  
INV=4.0  
(SEE SHEET C500 - TYP.)

PROP. CIVIL DMH-1  
RIM=11.9  
INV=5.4

PROP. SIDEWALK  
(DESIGN BY OTHERS)  
(TYP.)

BROADWAY  
(PUBLIC-76' WIDE)  
(SHLO # 6610)

PROP. BIKE LANE &  
SIDEWALK  
(DESIGN BY OTHERS)

TC=12.38  
BC=11.88  
(AECOM)

TC=12.25  
BC=11.75  
(AECOM)

TC=11.94  
BC=11.44  
(AECOM)

TC=11.34  
BC=10.84  
(AECOM)

TC=10.63  
BC=10.13  
(AECOM)

TC=10.80  
BC=10.30  
(AECOM)

TC=14.32  
BC=13.82  
(AECOM)

TC=12.38  
BC=11.88  
(AECOM)

TC=12.60

TC=12.23

TC=11.75

TC=11.51

TC=11.07

TC=11.19

TC=11.28

TC=11.50

TC=11.01  
BC=10.51  
(AECOM)

TC=14.83

TC=14.54

TC=15.02

TC=14.83

TC=14.54

TC=15.02

TC=14.83

TC=14.54

TC=15.02

TC=14.83

PROP. LIMIT OF  
WORK WITHIN CITY  
OF BOSTON

PROP. LANDSCAPE  
AREA (TYP.)  
(SEE LA PLANS)

PROP. SYNTHETIC  
TURF (TYP.)  
(SEE LA PLANS)

PROP. PERFORATED HDPE DRAIN  
PIPES (DESIGN BY OTHERS) (TYP.)  
PROP. INFILTRATION TRENCH BELOW  
PIPING (SEE DETAIL SHEET C500)

PROP. HDPE DRAIN PIPE  
(DESIGN BY OTHERS)  
(TYP.)

ZONE AE (BOSTON)  
(EL 17.46-ECB)  
(EL 11-NAVD88)

ZONE X

MATCH LINE - PLAN A

MATCH LINE - PLAN B





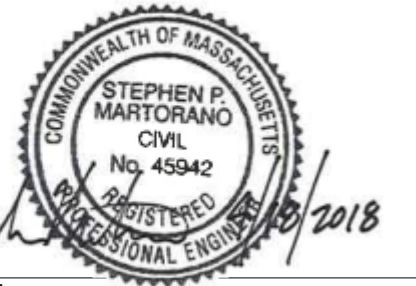


Consultants:



45 FRANKLIN STREET, 5TH FLOOR  
BOSTON, MA 02110  
Phone: (617) 849-8040  
Fax: (617) 849-8040  
www.BohlerEngineering.com

Seals:



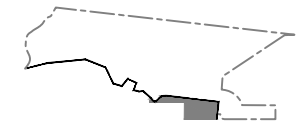
Project Title:

**Alford Street Pedestrian and  
Landscape Improvements  
Boston, MA**

Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Key Plan:



Project No.: Jacobs #L1009100, Bohler #M181002

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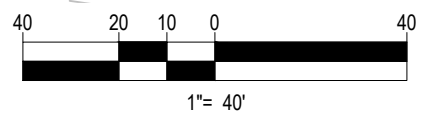
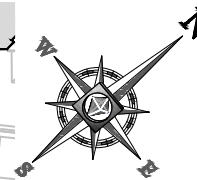
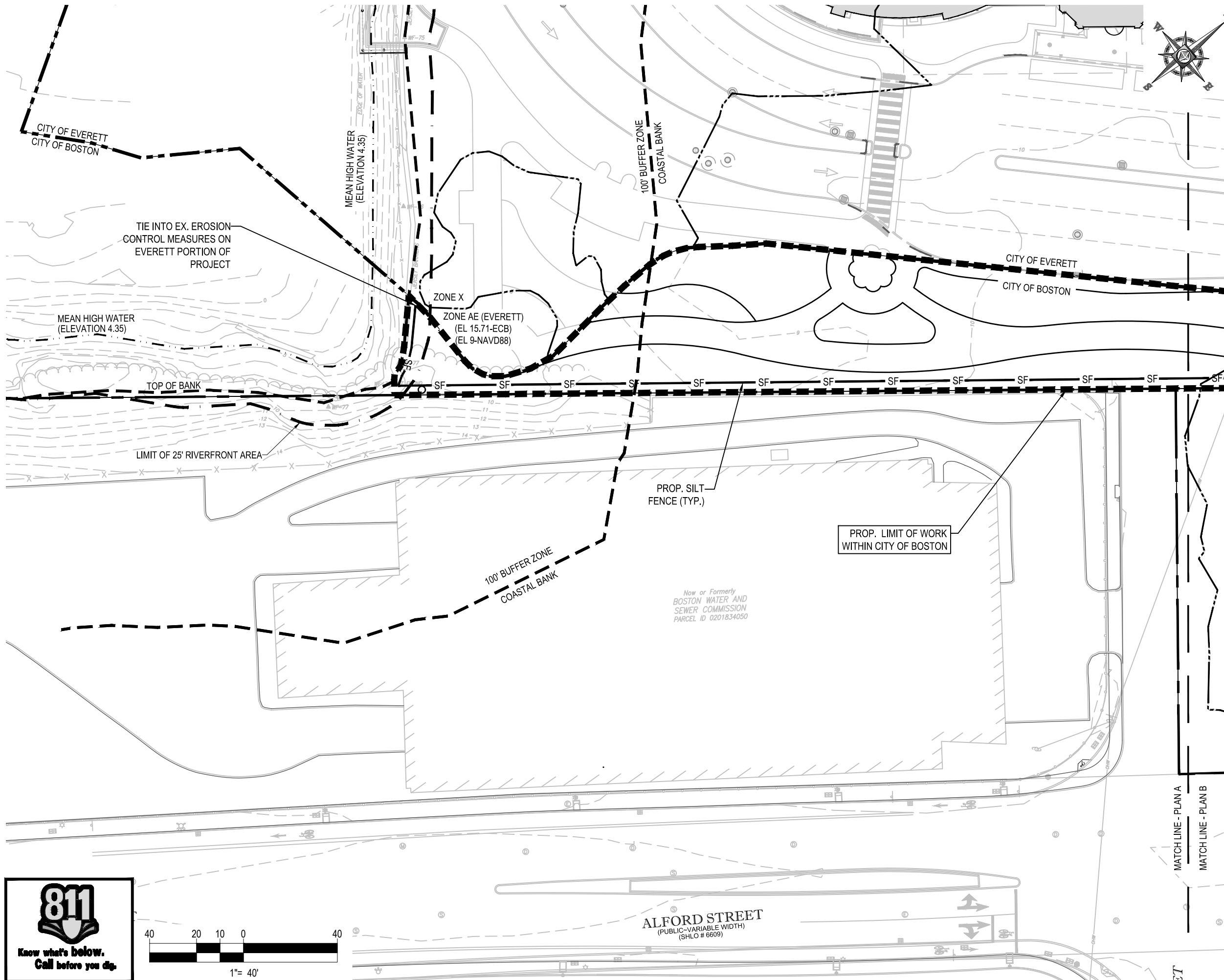
Date: 04/18/2018

