Notice of Intent

Suffolk Downs Redevelopment: Phase 1 Project

525 William F. McClellan Highway
Boston, Massachusetts 02128

Prepared for:
The McClellan Highway Development Company, LLC
c/o The HYM Investment Group, LLC
One Congress Street, 11th Floor
Boston, MA, 02114

Prepared by:

B E A L S + T H O M A S
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

Submitted in Compliance with the Massachusetts Wetlands Protection Act

January 17, 2018

285403NI001

B E A L S + T H O M A S
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

T 508.366.0560
F 508.366.4391
www.bealsandthomas.com
Regional Office: Plymouth, MA

January 17, 2018

Boston Conservation Commission
City of Boston Environment Department
Boston City Hall, Room 709
Boston, Massachusetts 02201

Via: Hand Delivery

Reference: Notice of Intent
Suffolk Downs Redevelopment:
Phase 1 Project
525 William F. McClellan Highway
East Boston, Massachusetts
B+T Project No. 2854.03

Dear Commissioners:

On behalf of the applicant, The McClellan Highway Development Company, LLC, which is an affiliate of The HYM Investment Group, LLC, Beals and Thomas, Inc. (B+T) respectfully submits this Notice of Intent (NOI) for work within Land Subject to Coastal Storm Flowage (LSCSF) and the 100-foot buffer zone to Bank associated with an intermittent stream and man-made pond. The work is in connection with a proposed development that entails construction of two (2) new office buildings (together approximately 520,000 gsf), with garage parking, access drives, and associated appurtenances, including utilities and a new comprehensive stormwater management system on a portion of the Suffolk Downs property located at 525 William F. McClellan Highway in East Boston, Massachusetts. The project will also include surcharging in connection with the proposed construction of access drives to support the development, as well as placement of a clean cap over pervious portions of the development area as a best management practice to address historic urban fill. Refer to Section 2 for additional detail.

The proposed project represents the initial phase in Boston of an overall master planned development encompassing the entire 161± acre Suffolk Downs property in both Boston and Revere. An Expanded Environmental Notification Form requesting a Phase One Waiver from further review under the Massachusetts Environmental Policy Act was submitted to the Massachusetts Environmental Policy Act Office on November 30, 2017, and an expanded Project Notification Form was submitted to the Boston Planning and Development Agency on December 5, 2017. Future Notices of Intent will be submitted to the Boston and Revere Conservation Commissions as necessary to address work within jurisdictional areas associated with future phases of development.

This filing is submitted in accordance with the Massachusetts Wetlands Protection Act, MGL, Chapter 131, Section 40 and associated Regulations at 310 CMR 10.00 (collectively referred to as the Act).

As required, enclosed are 1 original and 7 copies of the NOI submission package including the following information for your review. A link to a compiled pdf of the application package will be emailed to the Conservation Office, as well.

Section 1:	Notice of Intent Forms
Section 2:	Project Narrative
Section 3:	Abutter Information
Section 4:	Stormwater Management Information
Section 5:	Wetland Boundary Documentation
Section 6:	Surcharge Information
Section 7:	Example Buffer Zone Plantings
Section 8:	Climate Change Preparedness and Resiliency Checklist
Section 9:	Figures and Plans

As required, a copy of this filing has been provided to the Northeast Regional Office of the Massachusetts Department of Environmental Protection (MassDEP). Pursuant to requirements of the Act, abutters within 100 feet of the subject property will be notified via certified mail that this NOI has been filed with the Boston Conservation Commission.

Enclosed is a check payable to the City of Boston in the amount of $1,500 for the required local filing fee (.075% of the cost for projects that are more than $100,000 to a maximum of $1,500), which we understand incorporates the state-mandated local filing fee of $1,062.50. A separate check in the amount of $1037.50 has been forwarded to the MassDEP Lock Box to cover the state portion of the filing fee (for construction of two commercial buildings in the buffer zone or resource area and associated activities).

We understand that the Commission will provide legal notice of the hearing in the Boston Herald and that the applicant will be billed directly for the cost of the ad.

Should you have any questions regarding this matter or require additional information, please contact us at (508) 366-0560. We thank you for your consideration of this Notice of Intent and look forward to meeting with the Commission at the February 7, 2018 public hearing.

Very truly yours,

BEALS AND THOMAS, INC.

Stacy H. Minihane

Elizabeth Clark

Stacy H. Minihane, PWS
Senior Associate

Elizabeth A. Clark, PE, ENV SP
Senior Engineer

Enclosures

cc: DEP Northeast Regional Office (1 copy via Certified Mail)
The McClellan Highway Development Company, LLC, c/o The HYM Investment Group, LLC (attn.: Mr. Thomas O'Brien and Mr. Douglas Manz, 1 copy each via Hand Delivery and email)

SHM/eac/rpk/aak/285403NI001

TABLE OF CONTENTS

Section 1.0
Notice of Intent Forms

Notice of Intent (WPA Form 3)
Wetland Fee Transmittal Form
Copy of Checks

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

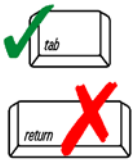
Provided by MassDEP:

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):

525 McClellan Highway — a. Street Address
East Boston — b. City/Town
02128 — c. Zip Code

Latitude and Longitude:
42.392437 — d. Latitude
-70.996984 — e. Longitude

0102524000 — f. Assessors Map/Plat Number
NA — g. Parcel /Lot Number

2. Applicant:

Thomas — a. First Name
O'Brien — b. Last Name
The McClellan Highway Development Company, LLC — c. Organization
c/o The HYM Investment Group, LLC, One Congress Street, 11th Floor — d. Street Address
Boston — e. City/Town
MA — f. State
02114 — g. Zip Code
(617) 248-8905 — h. Phone Number
i. Fax Number
tobrien@hyminvestments.com — j. Email Address

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

a. First Name
b. Last Name
c. Organization
d. Street Address
e. City/Town
f. State
g. Zip Code
h. Phone Number
i. Fax Number
j. Email address

4. Representative (if any):

Stacy — a. First Name
Minihane — b. Last Name
Beals and Thomas, Inc. — c. Company
144 Turnpike Road — d. Street Address
Southborough — e. City/Town
MA — f. State
01772 — g. Zip Code
(508) 366-0560 — h. Phone Number
i. Fax Number
sminihane@bealsandthomas.com — j. Email address

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

$2,100 — a. Total Fee Paid
$1,037.50 — b. State Fee Paid
$1,062.50 — c. City/Town Fee Paid

A. General Information (continued)

6. General Project Description:

Initial Phase in Boston of the Suffolk Downs Redevelopment Master Plan: Construction of two (2) new office buildings (together approximately 520,000 gsf), with garage parking, access drives, and associated appurtenances, including utilities and a new comprehensive stormwater management system.

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

1. ☐ Single Family H ome
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:

a. County	b. Certificate # (if registered land)
Suffolk	133905
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.

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. ☐ Bank	1. linear feet	2. linear feet
b. ☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet	
	2. cubic feet of flood storage lost	3. cubic feet replaced

f. ☐ Riverfront Area

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: _____ square feet

4. Proposed alteration of the Riverfront Area:

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.

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. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment
	Size of Proposed Alteration	Proposed Replacement (if any)
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ 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. ☒ Land Subject to Coastal Storm Flowage	372,000 sf 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

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings

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

1. 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.

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

MassGIS viewed 12/13/17
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*

1. ☐ 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

2. ☐ 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.

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). 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; 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
1213 Purchase Street – 3rd Floor
New Bedford, MA 02740-6694
Email: 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

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.

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

b. ACEC

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

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.

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.

ORAD issued by the Boston Conservation Commission, MassDEP File No. 006-1546, dated September 20, 2017, with the exception of bank flags BF-H60 through BF-H67, which were placed in the field on December 4, 2017 based on first observable break in slope to delineate the far side of the H-Series intermittent stream.

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

Various- See Section 9 for list
a. Plan Title

Beals and Thomas, Inc. | Elizabeth A. Clark, PE
b. Prepared By | c. Signed and Stamped by

January 17, 2018 | 1" = 40'
d. Final Revision Date | e. Scale

- Landscape Drawings by Stoss Landscape Urbanism – See Section 9 for list
- Notice of Intent Suffolk Downs Redevelopment: Phase 1 Office Building | January 17, 2018
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:

1078 | 12/14/17
2. Municipal Check Number | 3. Check date

1101 | 1/16/18
4. State Check Number | 5. Check date

The McClellan Highway Development Company LLC
6. Payor name on check: First Name | 7. Payor name on check: Last Name

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.

1. Signature of Applicant

2. Date 12/14/17

3. Signature of Property Owner (if different)

4. Date

Stacey H. Minihane
5. Signature of Representative (if any)

12-20-17
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.

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:

525 McClellan Highway	East Boston
a. Street Address	b. City/Town
1101	$1,037.50
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Thomas	O'Brien
a. First Name	b. Last Name

The McClellan Highway Development Company, LCC
c. Organization

c/o The HYM Investment Group, One Congress Street, 11th Floor
d. Mailing Address

Boston	MA	02114
e. City/Town	f. State	g. Zip Code

(617) 248-8905		tobrien@hyminvestments.com
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

a. First Name	b. Last Name

c. Organization

d. Mailing Address

e. City/Town	f. State	g. Zip Code

h. Phone Number	i. Fax Number	j. Email Address

B. Fees

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

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.

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
3b.) each building including site	2	$2,100	$2,100

Step 5/Total Project Fee: $2,100

Step 6/Fee Payments:

Total Project Fee:	$2,100 (a. Total Fee from Step 5)
State share of filing Fee:	$1,037.50 (b. 1/2 Total Fee **less $**12.50)
City/Town share of filling Fee:	$1,062.50 (c. 1/2 Total Fee **plus** $12.50)

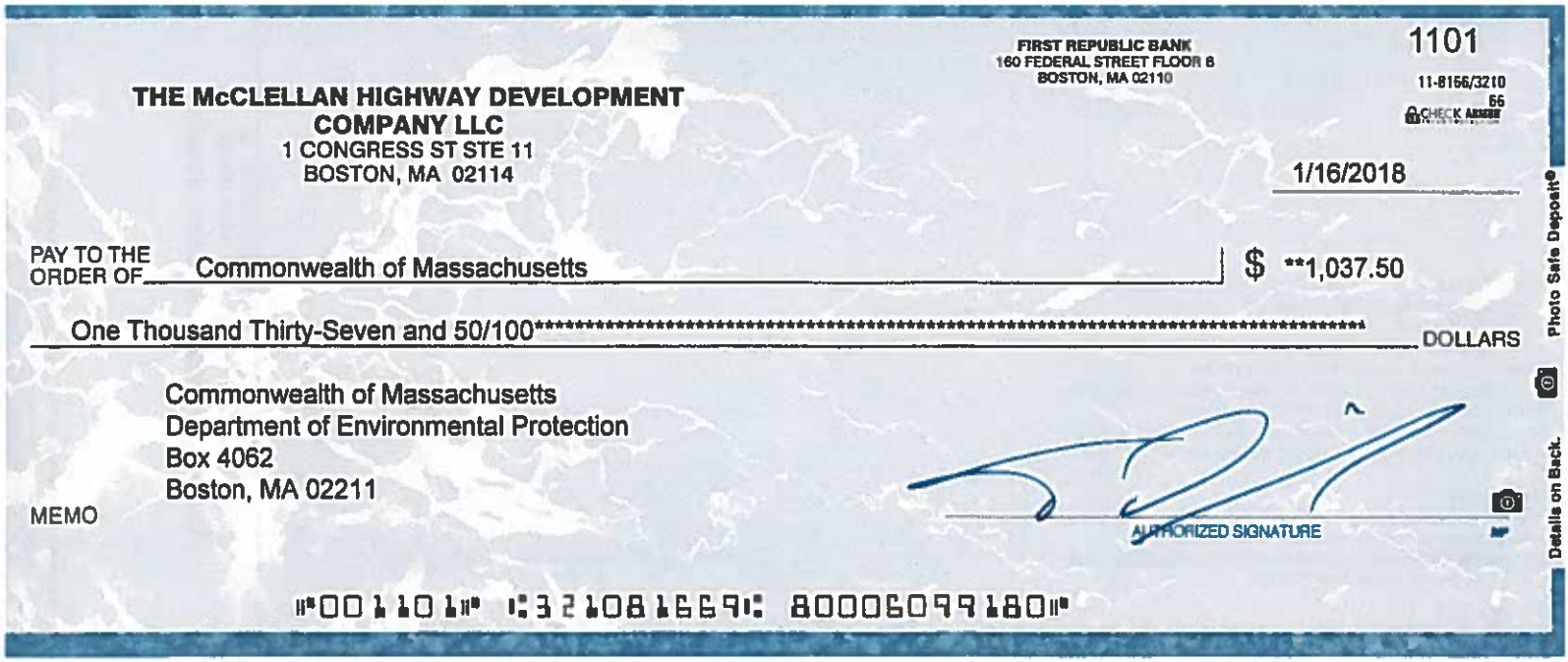
C. Submittal Requirements

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.)



FIRST REPUBLIC BANK
160 FEDERAL STREET FLOOR 6
BOSTON, MA 02110

1101

11-8156/3210
66

THE McCLELLAN HIGHWAY DEVELOPMENT
COMPANY LLC
1 CONGRESS ST STE 11
BOSTON, MA 02114

1/16/2018

PAY TO THE ORDER OF Commonwealth of Massachusetts $ **1,037.50

One Thousand Thirty-Seven and 50/100********** DOLLARS

Commonwealth of Massachusetts
Department of Environmental Protection
Box 4062
Boston, MA 02211

MEMO

AUTHORIZED SIGNATURE

Photo Safe Deposit®
Details on Back.

⑈001101⑈ ⑆321081669⑆ 800060991801⑈

THE McCLELLAN HIGHWAY DEVELOPMENT COMPANY LLC 1101

Commonwealth of Massachusetts 1/16/2018

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
1/16/2018	Bill	State Fee (Boston)2	1,037.50	1,037.50		1,037.50
					Check Amount	1,037.50

10050-000 Dev. Cash 1,037.50

THE McCLELLAN HIGHWAY DEVELOPMENT COMPANY LLC 1101

Commonwealth of Massachusetts 1/16/2018

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
1/16/2018	Bill	State Fee (Boston)2	1,037.50	1,037.50		1,037.50
					Check Amount	1,037.50

10050-000 Dev. Cash 1,037.50

FIRST REPUBLIC BANK
160 FEDERAL STREET FLOOR 8
BOSTON, MA 02110

1078

11-8166/3210
66

CHECK ARMOR

THE McCLELLAN HIGHWAY DEVELOPMENT COMPANY LLC
1 CONGRESS ST STE 11
BOSTON, MA 02114

12/14/2017

PAY TO THE ORDER OF City of Boston $ **1,500.00

One Thousand Five Hundred and 00/100********** DOLLARS

City of Boston
Conservation Commission
1 City Hall Square
Room 709
MEMO Boston, MA 02201-2031

AUTHORIZED SIGNATURE

Photo Safe Deposit®

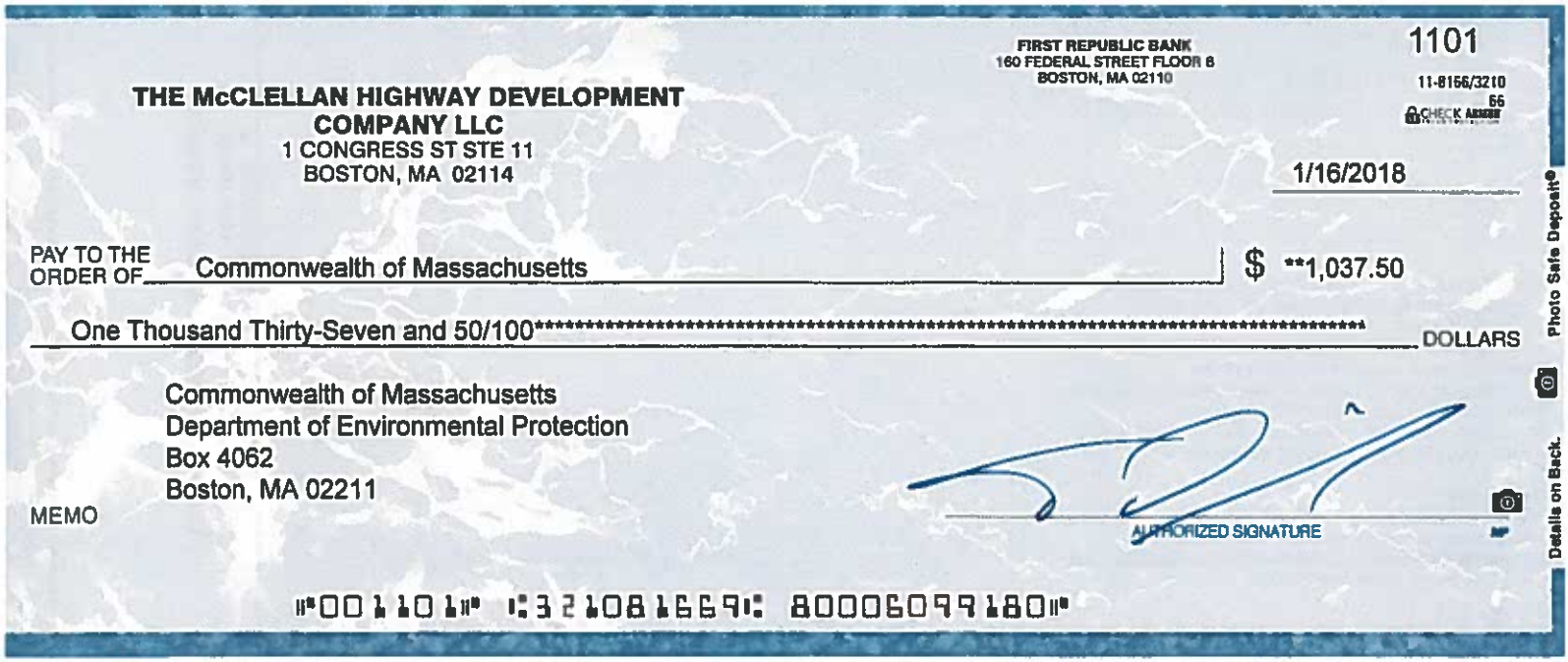
Details on Back.

⑈001078⑈ ⑆321081669⑆ 800060991801⑈

THE McCLELLAN HIGHWAY DEVELOPMENT COMPANY LLC 1078

City of Boston 12/14/2017

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
12/1/2017	Bill	Phase 1 NOI filing	1,500.00	1,500.00		1,500.00
					Check Amount	1,500.00



FIRST REPUBLIC BANK
160 FEDERAL STREET FLOOR 6
BOSTON, MA 02110

1101

11-8156/3210
66

THE McCLELLAN HIGHWAY DEVELOPMENT
COMPANY LLC
1 CONGRESS ST STE 11
BOSTON, MA 02114

1/16/2018

PAY TO THE ORDER OF Commonwealth of Massachusetts $ **1,037.50

One Thousand Thirty-Seven and 50/100********** DOLLARS

Commonwealth of Massachusetts
Department of Environmental Protection
Box 4062
Boston, MA 02211

MEMO

AUTHORIZED SIGNATURE

Photo Safe Deposit®
Details on Back.

⑈001101⑈ ⑆321081669⑆ 800060991801⑈

THE McCLELLAN HIGHWAY DEVELOPMENT COMPANY LLC 1101

Commonwealth of Massachusetts 1/16/2018

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
1/16/2018	Bill	State Fee (Boston)2	1,037.50	1,037.50		1,037.50
					Check Amount	1,037.50

10050-000 Dev. Cash 1,037.50

THE McCLELLAN HIGHWAY DEVELOPMENT COMPANY LLC 1101

Commonwealth of Massachusetts 1/16/2018

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
1/16/2018	Bill	State Fee (Boston)2	1,037.50	1,037.50		1,037.50
					Check Amount	1,037.50

10050-000 Dev. Cash 1,037.50

Section 2.0
Project Narrative

2.0 PROJECT NARRATIVE

2.1 Introduction

The proposed project represents the initial phase in Boston of the redevelopment of the Suffolk Downs property, and entails construction of two (2) new office buildings (together approximately ±520,000 gsf), with garage parking, access drives, and associated appurtenances, including utilities and a new comprehensive stormwater management system. The project will also include surcharging in connection with the proposed construction of access drives to support the development, as well as placement of a clean cap over pervious portions of the development area as a best management practice to address historic urban fill.

The portion of the Suffolk Downs property being redeveloped through this initial phase (the "Site") is located in the southeastern portion of the Suffolk Downs thoroughbred racetrack property, and is bounded by the racetrack and associated infield to the north, west and south, Waldemar Avenue to the south and the MBTA blue line to the east. Tomasello Drive lies west of the Site.

Refer to Section 9 for a USGS locus map and aerial map depicting the Site and surrounding area.

2.2 Existing Conditions

The Site contains the southerly portion of the dirt racetrack and grass infield as well as other disturbed/developed areas, including a paved drive that extends along the southern boundary of the Site. Historically (circa 1900), the Site contained marshlands that were subsequently filled. Urban fill containing elevated concentrations of metals and polycyclic aromatic hydrocarbons is present; however, the levels represent a background condition and are therefore considered to pose No Significant Risk and are not regulated by the Massachusetts Contingency Plan.

There is a manmade pond in the infield west of the development area (the infield pond), and an intermittent stream channel along the easterly boundary of the Site (the H-series stream). The water level of the pond is regulated by a water control structure at the northern edge of the pond. A stockade style fence is present parallel and proximate to the stream. Pursuant to the Massachusetts Surface Water Quality Standards the stream is an Outstanding Resource Water (ORW) because it is tributary to Belle Isle Inlet. Although the stream does not appear to provide noteworthy habitat (its substrate is mucky and stagnant water was observed in December 2017), the Surface Water Quality Standards designate the overall ORW as excellent habitat for fish, other aquatic life, and wildlife and indicate it shall have an excellent aesthetic value.

Stormwater runoff from the race track and infield areas currently drains to the infield pond via drainage channels. Overflow from the pond drains to Sales Creek (which lies outside of the Site but within the overall Suffolk Downs property) via an 18-inch culvert. Areas

outside of the race track drain to the H-series stream, which also discharges to Sales Creek. Refer to the Stormwater Management Report included in Section 4 for detailed topographic, soils, and existing stormwater management information.

Resource areas, with the exception of Bank associated with the far side of the intermittent stream and Land Under Water Bodies and Waterways associated with the stream and pond, were confirmed by Order of Resource Area Delineation issued by the Boston Conservation Commission, MassDEP File No. 006-1546, dated September 20, 2017.

Blue and white striped bank flags BF-H60 through BF-H67 were placed in the field on December 4, 2017 to delineate the missing Bank, which is contiguous with the first observable break in slope, and is depicted on the enclosed plans.

Looking north towards infield pond

H-Series intermittent stream east of project site. Bank to left of photograph previously confirmed by ORAD; Bank to right of photograph delineated December 4, 2017 as first observable break in slope.

The pond and stream have associated Bank and Land Under Water Bodies and Waterways. The majority of the Site also lies within the 100-year floodplain (Land Subject to Coastal Storm Flowage (LSCSF)) associated with Belle Isle Inlet to the east. Additionally, a 100-foot buffer zone extends from Bank. No other jurisdictional areas are present within the Site.

The buffer zone and LSCSF within the development area are previously heavily disturbed by paved and unpaved areas and other improvements, including portions of the dirt horse racing track. Vegetation, where existing, is dominated by invasive plant species and turf grass.

2.3 Proposed Conditions

2.3.1 Description of Work

Building
The proposed project will include the construction of two (2) six and seven story office buildings (together approximately 520,000 gsf) separated by an open-air walkway. The buildings are connected by internalized below grade structured parking accommodating up to approximately 520 parking spaces. Associated site improvements are also proposed as described below. Portions of the Site lie within LSCSF and the 100-foot buffer zone to Bank.

The total footprint of the two new buildings is approximately 118,000 sf, with approximately a third of one of the buildings within the buffer zone to the stream and the majority of both buildings within LSCSF.

Resiliency
Portions of the Site will be elevated above the 100-year flood elevation to address resiliency and future sea level rise. Specifically, the portions of the access drives that are proposed to be incorporated into the future build-out of the larger master planned development (the "Master Plan Project") have been designed with a minimum top of curb elevation of 20.83 feet Boston City Base (BCB), which is 40-inches above the 100-year flood elevation. Twelve inches of freeboard will be added to the base flood elevation for the buildings to account for localized storm surges, resulting in a finished floor elevation of 22' BCB.

Access and Utilities
The project includes temporary, permanent, and emergency access drives. A 24-foot wide paved temporary access drive with bituminous concrete curbing will be constructed from Tomasello Drive to the proposed permanent drive adjacent to the buildings. The temporary drive is located outside of the buffer zone but within LSCSF. The temporary drive is expected to be further improved or replaced as part of future development associated with the Master Plan Project.

The permanent drive has a width varying between 43 - 50 feet and includes granite curbing. Sidewalks will be constructed on each side of the permanent drive; sidewalks will be bituminous concrete on the infield pond side of the drive and concrete on the building side of the drive. The majority of the permanent access drive lies outside of the buffer zone but within LSCSF.

A 14-foot wide pervious emergency access way will be provided behind the buildings. The emergency access drive is located within the buffer zone to the stream and within LSCSF.

Sewer and water utilities will be installed largely within the proposed permanent drive and will connect to the municipal systems near the Suffolk Downs MBTA T-Station within the public right-of-way associated with Washburn Avenue. The off-site utility connections are not located within jurisdiction (they are outside of the buffer zone as well as LSCSF). Additionally, the portion of the existing sewer main associated with the concentrated animal feeding operation (CAFO) within the Site will be relocated to avoid conflict with the proposed building.

Prior to construction, the access drives (except the emergency access drive) and utility corridors will be surcharged by placing temporary soil piles above the proposed finished roadway surface elevations to reduce future settlement of roadways and associated utilities, given the underlying historic marsh soils that would otherwise be compressed and settle by the proposed raise in grade. Refer to Section 6 for information regarding the proposed surcharge program. The project schedule may dictate that surcharging be completed faster than indicated in Section 6. This would be accomplished by increasing the height of the surcharge piles. The toe of slope for the surcharging will not extend beyond the overall project limit of work.

Pedestrian facilities, including an on-site accessible walkway extending to the easterly property line for potential future connection to the MBTA Suffolk Downs station, are also proposed.

Stormwater Management

A comprehensive stormwater management system designed in accordance with the MassDEP Stormwater Management Standards and Boston Water and Sewer Commission (BWSC) Stormwater Requirements will address the proposed development in compliance with municipal and state requirements. Refer to Section 4 for information detailing the proposed stormwater management system.