Drawing Sheet Title:

**EROSION & SEDIMENT  
CONTROL PLAN A**

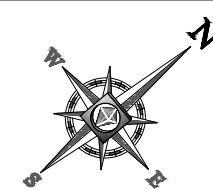
Drawing Sheet Number:

**C400**









One Broadway  
Cambridge, Massachusetts  
02142  
P 617.491.6450  
F 617.491.7104  
W www.Jacobs.com

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BOSTON, MA 02110  
Phone: (617) 849-8040  
Fax: (617) 849-8040  
www.BohlerEngineering.com

Seals:



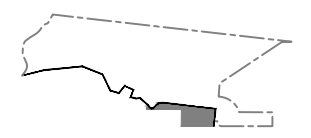
Project Title:

## Alford Street Pedestrian and Landscape Improvements Boston, MA

Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Key Plan:



Project No.: Jacobs #L1009100, Bohler #M181002

Copyright: 2016 Jacobs Engineering Group

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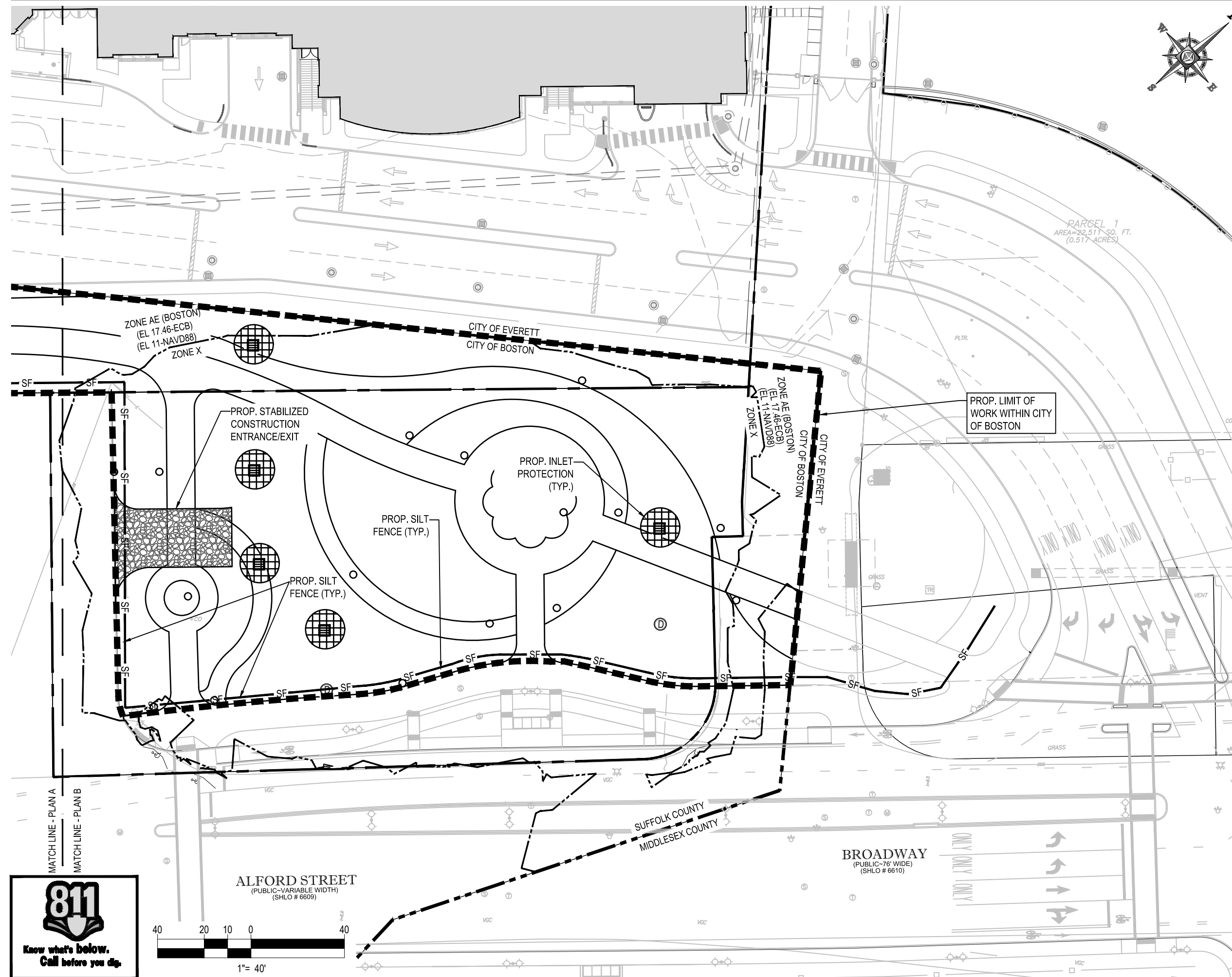
Date: 04/18/2018

Drawing Sheet Title:

### EROSION & SEDIMENT CONTROL PLAN B

Drawing Sheet Number:

# C401





Consultants:



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BOSTON, MA 02110  
Phone: (617) 849-8040  
Fax: (617) 849-8040  
www.BohlerEngineering.com

Seals:



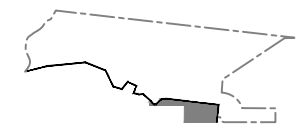
Project Title:

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Medford, MA 02155

Key Plan:



Project No.: Jacobs #L1009100, Bohler #M181002

Copyright: 2016 Jacobs Engineering Group

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Date: 04/18/2018

Drawing Sheet Title:

**SOIL EROSION CONTROL  
NOTES & DETAILS SHEET**

Drawing Sheet Number:

# C402

### EROSION & SEDIMENT CONTROL NOTES

- ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE AS SET FORTH IN THE MOST CURRENT STATE SEDIMENT AND EROSION CONTROL MANUAL.
- THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION SHALL BE LEFT UNDISTURBED OR UNVEGETATED. CONSTRUCTION AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 14 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 14 DAYS OF FINAL DISTURBANCE.
- SEDIMENT BARRIERS (SILT FENCES, STRAW BARRIERS, ETC.) SHALL BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF THE CONTIGUOUS DOWN-SLOPE AREA ABOVE THEM. MUD-CATCHERS SHALL BE USED TO ANCHOR MUD-CATCH AREAS WITH SLOPES GREATER THAN 10% AFTER OBTAINING THE SLOPE APPROVAL FOR ALL SLOPES GREATER THAN 10%.
- INSTALL SILT FENCE AT THE TOE OF SLOPE TO FILTER SILT FROM RUNOFF. SEE SILT FENCE DETAIL FOR PROPER INSTALLATION. SILT FENCE SHALL REMAIN IN PLACE PER NOTES.
- ALL SEDIMENT CONTROL STRUCTURES SHALL BE BARRIERS TO EROSION AND NOT PERMANENT. THEY SHALL BE REMOVED FOLLOWING ANY PERMANENT TREATMENT OR STORM EVENT OR WHEN NO LONGER NECESSARY DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. SEDIMENT DEPOSITED SHALL BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITED TO APPROXIMATELY THE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL STRUCTURES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS ABOVE ARE STABILIZED BY PLANT.
- NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO TO ONE (2:1).
- FINAL SEEDING OF THE DISTURBED AREAS IS NOT COMPLETED 45 DAYS PRIOR TO THE FIRST RAINFALL EVENT. TEMPORARY MULCH (COMPOST SEEDING MAT) IS NOT APPLIED TO PROTECT THE SITE AND PREVENT EROSION. THE NEXT RECOMMENDED SEEDING PERIOD.
- TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINAL GRADED SHALL BE COMPLETED 45 DAYS PRIOR TO THE FIRST RAINFALL EVENT TO PROTECT FROM IMPROPER EROSION.
- DURING THE CONSTRUCTION PHASE, UNDISTURBED SEEDING SHALL BE RETURNED TO THE SITE AND REGRASSING ONTO OPEN AREAS.
- ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS STABILIZED.
- WETLANDS SHALL BE PROTECTED WITH STRAWBALES AND/OR SILT FENCE INSTALLED AT THE EDGE OF THE WETLAND OR THE BOUNDARY OF WETLAND DISTURBANCE.
- ALL AREAS WITHIN 100 FEET OF A CLASSIFIED WETLAND OR STREAM SHALL HAVE AN EXPOSURE VECTOR OF NOT MORE THAN 7 DAYS.
- ALL AREAS WITHIN 100 FEET OF A CLASSIFIED WETLAND OR STREAM SHALL FOLLOW APPROPRIATE EROSION CONTROL MEASURES PRIOR TO EACH STORM IF NOT BEING ACTIVELY WORKED.

**MULCH**

LOCATION	MULCH	DATE USED/SEED
PROTECT AREA	STRAW OR STRAW	NO POSTS
KEY AREA	IMMEDIATE OR COVERED COMPOST MAT OR STRAW (ANCHORED)	WOOD POSTS
MODERATE TO HIGH VELOCITY AREAS OR STEEP SLOPES GREATER THAN 1:1	JUTE MESH OR EXCELOR MAT	AS REQUIRED

(2) 1" SQ. X 48" OAK STAKES (REFER TO SECTIONAL REPORT FOR FINAL DESIGN REQUIREMENT)

\*A HYDROLYZABLE FORM OF WOOD OR PAPER FIBER MAY BE APPLIED FOLLOWING SEEDING. A SUITABLE GRADE SUCH AS OSUNDAK, OR MUD PLUS SHALL BE USED ON STORM MULCH TO PREVENT WIND LOSS.

**WETLANDS/STREAMS**

ANCHOR MULCH WITHIN PERIODS OF TIME (1 TO 14 DAYS) TO LOCK MULCH INTO PLACE. WOOD CELLULOSE (FEED-TYPE) OR CHEMICAL TACKERS FOR MANUFACTURERS' SPECIFICATIONS SHALL BE USED TO STABILIZE STRAW BALE MATS AND MULCH. MULCH SHALL BE REMOVED ONCE THE SITE IS STABILIZED.

### GENERAL CONSTRUCTION SEQUENCE

(SUBJECT TO CHANGE PER CONTRACTOR)

THE FOLLOWING CONSTRUCTION SEQUENCE IS RECOMMENDED:

- INSTALLATION OF STABILIZED CONSTRUCTION ENTRANCE MAT (AS SHOWN)
- INSTALLATION OF EROSION CONTROL BARRIERS (SILT FENCES) (AS SHOWN)
- INSTALLATION OF EROSION CONTROL STRUCTURES
- CONSTRUCTION OF EXISTING SITE PAVEMENT AND ADJACENT ADJACENT AREAS
- LANDSCAPING AND GRASSING
- SEEDING AND EROSION CONTROL AS NECESSARY
- CONSTRUCTION OF UTILITIES
- STABILIZE PERMANENT LAWN AREAS AND SLOPES
- INSTALLATION OF SILT PROTECTION OF CHUTE UTILITIES (AS SHOWN)
- CONSTRUCTION OF ALL REPOSED AREAS
- FINAL GRADING OF ALL REPOSED AREAS
- LANDSCAPING PER LANDSCAPING PLAN
- POSITIVE EROSION CONTROL AS DISTURBED AREAS BECOME STABILIZED TO 10% STABILIZATION OR GREATER.