In summary, the stormwater management system includes two basins designed to improve the quality of stormwater runoff discharged to the watershed from existing developed areas, as well as the newly developed area. The basin outlet structures have been designed as multi-stage outlets to provide control for a variety of storm events and will direct stormwater via overland flow towards the H-series stream along the eastern portion of the Site. In the event of overtopping, emergency spillways have been provided to direct the excess flow via overland flow towards the H-series stream, consistent with the existing drainage pattern.

Proposed stormwater management measures will control peak runoff rates (up to and including BWSC's recommended increased rainfall depth of 8.8 inches for the 100-year storm event), provide water quality treatment, promote groundwater recharge, and promote sediment removal. The Site will continue to discharge to

LSCSF under proposed conditions. Under this condition, the MassDEP Stormwater Management Standards waive the requirement to mitigate peak stormwater discharge rates; however, Sales Creek is isolated from tidal flows by the Bennington Street tide gates and Department of Conservation and Recreation (DCR) pumping station. Therefore, the project stormwater management system has been designed so as not to increase stormwater flows to the pumping station. Further, the stormwater management system is designed to treat a minimum of the first inch of runoff generated by the on-site paved impervious areas.

Public Access and Open Space
The project incorporates the following open space elements (both green and hardscapes):

- Approximately 0.4 acres of open space will be improved in association with the construction of the pedestrian walkway between and around the buildings.
- Approximately 0.8 acres of landscaping is associated with the access drives and other areas of public access immediately adjacent to the proposed building.

An additional 1.4 acre area has been designated as publicly accessible open space to be provided with the buildings covered by this NOI; however, this public open space is expected to be designed as part of the overall 40 acre open space network in the master planning process for the entire Suffolk Downs site which will proceed after the anticipated construction start date for the two buildings. Therefore, the 1.4 acre area is not addressed in this NOI and will be addressed in a separate NOI submitted prior to completion of the buildings.

Although not required, in association with opening portions of the development area to the public, a one-foot "clean cap" of soil with an underlying marker layer will be placed within pervious (i.e. softscape) portions of the development area to prevent direct human contact with certain historic urban fill on-site. A construction fence will be placed around the development as a best management practice to prevent direct human contact with uncapped areas of the property.

Landscaping
The project landscaping builds on the Site's proximity to Belle Isle Marsh and is identified by a coastal theme in the planting and material palette. Plants selected for landscaped areas within the buffer zone include native trees, shrubs, and herbaceous species, many with high wildlife habitat value for cover and forage. Refer to the information in Section 7 for examples of the types of species anticipated to be utilized within the buffer zone at the Site. Of note, a living fence will be established parallel to the H-series stream, as a best management practice to prevent human contact with urban fill soils in this area, and to avoid disturbance to stream resource areas that would otherwise occur in association with the alternative best

management practice of installing a clean cap with marker layer. The specific species within this planting area will be selected based upon specific Site conditions, particularly relating to soil, and will be coordinated with the project team to ensure that they provide an appropriate barrier. This living fence will also provide wildlife habitat in a presently highly disturbed area. Further, the existing stockade-style fence will be removed, thereby improving wildlife movement in the vicinity of the H-series stream.

Construction Sequence

1. Stake Limit of Construction. Workers shall be informed that no construction activity is to occur beyond this limit at any time.
2. Install erosion and sediment controls.
3. Construct staging and materials storage area.
4. Begin site clearing and grubbing operations.
5. Construct temporary drainage channels and sediment basins.
6. Relocate CAFO Force Main.
7. Commence Foundation Construction.
8. Commence Surcharge Operations.
9. Install utilities, storm drains, sanitary sewers, and water services.
10. Begin overall site grading.
11. Install gutters, curbs, and prepare pavement subgrade.
12. Finalize pavement activities and stabilize roadway side slopes. Install 1.0-foot clean cap in pervious (softscape) areas within the fence limit.
13. Install permanent stormwater basins.
14. Remove all temporary control best management practices and stabilize any areas disturbed by their removal with erosion controls.
15. Prepare final seeding and landscaping.
16. Monitor stabilized areas until final stabilization is reached.

2.3.2 Impacts to Wetland Resource Areas

A large portion of the proposed work will occur within LSCSF, and portions of the project will occur within the 100-foot buffer zones to Bank associated with the infield pond and H-series intermittent stream. As previously discussed, the Site is previously and significantly disturbed. Additionally, the floodplain results from coastal flooding, and the access ways, buildings and portions of the Site are being elevated to create a project resilient to both current flooding as well as future flooding associated with sea level rise. Hardscapes are a minimum distance of 30-feet from Bank. Landscaped areas within the buffer zone incorporate native plantings that will provide wildlife habitat, particularly the living fence parallel to the H-series stream.

Therefore, proposed work will not affect the ability of LSCSF or the buffer zone to Bank to protect the Interests of the Act. A discussion of the project in relation to the Interests is provided in the following section.

2.4 Interests of the Massachusetts Wetlands Protection Act

The following is a discussion of the relationship of the Site to the interests of the Massachusetts Wetlands Protection Act (Act) as defined by 310 CMR 10.01(2).

2.4.1 Protection of Public and Private Water Supply and Ground Water Supply

The Site is not located within a public water supply protection area, nor is it within an aquifer. Infiltration will be incorporated to the maximum extent practicable, although opportunities to infiltrate are limited due to high groundwater and low permeability soils. However, Sales Creek to the north of the Site appears to be the local groundwater discharge point, as well as the hydrogeologic divide in the area, which indicates that sufficient flow will maintained to this system. The proposed stormwater management measures comply with local and state requirements as described herein. Refer to Section 4 for detailed stormwater management information. Therefore, the public and private water supply and groundwater supply protection interests of the Act will be upheld.

2.4.2 Flood Control and Storm Damage Prevention

Flood control, storm damage prevention, and resiliency measures to address future sea level rise and climate change preparedness have been incorporated into the site design as described herein, and in Section 8. Furthermore, as described herein, the project has been designed so as to not increase stormwater flows to the DCR pumping station, despite the MassDEP Stormwater Standard's waiving the requirement to mitigate peak stormwater discharge rates for projects in LSCSF. Therefore, the flood control and storm damage prevention interests of the Act will be maintained.

2.4.3 Prevention of Pollution

The stormwater management system has been designed to provide treatment of stormwater runoff associated with the proposed impervious surfaces on-site in accordance with the MassDEP Stormwater Management Standards. The stormwater BMPs are designed to treat a minimum of the first inch of runoff generated by the on-site paved impervious areas. Refer to the Stormwater Management Report in Section 4 for additional detail.

Additionally, erosion control measures consisting of staked straw bales with silt fence, a stabilized construction entrance, and temporary construction sedimentation basins (to be sited by the contractor) will be implemented at or within the limit of work as depicted on the enclosed plans.

Finally, best management practices to preclude direct human contact with urban fill will be incorporated as described herein.

Therefore, the pollution interests of the Act will be upheld.

2.4.4 Protection of Fisheries, Shellfisheries and Wildlife Habitat

The Site does not contain NHESP designated areas (estimated habitats, priority habitats, vernal pools, BioMap 2 Habitat), and presently contains developed areas associated with the Suffolk Downs thoroughbred horse racing facility, including portions of the race track, infield, and paved areas.

The man-made infield pond may provide nominal shellfish or fisheries habitat. Proposed work is not anticipated to negatively impact this resource area. Further, work has avoided impacts to Bank and Land Under Water Bodies and Waterways.

Despite the H-series intermittent stream's designation as an ORW due to its tributary nature to Belle Isle Marsh, it is not anticipated that it provides substantial shellfish or fisheries habitat, given its stagnant and channelized nature and apparent functioning essentially as a stormwater drainage channel. However, if shellfish or fisheries are present, proposed work is not anticipated to impact these resources.

Therefore, the fisheries, shellfisheries, and wildlife habitat interests of the Act will be protected.

2.5 Summary

The applicant respectfully requests that the Conservation Commission issue an Order of Conditions allowing the initial phase of the Suffolk Downs Master Planned redevelopment consisting of the construction of two (2) new office buildings (together approximately 520,000 gsf) and associated site improvements within LSCSF and the 100-foot buffer zone to Bank to proceed as detailed herein and in the attached information, and as depicted on the enclosed plans.

Section 3.0
Abutter Information

Affidavit of Service
Notification to Abutters
Certified List of Abutters

AFFIDAVIT OF SERVICE

Under the Massachusetts Wetlands Protection Act

I, Stacy H. Minihane, hereby certify under the pains and penalties of perjury that on January 17, 2018, I gave notification to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the DEP Guide to Abutter Notification dated April 8, 1994, in connection with the following matter:

> A Notice of Intent filed under the Massachusetts Wetlands Protection Act by The McClellan Highway Development Company, LLC with the Boston Conservation Commission on January 17, 2018 for property located at 525 William F. McClellan Highway (the Suffolk Downs property).

The form of the notification, and a list of the abutters to whom it was given and their addresses, are attached to this Affidavit of Service.

Stacy H. Minihane
Name

1/17/18
Date

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 The McClellan Highway Development Company, LLC.

B. The applicant has filed a Notice of Intent with the Conservation Commission for the municipality of Boston seeking permission to remove, fill, dredge, or alter an Area Subject to Protection Under the Wetlands Protection Act (General Laws Chapter 131, Section 40). The project entails construction of two (2) new office buildings (together approximately 520,000 gsf) with garage parking, access drives, and associated appurtenances, including a new comprehensive stormwater management system, on a portion of the Suffolk Downs property in East Boston, within Land Subject to Coastal Storm Flowage (i.e. the 100-year floodplain) and the 100-foot buffer zone to Bank associated with an intermittent stream and man-made pond.

C. The address of the lot where the activity is proposed is 525 McClellan Highway, Assessor's Parcel 0102524000 (Suffolk Downs).

D. Information regarding the date, time, and place of the public hearing and copies of the Notice of Intent may be examined at the Boston Environment Office, 1 City Hall Square, Room 709, Boston, MA 02201 between the hours of 9:00AM – 5:00 PM Monday through Friday. For more information call: 617-635-3850 (the Boston Environment Office).

E. Copies of the Notice of Intent may be obtained from either (check one) the applicant ☐, or the applicant's representative ☒, by calling this telephone number 508-366-0560 between the hours of 8:00 and 5:00 on the following days of the week: Monday –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 may also 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:
Northeast Region: 978-694-3200

SHM/285403NI001

PID	OWNER	ADDRESSEE	MLG_ADDRESS	MLG_CITYSTATE	MLG_ZIPCODE	LOC_ADDRESS	LOC_CITY	LOC_ZIPCODE
102199000	GRANARA DAVID RICHARD		142 WALDEMAR AV	E BOSTON MA	2128	WALDEMAR AV	EAST BOSTON	2128
102203000	DIGIACOMO DIANE J		124 WALDEMAR AV	E BOSTON MA	2128	124 WALDEMAR AV	EAST BOSTON	2128
102207000	VIGNOLI LOUISE H	C/O LOUISE H VIGNOLI	116 WALDEMAR AV	EAST BOSTON MA	2128	WALDEMAR AV	EAST BOSTON	2128
102197000	SCARPA ANTHONY		144 WALDEMAR AV	E BOSTON MA	2128	144 WALDEMAR AV	EAST BOSTON	2128
102204000	LASHOTO GAIL L	C/O MARGARET CAMPLESE	120 WALDEMAR AV	E BOSTON MA	2128	120 WALDEMAR AV	EAST BOSTON	2128
102206000	VIGNOLI LOUISE H	C/O LOUISE H VIGNOLI	116 WALDEMAR AV	EAST BOSTON MA	2128	116 WALDEMAR AV	EAST BOSTON	2128
102201000	SALGADO CESAR	C/O CESAR SALGADO	132 WALDEMAR AV	EAST BOSTON MA	2128	132 WALDEMAR AV	EAST BOSTON	2128
102195000	GOMEZ GERARDO A	C/O GERARDO A GOMEZ	15 CONDOR ST #3	EAST BOSTON MA	2128	150 WALDEMAR AV	EAST BOSTON	2128
102200000	ROSSETTI MICHAEL J TS	C/O MICHAEL ROSSETTI	138 WALDEMAR AV	EAST BOSTON MA	2128	WALDEMAR AV	EAST BOSTON	2128
102209001	CITY OF BOSTON		WALDEMAR AVE	EAST BOSTON MA	2128	WALDEMAR AV	EAST BOSTON	2128
102209000	FOLSOM LEROY G & MARY BE		104 WALDEMAR AVE	EAST BOSTON MA	2128	104 WALDEMAR AV	EAST BOSTON	2128
102214000	GOMES ELAINE	C/O ELAINE GOMES	80 WALDEMAR AV	EAST BOSTON MA	2128	80 WALDEMAR AV	EAST BOSTON	2128
102211000	RISTAINO CAMILLE	C/O CAMILLE RISTAINO TS	92 WALDEMAR AVE	EAST BOSTON MA	2128	92 WALDEMAR AV	EAST BOSTON	2128
102210000	RISTAINO CAMILLE	C/O RISTAINO IRREVOC TRUST	96 WALDEMAR AVE	EAST BOSTON MA	2128	96 WALDEMAR AV	EAST BOSTON	2128
102212000	FERRARO FRANCIS H TS		5132 N PALM AVE PMB 114	FRESNO CA	93704	90 WALDEMAR AV	EAST BOSTON	2128
102208000	MARINO ANTONIO ETAL		108 WALDEMAR AVE	EAST BOSTON MA	2128	108 WALDEMAR AV	EAST BOSTON	2128
102279000	SONS DIVINE PROV INC		BOARDMAN	EAST BOSTON MA	2128	BOARDMAN ST	EAST BOSTON	2128
102277001	PASCUCCI ANTHONY M		15 CRESTWAY RD	EAST BOSTON MA	2128	15 CRESTWAY RD	EAST BOSTON	2128
102283000	SPINNAZZOLA FELICE N		18 CRESTWAY RD	EAST BOSTON MA	2128	18 CRESTWAY RD	EAST BOSTON	2128
102281000	VARGAS KAREN		26 CRESTWAY RD	EAST BOSTON MA	2128	26 CRESTWAY RD	EAST BOSTON	2128
102501000	INGEMI FRANK		91 WALDEMAR AV	EAST BOSTON MA	2128	WALDEMAR AV	EAST BOSTON	2128
102499000	FRASSICA PETER F ETAL		97 WALDEMAR AVE	EAST BOSTON MA	2128	97 WALDEMAR AV	EAST BOSTON	2128
102511000	CIAMPA MINIO ETAL		53 WALDEMAR AVE	EAST BOSTON MA	2128	WALDEMAR AV	EAST BOSTON	2128
102512000	CUMMINGS MARISA	C/O MARISA CUMMINGS	45 WALDEMAR AVE	EAST BOSTON MA	2128	45 WALDEMAR AV	EAST BOSTON	2128
102516000	LABADINI LINDA J	C/O LINDA LABADINI	37 WALDEMAR AV	EAST BOSTON MA	2128	WALDEMAR AV	EAST BOSTON	2128
102519000	RACCA FOSTER		21 WALDEMAR AVE	EAST BOSTON MA	2128	21 WALDEMAR AV	EAST BOSTON	2128
102515000	LABADINI LINDA J	C/O LINDA LABADINI	37 WALDEMAR AV	EAST BOSTON MA	2128	37 WALDEMAR AV	EAST BOSTON	2128
102518000	LOPRESTI MICHAEL JR ETAL		23 WALDEMAR AVE	EAST BOSTON MA	2128	23 WALDEMAR AV	EAST BOSTON	2128
102449000	PASSE INC	C/O PAULA S RECHNITZ	121 56TH AV SO; #LB309	ST PETERSBURG FL	33705	WALDEMAR AV	EAST BOSTON	2128
102506000	BRODIN DEREK J	C/O KOREN BRODIN	69 WALDEMAR AVE	EAST BOSTON MA	2128	69 WALDEMAR AV	EAST BOSTON	2128
102509000	DELPRATO NICHOLAS J		61 WALDEMAR AV	E BOSTON MA	2128	61 WALDEMAR AV	EAST BOSTON	2128
102524000	MCCLELLAN HIGHWAY	C/O HYM INVESTMENT GROUP LLC	ONE CONGRESS ST 10TH FLR	BOSTON MA	2114	111 WALDEMAR AV	EAST BOSTON	2128
102520000	WYATT JOHN B		17 WALDEMAR AV	EAST BOSTON MA	2128	17 WALDEMAR AV	EAST BOSTON	2128
102448000	PASSE INC	C/O PAULA S RECHNITZ	121 56TH AV SO; #LB309	ST PETERSBURG FL	33705	295 WALDEMAR AV	EAST BOSTON	2128
102233000	BUTT KHALID M H	KHALID M H BUTT MD	38 BROOKWOOD DRIVE	BRIARCLIFF MANOR NY	10510	16 WALDEMAR AV	EAST BOSTON	2128
102276000	LEGGIERO ANTHONY P		7 CRESTWAY RD	EAST BOSTON MA	2128	7 CRESTWAY RD	EAST BOSTON	2128
102278000	FIVE WALDEMAR LLC	C/O FIVE WALDEMAR LLC	50 FRANKLIN ST #400	BOSTON MA	2110	5 WALDEMAR AV	EAST BOSTON	2128
102282000	SPINNAZZOLA FELICE N		18 CRESTWAY RD	EAST BOSTON MA	2128	CRESTWAY RD	EAST BOSTON	2128
102280000	CITY OF BOSTON		160-250 WALDEMAR AVE	EAST BOSTON MA	2128	160 WALDEMAR AV	EAST BOSTON	2128
102508000	PETRILLO ROBERT W ETAL		65 WALDEMAR AVE	EAST BOSTON MA	2128	65 WALDEMAR AV	EAST BOSTON	2128
102517000	MAGALETTA FRANCIS J TS	C/O FRANCIS J MAGALETTA TS	27 WALDEMAR AV	EAST BOSTON MA	2128	27 WALDEMAR AV	EAST BOSTON	2128
102500000	NGUYEN YEN DUC		93 WALDEMAR AV	E BOSTON MA	2128	93 WALDEMAR AV	EAST BOSTON	2128
102502000	MANZO ANGELINA D	C/O ANGELINA D MANZO	79 81 WALDEMAR AV	E BOSTON MA	2128	79 WALDEMAR AV	EAST BOSTON	2128
102504000	SEVENTY-5 WALDERMAR AV CONDO	C/O QCP GROUP LLC	75 WALDEMAR AVE	E BOSTON MA	2128	75 WALDEMAR AV	EAST BOSTON	2128
102510000	DELPRATO NICHOLAS J		61 WALDEMAR AV	E BOSTON MA	2128	WALDEMAR AV	EAST BOSTON	2128
102521000	ARREDONDO CARLOS	C/O CARLOS ARREDONDO	15 WALDEMAR AVENUE	EAST BOSTON MA	2128	15 WALDEMAR AV	EAST BOSTON	2128

102504002	PUENTES DANIELA PACHON	C/O DANIELA PACHON PUENTES	75 WALDEMAR AV #101	EAST BOSTON MA	2128	75 WALDEMAR AV Apt 101	EAST BOSTON	2128
102504008	KIMBALL PATRICK	C/O PATRICK KIMBALL	75 WALDEMAR AV #104	EAST BOSTON MA	2128	75 WALDEMAR AV Apt 104	EAST BOSTON	2128
102504012	ZHAN YUMEI	C/O YUMEI ZHAN	10 HAMMOND POND PKWY #302	NEWTON MA	2467	75 WALDEMAR AV Apt 202	EAST BOSTON	2128
102504014	LOASETHAKUL WATANA	C/O WATANA LOASETHAKUL	84 JAQUES ST	SOMERVILLE MA	2145	75 WALDEMAR AV Apt 203	EAST BOSTON	2128
102504022	LEUNG GEN SANG	C/O GEN SANG LEUNG	75 WALDEMAR AV #303	EAST BOSTON MA	2128	75 WALDEMAR AV Apt 303	EAST BOSTON	2128
102504024	ANAKOR IFENNA K	C/O IFENNA K ANAKOR	673 FRANKLIN ST	WORCESTER MA	1604	75 WALDEMAR AV Apt 304	EAST BOSTON	2128
102213000	TELESE REALTY TRUST	ROCCO TELESE	85 FAYWOOD AV	EAST BOSTON MA	2128	WALDEMAR AV	EAST BOSTON	2128
102504004	MOLINA-ALVARADO GEYRI W	C/O GEYRI W MOLINA-ALVARADO	75 WALDEMAR AV #102	EAST BOSTON MA	2128	75 WALDEMAR AV Apt 102	EAST BOSTON	2128
102504006	NEIDBALA JAMES	C/O JAMES NEIDBALA	304 HADLEY ST	SOUTH HADLEY MA	1075	75 WALDEMAR AV Apt 103	EAST BOSTON	2128
102504010	LOASETHAKUL WATANA	C/O WATANA LOASETHAKUL	84 JAQUES ST	SOMERVILLE MA	2145	75 WALDEMAR AV Apt 201	EAST BOSTON	2128
102504016	GRUZEN WUNTANEE S	C/O WUNTANEE S GRUZEN	84 JAQUES STREET	SOMERVILLE MA	2145	75 WALDEMAR AV Apt 204	EAST BOSTON	2128
102504018	KALAJ HANE	C/O HANE KALAJ	75 WALDEMAR AV #301	E BOSTON MA	2128	75 WALDEMAR AV Apt 301	EAST BOSTON	2128
102504020	ANGJELIU ERION	C/O ERION ANGJELIU	75 WALDEMAR AV #302	EAST BOSTON MA	2128	75 WALDEMAR AV Apt 302	EAST BOSTON	2128
102504026	RAGMANI BEN ADAM	C/O BEN ADAM RAGMANI	75 WALDEMAR AV #401	E BOSTON MA	2128	75 WALDEMAR AV Apt 401	EAST BOSTON	2128
102504028	BALLA DORIAN	C/O DORIAN BALLA	75 WALDEMAR AVE #402	EAST BOSTON MA	2128	75 WALDEMAR AV Apt 402	EAST BOSTON	2128
102504030	SHIMA LUAN	C/O LUAN SHIMA	7 MOUNT PLEASANT ST	SAUGUS MA	1906	75 WALDEMAR AV Apt 403	EAST BOSTON	2128
102504032	DORJEE NAMGYAL	C/O NAMGYAL DORJEE	75 WALDEMAR AV UNIT 404	EAST BOSTON MA	2128	75 WALDEMAR AV Apt 404	EAST BOSTON	2128
101562000	MASSACHUSETTS BAY		1240 BENNINGTON	EAST BOSTON MA	2128	1240 BENNINGTON ST	EAST BOSTON	2128
101660000	MASSACHUSETTS PORT AUTHORITY		1 HARBORSIDE DR #200S	EAST BOSTON MA	2128	WM F MCCLELLAN HW	EAST BOSTON	2128
101662000	FOUR40 MCCLELLAN LLC	C/O CARGO VENTURES LLC	17 STATE ST 9TH FL	NEW YORK NY	10004	440 WM F MCCLELLAN HW	EAST BOSTON	2128

Loc: WASHBURN AVE Parcel ID #: 3-28-17C
LUC: 132

CANZANO JOSEPH

130 WASHBURN Ave

REVERE MA 02151

Loc: WINTHROP AVE Parcel ID #: 4-80-14B
LUC: 367

MCCLELLAN HIGHWAY DEVELOPMENT COMPANY LLC
C/O HYM INVESTMENT GROUP LLC
1 CONGRESS ST
10TH FLR
BOSTON MA 02114

Loc: LEE BURBANK HWY Parcel ID #: 5-120B-21A
LUC: 420

TOSCO TERMINAL COMPANY
C/O IRVING OIL LTD
P O BOX 868

CALAIS ME 04619

Loc: BELLE ISLE INLET Parcel ID #: 5-80-1A
LUC: 420

IRVING OIL TERMINALS INC
C/O IRVING OIL LTD
P O BOX 868

CALAIS ME 04619

Loc: LEE BURBANK HWY Parcel ID #: 5-80-2
LUC: 420

IRVING OIL TERIMINALS INC
ATTN: IRVING OIL LTD
P O BOX 868

CALAIS ME 04619

Loc: WESTERLY SIDE OF Parcel ID #: 5-80-3
LUC: 420

IRVING OIL TERMINALS INC
C/O IRVING OIL LTD
P O BOX 868

CALAIS ME 04619

Loc: 49 LEE BURBANK HWY Parcel ID #: 5-80-4
LUC: 420

GLOBAL COMPANIES LLC
ATTN: TERMINAL OPERATIONS
800 SOUTH ST
SUITE 500
WALTHAM MA 02454

Loc: 36-40 FURLONG DR 1 Parcel ID #: 6-80-10C-1
LUC: 344

TARGET CORPORATION T-1942
C/O PROPERTY TAX TPN-0950
P O BOX 9456

MINNEAPOLIS MN 55440-9456

Loc: 36-40 FURLONG DR 2 Parcel ID #: 6-80-10D-2
LUC: 344

CEDAR-REVERE LLC

44 SOUTH BAYLES AVE
SUITE 304
PORT WASHINGTON NY 11050-3767

Loc: 51 LEE BURBANK HWY Parcel ID #: 6-80-5A
LUC: 420

GLOBAL COMPANIES LLC
ATTN; TERMINAL OPERATIONS
800 SOUTH ST
SUITE 500
WALTHAM MA 02454

THIS IS A TRUE & ATTEST
COPY OF THE RECORDS OF
ASSESSOR'S OFFICE OF
CITY OF REVERE
DATE: 12/19/17

Section 4.0
Stormwater Management Information
(UNDER SEPARATE COVER)

STORMWATER MANAGEMENT REPORT

SUFFOLK DOWNS REDEVELOPMENT PHASE 1

Boston, MA

Prepared for:
The McClellan Highway Development Company, LLC
c/o The HYM Investment Group, LLC
One Congress Street, 11th Floor
Boston, Massachusetts, 02114

Presented by:

BEALS + THOMAS
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

January 3, 2017

Calculated by: **Elizabeth Ennis, PE**

Checked by: **Elizabeth Clark, PE**

Approved by:

COMMONWEALTH OF MASSACHUSETTS
ELIZABETH A. CLARK
CIVIL
No. 47873
REGISTERED PROFESSIONAL ENGINEER
1-3-2018

Elizabeth Clark, PE

285402RP004A

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LIST OF APPENDICES

1.0 INTRODUCTION

The proposed Phase 1 Project includes a stormwater management system designed to mitigate potential impacts to the existing watershed from the proposed project. Stormwater management measures are proposed to control peak runoff rates, provide water quality treatment, promote groundwater recharge, and promote sediment removal. The stormwater management system has been designed to comply with:

- The 2008 Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Handbook,
- The Massachusetts Wetland Protection Act Regulations (310 CMR 10.00),
- The Boston Water and Sewer Commission Stormwater Requirements.