### EROSION CONTROL NOTES DURING WINTER CONSTRUCTION

- WINTER CONSTRUCTION PERIOD NOVEMBER 1 THROUGH APRIL 15.
- WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE SITE BE WITHOUT STABILIZATION AT ANY ONE TIME.
- EXPOSED AREAS SHOULD BE LIMITED TO THAT WHICH CAN BE RECLAIMED IN ONE DAY PRIOR TO ANY EVENT.
- CONSTRUCTION OF EXISTING PAVEMENT ON EXISTING AREAS SHALL BE DONE OVER THE EXISTING SURFACE. SURFACE ON THE AREAS BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE BE WITHOUT EROSION CONTROL PROTECTION AS SET FORTH ABOVE.
- AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW OR STRAW AT A RATE OF 100 LB PER 100 SQUARE FEET OR WITH FIBER OR WITHOUT FIBER (COMPOST SEEDING MAT) OR MULCHING AS APPROVED BY THE AGENCY.
- BETWEEN THE DATES OF OCTOBER AND APRIL, LOW OR NO SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE FREEZING TEMPERATURES, SLOPES SHALL BE GRASSED AND OTHER PROTECTED WITH MULCH OR TEMPORARY SEEDING AND MULCHING. SUCH MAT AS THE FINAL TREATMENT CAN BE APPLIED. IF THE MAT IS APPLIED AFTER NOVEMBER 15 AND BEFORE THE CONSTRUCTION BEGINS, THE GRASSING SHALL BE DONE PRIOR TO THE AREA BEING WORKED. SEEDING AT A RATE OF 20 LB PER 100 SQUARE FEET FOR PERMANENT SEEDING AND 10 LB PER 100 SQUARE FEET FOR TEMPORARY SEEDING SHALL BE USED. DISTURBED AREAS SHALL BE CONTINUOUSLY GRASSED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM PROBLEMS BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT UNPROTECTED OVER THE WINTER OR COVERED WITH MULCH OR STRAW UNTIL PROTECTION OF THE AREA BEING WORKED IS COMPLETE. SUCH TIME AS WEATHER CONDITIONS ALLOW SHOULD BE TAKEN TO APPLY PERMANENT SEEDING AND MULCHING PRIOR TO THE END OF THE WINTER CONSTRUCTION PERIOD.
- MULCHING REQUIREMENTS:
  - BETWEEN THE DATES OF NOVEMBER 15 AND APRIL 15, ALL MULCH SHALL BE ANCHORED BY EITHER PERMANENT MULCH NETTING OR WOOD CELLULOSE FIBER.
  - MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 10% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GREATER THAN 10%.
  - MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 10% AFTER OCTOBER 15. THE SAME APPLIES FOR ALL SLOPES GREATER THAN 10%.
- AFTER NOVEMBER 15, THE CONTRACTOR SHALL APPLY COMPOST SEEDING OR MULCH AND ANCHORING ON ALL BARE EARTH AT THE END OF EACH WORKING DAY.
- DURING THE WINTER CONSTRUCTION PERIOD, ALL SNOW SHALL BE REMOVED FROM AREAS OF SEEDING AND MULCHING PRIOR TO PLACEMENT.
- SEEDING OF WETLANDS, SWAMP, WOODS, CONSTRUCTION MATERIALS, ETC. MUST REMAIN COVERED AT ALL TIMES TO MINIMIZE ANY SOIL PROBLEMS THAT MAY OCCUR WITH ADJACENT PROPERTIES AND TO PREVENT SOIL PROTECTION AGAINST EROSION DAMAGE.
- EXISTING CATCH-BASIN STRUCTURES SHALL BE PROTECTED UNTIL SUCH TIME AS THEY ARE REMOVED.

**CHART 1**

PERCENT SLOPE OF ROADWAY	LENGTH OF STONE REQUIRED	
	COARSE GRAINED SOILS	FINE GRAINED SOILS
0% TO 5%	50 FT	50 FT
5% TO 10%	100 FT	100 FT
>10%	ENTIRE ENTRANCE STABILIZED WITH FABRIC BASE COURSE (1)	200 FT

(1) AS PRESCRIBED BY LOCAL ORDINANCE OR OTHER GOVERNING AUTHORITY.

**MAINTENANCE NOTES:**

- INSPECT TRAPPED CONSTRUCTION ENTRANCE AND TRAPPING PAD AND SEDIMENT TRAPPING PAD WEEKLY OR AFTER EVERY MAJOR RAIN STORM EVENT.
- WATER FROM TRAPPING PAD SHALL BE DIRECTED TOWARD A SEDIMENT TRAP. SUFFICIENT DRAINAGE SHALL BE MAINTAINED.
- EXCESSIVELY MUD-CLOGGED STONE SHALL BE REMOVED AND REPLACED, AS NEEDED.

### STABILIZED CONSTRUCTION EXIT

N.T.S.

**INSTALLATION:**

- EXCAVATE A 6" X 6" TRENCH ALONG THE LINE OF EROSION CONTROL OF THE SITE.
- UNROLL THE DRAINAGE FABRIC AND POSITION THE POSTS AGAINST THE BACK (DOWNSTREAM) WALL OF THE TRENCH (NET SIDE AWAY FROM FLOW DIRECTION).
- DRIVE THE POST INTO THE GROUND UNTIL THE SETTING BOLTS ARE AT THE TRENCH BOTTOM.
- LAY THE TOP FLAP OF THE FABRIC ONTO THE UNDISTURBED BOTTOM OF THE TRENCH BACKFILL. THE TRENCH AND TAMP THE SOIL. TOP SOIL CAN ALSO BE ACCUMULATED BY LAYING FABRIC ON UNDISTURBED GROUND AND PLACING A TRENCH AND FILL AT THE EDGE.

**TYP. SILTATION FENCE DETAIL**

N.T.S.

**SECTION 1**

**SECTION 2**

**ELEVATION**

REFER TO SILT FENCE DETAIL FOR SILT FENCE INSTALLATION

**ISOMETRIC VIEW**

**SECTION VIEW**

PROFILE VIEW OF INSTALLED FILTER SACK

PROPERTIES	TEST METHOD	VALUES
GRAIN TENSILE STRENGTH	ASTM D4802	300 LBS
GRAIN TENSILE ELONGATION	ASTM D4802	20%
MULLEN BURST	ASTM D2376	800 PSF
TRAPMENT TEST	ASTM D4802	120 LBS
UV RESISTANCE	ASTM D4355	90%
APPARENT OPENING SIZE	ASTM D4841	40 US SIEVE
FLOW RATE	ASTM D4841	40 GAL PER 500 FT <sup>2</sup>
FLOW RATE	ASTM D4841	1.5 SEC-4"

**MODERATE TO HIGH FLOW RESISTANCE FABRIC (SEE SEPARATE TABLE)**

PROPERTIES	TEST METHOD	VALUES
GRAIN TENSILE STRENGTH	ASTM D4802	200 LBS
GRAIN TENSILE ELONGATION	ASTM D4802	20%
MULLEN BURST	ASTM D2376	400 PSF
TRAPMENT TEST	ASTM D4802	45 LBS
UV RESISTANCE	ASTM D4355	90%
APPARENT OPENING SIZE	ASTM D4841	20 US SIEVE
FLOW RATE	ASTM D4841	200 GAL PER 500 FT <sup>2</sup>
FLOW RATE	ASTM D4841	1.5 SEC-4"

DO NOT USE IN PAVED AREAS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS. TO BE USED IN EXISTING RIGHT OF WAY.

STRAW BALE / SILT FENCE INSTALLATION (IF NEEDED) N.T.S. FILTER SACKS (GRATED INLETS) N.T.S.



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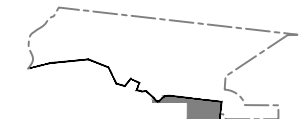
Project Title:

**Alford Street Pedestrian and  
Landscape Improvements  
Boston, MA**

Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 2200  
Medford, MA 02155

Key Plan:



Project No.: Jacobs #L1009100, Bohler #M181002

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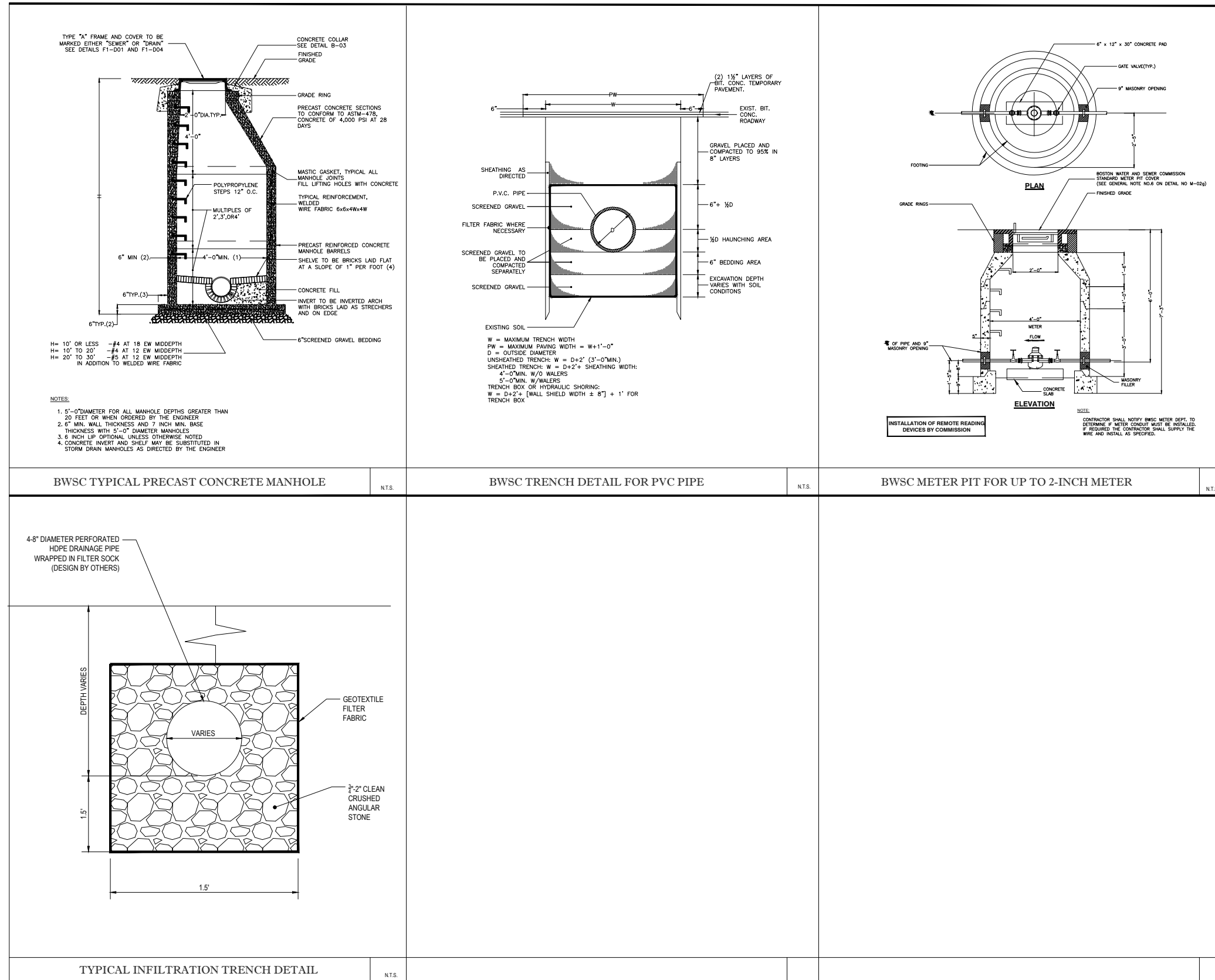
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**CONSTRUCTION DETAIL  
SHEET**