The Phase 1 Project Site currently discharges to Land Subject to Coastal Storm Flowage (LSCSF) and ultimately to the Atlantic Ocean. The MassDEP Stormwater Management Handbook waives the requirement to mitigate peak stormwater discharge rates for projects that discharge to LSCSF, however Sales Creek is isolated from tidal flows by the Bennington Street tide gates and Department of Conservation and Recreation (DCR) pumping station. To demonstrate that the Phase 1 Project will not increase stormwater flows to the pumping station, the pre- and post-development hydrologic conditions were modeled using HydroCAD™ software. The hydrologic model shows that post-development stormwater runoff rates will be less than or equal to the pre-development rates.

To account for increased storm intensity projected to occur due to climate change, the 10-year and 100-year storm events used in the design of the proposed stormwater management system are based on the Boston Water and Sewer Commission's (BWSC) increased rainfall recommendations of 6.00 inches and 8.78 inches, respectively.

The following table summarizes the peak runoff rates for the pre- and post-development conditions.

	2 Year		10 Year		100 Year	
	Pre	Post	*Pre*	Post	*Pre*	Post
Design Point 2	*7.32*	5.60	*21.68*	16.60	*37.03*	28.35
Design Point 2A	*40.65*	34.59	*93.12*	85.23	*144.92*	137.36
Design Point 2C	*20.44*	17.18	*57.28*	49.52	*95.90*	83.72

2.0 PRE-DEVELOPMENT CONDITIONS

2.1 Site Conditions

Suffolk Downs was constructed in the early 1930s by filling marshlands and tidal creeks. At that time, the majority of the existing on-site stormwater management system was built and the portion of Sales Creek that passes through the Project Site was reconstructed as a drainage channel. This occurred prior to the promulgation of MassDEP Stormwater Management Standards; therefore the existing stormwater management infrastructure provides negligible stormwater quality treatment. The existing system primarily consists of catch basins, drain pipes, stormwater outfalls and conveyance channels. Drainage channels that surround the infield racetrack capture runoff from the racetrack and discharge it to the infield pond or Sales Creek.

Improvements have been made to the system over time. Between 2003 and 2005 in conjunction with the development of the shopping plaza to the west, the drainage system from Tomasello Road and select parking lots on the Project Site were redirected to the stormwater basin located off-site to the west of the Project Site.

In 2012 further improvements were made to treat runoff from the barn and stable areas, which are classified as a Concentrated Animal Feeding Operation (CAFO) pursuant to the Clean Water Act. These improvements ensure that pollutants from the CAFO do not enter Sales Creek. The work included: conveying all stormwater runoff from the CAFO to a process water holding pond, where it is then pumped to the BWSC sanitary sewer system during dry weather, installing four sand filters to treat the runoff from the racetrack, installing a dedicated roof runoff collection system for the stable barns, and installing infiltration islands.

The Phase 1 Project Site drains to two primary locations on-site. The track area and infield drains to the pond located within the infield. The race track and infield areas drain to the pond located within the infield (the “infield pond”). The infield pond is approximately a 1-acre human-made feature constructed for ornamental purposes prior to 1938. A number of drainage channels direct runoff from the track to the pond. The level of the pond is regulated by a water control structure at the northern edge of the pond which artificially controls the mean annual flood level of the pond. Overflow from the pond drains to Sales Creek via an 18-inch culvert.

The existing overflow parking area and area outside of the track drain to the intermittent stream located along the eastern perimeter of the Project Site (H-series flags). the intermittent stream also drains to Sales Creek.

Sales Creek discharges to Belle Isle Marsh and ultimately Boston Harbor. Sales Creek is isolated from tidal flows by the Bennington Street tide gates and a stormwater pumping station that is owned and operated by the Department of Conservation and Recreation (DCR). During lower tides, Sales Creek flows directly via gravity to Belle Isle Inlet via

culverts under Bennington Street. During higher tides, when the tide gates are closed, flow in Sales Creek may be pumped to Belle Isle Inlet by the Bennington Street stormwater pumping station to mitigate high water levels in Sales Creek.

2.1.1 Critical Areas

Critical Areas as defined by Standard 6 of the 2008 MassDEP Stormwater Management Handbook are areas where high levels of stormwater treatment is required; typically the first inch of runoff is treated using specific best management practices (BMPs) and pre-treatment methods. Specific source control and pollution prevention measures are also required.

The Massachusetts Surface Water Quality Standards (314 CMR 4.00) lists both Sales Creek and the H-series intermittent stream as Class SA Outstanding Resource Waters (ORW). Pursuant to the Surface Water Quality Standards, these waters are designated as an excellent habitat for fish, other aquatic life, and wildlife and shall have an excellent aesthetic value.

Belle Isle Marsh consists of approximately 241-acres and is part of the larger Rumney Marsh Area of Critical Environmental Concern (ACEC). Belle Isle Marsh is designated as a shellfish growing area by the Division of Marine Fisheries but is currently listed as an area where shellfish growing is prohibited.

Both ORWs and shellfish growing areas are classified as critical areas.

2.1.2 Total Maximum Daily Loads

MassDEP has issued a draft Pathogen Total Maximum Daily Load (TMDL) for the Boston Harbor Watershed (excluding the Neponset River sub-basin). A TMDL is the greatest amount of a pollutant that a waterbody can accept and still meet water quality standards for protecting public health and maintaining the designated beneficial uses of those waters for drinking, swimming, recreation, and fishing. A TMDL is implemented by specifying how much of that pollutant can come from point, nonpoint, and natural sources. Urban runoff, combined sewer overflows, sewer overflows and heavy industrial activity have impaired Boston Harbor. Known pollutants include, but are not limited to, fecal coliform, e. coli, phosphorus, and total suspended solids.

2.2 Soil Description

The Natural Resources Conservation Service (NRCS) Web Soil Survey indicates that the soils within the racetrack consist of Udorthents with wet substratum. These soils are located in areas that were previously tidal marshes, river floodplains, bays, harbors, and swamps. The fill consists of rubble, refuse, and mixed soil material, typically, sand, gravel, and channel dredgings. The parking areas are listed as Urban land with wet substratum. These soils consist of developed areas within Udorthents, wet substratum. No hydrologic soil class is assigned to these soil types, but permeability is typically low.

Small areas of Newport silt loam line the southern boundary of the Phase 1 Project Site. This is a deep, well-drained soil with moderate permeability, and typically shallow groundwater. It is classified as hydrologic soil class B. The soils along the eastern boundary of the Phase 1 Project Site consist of Ipswich mucky peat, which is a very poorly drained, nearly level soil in tidal marshes. It is listed as hydrologic soil class A/D.

Test pits performed on the Project Site in 2012 by Haley and Aldrich, Inc., indicated consistent material generally throughout the Project Site, consisting of fill. The top 24-inches of soil are classified as either poorly graded sand or silty sand. Below 24-inches the soil is mostly unclassified fill, poorly graded sand, silty sand, or clayey sand. Groundwater was found on average 2 to 7-feet below existing grade.

2.3 Hydrologic Analysis

Sub-catchment areas were delineated based on existing runoff patterns and topographic information. This information is shown on the *Pre-Development Conditions Hydrologic Areas Map* included in Appendix B. Summaries of each area with respect to Curve Number and Time of Concentration calculations can be found in the model results also in Appendix B.

To account for the increased storm intensity projected to occur due to climate change rainfall depths used in the hydrologic model were based on a presentation entitled “BWSC Climate Change Risk Assessment, Findings and Mitigation/Adaptation Strategies for Wastewater and Storm Drainage”, dated January 28, 2015 and prepared by Boston Water and Sewer Commission. The 10-year and 100-year storm events were modeled with a total depth of 6.00 inches and 8.78 inches, respectively.

3.0 POST-DEVELOPMENT CONDITIONS

3.1 Design Strategy

During the design phase of the site layout, consideration was given to conserving environmentally sensitive features and minimizing impact on the existing hydrology. On-site resource areas, such as those associated with the intermittent stream and infield pond, will not be altered by the proposed project.

A stormwater management system has been designed to provide treatment for stormwater runoff associated with the proposed impervious surfaces on site. All stormwater BMPs were designed to treat a minimum of the first 1.0 inch of runoff generated by the new on-site impervious areas. Proprietary stormwater treatment systems were designed to treat the runoff rate associated with the water quality volume in accordance with the requirements of the MassDEP Stormwater Handbook.

To mitigate increased stormwater flow rates associated with the proposed impervious area, two infiltration basins have been proposed. The bottom of infiltration basin 1 has been set at elevation 14.5. Based on soil borings within this area groundwater is assumed to be at elevation 12.0 approximately. The bottom of infiltration basin 2 is set at elevation 12.5. Groundwater is assumed to be at elevation 10.0 is this area. To facilitate infiltration the project will include removing and replacing the soil beneath infiltration basins with sandy soils to the depth of estimated seasonal high groundwater The soils will be replaced with sandy soils.

Both infiltration basins were sized using the Simply Dynamic Method, as described in Chapter 3 of the Massachusetts Stormwater Handbook. The system has been designed to meet the required recharge volume, and will fully dewater within 72 hours. A mounding analysis was performed to ensure that the potential rise in groundwater elevation would not interfere with the system fully dewatering within 72 hours. See Appendix D for groundwater mounding calculations.

3.2 Hydrologic Analysis

The established design points used in the pre-development conditions analysis were used in the post-development analysis for direct comparison. The tributary areas and flow paths were modified to reflect post-development conditions. See Appendix C for the *Post-Development Conditions Hydrologic Areas Map*. Summaries of each area with respect to Curve Number and Time of Concentration calculations can be found in the model results in Appendix C.

3.3 Hydraulic Calculations

In compliance with Boston Water Sewer requirements, the proposed storm drain system was analyzed based on the 6-inch 24-hour design storm, which equates to the 25-year storm event using the Rational Formula. A watershed map and detailed hydraulic analysis are provided in Appendix E.

3.4 Compliance with MassDEP Stormwater Management Standards

The proposed stormwater management system was designed in compliance with the ten (10) DEP Stormwater Management Standards. The following summary provides key information related to the proposed stormwater management system, its design elements, and mitigation measures for potential impacts.

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

There will be no direct discharge of untreated stormwater to nearby wetlands or waters of the Commonwealth. Runoff from all impervious areas of the Phase 1 Project Site will be conveyed to stormwater management controls for water quality treatment and runoff rate attenuation prior to discharge to adjacent streams and wetlands.

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

As previously discussed, the Phase 1 Project will control post-development peak discharge rates for the 2-, 10-, and 100-year, 24-hour storms so as to maintain pre-development peak discharge rates.

STANDARD 3: **Loss of annual recharge to groundwater shall be eliminated or minimized through the use of environmentally sensitive site design, low impact development techniques, stormwater management practices and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil types. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.**

The stormwater management system includes two infiltration basins that will effectively recharge groundwater on-site. Infiltration BMPs were sized using the simple dynamic method based on the required recharge volume for the post-development site. As a result, annual recharge from the post-development site will approximate the annual recharge from the site under pre-development conditions. See Appendix D for stormwater BMP design worksheets and Groundwater Recharge Calculation.

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

The proposed Phase 1 Project will be designed to meet the water quality requirements of Standard 4 using on-site treatment trains that achieve 80% TSS removal. Structural BMPs designed for water quality treatment, including deep sump hooded catch basins, water quality treatment systems, and infiltration basins will be sized to capture and treat the flow rate associated with the first 1.0-inch of runoff from the proposed impervious surfaces. All proposed stormwater management BMPs will be operated and maintained to ensure continued water quality treatment of runoff. A Site Owner's Manual that complies with the Long-Term Pollution Prevention Plan (Standard 4) and the Long-Term Operation and Maintenance Plan (Standard 9) requirements of the 2008 MassDEP Stormwater Management Standards will be developed. The Manual will outline the source control and pollution prevention measures and maintenance requirements of the stormwater BMPs associated with the proposed development.

STANDARD 5: **For land uses with higher potential pollutant loads (LUHPPLs), 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 Phase 1 Project includes a parking lot with high intensity use. The primary parking for the Project will be located within the building. Runoff from the interior spaces will be collected by and oil water separator designed in accordance with the plumbing code prior to discharging to the sewer system.

STANDARD 6: **Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for critical areas. Critical areas are Outstanding Resource Waters, shellfish beds, swimming beaches, coldwater fisheries and recharge areas for public water supplies.**

The proposed BMPs will be consistent with the MassDEP Stormwater Management Handbook for discharges within critical areas. The stormwater management system will be designed to capture and treat the first 1.0-inch of runoff as stipulated in the MassDEP Stormwater Management Handbook. Deep sump hooded catch basins and water quality treatment systems are proposed to remove pollutants from the first 1.0-inch of runoff from all new impervious areas. Adequate pretreatment will be provided before discharge.

STANDARD 7: **Redevelopment of previously developed sites must meet the Stormwater Management Standards to the maximum extent practicable. However, if it is not practicable to meet all the Standards, new (retrofitted or expanded) stormwater management systems must be designed to improve existing conditions.**

The Project is a mix of new development and redevelopment. All new impervious areas will be designed to fully comply with all standards of the Stormwater Management Handbook.

STANDARD 8: **A plan to control construction-related impacts during 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.**

A Stormwater Pollution Prevention Plan (SWPPP) will be developed to comply with Section 3 of the NPDES Construction General Permit for Stormwater Discharges; therefore the requirements of Standard 8 will be fulfilled.

STANDARD 9: **A Long-Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.**

The Site Owner's Manual complies with the Long-Term Pollution Prevention Plan (Standard 4) and the Long-Term Operation and Maintenance Plan (Standard 9) requirements of the 2008 Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards. The Manual outlines source control and pollution prevention measures and maintenance requirements of the stormwater best management practices (BMPs) associated with the proposed development.

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

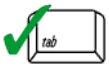
There will be no illicit discharges to the proposed stormwater management system associated with the proposed Phase 1 Project. An Illicit Discharge Compliance Statement will be provided prior to the discharge of any stormwater to any post-construction BMPs.

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

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.[1] 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[2]
- 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.

[1] 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.

[2] 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.

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

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.

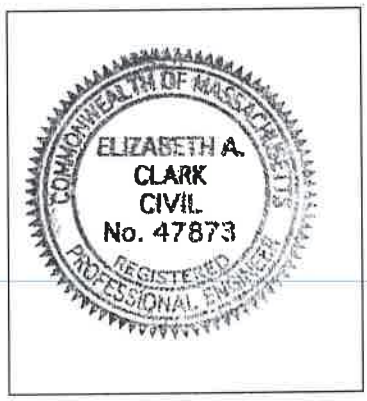
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the 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



Elizabeth Clark 1-3-2018
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

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): _____

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

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[1]

☐ 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.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

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

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

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

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

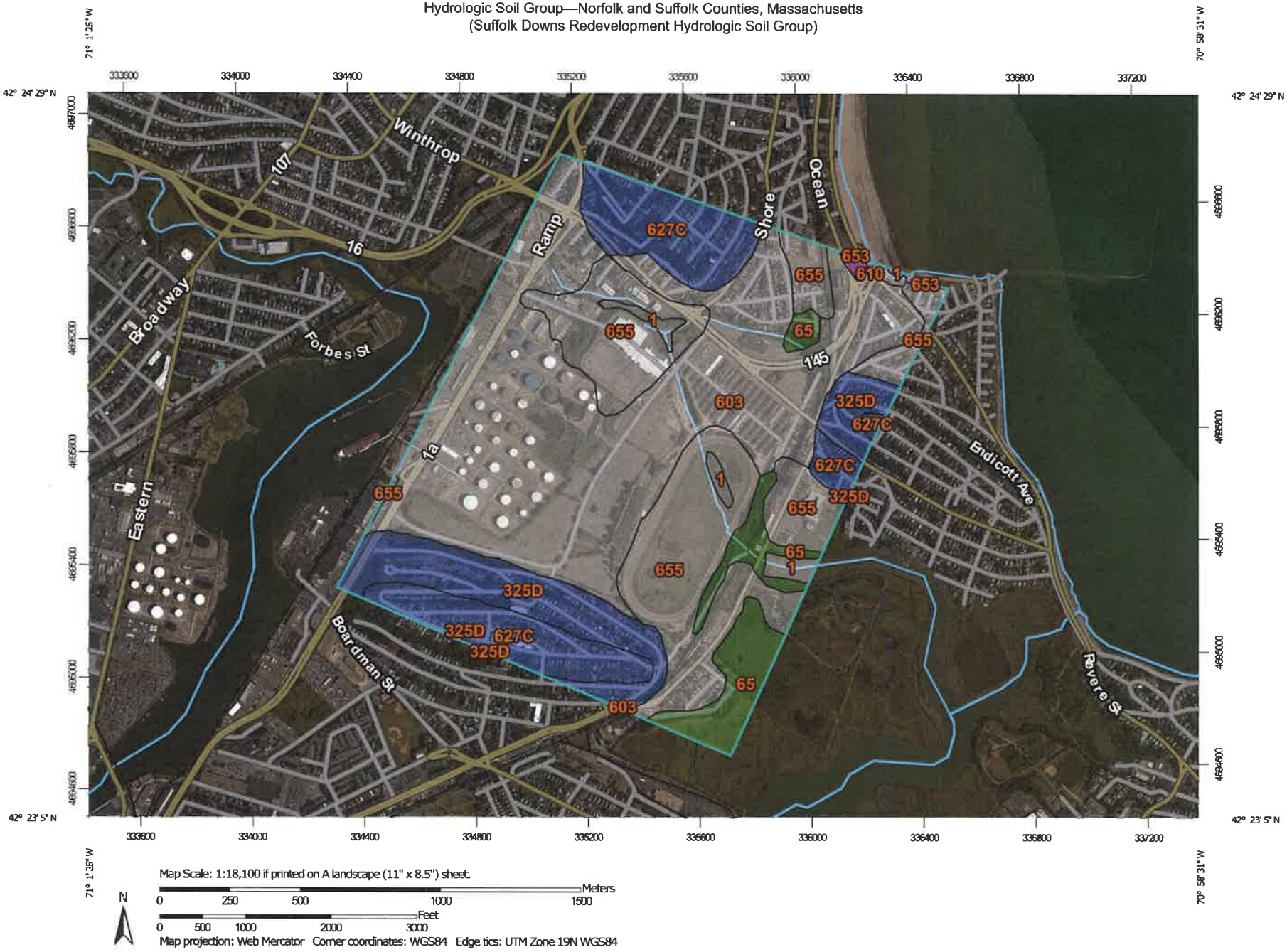
☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ 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.

Appendix A
Soil Data

Hydrologic Soil Group—Norfolk and Suffolk Counties, Massachusetts
(Suffolk Downs Redevelopment Hydrologic Soil Group)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

<= 12.9254

> 12.9254 and <= 55.0000

> 55.0000 and <= 70.7800

> 70.7800 and <= 100.0000

Not rated or not available

Soil Rating Lines

<= 12.9254

> 12.9254 and <= 55.0000

> 55.0000 and <= 70.7800

> 70.7800 and <= 100.0000

Not rated or not available

Soil Rating Points

<= 12.9254

> 12.9254 and <= 55.0000

> 55.0000 and <= 70.7800

> 70.7800 and <= 100.0000

Not rated or not available

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.

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: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 13, Oct 6, 2017

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

Date(s) aerial images were photographed: Mar 30, 2011—Aug 25, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Norfolk and Suffolk Counties, Massachusetts (MA616)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		9.0	1.4%
65	Ipswich mucky peat, 0 to 2 percent slopes, very frequently flooded	A/D	40.2	6.1%
325D	Newport silt loam, 15 to 25 percent slopes	B	64.9	9.9%
603	Urban land, wet substratum, 0 to 3 percent slopes		298.6	45.4%
610	Beaches		1.3	0.2%
627C	Newport-Urban land complex, 3 to 15 percent slopes	B	85.2	13.0%
653	Udorthents, sandy	A	2.0	0.3%
655	Udorthents, wet substratum		156.3	23.8%
Totals for Area of Interest			657.6	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

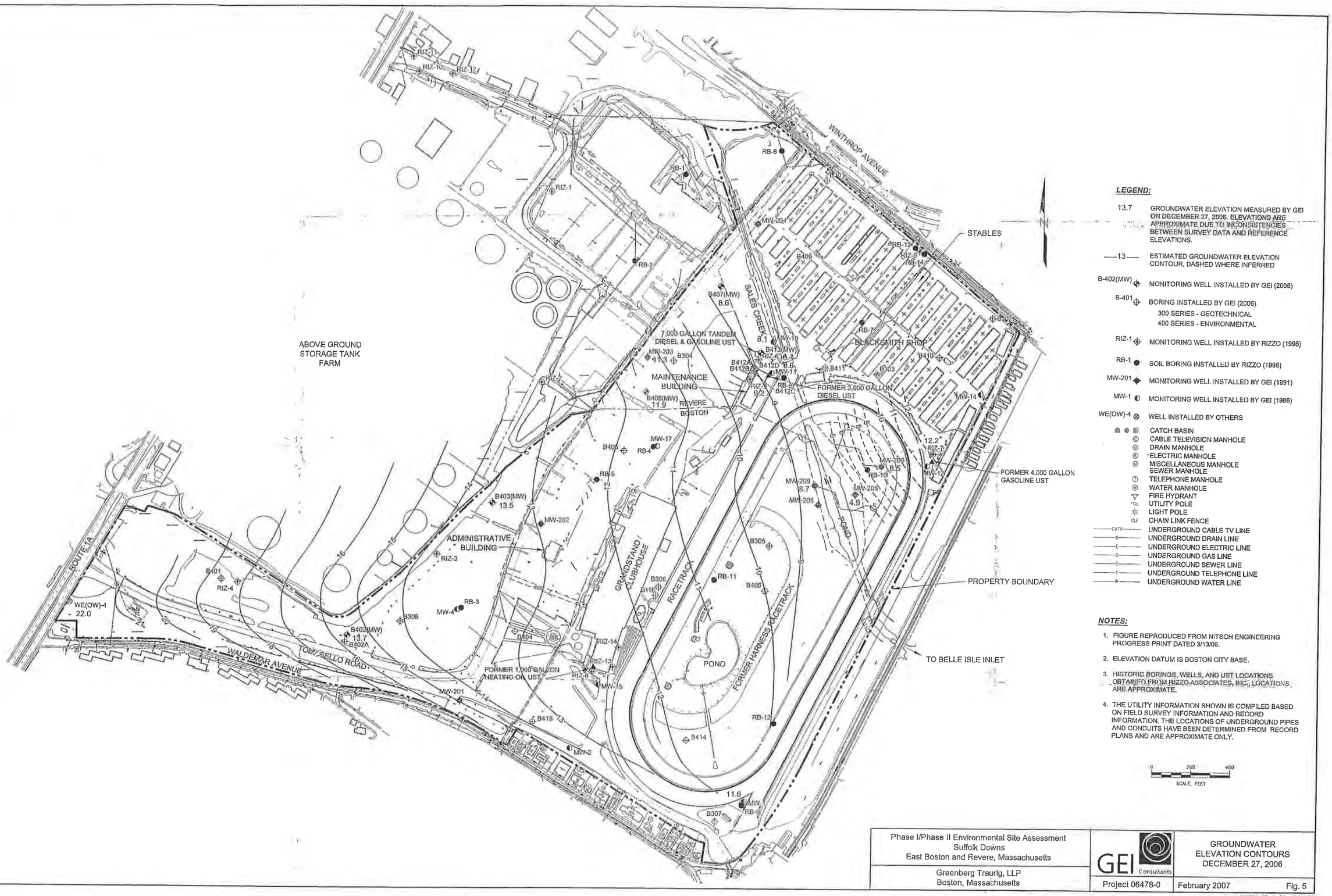
If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Phase I/Phase II Environmental Site Assessment
Suffolk Downs
East Boston and Revere, Massachusetts

Greenberg Traurig, LLP
Boston, Massachusetts

GEI Consultants

GROUNDWATER ELEVATION CONTOURS DECEMBER 27, 2006

Project 06478-0 | February 2007 | Fig. 5

06478G-BE gtc/djm 2/12/07

BORING LOG

B414

Client:	Greenberg Traurig LLP	**Boring Location:**	Suffolk Downs	**Boring Method:**	Geoprobe
Contractor:	Geosearch			**Core Barrel:**	NA
Operator:	R. Kaddy	**Ground Elevation (ft):**	NM	**Casing ID:**	NA
Logged By:	A. Ahles	**Total Depth (ft):**	20	**Sampler:**	2" Macrocore
Date Start to Finish:	12/22/06 - 12/22/06	**Groundwater Depth (ft):**	3.05	**Hammer Wt./Fall:**	NA

Abbreviations: S = Split Spoon Sample; DP = Direct Push Sample; U = Undisturbed Tube Sample; C = Rock Core Sample; Pen. = Penetration length; Rec. = Recovery Length; WOR = Weight Of Rods; WOH = Weight Of Hammer; RQD = Rock Quality Designation; OVM = Organic Vapor Meter; NA,NM = Not Applicable, Not Measured; S_v = Pocket Torvane Shear Strength; Q_p = Pocket Penetrometer Unconfined Compressive Strength

Elevation (ft)	Depth (ft)	Sample Information: Sample No.	Pen./Rec. (inches)	Sample Depth (Sample Elev.) (ft)	Blows per 6 in. or RQD (%)	Layer	Descriptions	Remarks
	0	S1	60/29	0.0 to 5.0	PUSH	TOPSOIL	Top 4" topsoil	OVM = 0.0
							S1 (TOP 25"): WIDELY GRADED SAND WITH GRAVEL (SW): ≅80% fine to coarse sand; ≅20% fine gravel, max size 0.75" diameter; fill characteristics included brick and wood; moist	OVM = 0.0
							S1 (BOT 4"): SANDY ORGANIC SOIL (OL/OH) : ≅50% sand; organic; roots; wood pieces; organic odor; wet; black.	
	5	S2	60/14	5.0 to 10.0	PUSH	FILL	S2: SANDY ORGANIC SOIL (OL/OH): ≅60% sand; ≅20% gravel; ≅20% organic; fill characteristics included brick, wood, and ceramics; organic odor; wet; black.	
	10	S3	60/29	10.0 to 15.0	PUSH		S3 (TOP 10"): Similar to S2.	OVM = 0.0
							S3 (BOT 19"): ORGANIC SOIL (OL/OH): Mostly non-plastic to low plasticity silt; seashells; wet; gray.	OVM = 0.0
	15	S4	60/34	15.0 to 20.0	PUSH		S4 (TOP 10"): Similar to S3 (BOT 19").	OVM = 0.0
						SAND	S4 (BOT 24"): NARROWLY GRADED SAND: Mostly fine sand; ≤5% silt; wet; gray.	OVM = 0.0
	20						BOTTOM OF BOREHOLE, 20.0 FEET	
	25							
	30							

Notes: Organic Vapor Meter (OVM) readings reported in parts per million (ppm)

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

Project: Suffolk Downs

GEI Proj. No.: 064780
Location: East Boston/Revere, MA

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

Appendix B
Pre-Development Hydrologic Analysis

BEALS + THOMAS
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

CALCULATION SUMMARY

T 508.366.0560
F 508.366.4391
www.bealsandthomas.com
Regional Office: Plymouth, MA

JOB NO./LOCATION:

2854.02
Boston/Revere, Massachusetts

CLIENT/PROJECT:

HYM Investments, LLC
Suffolk Downs Redevelopment

SUBJECT/TITLE:

Existing Conditions Hydrologic Analysis Phase 1

OBJECTIVE OF CALCULATION:

- To determine the pre-development peak rates of runoff from the site for the 2, 10 and 100 year storm events

CALCULATION METHOD(S):

- CN and Tc determined based on TR-55 methodology.
- Runoff rates computed using HydroCAD version 10.0

ASSUMPTIONS:

- Surface cover types and boundaries have been estimated based upon MassGIS, USGS Color Ortho Imagery 2016, aerial photography viewed on Google Earth, and AutoCAD file 285402B004D.dwg
- Upgradient tributary area was based upon data obtained from the MassGIS Oliver program. Surface cover was based on aerial photography viewed on Google Earth.
- Wetland areas modeled as hydrologic soil class "D" soils. Urban Land, Udorthents, and Ipswich Mucky Peat Model as Hydrologic soil class "C" soils.
- Rainfall depth for 10-year storm event and 100-year storm event based on BWSC Climate Change Risk Assessment, Findings and Mitigation/Adaptation Strategies for Wastewater and Storm Drainage dated 01/28/2015.