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Consultants:



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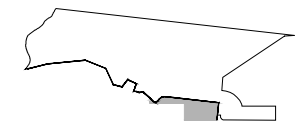
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Boston, MA**

Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 220  
Medford, MA 02155

Key Plan:



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Drawing Sheet Title:

**LANDSCAPE PLANTING  
LEGEND & NOTES**

Drawing Sheet Number:

**L100**

## PLANTING LEGEND

	<p><b>EVERGREEN CONIFERS</b></p> <p>PINUS SYLVESTRIS (SCOTCH PINE)</p> <p>PICEA GLAUCA (WHITE SPRUCE) PICEA PUNGENS (BLUE SPRUCE) PICEA ABIES (NORWAY SPRUCE)</p> <p>PINUS MUGO 'PUMILIO' (DWARF MOUNTAIN PINE)</p>		<p><b>NATIVE SHRUB &amp; GROUNDCOVER PALETTE</b></p> <p>CLETHRA ALNIFOLIA (SUMMERSWEET) IVA FRUTESCENS (MARSH ELDER) MYRICA PENNSYLVANICA (BAYBERRY) PRUNUS MARITIMA (BEACH PLUM) ROSA CAROLINA (CAROLINA ROSE) ROSA VIRGINIANA (VIRGINIA ROSE) CAKILE EDENTULA (SEA ROCKET) DISTICHLIS SPICATA (SPIKE GRASS) HONCKENYA PEPOIDES (SEABEACH SAND WORT) JUNCUS GERARDII (BLACK GRASS) LIMONIUM CAROLINIANUM (SEA LAVENDER) PANICUM VIRGATUM 'SHENANDOAH' (SHENANDOAH SWITCH GRASS) SCHIZACHYRIUM SCOPARIUM 'THE BLUES' (THE BLUES LITTLE BLUESTEM) SOLIDAGO SEMPERVIRENS (SEASIDE GOLDENROD)</p>
	<p><b>DECIDUOUS / SPRING FLOWERING</b></p> <p>ACER RUBRUM (RED MAPLE) ACER GRISEUM (PAPERBARK MAPLE)</p> <p>PRUNUS SUBHIRTELLA 'PENDULA' (WEEPING CHERRY) PRUNUS CERASIFERA (PURPLE PLUM) AMELANCHIER LAEVIS (ALLEGHENY SERVICEBERRY)</p>		<p><b>SYNTHETIC TURF</b></p>
	<p><b>SHRUB &amp; GROUNDCOVER PALETTE</b></p> <p>ARCTOSTAPHYLOS UVA URSI (BEARBERRY) AZALEA SPECIES 'ENCORE' (EVERGREEN AZALEA) EUONYMUS FORTUNEI (WINTERCREEPER EUONYMUS) EUONYMUS FORTUNEI 'VARIEGATA' (VARIEGATED WINTERCREEPER EUONYMUS) ILEX CRENATA 'COMPACTA' (DWARF JAPANESE HOLLY) ILEX CRENATA 'HOOGENDORN' (HOOGENDORN JAPANESE HOLLY) ILEX GLABRA (INKBERRY HOLLY) JUNIPERUS HORIZONTALIS 'BLUE CHIP' (BLUE CHIP JUNIPER) LIRIOPE SPECIE 'VARIEGATA' (VARIEGATED LILY TURF) PACHYSANDRA TERMINALIS 'VARIEGATED' (VARIEGATED JAPANESE SPURGE) PIERIS JAPONICA 'MOUNTAIN FIRE' (JAPANESE PIERIS) ROSA SPECIE 'DRIFT' (DRIFT ROSE) VINCA MINOR (COMMON PERIWINKLE) VINCA MINOR 'VARIEGATA' (VARIEGATED COMMON PERIWINKLE)</p>		

## GENERAL NOTES

**PLANTING NOTES:**

- ALL TREES PLANTED WITHIN 5' OF A HARDSCAPE SURFACE SHALL BE PLANTED WITH A ROOT GUARD TO DIRECT ROOT GROWTH DOWNWARD.
- PORTIONS OF THE PLANTING AREAS NOT LANDSCAPED (AS NOTED ON PLANS) SHALL RECEIVE A 2" MINIMUM LAYER OF PLANTER MULCH.
- PLEASE NOTE THAT THE PLANT MATERIALS INCLUDED IN THIS LIST ENCOMPASS THE PALETTE ANTICIPATED FOR THE ENTIRE PROJECT, AND ARE NOT RESTRICTED SOLELY TO THE PROJECT AREA COLORED ON THIS PLAN. CONSEQUENTLY, THE PALETTE INCLUDES MATERIALS THAT MAY NOT NECESSARILY BE USED NOR BE SUITABLE IN EVERY PROJECT AREA. THE MAIN PURPOSE OF THIS PALETTE IS TO SERVE AS AN INDICATION OF PLANT CHARACTERISTICS WITH RESPECT TO THE OVERALL LANDSCAPE, AND WILL BE FURTHER REFINED AND ENHANCED IN THE PREPARATION OF CONSTRUCTION DOCUMENTS.
- THE FINAL PLANTING AND CONSTRUCTION DOCUMENTS, AS DESIGNED AND PREPARED BY THE LANDSCAPE ARCHITECT, WILL SELECT PLANT MATERIALS FOR SPECIFIC DESIGN EFFECTS.