SOURCES OF DATA/EQUATIONS:

- Alta/NSPS Land Title Survey, Suffolk Downs, Boston/Revere, Massachusetts, prepared by Beals and Thomas, Inc., dated 05/23/17.
- Pre-Development Conditions Hydrologic Areas Map Phase 1, dated 11/30/2017 prepared by Beals and Thomas, Inc.
- TR-55 Urban Hydrology for Small Watersheds, SCS, 1986.
- NRCS Soil Survey for Middlesex Country downloaded from Web Soil Survey 2.0 on 05/04/2017.

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	[signature]	11/16/17	[signature]	11/16/17	[signature]	11/16/17

BEALS + THOMAS
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

T 508.366.0560
F 508.366.4391
www.bealsandthomas.com
Regional Office: Plymouth, MA

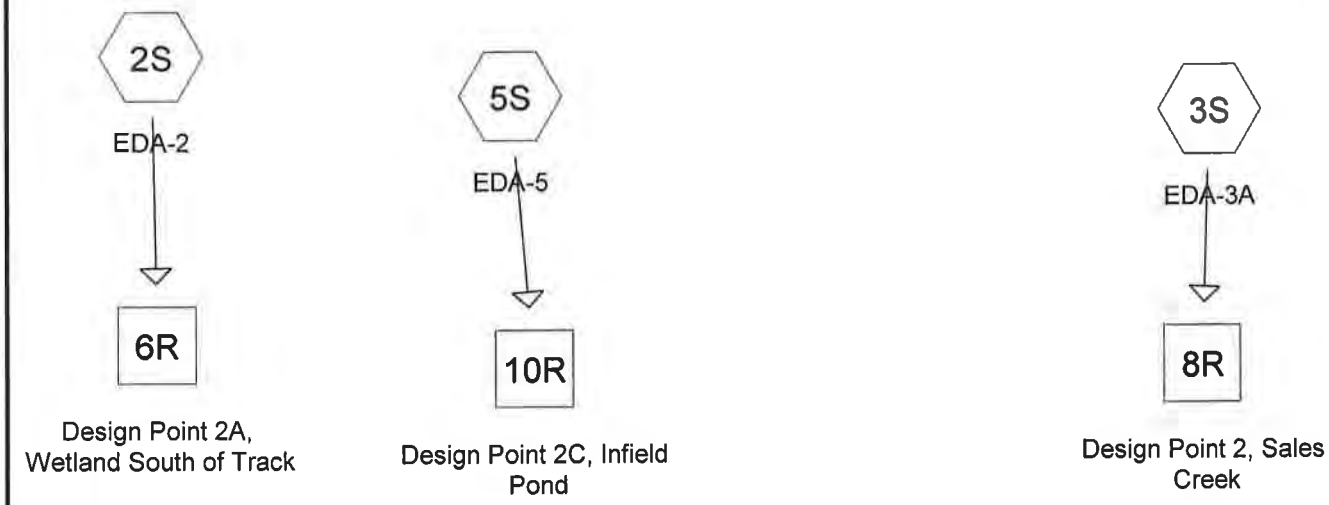
CONCLUSIONS:

The following numbers represent the peak rates of runoff from the site under existing conditions

Peak Rates of Runoff

Storm Event	Design Point 2 Sales Creek (cfs)	Design Point 2A Wetland South of the Track (cfs)	Design Point 2C Infield Pond (cfs)
2-year	7.32	40.65	20.44
10-year	21.68	93.12	57.28
100-year	37.03	144.92	95.90

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	L Emms	11/16/17	E. Clarke	11/16/17	E. Clarke	11/16/17



Subcat Reach Pond Link

Routing Diagram for 285400HC005 - Phase 1 Existing
Prepared by {enter your company name here}, Printed 11/16/2017

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.477	61	>75% Grass cover, Good, HSG B (2S)
23.839	74	>75% Grass cover, Good, HSG C (2S, 3S, 5S)
0.207	73	Brush, Good, HSG D (3S, 5S)
1.220	73	Brush, Good, HSG D (Wetland) (2S)
3.225	87	Dirt (5S)
1.989	87	Dirt track, HSG C (2S, 3S)
1.225	96	Gravel surface, HSG C (2S)
1.674	98	Paved parking, HSG B (2S)
7.927	98	Paved parking, HSG C (2S, 3S, 5S)
0.727	98	Roofs, HSG B (2S)
0.143	98	Roofs, HSG C (2S, 5S)
0.046	98	Water Surface, HSG B (2S)
1.348	98	Water Surface, HSG C (2S, 3S, 5S)

Summary for Subcatchment 2S: EDA-2

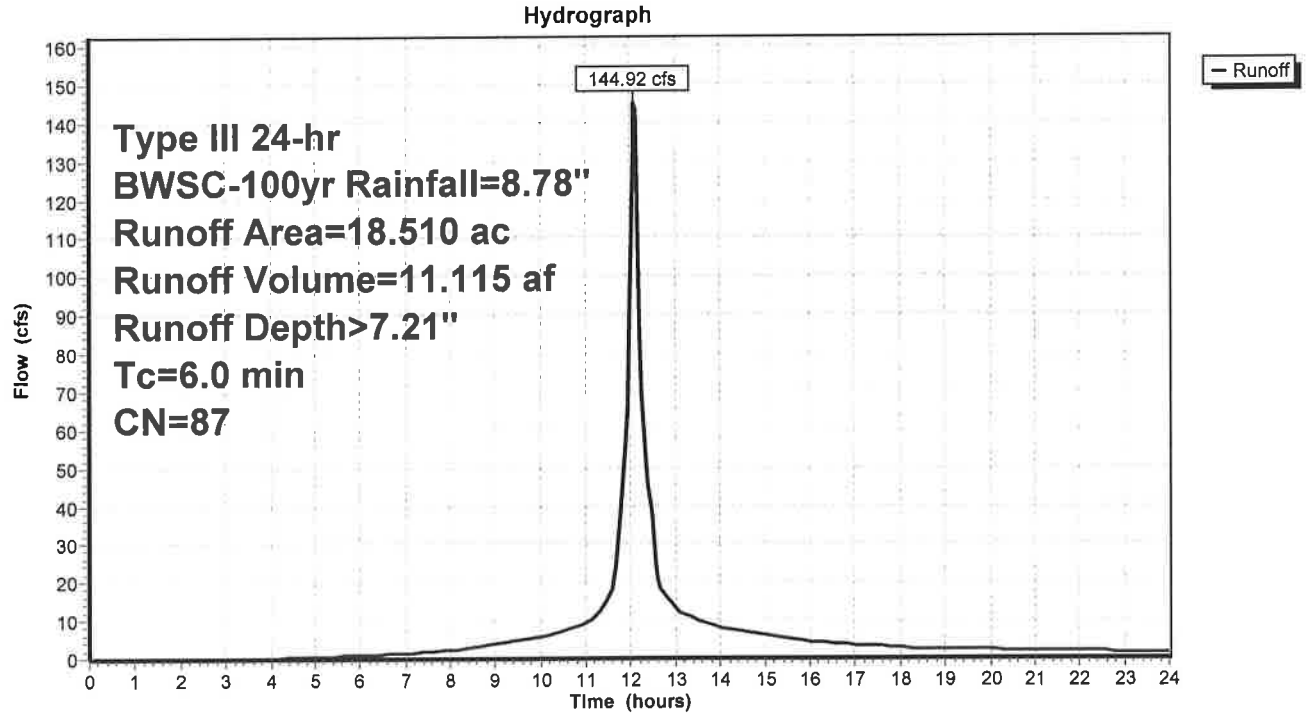
Runoff = 144.92 cfs @ 12.09 hrs, Volume= 11.115 af, Depth> 7.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr BWSC-100yr Rainfall=8.78"

	Area (ac)	CN	Description
*	1.220	73	Brush, Good, HSG D (Wetland)
	0.049	98	Roofs, HSG C
	0.727	98	Roofs, HSG B
	1.674	98	Paved parking, HSG B
	7.387	98	Paved parking, HSG C
	0.014	98	Water Surface, HSG C
	4.388	74	>75% Grass cover, Good, HSG C
	1.477	61	>75% Grass cover, Good, HSG B
	1.225	96	Gravel surface, HSG C
	0.046	98	Water Surface, HSG B
*	0.303	87	Dirt track, HSG C
	18.510	87	Weighted Average
	8.613		46.53% Pervious Area
	9.897		53.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, direct enty**

Subcatchment 2S: EDA-2



Summary for Subcatchment 3S: EDA-3A

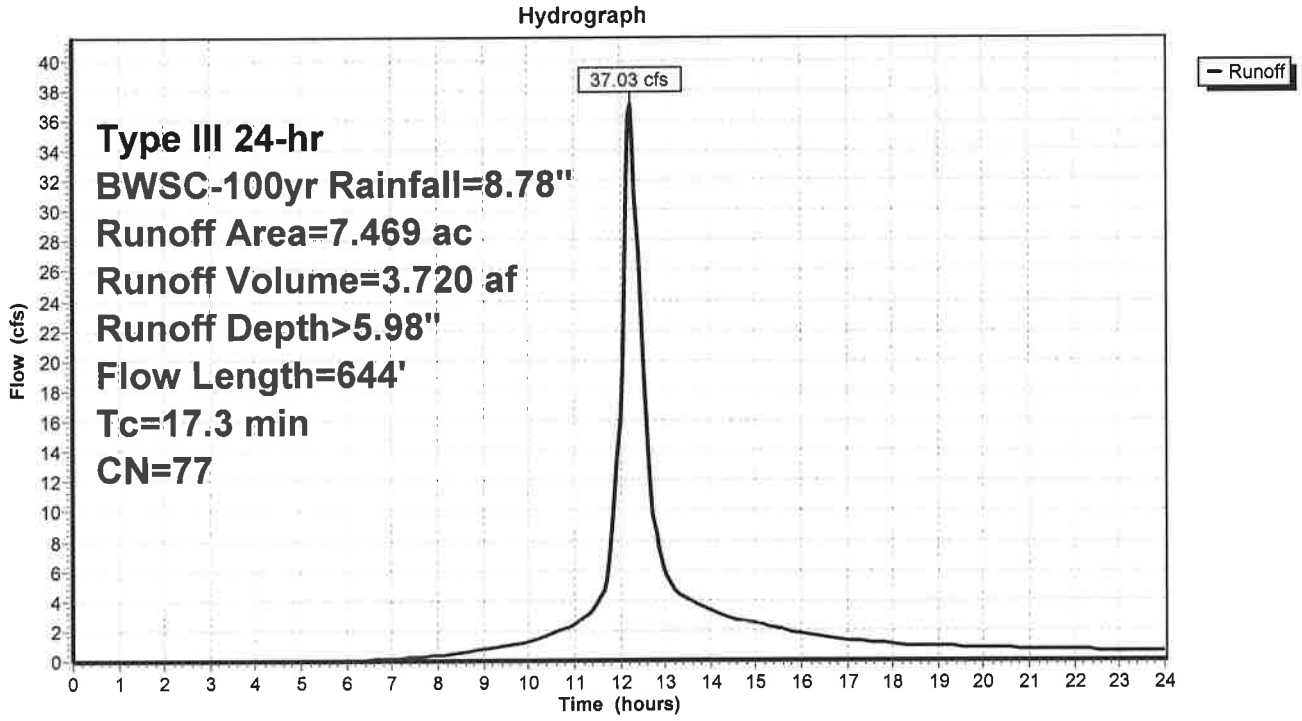
Runoff = 37.03 cfs @ 12.24 hrs, Volume= 3.720 af, Depth> 5.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr BWSC-100yr Rainfall=8.78"

	Area (ac)	CN	Description
	5.657	74	>75% Grass cover, Good, HSG C
*	1.686	87	Dirt track, HSG C
	0.006	98	Paved parking, HSG C
	0.062	73	Brush, Good, HSG D
	0.058	98	Water Surface, HSG C
	7.469	77	Weighted Average
	7.405		99.14% Pervious Area
	0.064		0.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	47	0.0217	0.15		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.20"
1.3	68	0.0150	0.86		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.0	89	0.0110	0.73		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	55	0.0180	0.94		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.7	46	0.0217	1.03		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
1.6	75	0.0130	0.80		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
1.3	65	0.0150	0.86		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
3.1	118	0.0080	0.63		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	52	0.0190	0.96		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	16	0.0625	1.75		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.0	13	0.3840	4.34		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
17.3	644	Total			

Subcatchment 3S: EDA-3A



Summary for Subcatchment 5S: EDA-5

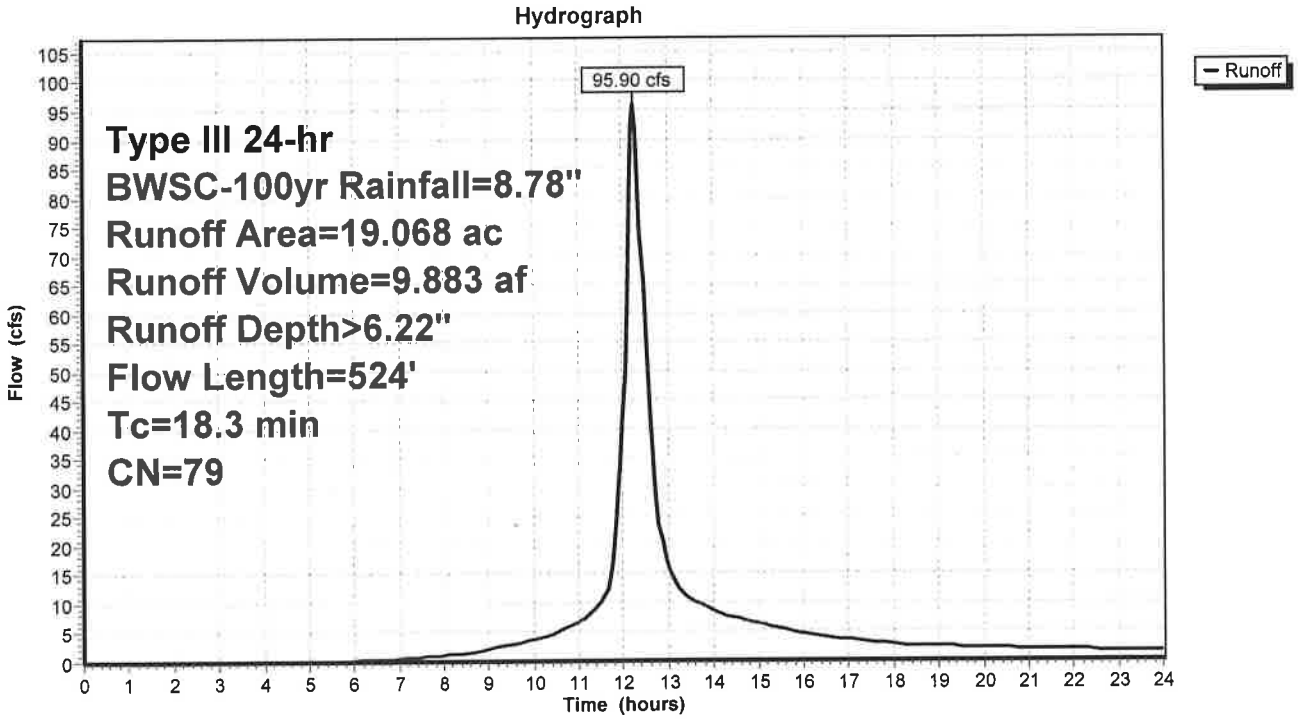
Runoff = 95.90 cfs @ 12.25 hrs, Volume= 9.883 af, Depth> 6.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr BWSC-100yr Rainfall=8.78"

	Area (ac)	CN	Description
	1.276	98	Water Surface, HSG C
*	3.225	87	Dirt
	13.794	74	>75% Grass cover, Good, HSG C
	0.094	98	Roofs, HSG C
	0.145	73	Brush, Good, HSG D
	0.534	98	Paved parking, HSG C
	19.068	79	Weighted Average
	17.164		90.01% Pervious Area
	1.904		9.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.20"
1.1	60	0.0167	0.90		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
6.6	197	0.0050	0.49		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
3.9	136	0.0070	0.59		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.7	44	0.0227	1.05		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.0	7	0.1429	2.65		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	30	0.0333	1.28		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
18.3	524	Total			

Subcatchment 5S: EDA-5

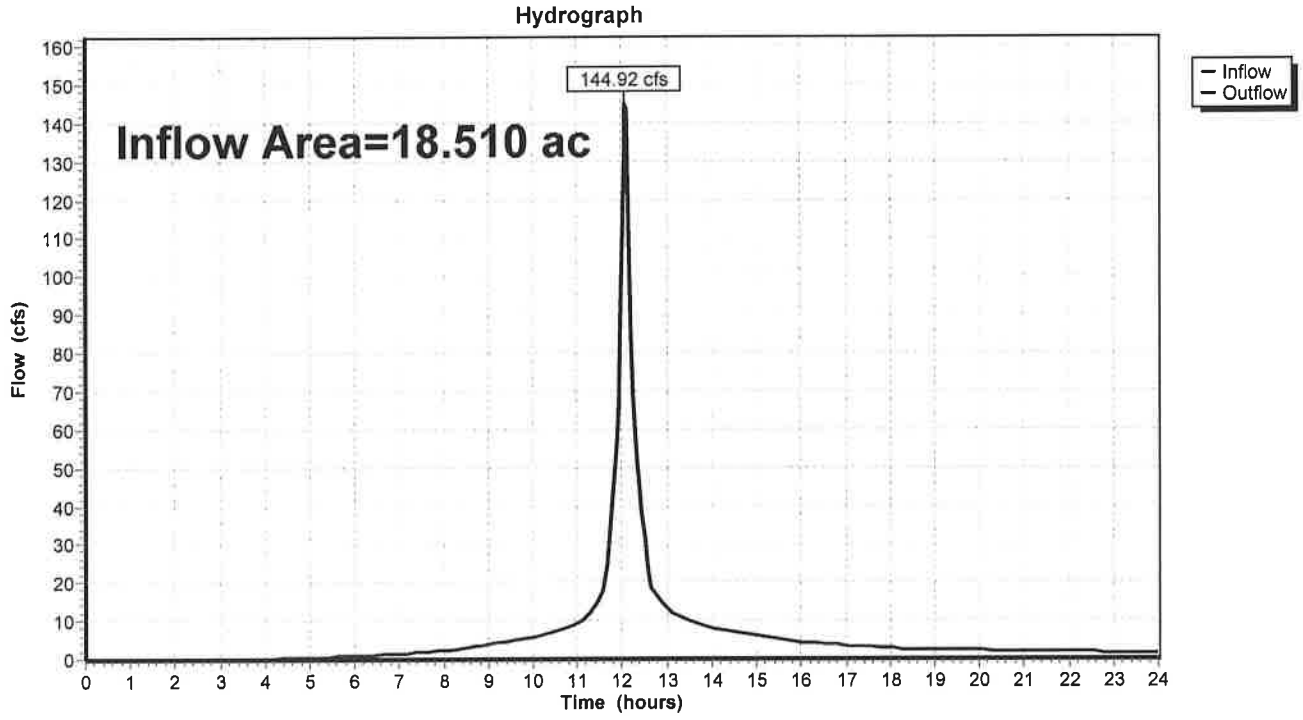


Summary for Reach 6R: Design Point 2A, Wetland South of Track

Inflow Area = 18.510 ac, 53.47% Impervious, Inflow Depth > 7.21" for BWSC-100yr event
Inflow = 144.92 cfs @ 12.09 hrs, Volume= 11.115 af
Outflow = 144.92 cfs @ 12.09 hrs, Volume= 11.115 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 6R: Design Point 2A, Wetland South of Track

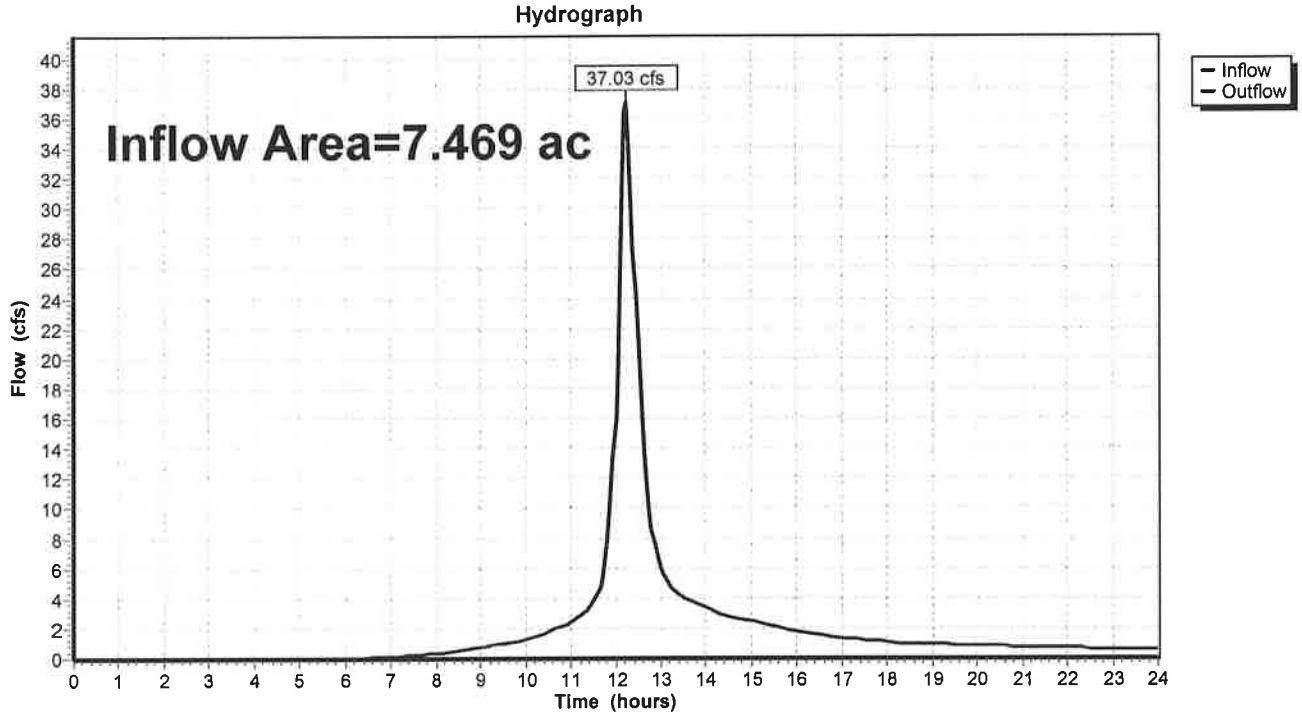


Summary for Reach 8R: Design Point 2, Sales Creek

Inflow Area = 7.469 ac, 0.86% Impervious, Inflow Depth > 5.98" for BWSC-100yr event
Inflow = 37.03 cfs @ 12.24 hrs, Volume= 3.720 af
Outflow = 37.03 cfs @ 12.24 hrs, Volume= 3.720 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 8R: Design Point 2, Sales Creek

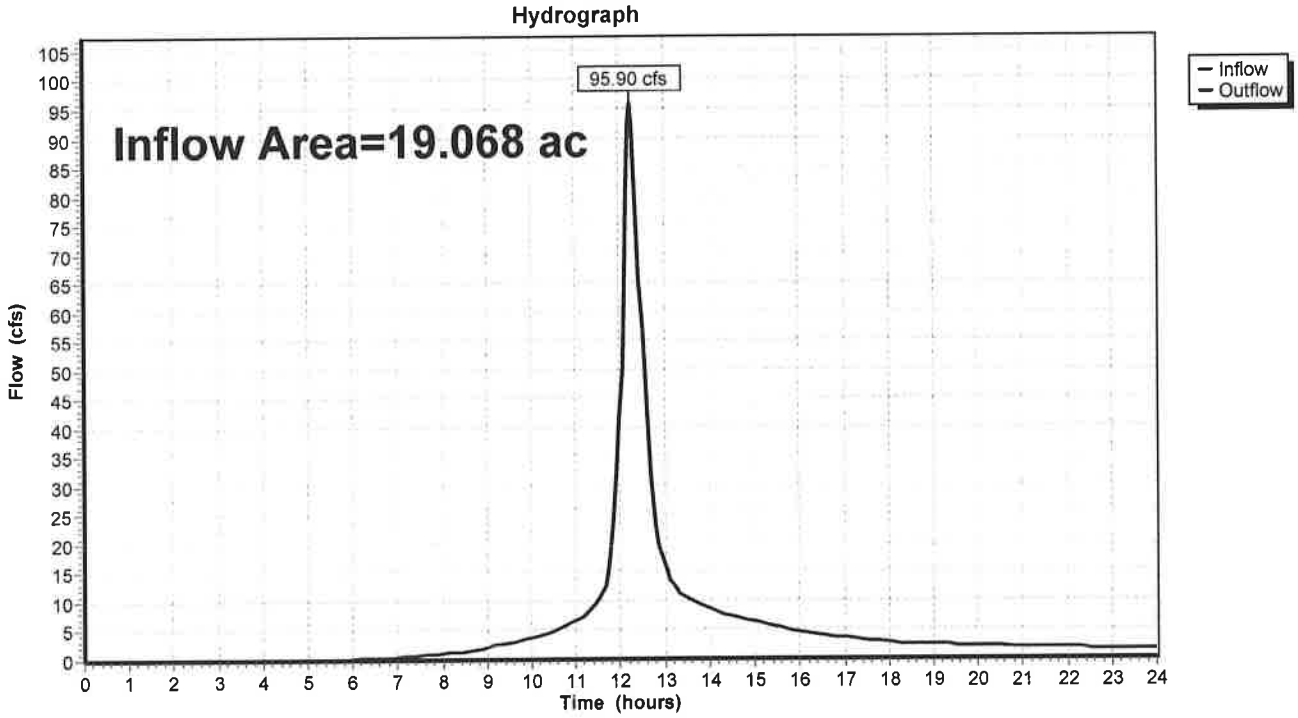


Summary for Reach 10R: Design Point 2C, Infield Pond

Inflow Area = 19.068 ac, 9.99% Impervious, Inflow Depth > 6.22" for BWSC-100yr event
Inflow = 95.90 cfs @ 12.25 hrs, Volume= 9.883 af
Outflow = 95.90 cfs @ 12.25 hrs, Volume= 9.883 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 10R: Design Point 2C, Infield Pond



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: EDA-2 Runoff Area=18.510 ac 53.47% Impervious Runoff Depth>1.91"
Tc=6.0 min CN=87 Runoff=40.65 cfs 2.951 af

Subcatchment 3S: EDA-3A Runoff Area=7.469 ac 0.86% Impervious Runoff Depth>1.21"
Flow Length=644' Tc=17.3 min CN=77 Runoff=7.32 cfs 0.751 af

Subcatchment 5S: EDA-5 Runoff Area=19.068 ac 9.99% Impervious Runoff Depth>1.33"
Flow Length=524' Tc=18.3 min CN=79 Runoff=20.44 cfs 2.115 af

Reach 6R: Design Point 2A, Wetland South of Track Inflow=40.65 cfs 2.951 af
Outflow=40.65 cfs 2.951 af

Reach 8R: Design Point 2, Sales Creek Inflow=7.32 cfs 0.751 af
Outflow=7.32 cfs 0.751 af

Reach 10R: Design Point 2C, Infield Pond Inflow=20.44 cfs 2.115 af
Outflow=20.44 cfs 2.115 af

Total Runoff Area = 45.047 ac Runoff Volume = 5.818 af Average Runoff Depth = 1.55"
73.66% Pervious = 33.182 ac 26.34% Impervious = 11.865 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: EDA-2 Runoff Area=18.510 ac 53.47% Impervious Runoff Depth>4.51"
Tc=6.0 min CN=87 Runoff=93.12 cfs 6.963 af

Subcatchment 3S: EDA-3A Runoff Area=7.469 ac 0.86% Impervious Runoff Depth>3.47"
Flow Length=644' Tc=17.3 min CN=77 Runoff=21.68 cfs 2.159 af

Subcatchment 5S: EDA-5 Runoff Area=19.068 ac 9.99% Impervious Runoff Depth>3.67"
Flow Length=524' Tc=18.3 min CN=79 Runoff=57.28 cfs 5.828 af

Reach 6R: Design Point 2A, Wetland South of Track Inflow=93.12 cfs 6.963 af
Outflow=93.12 cfs 6.963 af

Reach 8R: Design Point 2, Sales Creek Inflow=21.68 cfs 2.159 af
Outflow=21.68 cfs 2.159 af

Reach 10R: Design Point 2C, Infield Pond Inflow=57.28 cfs 5.828 af
Outflow=57.28 cfs 5.828 af

Total Runoff Area = 45.047 ac Runoff Volume = 14.949 af Average Runoff Depth = 3.98"
73.66% Pervious = 33.182 ac 26.34% Impervious = 11.865 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 2S: EDA-2 Runoff Area=18.510 ac 53.47% Impervious Runoff Depth>7.21"
Tc=6.0 min CN=87 Runoff=144.92 cfs 11.115 af

Subcatchment 3S: EDA-3A Runoff Area=7.469 ac 0.86% Impervious Runoff Depth>5.98"
Flow Length=644' Tc=17.3 min CN=77 Runoff=37.03 cfs 3.720 af

Subcatchment 5S: EDA-5 Runoff Area=19.068 ac 9.99% Impervious Runoff Depth>6.22"
Flow Length=524' Tc=18.3 min CN=79 Runoff=95.90 cfs 9.883 af

Reach 6R: Design Point 2A, Wetland South of Track Inflow=144.92 cfs 11.115 af
Outflow=144.92 cfs 11.115 af

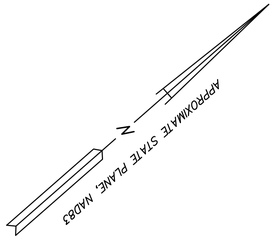
Reach 8R: Design Point 2, Sales Creek Inflow=37.03 cfs 3.720 af
Outflow=37.03 cfs 3.720 af

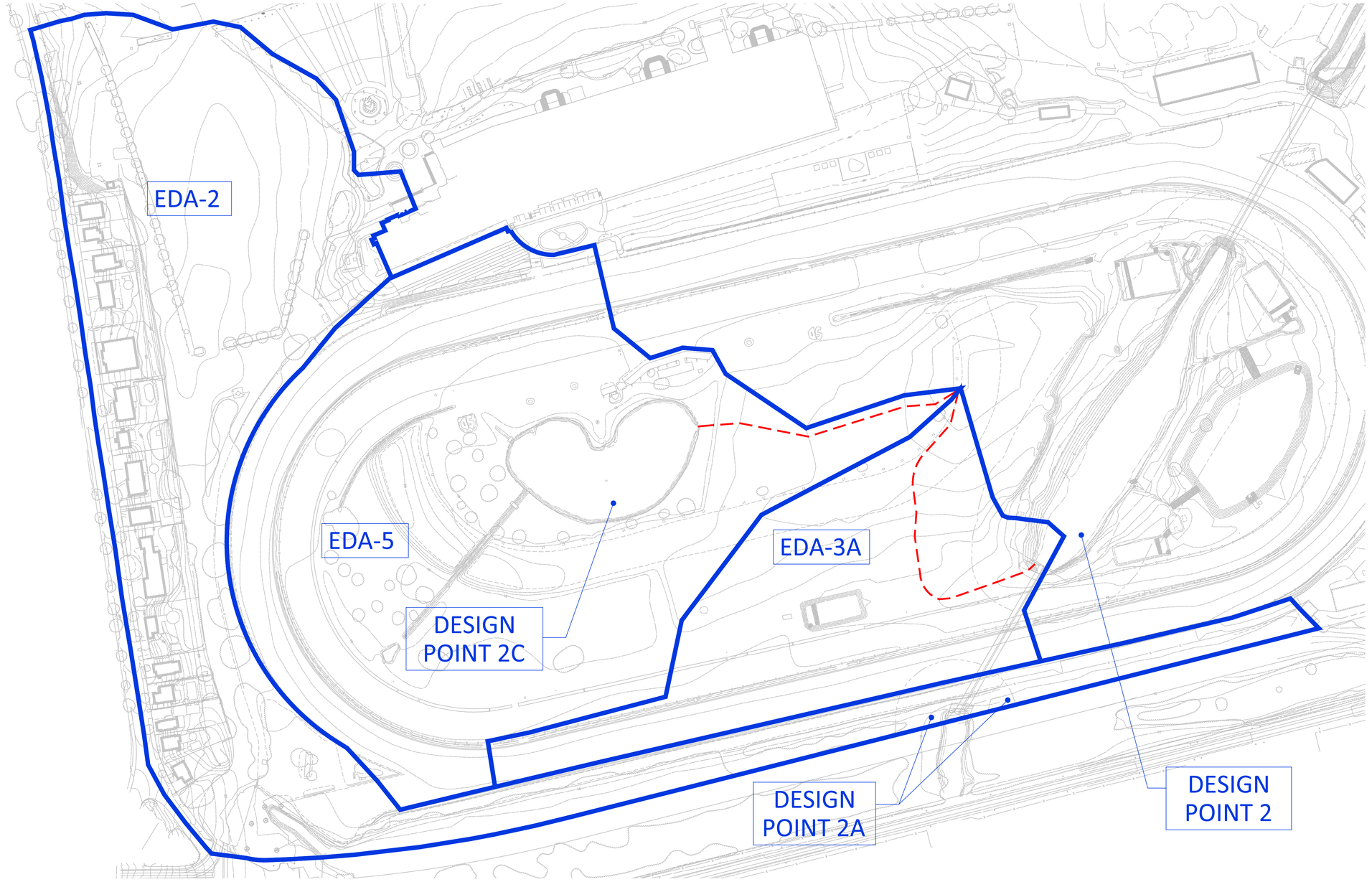
Reach 10R: Design Point 2C, Infield Pond Inflow=95.90 cfs 9.883 af
Outflow=95.90 cfs 9.883 af

Total Runoff Area = 45.047 ac Runoff Volume = 24.718 af Average Runoff Depth = 6.58"
73.66% Pervious = 33.182 ac 26.34% Impervious = 11.865 ac

Suffolk Downs

Boston, Massachusetts





LEGEND

WATERSHED BOUNDARY

TIME OF CONCENTRATION

NOTE: TIME OF CONCENTRATION'S NOT SHOWN ASSUMED TO BE 6 MINUTES.

METERS 0 10 25 50 75
FEET 0 50 100 200 300

B E A L S + T H O M A S
Civil Engineers + Landscape Architects +
Land Surveyors + Planners +
Environmental Specialists

B+T Drawing No. 285402P049A-001 Date: 11/30/2017 Scale: 1" = 100'

Pre-Development Conditions Hydrology Map

Phase 1

Appendix C
Post-Development Hydrologic Analysis

BEALS + THOMAS
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

CALCULATION SUMMARY

T 508.366.0560
F 508.366.4391
www.bealsandthomas.com
Regional Office: Plymouth, MA

JOB NO./LOCATION:

2854.02
Boston/Revere, Massachusetts

CLIENT/PROJECT:

HYM Investments, LLC
Suffolk Downs Redevelopment

SUBJECT/TITLE:

Proposed Conditions Hydrologic Analysis Phase 1

OBJECTIVE OF CALCULATION:

- To determine the post-development peak rates of runoff from the site for the 2, 10 and 100 year storm events

CALCULATION METHOD(S):

- CN and Tc determined based on TR-55 methodology.
- Runoff rates computed using HydroCAD version 10.0

ASSUMPTIONS:

- Surface cover types and boundaries have been estimated based upon MassGIS, USGS Color Ortho Imagery 2016, aerial photography viewed on Google Earth, and AutoCAD file 285402B004D.dwg
- Upgradient tributary area was based upon data obtained from the MassGIS Oliver program. Surface cover was based on aerial photography viewed on Google Earth.
- Wetland areas modeled as hydrologic soil class "D" soils. Urban Land, Udorthents, and Ipswich Mucky Peat Model as Hydrologic soil class "C" soils.
- Rainfall depth for 10-year storm event and 100-year storm event based on BWSC Climate Change Risk Assessment, Findings and Mitigation/Adaptation Strategies for Wastewater and Storm Drainage dated 01/28/2015.

SOURCES OF DATA/EQUATIONS:

- Alta/NSPS Land Title Survey, Suffolk Downs, Boston/Revere, Massachusetts, prepared by Beals and Thomas, Inc., dated 05/23/17.
- Post-Development Conditions Hydrologic Areas Map Phase 1, dated 11/30/2017 prepared by Beals and Thomas, Inc.
- TR-55 Urban Hydrology for Small Watersheds, SCS, 1986.
- NRCS Soil Survey for Middlesex Country downloaded from Web Soil Survey 2.0 on 05/04/2017.

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	AEMMS	12/21/17	E Cole	12/27/17	E. Cole	12/27/17

BEALS + THOMAS
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

CALCULATION SUMMARY

T 508.366.0560
F 508.366.4391
www.bealsandthomas.com
Regional Office: Plymouth, MA

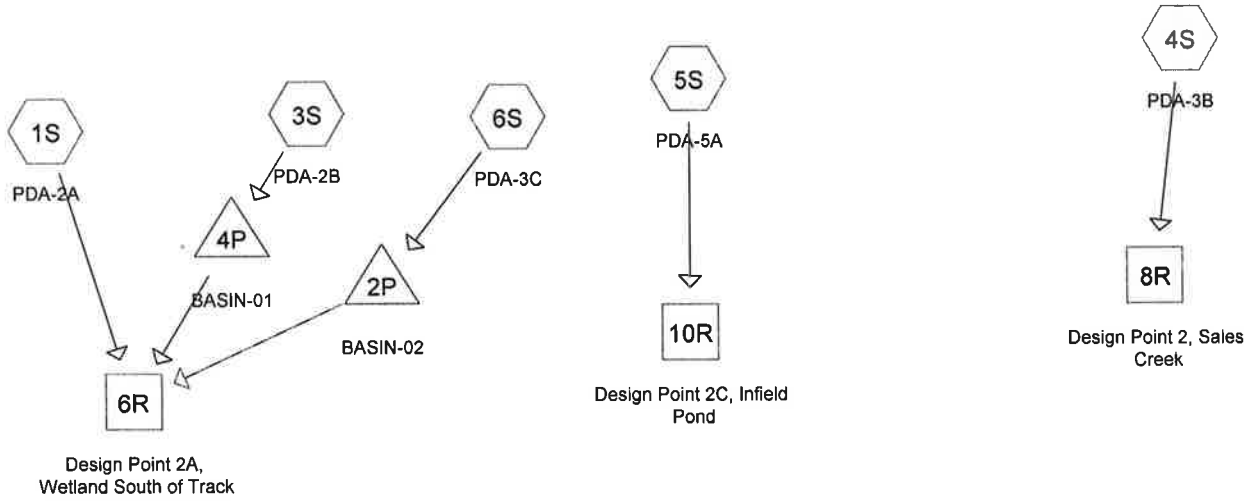
CONCLUSIONS:

The following numbers represent the peak rates of runoff from the site under existing conditions

Peak Rates of Runoff

Storm Event	Design Point 2 Sales Creek (cfs)	Design Point 2A Wetland South of the Track (cfs)	Design Point 2C Infield Pond (cfs)
2-year	5.60	34.59	17.18
10-year	16.60	85.23	49.52
100-year	28.35	137.36	83.72

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	[illegible]	12/21/17				



Subcat Reach Pond Link

Routing Diagram for 285400HC006B

Prepared by {enter your company name here}, Printed 12/19/2017

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.447	61	>75% Grass cover, Good, HSG B (1S, 5S)
21.793	74	>75% Grass cover, Good, HSG C (1S, 3S, 4S, 5S, 6S)
0.207	73	Brush, Good, HSG D (4S, 5S)
1.220	73	Brush, Good, HSG D (Wetland) (1S)
1.073	87	Dirt track, HSG C (4S)
0.635	96	Gravel surface, HSG C (1S)
1.686	98	Paved parking, HSG B (1S, 5S)
12.066	98	Paved parking, HSG C (1S, 3S, 4S, 5S, 6S)
0.727	98	Roofs, HSG B (1S, 5S)
2.833	98	Roofs, HSG C (1S, 5S, 6S)
0.061	98	Water Surface, HSG B (1S, 5S)
1.311	98	Water Surface, HSG C (1S, 4S, 5S)

Summary for Subcatchment 1S: PDA-2A

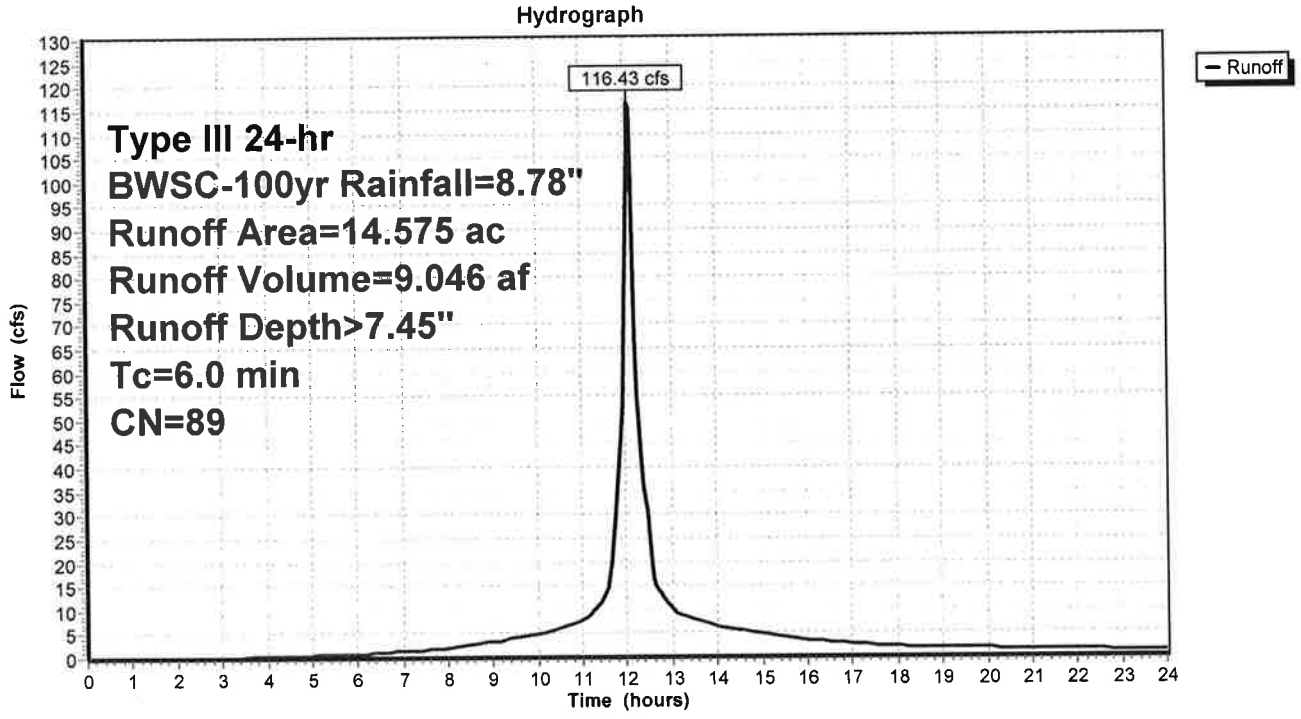
Runoff = 116.43 cfs @ 12.09 hrs, Volume= 9.046 af, Depth> 7.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr BWSC-100yr Rainfall=8.78"

	Area (ac)	CN	Description
*	1.220	73	Brush, Good, HSG D (Wetland)
	0.019	98	Roofs, HSG C
	0.433	98	Roofs, HSG B
	1.426	98	Paved parking, HSG B
	6.832	98	Paved parking, HSG C
	0.006	98	Water Surface, HSG C
	3.125	74	>75% Grass cover, Good, HSG C
	0.833	61	>75% Grass cover, Good, HSG B
	0.635	96	Gravel surface, HSG C
	0.046	98	Water Surface, HSG B
	14.575	89	Weighted Average
	5.813		39.88% Pervious Area
	8.762		60.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, direct enty**

Subcatchment 1S: PDA-2A



Summary for Subcatchment 3S: PDA-2B

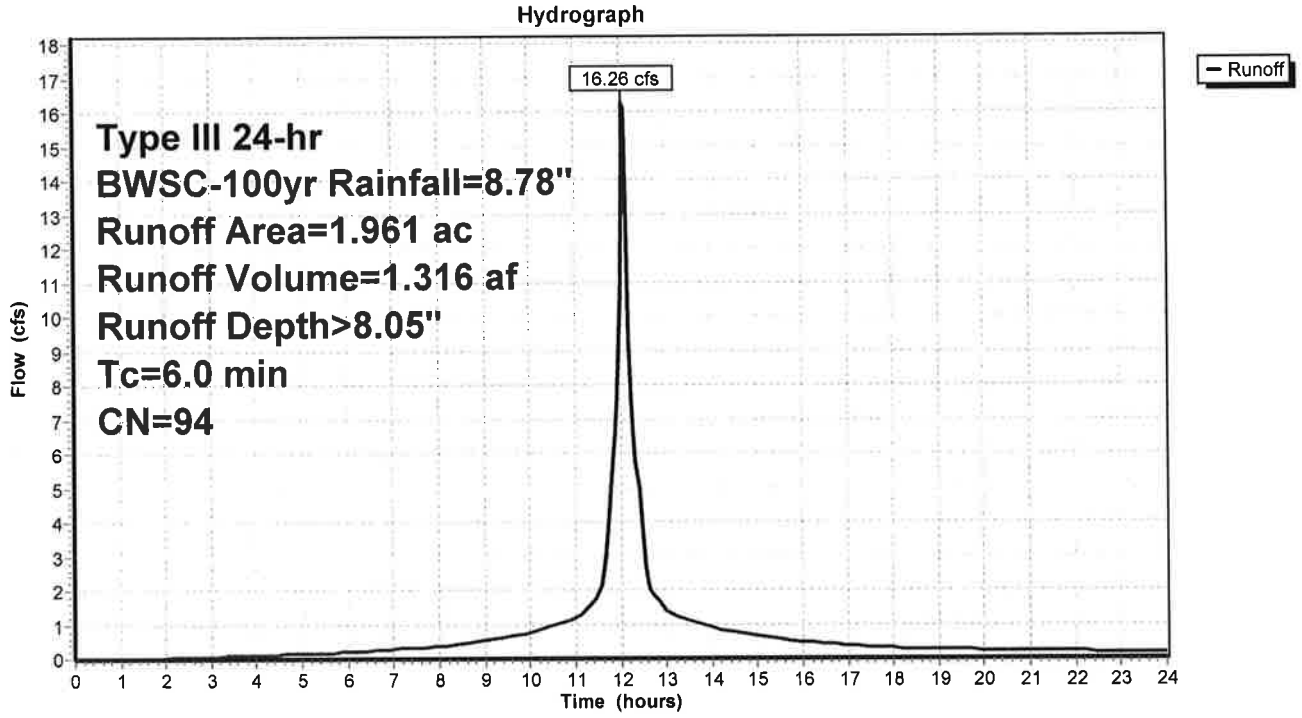
Runoff = 16.26 cfs @ 12.09 hrs, Volume= 1.316 af, Depth> 8.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr BWSC-100yr Rainfall=8.78"

Area (ac)	CN	Description
1.595	98	Paved parking, HSG C
0.366	74	>75% Grass cover, Good, HSG C
1.961	94	Weighted Average
0.366		18.66% Pervious Area
1.595		81.34% Impervious Area

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

Subcatchment 3S: PDA-2B



Summary for Subcatchment 4S: PDA-3B

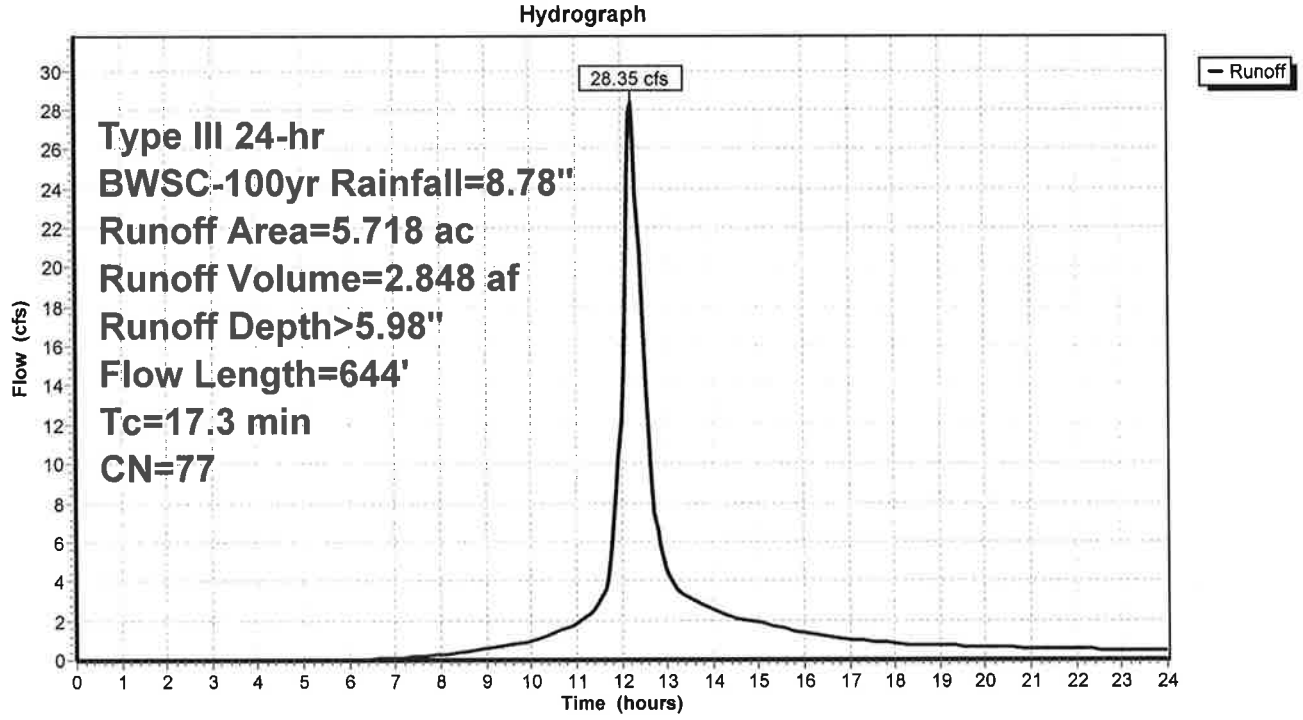
Runoff = 28.35 cfs @ 12.24 hrs, Volume= 2.848 af, Depth> 5.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr BWSC-100yr Rainfall=8.78"

	Area (ac)	CN	Description
	4.519	74	>75% Grass cover, Good, HSG C
*	1.073	87	Dirt track, HSG C
	0.006	98	Paved parking, HSG C
	0.062	73	Brush, Good, HSG D
	0.058	98	Water Surface, HSG C
	5.718	77	Weighted Average
	5.654		98.88% Pervious Area
	0.064		1.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	47	0.0217	0.15		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 3.20"
1.3	68	0.0150	0.86		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
2.0	89	0.0110	0.73		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
1.0	55	0.0180	0.94		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
0.7	46	0.0217	1.03		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
1.6	75	0.0130	0.80		**Shallow Concentrated Flow, Grass** Short Grass Pasture Kv= 7.0 fps
1.3	65	0.0150	0.86		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
3.1	118	0.0080	0.63		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.9	52	0.0190	0.96		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.2	16	0.0625	1.75		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.0	13	0.3846	4.34		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
17.3	644	Total			