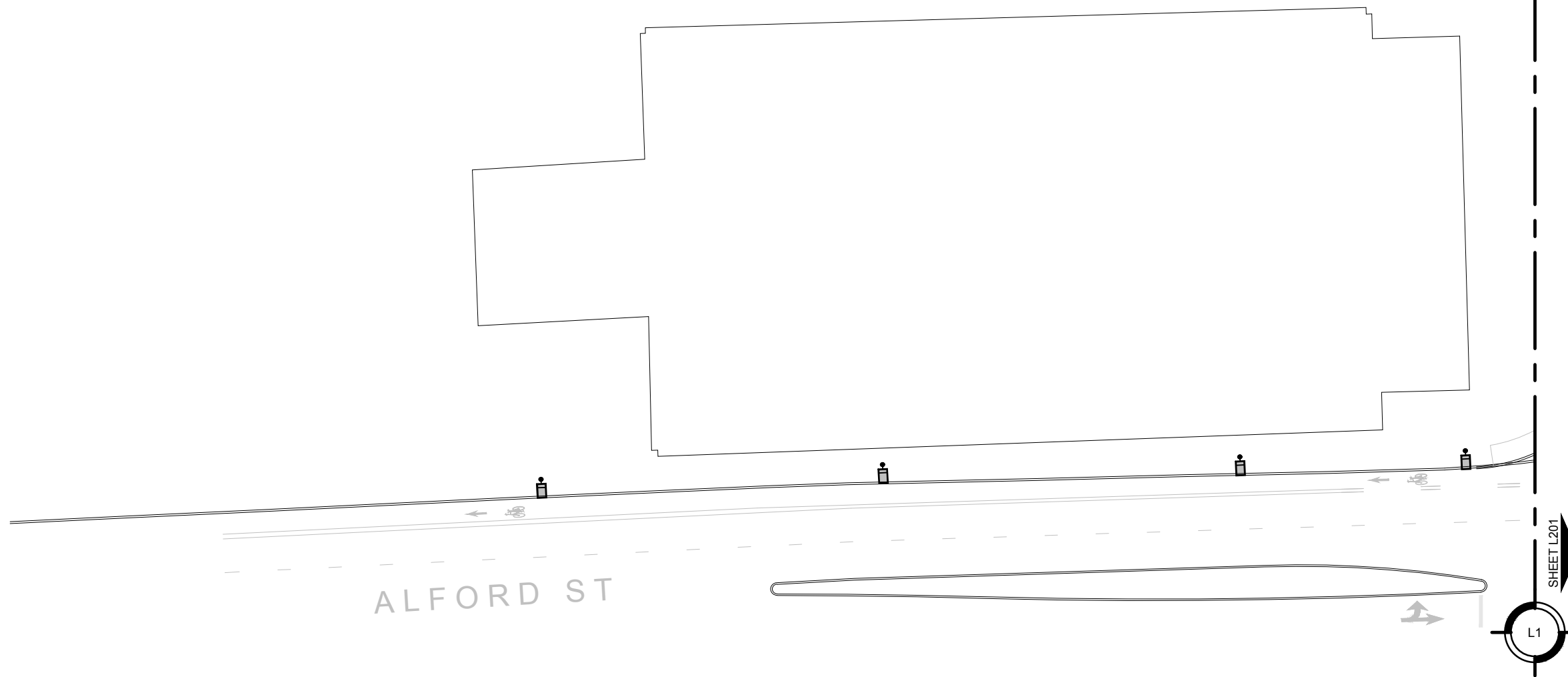
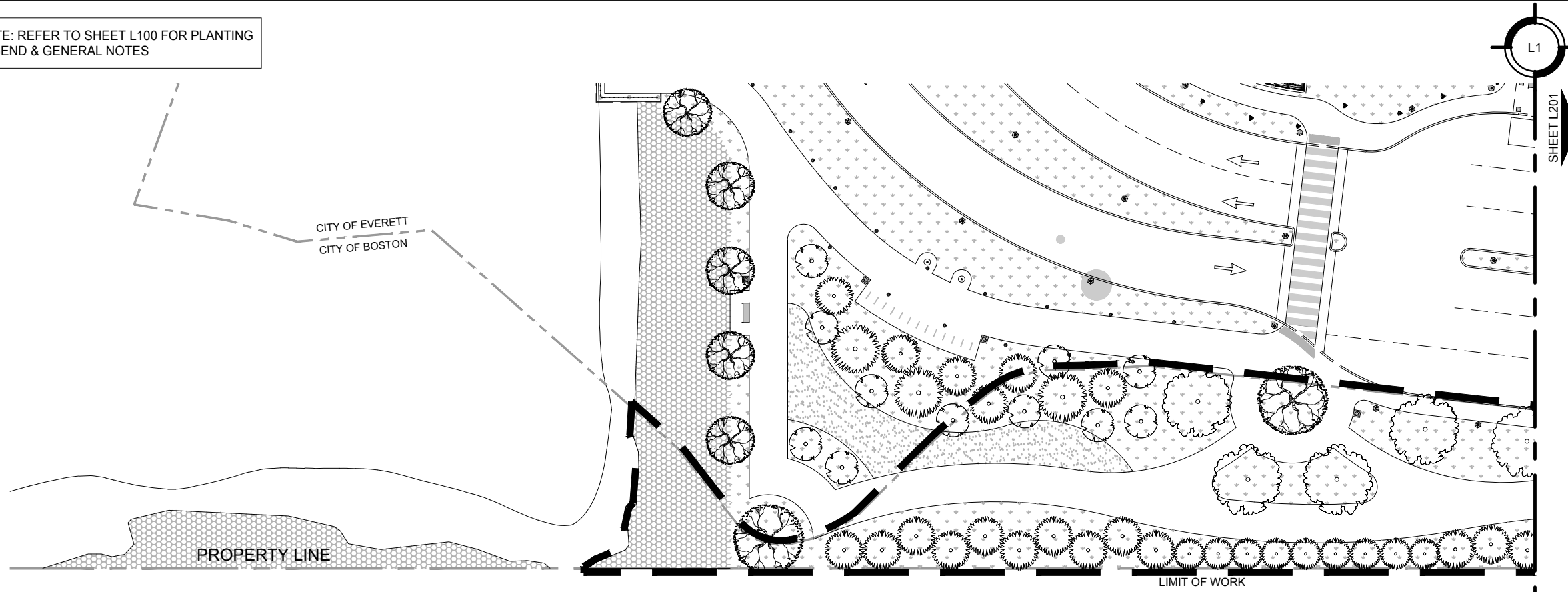
**IRRIGATION NOTES:**