Subcatchment 4S: PDA-3B



Summary for Subcatchment 5S: PDA-5A

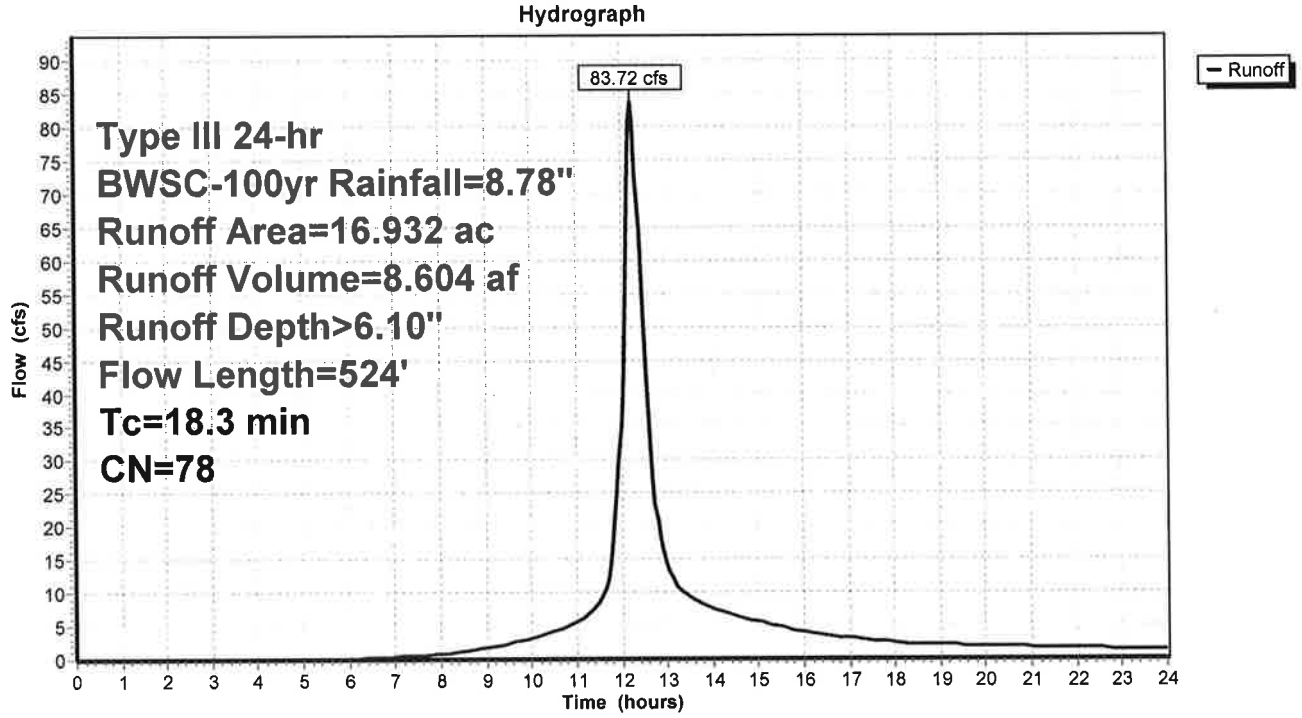
Runoff = 83.72 cfs @ 12.25 hrs, Volume= 8.604 af, Depth> 6.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr BWSC-100yr Rainfall=8.78"

Area (ac)	CN	Description
1.247	98	Water Surface, HSG C
13.004	74	>75% Grass cover, Good, HSG C
0.111	98	Roofs, HSG C
0.145	73	Brush, Good, HSG D
1.242	98	Paved parking, HSG C
0.260	98	Paved parking, HSG B
0.294	98	Roofs, HSG B
0.015	98	Water Surface, HSG B
0.614	61	>75% Grass cover, Good, HSG B
16.932	78	Weighted Average
13.763		81.28% Pervious Area
3.169		18.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		**Sheet Flow, grass** Grass: Short n= 0.150 P2= 3.20"
1.1	60	0.0167	0.90		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
6.6	197	0.0050	0.49		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
3.9	136	0.0070	0.59		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.7	44	0.0227	1.05		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.0	7	0.1429	2.65		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
0.4	30	0.0333	1.28		**Shallow Concentrated Flow, grass** Short Grass Pasture Kv= 7.0 fps
18.3	524	Total			

Subcatchment 5S: PDA-5A



Summary for Subcatchment 6S: PDA-3C

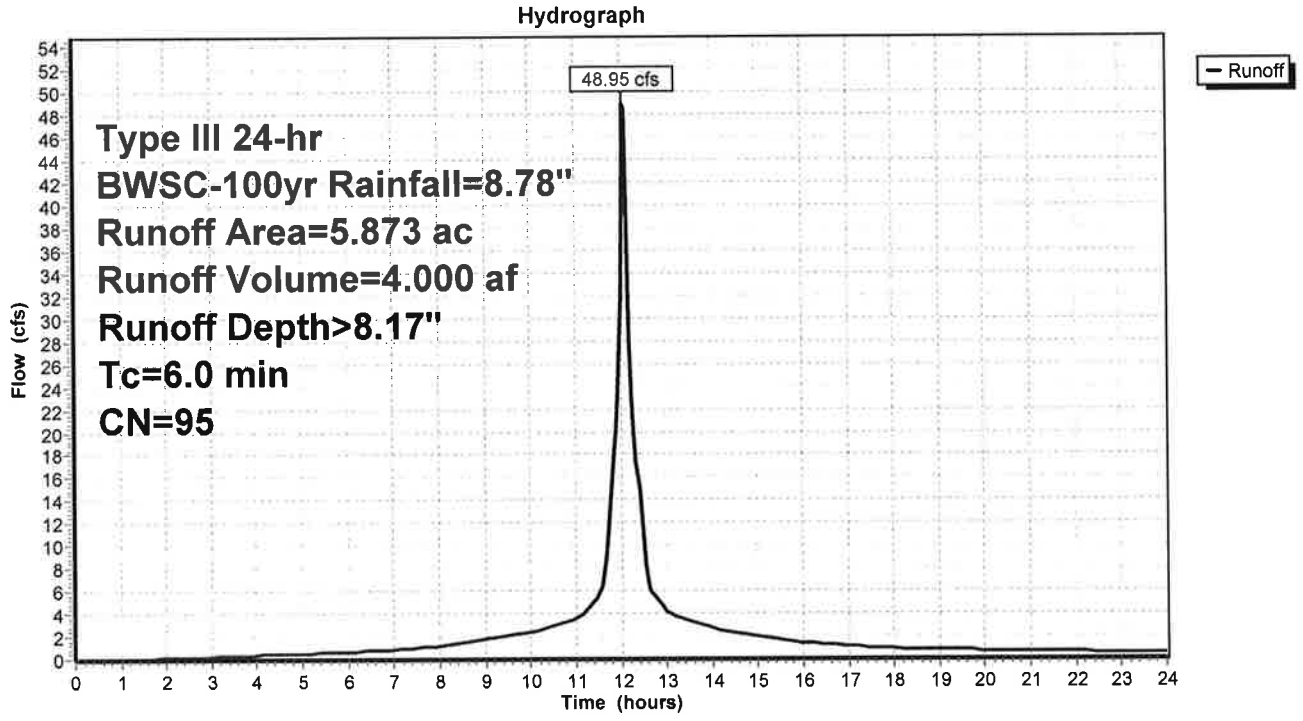
Runoff = 48.95 cfs @ 12.09 hrs, Volume= 4.000 af, Depth> 8.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type III 24-hr BWSC-100yr Rainfall=8.78"

Area (ac)	CN	Description
0.779	74	>75% Grass cover, Good, HSG C
2.391	98	Paved parking, HSG C
2.703	98	Roofs, HSG C
5.873	95	Weighted Average
0.779		13.26% Pervious Area
5.094		86.74% Impervious Area

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

Subcatchment 6S: PDA-3C

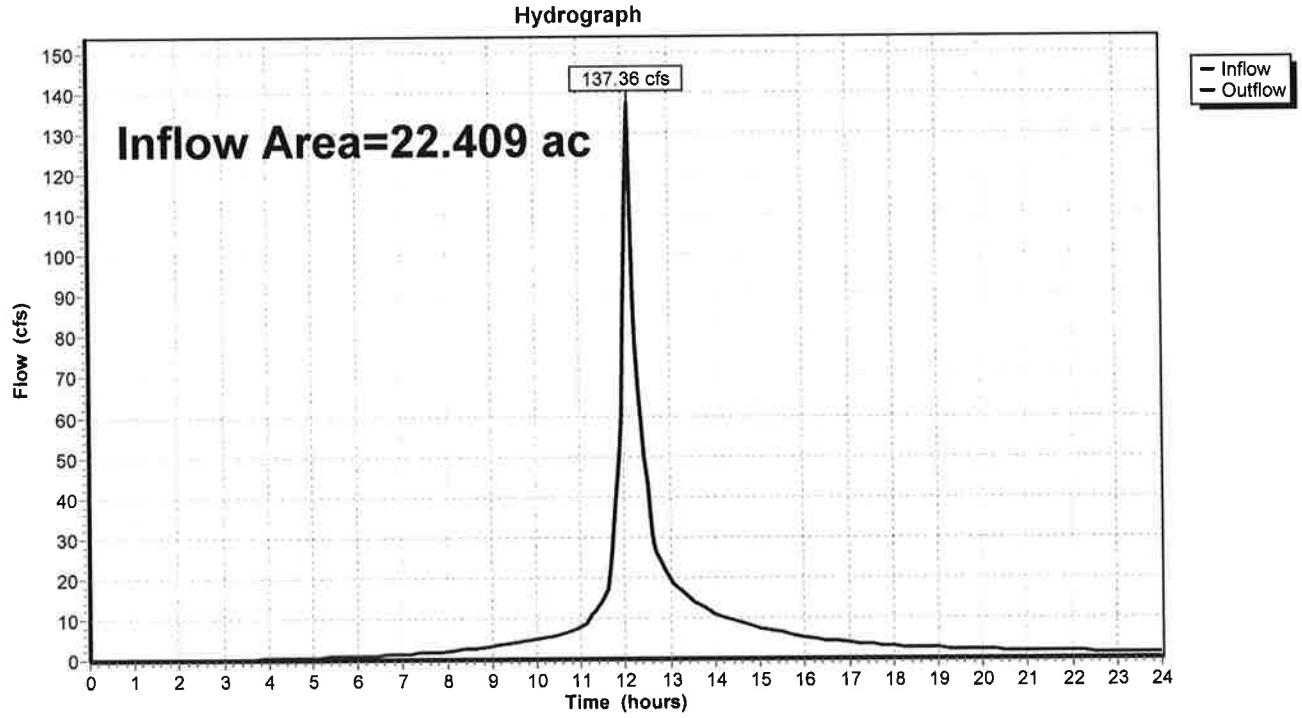


Summary for Reach 6R: Design Point 2A, Wetland South of Track

Inflow Area = 22.409 ac, 68.95% Impervious, Inflow Depth > 6.42" for BWSC-100yr event
Inflow = 137.36 cfs @ 12.09 hrs, Volume= 11.984 af
Outflow = 137.36 cfs @ 12.09 hrs, Volume= 11.984 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 6R: Design Point 2A, Wetland South of Track

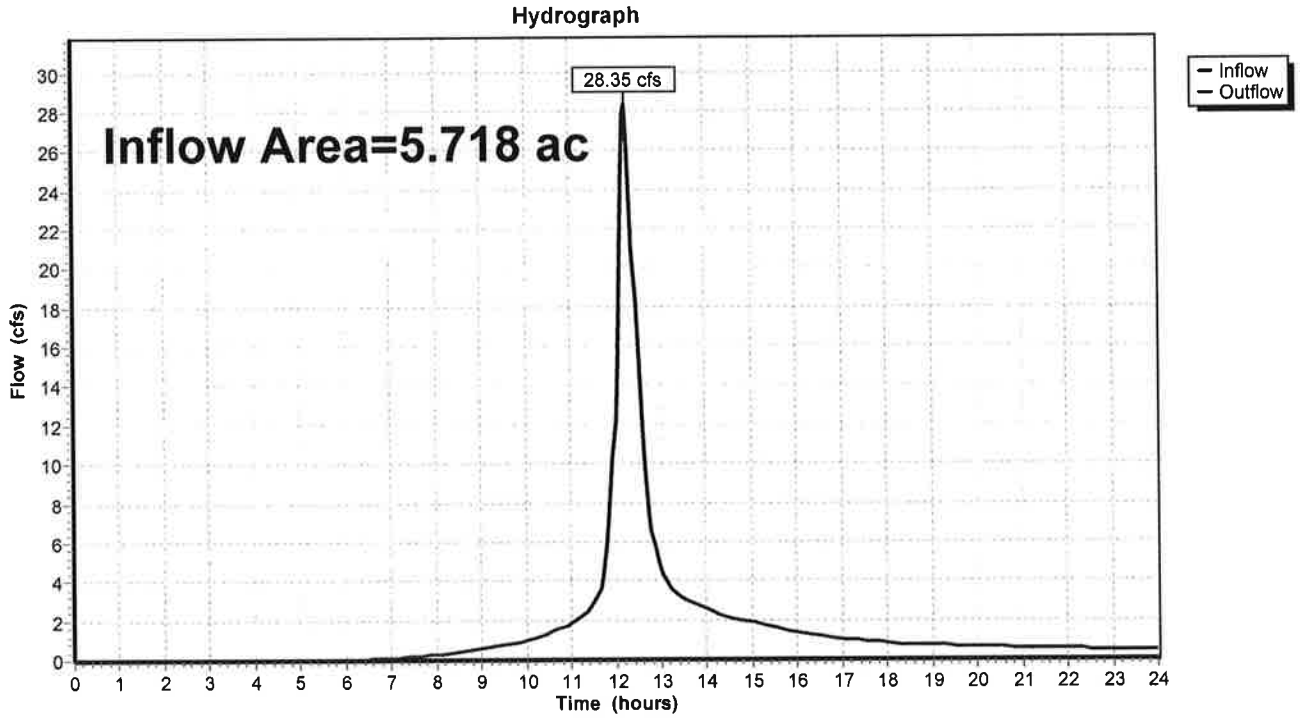


Summary for Reach 8R: Design Point 2, Sales Creek

Inflow Area = 5.718 ac, 1.12% Impervious, Inflow Depth > 5.98" for BWSC-100yr event
Inflow = 28.35 cfs @ 12.24 hrs, Volume= 2.848 af
Outflow = 28.35 cfs @ 12.24 hrs, Volume= 2.848 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 8R: Design Point 2, Sales Creek

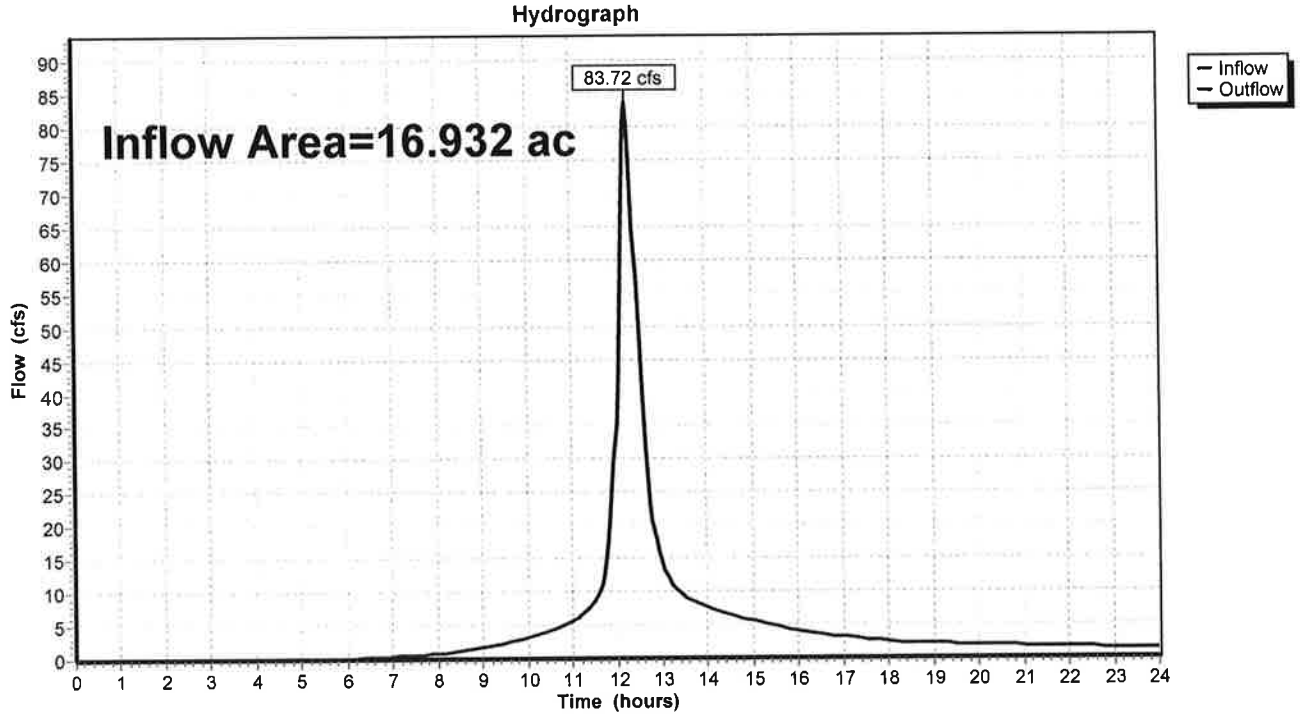


Summary for Reach 10R: Design Point 2C, Infield Pond

Inflow Area = 16.932 ac, 18.72% Impervious, Inflow Depth > 6.10" for BWSC-100yr event
Inflow = 83.72 cfs @ 12.25 hrs, Volume= 8.604 af
Outflow = 83.72 cfs @ 12.25 hrs, Volume= 8.604 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Reach 10R: Design Point 2C, Infield Pond



Summary for Pond 2P: BASIN-02

Inflow Area = 5.873 ac, 86.74% Impervious, Inflow Depth > 8.17" for BWSC-100yr event
Inflow = 48.95 cfs @ 12.09 hrs, Volume= 4.000 af
Outflow = 16.00 cfs @ 12.38 hrs, Volume= 2.763 af, Atten= 67%, Lag= 17.5 min
Discarded = 0.63 cfs @ 12.38 hrs, Volume= 0.736 af
Primary = 15.38 cfs @ 12.38 hrs, Volume= 2.027 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 18.67' @ 12.38 hrs Surf.Area= 18,840 sf Storage= 86,326 cf

Plug-Flow detention time= 193.8 min calculated for 2.763 af (69% of inflow)
Center-of-Mass det. time= 98.8 min (853.4 - 754.7)

Volume	Invert	Avail.Storage	Storage Description
#1	12.50'	112,875 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

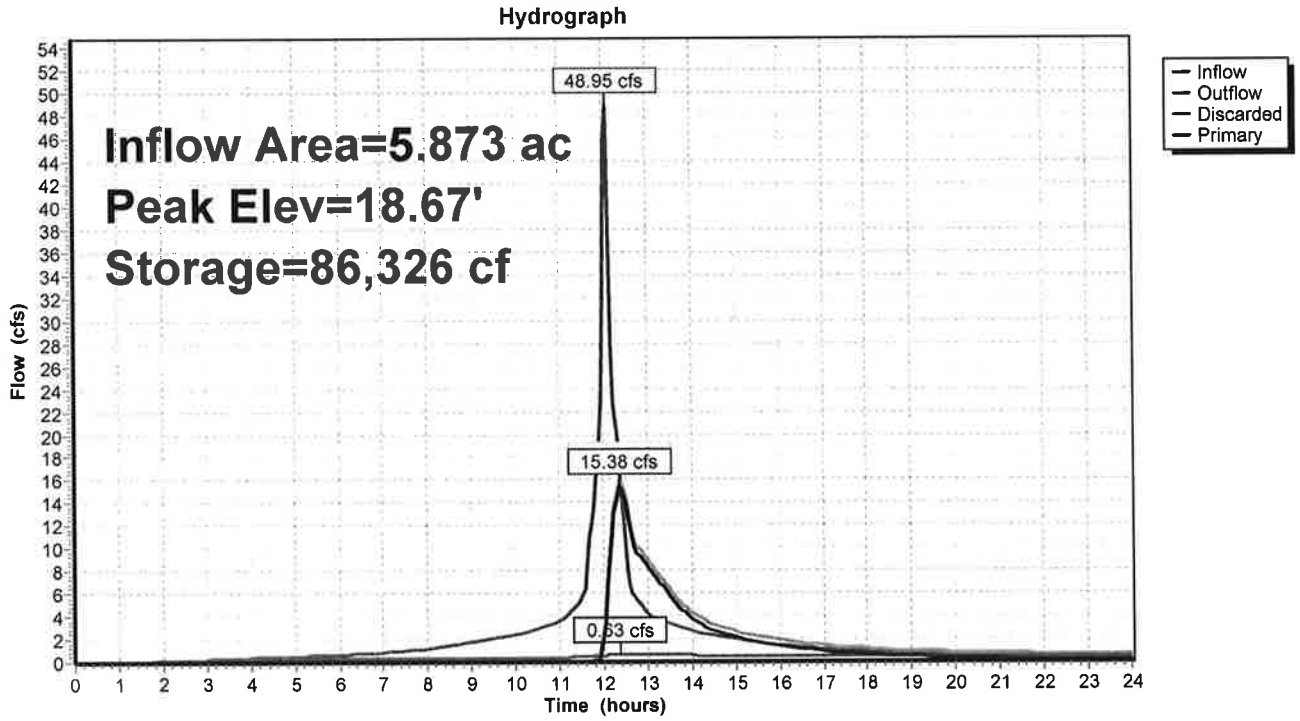
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
12.50	9,500	0	0
13.00	10,200	4,925	4,925
14.00	11,600	10,900	15,825
15.00	13,000	12,300	28,125
16.00	14,500	13,750	41,875
17.00	16,100	15,300	57,175
18.00	17,700	16,900	74,075
19.00	19,400	18,550	92,625
20.00	21,100	20,250	112,875

Device	Routing	Invert	Outlet Devices
#1	Discarded	12.50'	**1.070 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	16.70'	**15.0" Round Culvert X 2.00** L= 140.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 16.70' / 15.63' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#3	Primary	18.35'	**10.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.63 cfs @ 12.38 hrs HW=18.67' (Free Discharge)
└**1=Exfiltration** (Controls 0.63 cfs)

Primary OutFlow Max=15.29 cfs @ 12.38 hrs HW=18.67' (Free Discharge)
├**2=Culvert** (Inlet Controls 10.81 cfs @ 4.41 fps)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 4.48 cfs @ 1.41 fps)

Pond 2P: BASIN-02



Summary for Pond 4P: BASIN-01

Inflow Area = 1.961 ac, 81.34% Impervious, Inflow Depth > 8.05" for BWSC-100yr event
Inflow = 16.26 cfs @ 12.09 hrs, Volume= 1.316 af
Outflow = 15.21 cfs @ 12.12 hrs, Volume= 1.122 af, Atten= 6%, Lag= 1.9 min
Discarded = 0.16 cfs @ 12.12 hrs, Volume= 0.211 af
Primary = 15.05 cfs @ 12.12 hrs, Volume= 0.910 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 17.22' @ 12.12 hrs Surf.Area= 5,692 sf Storage= 11,247 cf

Plug-Flow detention time= 105.0 min calculated for 1.119 af (85% of inflow)
Center-of-Mass det. time= 42.3 min (801.1 - 758.8)

Volume	Invert	Avail.Storage	Storage Description
#1	14.50'	16,050 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

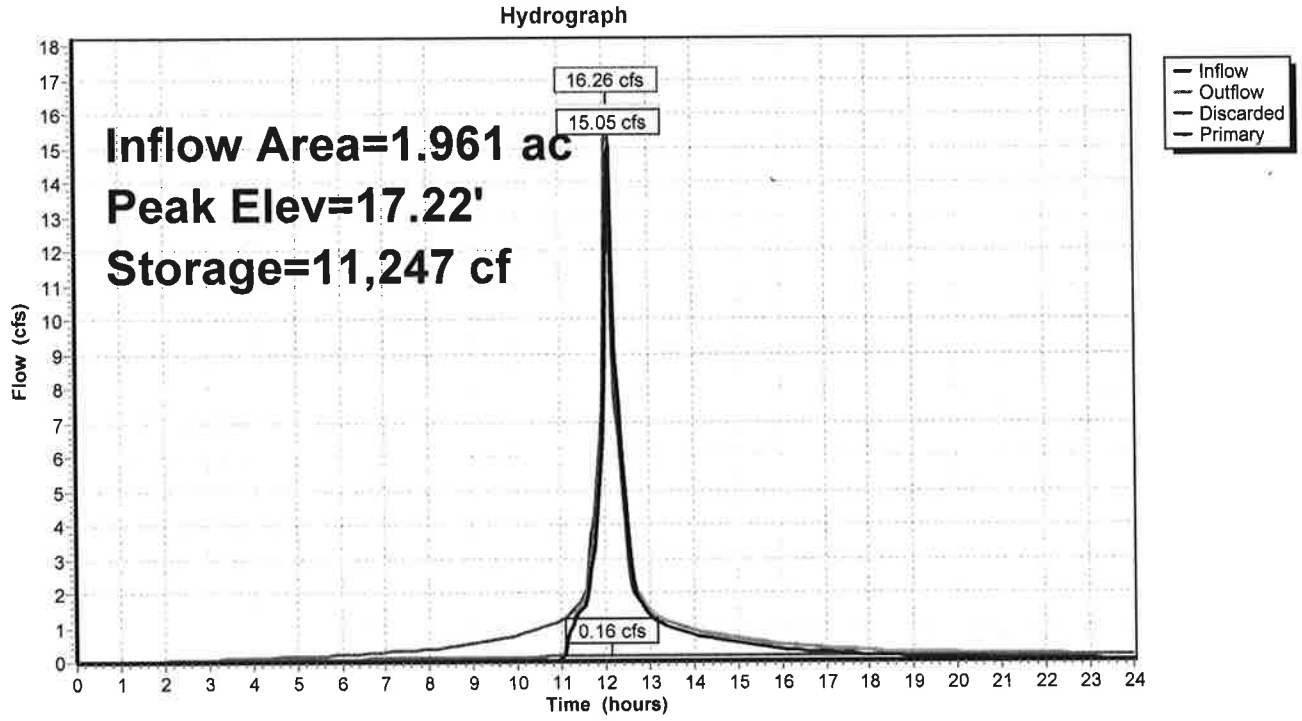
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
14.50	2,800	0	0
15.00	3,200	1,500	1,500
16.00	4,200	3,700	5,200
17.00	5,400	4,800	10,000
18.00	6,700	6,050	16,050

Device	Routing	Invert	Outlet Devices
#1	Discarded	14.50'	**1.070 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 0.00'
#2	Primary	16.70'	**15.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Discarded OutFlow Max=0.16 cfs @ 12.12 hrs HW=17.22' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.16 cfs)

Primary OutFlow Max=14.62 cfs @ 12.12 hrs HW=17.22' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 14.62 cfs @ 1.89 fps)

Pond 4P: BASIN-01



Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PDA-2A Runoff Area=14.575 ac 60.12% Impervious Runoff Depth>2.08"
Tc=6.0 min CN=89 Runoff=34.59 cfs 2.526 af

Subcatchment 3S: PDA-2B Runoff Area=1.961 ac 81.34% Impervious Runoff Depth>2.54"
Tc=6.0 min CN=94 Runoff=5.48 cfs 0.415 af

Subcatchment 4S: PDA-3B Runoff Area=5.718 ac 1.12% Impervious Runoff Depth>1.21"
Flow Length=644' Tc=17.3 min CN=77 Runoff=5.60 cfs 0.575 af

Subcatchment 5S: PDA-5A Runoff Area=16.932 ac 18.72% Impervious Runoff Depth>1.27"
Flow Length=524' Tc=18.3 min CN=78 Runoff=17.18 cfs 1.789 af

Subcatchment 6S: PDA-3C Runoff Area=5.873 ac 86.74% Impervious Runoff Depth>2.64"
Tc=6.0 min CN=95 Runoff=16.83 cfs 1.294 af

Reach 6R: Design Point 2A, Wetland South of Track Inflow=34.59 cfs 2.611 af
Outflow=34.59 cfs 2.611 af

Reach 8R: Design Point 2, Sales Creek Inflow=5.60 cfs 0.575 af
Outflow=5.60 cfs 0.575 af

Reach 10R: Design Point 2C, Infield Pond Inflow=17.18 cfs 1.789 af
Outflow=17.18 cfs 1.789 af

Pond 2P: BASIN-02 Peak Elev=15.74' Storage=38,116 cf Inflow=16.83 cfs 1.294 af
Discarded=0.42 cfs 0.519 af Primary=0.00 cfs 0.000 af Outflow=0.42 cfs 0.519 af

Pond 4P: BASIN-01 Peak Elev=16.80' Storage=8,966 cf Inflow=5.48 cfs 0.415 af
Discarded=0.14 cfs 0.169 af Primary=1.23 cfs 0.085 af Outflow=1.38 cfs 0.253 af

Total Runoff Area = 45.059 ac Runoff Volume = 6.600 af Average Runoff Depth = 1.76"
58.53% Pervious = 26.375 ac 41.47% Impervious = 18.684 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PDA-2A Runoff Area=14.575 ac 60.12% Impervious Runoff Depth>4.73"
Tc=6.0 min CN=89 Runoff=75.92 cfs 5.747 af

Subcatchment 3S: PDA-2B Runoff Area=1.961 ac 81.34% Impervious Runoff Depth>5.29"
Tc=6.0 min CN=94 Runoff=10.93 cfs 0.865 af

Subcatchment 4S: PDA-3B Runoff Area=5.718 ac 1.12% Impervious Runoff Depth>3.47"
Flow Length=644' Tc=17.3 min CN=77 Runoff=16.60 cfs 1.653 af

Subcatchment 5S: PDA-5A Runoff Area=16.932 ac 18.72% Impervious Runoff Depth>3.57"
Flow Length=524' Tc=18.3 min CN=78 Runoff=49.52 cfs 5.033 af

Subcatchment 6S: PDA-3C Runoff Area=5.873 ac 86.74% Impervious Runoff Depth>5.41"
Tc=6.0 min CN=95 Runoff=33.05 cfs 2.647 af

Reach 6R: Design Point 2A, Wetland South of Track Inflow=85.23 cfs 7.000 af
Outflow=85.23 cfs 7.000 af

Reach 8R: Design Point 2, Sales Creek Inflow=16.60 cfs 1.653 af
Outflow=16.60 cfs 1.653 af

Reach 10R: Design Point 2C, Infield Pond Inflow=49.52 cfs 5.033 af
Outflow=49.52 cfs 5.033 af

Pond 2P: BASIN-02 Peak Elev=17.49' Storage=65,241 cf Inflow=33.05 cfs 2.647 af
Discarded=0.54 cfs 0.678 af Primary=3.90 cfs 0.772 af Outflow=4.44 cfs 1.450 af

Pond 4P: BASIN-01 Peak Elev=17.11' Storage=10,575 cf Inflow=10.93 cfs 0.865 af
Discarded=0.15 cfs 0.195 af Primary=9.83 cfs 0.481 af Outflow=9.99 cfs 0.676 af

Total Runoff Area = 45.059 ac Runoff Volume = 15.945 af Average Runoff Depth = 4.25"
58.53% Pervious = 26.375 ac 41.47% Impervious = 18.684 ac

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: PDA-2A Runoff Area=14.575 ac 60.12% Impervious Runoff Depth>7.45"
Tc=6.0 min CN=89 Runoff=116.43 cfs 9.046 af

Subcatchment 3S: PDA-2B Runoff Area=1.961 ac 81.34% Impervious Runoff Depth>8.05"
Tc=6.0 min CN=94 Runoff=16.26 cfs 1.316 af

Subcatchment 4S: PDA-3B Runoff Area=5.718 ac 1.12% Impervious Runoff Depth>5.98"
Flow Length=644' Tc=17.3 min CN=77 Runoff=28.35 cfs 2.848 af

Subcatchment 5S: PDA-5A Runoff Area=16.932 ac 18.72% Impervious Runoff Depth>6.10"
Flow Length=524' Tc=18.3 min CN=78 Runoff=83.72 cfs 8.604 af

Subcatchment 6S: PDA-3C Runoff Area=5.873 ac 86.74% Impervious Runoff Depth>8.17"
Tc=6.0 min CN=95 Runoff=48.95 cfs 4.000 af

Reach 6R: Design Point 2A, Wetland South of Track Inflow=137.36 cfs 11.984 af
Outflow=137.36 cfs 11.984 af

Reach 8R: Design Point 2, Sales Creek Inflow=28.35 cfs 2.848 af
Outflow=28.35 cfs 2.848 af

Reach 10R: Design Point 2C, Infield Pond Inflow=83.72 cfs 8.604 af
Outflow=83.72 cfs 8.604 af

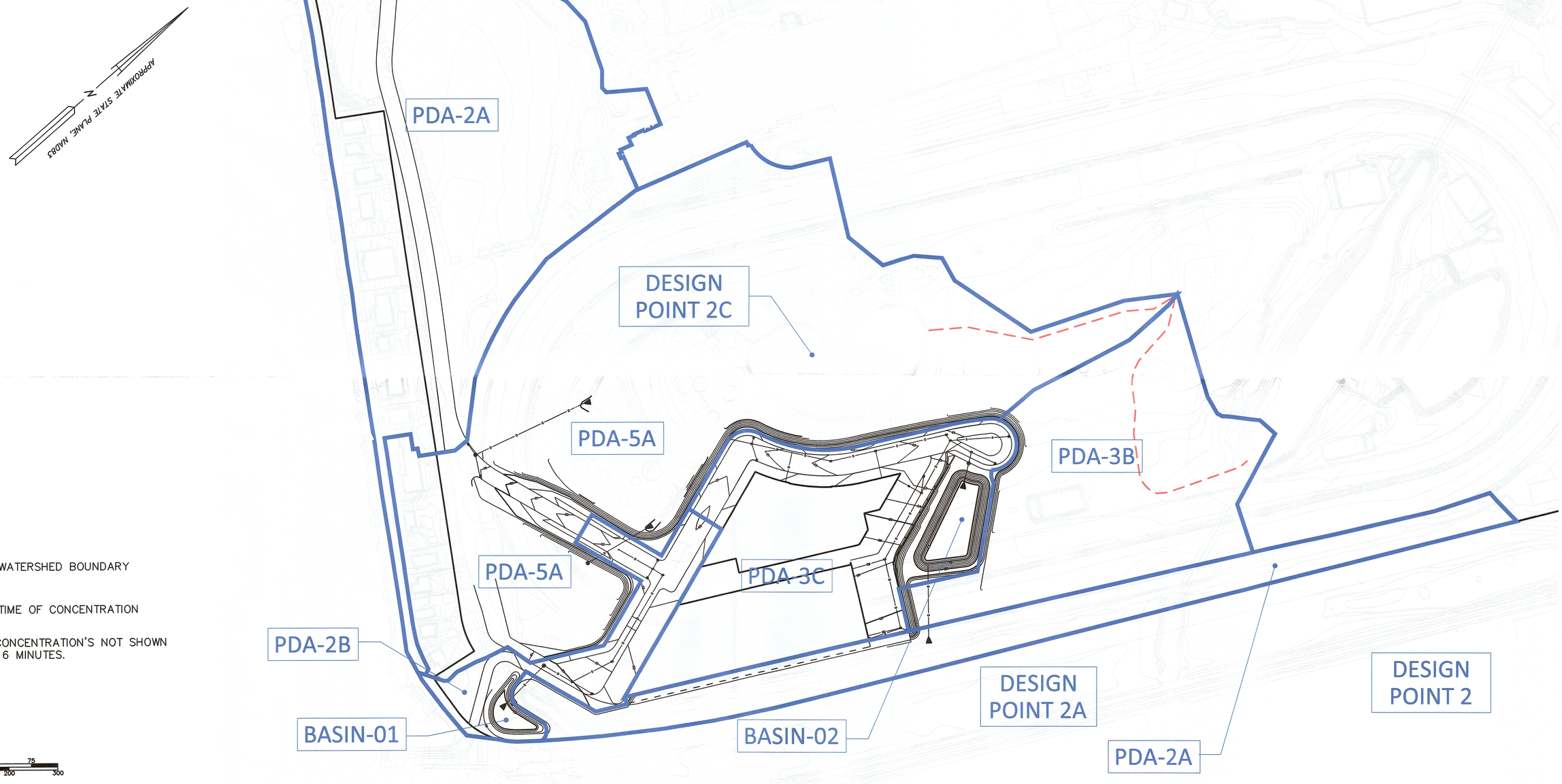
Pond 2P: BASIN-02 Peak Elev=18.67' Storage=86,326 cf Inflow=48.95 cfs 4.000 af
Discarded=0.63 cfs 0.736 af Primary=15.38 cfs 2.027 af Outflow=16.00 cfs 2.763 af

Pond 4P: BASIN-01 Peak Elev=17.22' Storage=11,247 cf Inflow=16.26 cfs 1.316 af
Discarded=0.16 cfs 0.211 af Primary=15.05 cfs 0.910 af Outflow=15.21 cfs 1.122 af

Total Runoff Area = 45.059 ac Runoff Volume = 25.815 af Average Runoff Depth = 6.87"
58.53% Pervious = 26.375 ac 41.47% Impervious = 18.684 ac

Suffolk Downs

Boston, Massachusetts



LEGEND

WATERSHED BOUNDARY

TIME OF CONCENTRATION

NOTE: TIME OF CONCENTRATION'S NOT SHOWN ASSUMED TO BE 6 MINUTES.

METERS 0 10 25 50 75
FEET 0 50 100 200 300

B E A L S + T H O M A S
Civil Engineers + Landscape Architects +
Land Surveyors + Planners +
Environmental Specialists

B+T Drawing No. 285402P049A-002 Date: 11/30/2017 Scale: 1" = 100'

Post-Development Conditions Hydrology Map

Phase 1

Appendix D
TSS Removal, Water Quality Volume, and Recharge Calculations

BEALS + THOMAS

Standard 3: Groundwater Recharge

Groundwater Recharge Volume Required:

Rv = F x Impervious Area, where:

Rv = Required Recharge Volume [Ac-ft]

F = Target Depth Factor associated with each Hydrologic Soil Group (HSG) [in]

Impervious Area = Total Impervious Area Increase under Post-development Conditions [Ac]

			Impervious Area [Acres]	Required Recharge Volume [Ac-ft]	
HSG "A", use F =	0.6	in	0.000	0.000	
HSG "B", use F =	0.35	in	0.000	0.000	
HSG "C", use F =	0.25	in	6.841	0.143	
HSG "D", use F =	0.1	in	0.000	0.000	
Total Required Recharge Volume (Rv) =				**0.143**	**Ac-ft**

Capture Area Adjustment: (Ref: DEP Handbook V.3 Ch.1 P.27-28)

Total Site Impervious Area (Total)=	6.841	Acres
Impervious Area Draining to Infiltrative BMPs (infil) =	6.69	Acres
Percent Imp. Area Draining to Infiltrative BMPs =	97.8%	
Capture Area Adjustment Factor = (Total)/(Infil) = Ca =	1.02	
Adjusted Required Recharge Volume = Ca x Rv	**0.146**	**Ac-ft**

Groundwater Recharge Volume Provided :

BMP	Provided Recharge Volume [Ac-ft]	
Infiltration Basin 1 =	0.194	
Infiltration Basin 2 =	1.203	
Total Provided Recharge Volume =	**1.397**	**Ac-ft**

PROVIDED GROUNDWATER RECHARGE VOLUME IS GREATER THAN OR EQUAL TO THE REQUIRED RECHARGE VOLUME, THEREFORE PROPOSED STORMWATER MANAGEMENT DESIGN IS IN COMPLIANCE WITH STANDARD 3.

JOB NO. 2854.03

JOB: Suffolk Downs Phase 1 Design

COMPUTED BY: EAE

DATE: 12/27/17

CHECKED BY: EAS

DATE: 12/28/17

BEALS + THOMAS

Proprietary Water Quality Inlet Sizing

Step 1: Define Minimum Flow Rate per Water Quality Inlet to Treat Desired Water Quality Volume

Water quality inlets are sized based on flow rate; therefore expressing Water Quality Volume as a flow rate based on the percentage of cumulative average volume captured ensures systems are sized to achieve the desired Water Quality treatment level.

$Q = (q_u)(A)(WQV)$ where:

Q = peak flow rate associated with first 1.0-inch of runoff [CFS]

q_u = The Peak Discharge [CFS/mi^2/in] Massachusetts DEP Standard Method to Convert Required Water Quality Volume to a Discharge Rate for Sizing Flow Based Manufactured Proprietary Stormwater Treatment Practices

A = Contributing Drainage Area, Impervious Surface Only [Ac]

WQV = The Water Quality Treatment Depth [In]

WQI No.	A (Ac)	Tc (Min)	WQV (in)	q_u (csm/in)	Q (cfs)
WQI-1	5.32	6.0	1.0	774	6.43
WQI-A	0.41	6.0	1.0	774	0.49
WQI-C	1.99	6.0	1.0	774	2.41
Total	7.72	Acres			

Step 2: Size Water Quality Inlet as recommended by Manufacturer

See attached Sizing Report(s) for recommended model(s).

Step 3: Water Quality Volume Provided by WQI unit(s)

Total Impervious Area Treated by WQI unit(s): 7.72 Acres

336,240 SF

Treated Water Quality Depth : 1.0 inches

(accounted for by Average Water Quality Flow Rate)

Total Water Quality Volume provided by Water Quality Inlets: 28,020 CF

JOB NO. Suffolk Downs Phase 1 Design COMPUTED BY: EAE CHECKED BY: EAE

JOB: 2854.03 DATE: 12/27/17 DATE: 12/28/17

BEALS + THOMAS

Standard 3: Drawdown

$$\text{Drawdown Time} = \frac{Rv}{(K)\,(\text{Bottom Area})}$$

where:

Rv = Storage Volume Below Outlet [Ac-ft]
K= Infiltration Rate [in/hr]
Bottom Area= Bottom Area of Recharge System [Ac]

Infiltration Basin 1

Rv =	0.194 Ac-ft	
K =	1.070 in/hr	
Bottom Area =	0.064 Acres	
Drawdown Time =	**33.820 Hours**	*< 72 Hours, Design is in compliance with the standard.*

Infiltration Basin 2

Rv =	1.203 Ac-ft	
K =	1.070 in/hr	
Bottom Area =	0.219 Acres	
Drawdown Time =	**61.605 Hours**	*< 72 Hours, Design is in compliance with the standard.*

Note:

1. The infiltration BMPs have been designed to fully drain within 72 hours, therefore the proposed stormwater management design is in compliance with Standard 3 .

2. Infiltration Rate based on Volume 3, Chapter 1, Table 2.3.3 *Rawls Rates* from the 2008 MA DEP Stormwater Management Handbook.

JOB NO. 2854.03 COMPUTED BY: EAE CHECKED BY: EAC

JOB: Suffolk Downs Phase 1 Design DATE: 12/22/17 DATE: 12/28/17

BEALS + THOMAS

TSS Removal

TSS Removal Calculation Worksheet

Location: Infiltration Basin 1

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	0.25	1.00	0.25	0.75
Water Quality Inlet	0.81	0.75	0.61	0.14
Infiltration Basin	0.55	0.14	0.08	0.06

Total TSS Removal = 94%

44% Pretreatment Provided Prior to Infiltration

JOB NO. 2854.02
JOB: Phase 1

COMPUTED BY: EAE
DATE: 12/22/17

CHECKED BY: EAE
DATE: 12/28/17

BEALS + THOMAS

TSS Removal

Location: Infiltration Basin 2

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	0.25	1.00	0.25	0.75
Water Quality Inlet	0.83	0.75	0.62	0.13
Infiltration Basin	0.55	0.13	0.07	0.06

Total TSS Removal = 94%

44% Pretreatment Provided Prior to Infiltration

JOB NO. 2854.02
JOB: Phase 1

COMPUTED BY: EAE
DATE: 12/22/17

CHECKED BY: EAE
DATE: 12/28/17

BEALS + THOMAS

TSS Removal

Location: WQI-A

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	0.25	1.00	0.25	0.75
Water Quality Inlet	0.87	0.75	0.65	0.10

Total TSS Removal = 90%

JOB NO. 2854.02
JOB: Phase 1

COMPUTED BY: EAE
DATE: 12/27/17

CHECKED BY: EAC
DATE: 12/28/17

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

PHASE 1 CONFIDENTIAL PROJECT
BOSTON, MA

Area	5.09 ac	Unit Site Designation	WQI C
Weighted C	0.9	Rainfall Station #	69
t_c	6 min		
CDS Model	3035-6	CDS Treatment Capacity	**7.6 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.09	0.09	9.8
0.04	9.6%	19.8%	0.18	0.18	9.2
0.06	9.4%	29.3%	0.27	0.27	9.0
0.08	7.7%	37.0%	0.37	0.37	7.3
0.10	8.6%	45.6%	0.46	0.46	8.0
0.12	6.3%	51.9%	0.55	0.55	5.8
0.14	4.7%	56.5%	0.64	0.64	4.3
0.16	4.6%	61.2%	0.73	0.73	4.2
0.18	3.5%	64.7%	0.82	0.82	3.2
0.20	4.3%	69.1%	0.92	0.92	3.9
0.25	8.0%	77.1%	1.15	1.15	7.0
0.30	5.6%	82.7%	1.37	1.37	4.7
0.35	4.4%	87.0%	1.60	1.60	3.6
0.40	2.5%	89.5%	1.83	1.83	2.0
0.45	2.5%	92.1%	2.06	2.06	2.0
0.50	1.4%	93.5%	2.29	2.29	1.1
0.75	5.0%	98.5%	3.44	3.44	3.4
1.00	1.0%	99.5%	4.58	4.58	0.6
1.50	0.0%	99.5%	6.87	6.87	0.0
2.00	0.0%	99.5%	9.16	7.60	0.0
3.00	0.5%	100.0%	13.74	7.60	0.1
					89.0
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.3%
				Predicted Net Annual Load Removal Efficiency =	**82.5%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

PHASE 1 CONFIDENTIAL PROJECT
BOSTON, MA

Area	0.30 ac	Unit Site Designation	WQI A
Weighted C	0.9	Rainfall Station #	69
t_c	6 min		
CDS Model	1515-3	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	9.9
0.04	9.6%	19.8%	0.01	0.01	9.3
0.06	9.4%	29.3%	0.02	0.02	9.1
0.08	7.7%	37.0%	0.02	0.02	7.4
0.10	8.6%	45.6%	0.03	0.03	8.2
0.12	6.3%	51.9%	0.03	0.03	6.0
0.14	4.7%	56.5%	0.04	0.04	4.4
0.16	4.6%	61.2%	0.04	0.04	4.4
0.18	3.5%	64.7%	0.05	0.05	3.3
0.20	4.3%	69.1%	0.05	0.05	4.1
0.25	8.0%	77.1%	0.07	0.07	7.4
0.30	5.6%	82.7%	0.08	0.08	5.1
0.35	4.4%	87.0%	0.09	0.09	4.0
0.40	2.5%	89.5%	0.11	0.11	2.3
0.45	2.5%	92.1%	0.12	0.12	2.2
0.50	1.4%	93.5%	0.14	0.14	1.2
0.75	5.0%	98.5%	0.20	0.20	4.2
1.00	1.0%	99.5%	0.27	0.27	0.8
1.50	0.0%	99.5%	0.41	0.41	0.0
2.00	0.0%	99.5%	0.54	0.54	0.0
3.00	0.5%	100.0%	0.81	0.81	0.2
					93.4
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**87.0%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

CDS ESTIMATED NET ANNUAL SOLIDS LOAD REDUCTION BASED ON THE RATIONAL RAINFALL METHOD

PHASE 1 CONFIDENTIAL PROJECT
BOSTON, MA

Area	2.91 ac	Unit Site Designation	WQI 1
Weighted C	0.9	Rainfall Station #	69
t_c	6 min		
CDS Model	3020-6	CDS Treatment Capacity	**3.9 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.05	0.05	9.8
0.04	9.6%	19.8%	0.10	0.10	9.2
0.06	9.4%	29.3%	0.16	0.16	8.9
0.08	7.7%	37.0%	0.21	0.21	7.2
0.10	8.6%	45.6%	0.26	0.26	8.0
0.12	6.3%	51.9%	0.31	0.31	5.8
0.14	4.7%	56.5%	0.37	0.37	4.2
0.16	4.6%	61.2%	0.42	0.42	4.2
0.18	3.5%	64.7%	0.47	0.47	3.2
0.20	4.3%	69.1%	0.52	0.52	3.8
0.25	8.0%	77.1%	0.65	0.65	6.9
0.30	5.6%	82.7%	0.79	0.79	4.7
0.35	4.4%	87.0%	0.92	0.92	3.6
0.40	2.5%	89.5%	1.05	1.05	2.0
0.45	2.5%	92.1%	1.18	1.18	1.9
0.50	1.4%	93.5%	1.31	1.31	1.0
0.75	5.0%	98.5%	1.96	1.96	3.2
1.00	1.0%	99.5%	2.62	2.62	0.5
1.50	0.0%	99.5%	3.93	3.90	0.0
2.00	0.0%	99.5%	5.24	3.90	0.0
3.00	0.5%	100.0%	7.86	3.90	0.1
					88.3
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.3%
				Predicted Net Annual Load Removal Efficiency =	**81.8%**

1 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

BEALS + THOMAS
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

CALCULATION SUMMARY

T 508.366.0560
F 508.366.4391
www.bealsandthomas.com
Regional Office: Plymouth, MA

JOB NO./LOCATION:

2854.03
East Boston, MA

CLIENT/PROJECT:

HYM Investment Group, LLC
Phase 1 Suffolk Downs Redevelopment

SUBJECT/TITLE:

Groundwater Mounding Calculations for Stormwater Basin #2

OBJECTIVE OF CALCULATION:

- To determine the maximum groundwater mounding height beneath Stormwater Basin #2

CALCULATION METHOD(S):

- Estimated maximum groundwater mounding height calculated using the Hantush Method.

ASSUMPTIONS:

- Recharge rate is equal to the vertical hydraulic conductivity of the soil beneath the over excavated basin = 1.07 in/hr = 2.14 ft/day
- Vertical hydraulic conductivity is assumed to be 55 micrometers/second based on web soil survey.
- Horizontal hydraulic conductivity is assumed to be 10 times the vertical hydraulic conductivity=157.28 ft/day.
- Specific yield = 0.03 for sandy clay loam.
- Groundwater elevation assumed to be at 10 feet based on GEI groundwater mapping.
- Average length of basin = 154.5 feet; ½ length of basin = 77.25 feet.
- Average width of basin = 61.5 feet; ½ width of basin = 30.75 feet.
- Stormwater basin #2 takes 61.605 hours to dewater; modeled as 2.57 days.
- Initial thickness of saturated zone = depth of the aquifer or confining layer beneath the basin. Initial thickness of saturated zone = 30 feet. Initial thickness of saturated zone obtained from Report of Geotechnical Due Diligence Evaluation Proposed Development Suffolk Downs Racetrack Site Boston/Revere, Massachusetts prepared by Haley & Aldrich, Inc, dated January 2017.

SOURCES OF DATA/EQUATIONS:

- Hantush equation spreadsheet published by the USGS.
- Web Soil Survey of area.
- Groundwater Elevation Contours for the Phase I/Phase II Environmental Site Assessment of Suffolk Downs, prepared by GEI, dated December 27, 2006.
- Site and Susurface Conditions Plan, prepared by Haley and Aldrich, dated January 2017.

CONCLUSIONS:

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	LEmms	12/21/17	E. Clark	12/27/17	E. Clark	12/27/17

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Regional Office: Plymouth, MA

The mounding analysis indicated that the groundwater elevation would rise approximately 2.144 feet if it were to infiltrate the entire volume of water beneath the first outlet. Therefore it can be concluded that the rise in groundwater elevation will not prohibit the basin from dewatering within 72 hours.

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	L Ennis	12/21/17	E. Clark	12/22/17	E Clark	12/22/17

This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.
Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

use consistent units (e.g. feet & days **or** inches & hours)

Conversion Table

inch/hour	feet/day
0.67	1.33
2.00	4.00

hours	days
36	1.50

In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).