- ALL LANDSCAPED AREAS WILL BE IRRIGATED WITH AN AUTOMATIC IRRIGATION SYSTEM USING STAND-ALONE CONTROLLERS. SHRUBS WILL BE CIRCUITED ON SEPARATE ZONES FROM TREES, THEREBY CREATING SEPARATE HYDROZONES. ALL IRRIGATED AREAS WILL BE SUPPLIED BY DOMESTIC WATER. ALL CONTROL VALVES, GATE VALVES, QUICK COUPLING VALVES, AND DRIP VALVE ASSEMBLIES WILL BE INSTALLED IN SEPARATE VALVE BOXES. GROUNDCOVER AREAS WILL BE DESIGNED USING A DRIP IRRIGATION SYSTEM. THE CONTROLLERS WILL BE ELECTRIC, AND LOCATED IN A FREESTANDING, STAINLESS STEEL, VANDAL RESISTANT ENCLOSURE. THE CONTROLLER ENCLOSURES WILL BE LOCATED IN STRATEGIC LOCATIONS THROUGHOUT THE LANDSCAPE WITH LINE OF SIGHT OF ALL CONTROLLED AREAS.





NOTE: REFER TO SHEET L100 FOR PLANTING LEGEND & GENERAL NOTES



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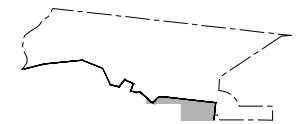
Project Title:

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Prepared For:

Everett Property, LLC  
101 Station Landing, Suite 220  
Medford, MA 02155

Key Plan:



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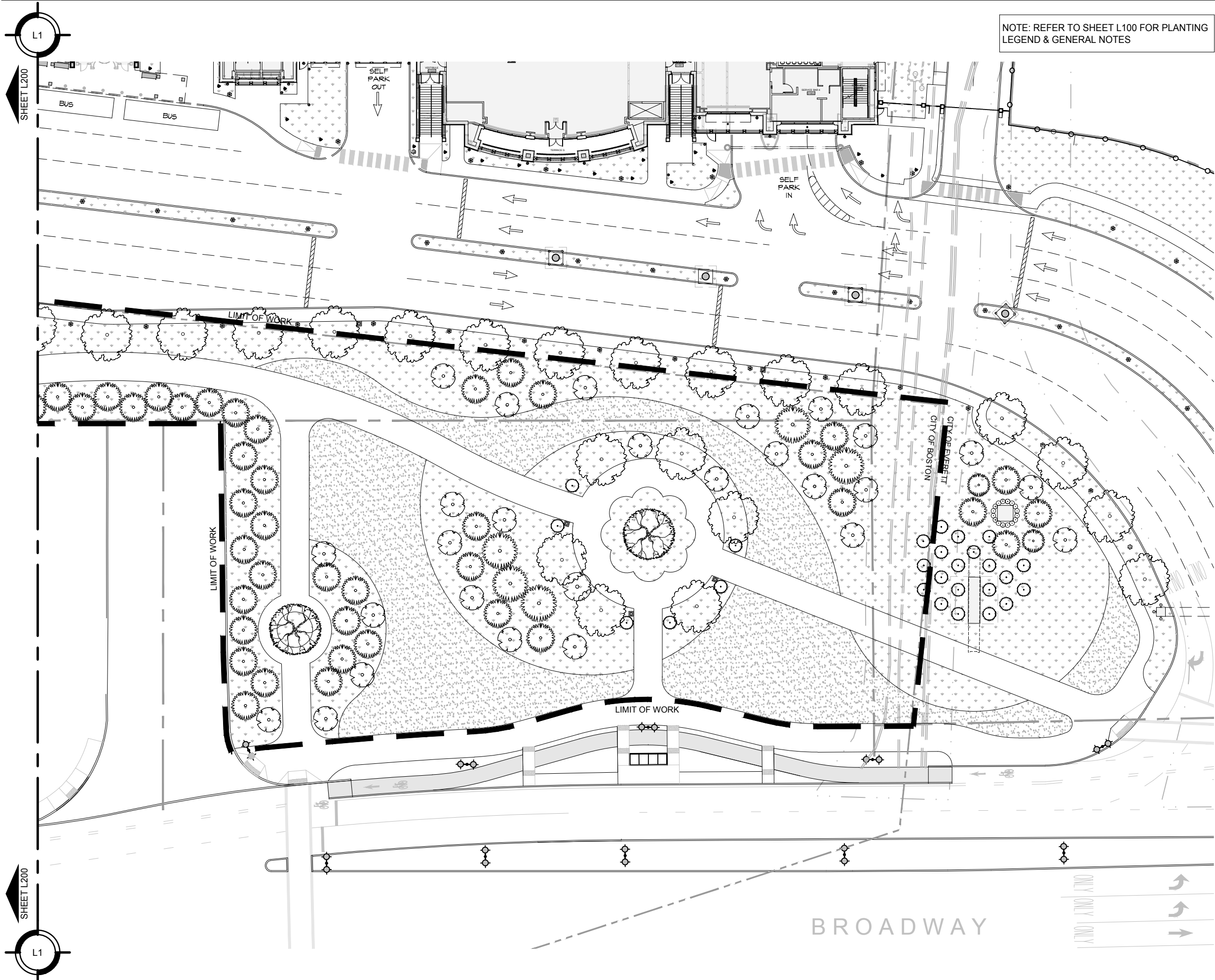
Drawing Sheet Title:

## LANDSCAPE PLANTING PLAN

Drawing Sheet Number:

# L200





NOTE: REFER TO SHEET L100 FOR PLANTING LEGEND & GENERAL NOTES



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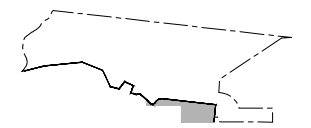
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**LANDSCAPE PLANTING  
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