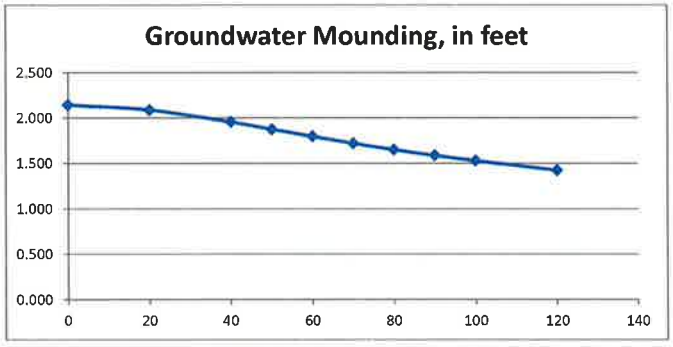
Input Values

2.1400	*R*	**Recharge (infiltration) rate (feet/day)**
0.030	Sy	**Specific yield, Sy (dimensionless, between 0 and 1)**
157.30	K	**Horizontal hydraulic conductivity, Kh (feet/day)***
30.750	x	**1/2 length of basin (x direction, in feet)**
77.250	y	**1/2 width of basin (y direction, in feet)**
2.570	t	**duration of infiltration period (days)**
30.000	hi(0)	**initial thickness of saturated zone (feet)**

32.144	h(max)	**maximum thickness of saturated zone (beneath center of basin at end of infiltration period)**
2.144	Δh(max)	**maximum groundwater mounding (beneath center of basin at end of infiltration period)**

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
2.144	0
2.090	20
1.955	40
1.876	50
1.796	60
1.721	70
1.651	80
1.587	90
1.529	100
1.424	120

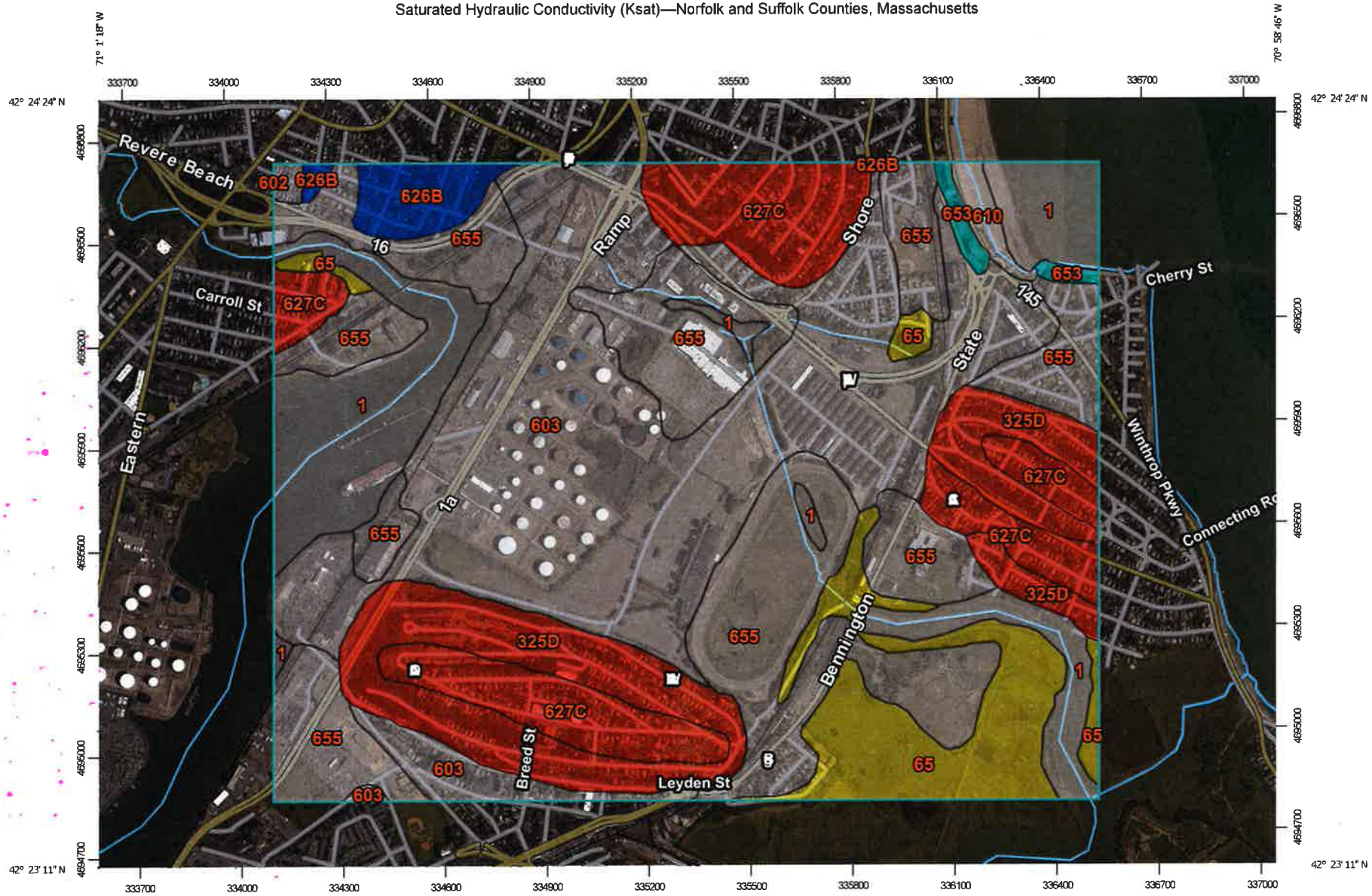
Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

Saturated Hydraulic Conductivity (Ksat)—Norfolk and Suffolk Counties, Massachusetts



Map Scale: 1:15,800 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 200 400 800 1200

Feet: 0 500 1000 2000 3000

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 Rating Polygons
- <= 12.9254
- > 12.9254 and <= 55.0000
- > 55.0000 and <= 70.7800
- > 70.7800 and <= 100.0000
- Not rated or not available

Soil Rating Lines
- <= 12.9254
- > 12.9254 and <= 55.0000
- > 55.0000 and <= 70.7800
- > 70.7800 and <= 100.0000
- Not rated or not available

Soil Rating Points
- <= 12.9254
- > 12.9254 and <= 55.0000
- > 55.0000 and <= 70.7800
- > 70.7800 and <= 100.0000
- Not rated or not available

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.

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: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 13, Oct 6, 2017

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

Date(s) aerial images were photographed: Mar 30, 2011—Aug 25, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
1	Water		123.6	11.0%
65	Ipswich mucky peat, 0 to 2 percent slopes, very frequently flooded	55.0000	84.4	7.5%
325D	Newport silt loam, 15 to 25 percent slopes	12.9254	120.6	10.7%
602	Urban land, 0 to 15 percent slopes		2.4	0.2%
603	Urban land, wet substratum, 0 to 3 percent slopes		363.3	32.2%
610	Beaches		7.3	0.6%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	100.0000	21.2	1.9%
627C	Newport-Urban land complex, 3 to 15 percent slopes	12.9254	120.8	10.7%
653	Udorthents, sandy	70.7800	6.7	0.6%
655	Udorthents, wet substratum		276.8	24.6%
Totals for Area of Interest			**1,127.0**	**100.0%**

Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Rating Options

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): Depth Range (Weighted Average)

Top Depth: 0

Bottom Depth: 48

Units of Measure: Inches

LEGEND:

- 13,7 — GROUNDWATER ELEVATION MEASURED BY GEI **ON DECEMBER 27, 2006. ELEVATIONS ARE APPROXIMATE DUE TO INCONSISTENCIES BETWEEN SURVEY DATA AND REFERENCE ELEVATIONS.**
- —13— ESTIMATED GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED
- B-402(MW) — MONITORING WELL INSTALLED BY GEI (2006)
- B-401 — BORING INSTALLED BY GEI (2006)
  - 300 SERIES - GEOTECHNICAL
  - 400 SERIES - ENVIRONMENTAL
- RIZ-1 — MONITORING WELL INSTALLED BY RIZZO (1998)
- RB-1 — SOIL BORING INSTALLED BY RIZZO (1998)
- MW-201 — MONITORING WELL INSTALLED BY GEI (1991)
- MW-1 — MONITORING WELL INSTALLED BY GEI (1988)
- WE(OW)-4 — WELL INSTALLED BY OTHERS
- CATCH BASIN
- CABLE TELEVISION MANHOLE
- DRAIN MANHOLE
- ELECTRIC MANHOLE
- MISCELLANEOUS MANHOLE
- SEWER MANHOLE
- TELEPHONE MANHOLE
- WATER MANHOLE
- FIRE HYDRANT
- UTILITY POLE
- LIGHT POLE
- CHAIN LINK FENCE
- CATV — UNDERGROUND CABLE TV LINE
- D — UNDERGROUND DRAIN LINE
- E — UNDERGROUND ELECTRIC LINE
- G — UNDERGROUND GAS LINE
- S — UNDERGROUND SEWER LINE
- T — UNDERGROUND TELEPHONE LINE
- W — UNDERGROUND WATER LINE

NOTES:

1. FIGURE REPRODUCED FROM NITSCH ENGINEERING PROGRESS PRINT DATED 3/13/06.
2. ELEVATION DATUM IS BOSTON CITY BASE.
3. HISTORIC BORINGS, WELLS, AND UST LOCATIONS OBTAINED FROM RIZZO ASSOCIATES, INC.; LOCATIONS ARE APPROXIMATE.
4. THE UTILITY INFORMATION SHOWN IS COMPILED BASED ON FIELD SURVEY INFORMATION AND RECORD INFORMATION. THE LOCATIONS OF UNDERGROUND PIPES AND CONDUITS HAVE BEEN DETERMINED FROM RECORD PLANS AND ARE APPROXIMATE ONLY.

0 200 400
SCALE, FEET

Phase I/Phase II Environmental Site Assessment
Suffolk Downs
East Boston and Revere, Massachusetts

Greenberg Traurig, LLP
Boston, Massachusetts

GEI Consultants

Project 06478-0

GROUNDWATER ELEVATION CONTOURS DECEMBER 27, 2006

February 2007 Fig. 5

084780-05 plc/djm 2/12/07

STRATA	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5
	THICKNESS IN FEET				
FILL	5 TO 15	5 TO 10	5 TO 10	10 TO 20	10 TO 20
ORGANICS	10 TO 12	5 TO 10	5 TO 10	0 TO 5	30 TO 50
ESTURINE	30 TO 50	5 TO 20	10 TO 25	0 TO 10	0 TO 10
MARINE SAND	0 TO 15	10 TO 20	5 TO 10	NE	5 TO 10
MARINE CLAY	0 TO 15	0 TO 10	30 TO 40	30 TO 40	30 TO 50
GLACIOFLUVIAL	0 TO 5	NE	NE	NE	0 TO 15
GLACIAL TILL	0 TO 15	0 TO 15	NE	0 TO 5	0 TO 15
EL. TOP OF BEDROCK (FT)	-40 TO -60	-40 TO -50	-50 TO -70	-40 TO -60	-60 TO -110

ZONE 1

ZONE 2

ZONE 3

ZONE 4

ZONE 5

WALDEMAR AVENUE

WASHINGTON AVENUE

ZONE 2 DESIGNATION FOR ZONES OF IDEALIZED SOIL CONDITIONS

CONDITIONS ARE FOR PLANNING PURPOSES ONLY. ACTUAL CONDITIONS COULD DIFFER FROM THOSE SHOWN HEREIN.

NOTES

1. BASE PLAN TAKEN FROM A DRAWING TITLED 9180_TOPO1_051712.dwg, PREPARED BY NITSCH ENGINEERING OF BOSTON, MASSACHUSETTS.
2. ALL ELEVATIONS ARE IN BOSTON CITY BASE (BCB) DATUM.

0 200 400 600 800
SCALE IN FEET

HALEY ALDRICH

PROPOSED DEVELOPMENT
SUFFOLK DOWNS
BOSTON/REVERE, MASSACHUSETTS

SITE AND SUSURFACE CONDITIONS PLAN

SCALE: AS SHOWN
JANUARY 2017

FIGURE 2

ERVIN, DAYNA Printed: 1/25/2017 9:45 AM Layout: D002
J:\GRAPHICS\129513\129513-001-D002.DWG

Appendix E
Hydraulic Calculations

BEALS + THOMAS
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

CALCULATION SUMMARY

T 508.366.0560
F 508.366.4391
mail@btiweb.com I www.btiweb.com
Regional Office: Plymouth, MA

JOB NO./LOCATION:

2854.00
East Boston, Massachusetts

CLIENT/PROJECT:

HYM Investment Group, LLC.
Suffolk Downs Phase 1 Redevelopment

SUBJECT/TITLE:

Hydraulic Calculations

OBJECTIVE OF CALCULATION:

- To determine the number and location of drainage structures required to intercept stormwater runoff from the proposed impervious areas.
- To design stormwater management system components to meet the design standards of the Massachusetts DEP Stormwater Management Handbook for erosion protection and water quality inlet capacity.

CALCULATION METHOD(S):

- Drainage structures and drain pipes were designed based on a 25-year storm frequency for Boston (6-inch storm).
- StormCAD V8i was used to design drainage structures and drainpipes. StormCAD calculates peak runoff rates using the Rational Method (Q = CiA) and determines pipe capacities using Manning's Formula.
- Runoff from master plan areas discharging into the drain pipes are based on the 10-year (6-inch storm event) calculated from the hydrologic model of the site using HydroCAD v10.0. Runoff from the master plan areas are modeled by direct entry of flow to manhole elements for pipe sizing.
- Runoff from proposed roof area to be discharged into the drain pipes are based on the 10-year (6-inch storm event) calculated from the hydrologic model of the site using HydroCAD v10.0. Runoff from the roof areas are modeled by direct entry of flow to manhole elements for pipe sizing.

ASSUMPTIONS:

- Runoff coefficients of C = 0.9 for impervious area and 0.3 for pervious areas were used (adapted from the American Society of Civil Engineers Manual on Engineering Practice No. 37).
- n = 0.013 for RCPs pipes.

SOURCES OF DATA/EQUATIONS:

- "Hydraulic Delineations Map", by Beals and Thomas, Inc., file 285402P049A, dated December 19, 2017.
- Proposed Conditions Hydrologic Analysis prepared by Beals and Thomas, Inc., HydroCAD file 285402HC006A.
- 25-year storm intensity obtained from Intensity/Duration rainfall curves in S.C.S. Technical Paper No. 40.
- Massachusetts DEP Stormwater Management Handbook.
- Manning's n for RCPs based on StormCAD V8i Conduit Catalog.

CONCLUSIONS:

- The proposed stormwater collection system will adequately collect and convey the peak runoff rates from the 25-year storm.

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	KEnns	12/27/17	E.ac	12/28/17	E.ac	12/28/17

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Regional Office: Plymouth, MA

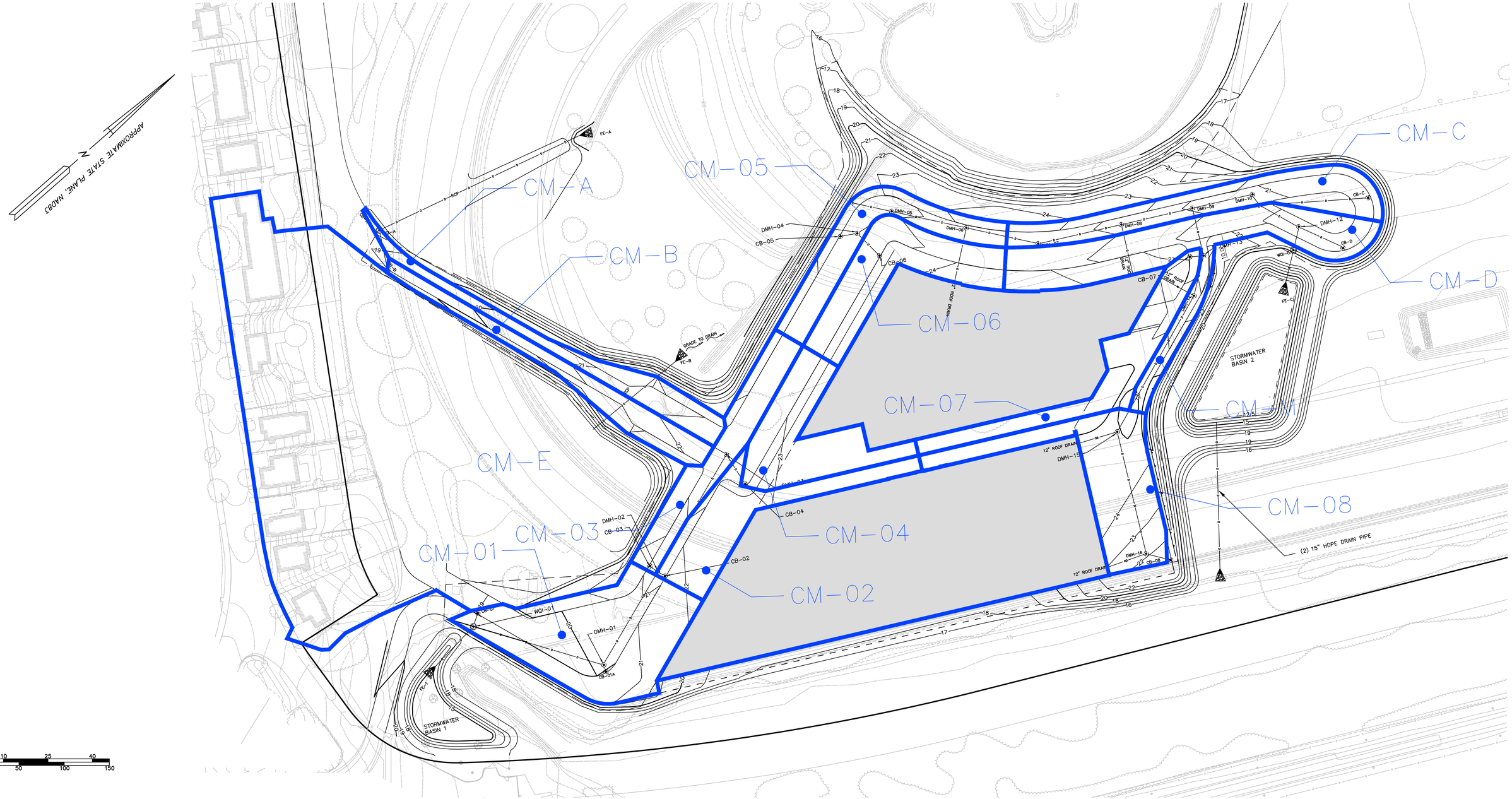
the 25-year storm.

- The hydraulic grade line (HGL) from the proposed stormwater collection system during the 100-year storm event does not exceed the proposed rim elevation.
- The proposed stormwater management design has been reviewed for compliance with the stormwater management standards described in the DEP's Stormwater Management Handbook, dated February 2008.

REV	CALC. BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
0	[illegible]	12/27/17	E. Clark	12/28/17	E. Clark	12/28/17

Suffolk Downs

Boston, Massachusetts



METERS
0 10 25 40
FEET
0 25 50 100 150

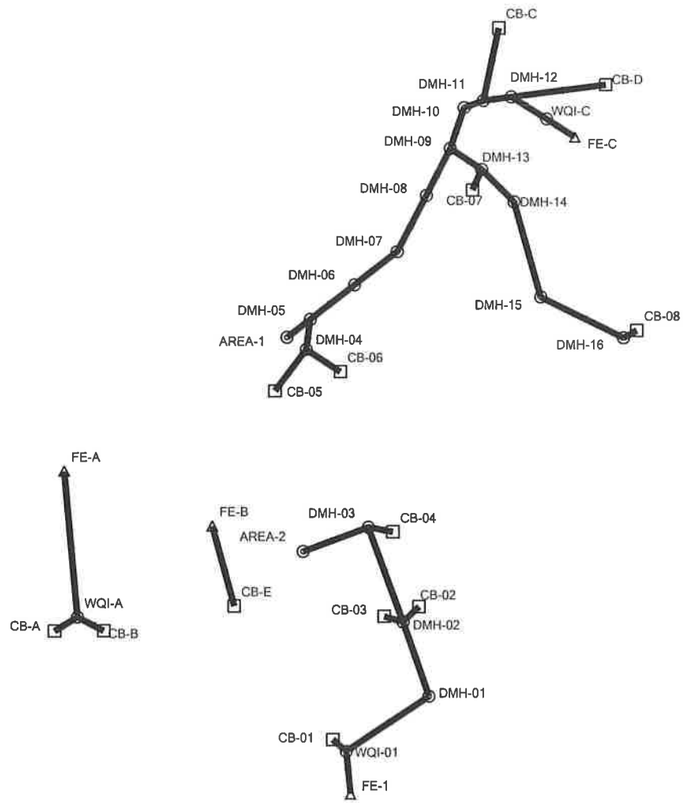
B E A L S + T H O M A S
Civil Engineers + Landscape Architects +
Land Surveyors + Planners +
Environmental Specialists

B+T Drawing No. 285402P049A-003 Date: 12/19/2017 Scale: 1" = 50'

Hydraulic Map

Phase 1

Scenario: Scenario - 1



FlexTable: Conduit Table - 25 year Storm event

Start Node	Stop Node	System Flow Time (min)	Upstream Inlet Area (acres)	Upstream Inlet C	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)	Invert (Start) (ft)	Invert (Stop) (ft)	Diameter (in)	Material	Manning's n	Length (Unified) (ft)	Slope (Calculated) (ft/ft)	Capacity (Full Flow) (cfs)	Velocity (ft/s)	Hydraulic Grade Line (Out) (ft)	Capacity (Excess Full Flow) (cfs)
CB-A	WQI-A	6.000	0.197	0.900	0.177	5.800	1.04	18.80	18.90	15.65	15.57	12.0	Concrete	0.013	24.0	0.003	2.06	2.62	16.15	1.02
WQI-A	FE-A	6.241	(N/A)	(N/A)	0.368	5.752	2.13	18.90	14.60	15.57	14.60	18.0	Concrete	0.013	242.0	0.004	6.65	3.35	15.15	4.52
CB-B	WQI-A	6.000	0.212	0.900	0.191	5.800	1.12	19.00	18.90	15.73	15.57	12.0	Concrete	0.013	41.0	0.004	2.23	2.84	16.15	1.11
DMH-03	DMH-02	54.378	(N/A)	(N/A)	3.877	2.212	8.65	22.70	21.33	16.56	15.99	36.0	Concrete	0.013	146.0	0.004	41.67	4.65	16.97	33.03
DMH-02	DMH-01	54.902	(N/A)	(N/A)	4.322	2.202	9.59	21.33	20.10	15.99	15.53	36.0	Concrete	0.013	114.0	0.004	42.37	4.85	16.50	32.77
DMH-01	WQI-01	55.294	(N/A)	(N/A)	4.322	2.194	9.56	20.10	20.00	15.53	14.95	36.0	Concrete	0.013	145.0	0.004	42.18	4.83	15.98	32.62
WQI-01	FE-1	55.794	(N/A)	(N/A)	4.789	2.184	10.54	20.00	14.70	14.95	14.70	36.0	Concrete	0.013	63.0	0.004	42.01	4.95	15.72	31.47
DMH-10	DMH-11	7.936	(N/A)	(N/A)	8.996	5.413	55.38	21.18	21.30	13.19	13.15	48.0	Concrete	0.013	10.0	0.004	90.84	7.58	15.43	35.47
DMH-16	DMH-15	6.049	1.608	0.900	1.776	5.790	10.36	22.15	25.00	15.01	14.48	30.0	Concrete	0.013	134.0	0.004	25.79	4.97	15.80	15.43
CB-08	DMH-16	6.000	0.365	0.900	0.329	5.800	1.92	21.32	22.15	15.35	15.01	18.0	Concrete	0.013	17.0	0.020	14.85	5.79	16.11	12.93
CB-C	DMH-11	6.000	0.321	0.900	0.289	5.800	1.69	20.50	21.30	13.55	13.15	18.0	Concrete	0.013	111.0	0.004	6.31	0.96	15.43	4.62
DMH-11	DMH-12	7.958	(N/A)	(N/A)	9.285	5.408	56.91	21.30	20.80	13.15	12.97	48.0	Concrete	0.013	44.0	0.004	91.87	7.70	15.29	34.96
CB-D	DMH-12	6.000	0.500	0.900	0.450	5.800	2.63	20.50	20.80	13.35	12.97	18.0	Concrete	0.013	50.0	0.008	9.16	1.49	15.29	6.53
DMH-12	WQI-C	8.053	(N/A)	(N/A)	9.735	5.389	59.18	20.80	21.00	12.97	12.88	48.0	Concrete	0.013	21.0	0.004	94.03	7.91	15.24	34.85
WQI-C	FE-C	8.098	(N/A)	(N/A)	9.735	5.380	59.09	21.00	12.75	12.88	12.75	48.0	Concrete	0.013	33.0	0.004	90.15	7.65	15.07	31.06
DMH-07	DMH-08	7.437	(N/A)	(N/A)	6.989	5.513	73.97	23.80	22.71	14.10	13.75	48.0	Concrete	0.013	89.0	0.004	90.07	8.00	16.35	16.10
DMH-15	DMH-14	6.498	(N/A)	(N/A)	1.776	5.700	10.20	25.00	23.18	14.48	13.80	30.0	Concrete	0.013	168.0	0.004	26.09	4.99	15.74	15.89
CB-01	WQI-01	6.000	0.519	0.900	0.467	5.800	2.73	19.00	20.00	15.50	14.95	12.0	Concrete	0.013	11.0	0.050	7.97	9.19	15.98	5.24
CB-04	DMH-03	6.000	0.291	0.900	0.262	5.800	1.53	22.60	22.70	16.70	16.56	18.0	Concrete	0.013	33.0	0.004	6.84	3.12	17.49	5.31
DMH-04	DMH-05	6.534	(N/A)	(N/A)	0.494	5.693	2.84	22.90	22.95	14.81	14.73	30.0	Concrete	0.013	20.0	0.004	25.94	0.58	17.37	23.10
CB-05	DMH-04	6.000	0.245	0.900	0.221	5.800	1.29	22.85	22.90	15.95	14.81	12.0	Concrete	0.013	13.0	0.088	10.55	1.64	17.37	9.26
CB-06	DMH-04	6.000	0.304	0.900	0.274	5.800	1.60	22.85	22.90	15.50	14.81	18.0	Concrete	0.013	29.0	0.024	16.20	0.91	17.37	14.60
DMH-05	DMH-06	7.111	(N/A)	(N/A)	6.002	5.578	68.89	22.95	23.60	14.73	14.41	48.0	Concrete	0.013	80.0	0.004	90.84	7.95	17.15	21.96
DMH-06	DMH-07	7.279	1.096	0.900	6.989	5.544	74.20	23.60	23.80	14.41	14.10	48.0	Concrete	0.013	77.0	0.004	91.14	8.08	16.85	16.94
DMH-08	DMH-09	7.623	(N/A)	(N/A)	6.989	5.475	44.86	22.71	22.00	13.75	13.44	48.0	Concrete	0.013	76.0	0.004	91.74	7.26	15.71	46.87
DMH-09	DMH-10	7.797	(N/A)	(N/A)	8.996	5.441	55.63	22.00	21.18	13.44	13.19	48.0	Concrete	0.013	63.0	0.004	90.48	7.57	15.45	34.86
DMH-13	DMH-09	7.199	(N/A)	(N/A)	2.008	5.560	11.25	22.30	22.00	13.64	13.44	30.0	Concrete	0.013	49.0	0.004	26.20	5.14	15.71	14.95
DMH-14	DMH-13	7.060	(N/A)	(N/A)	1.776	5.588	10.00	23.18	22.30	13.80	13.64	30.0	Concrete	0.013	41.0	0.004	25.62	4.90	15.73	15.62
CB-07	DMH-13	6.000	0.258	0.900	0.232	5.800	1.36	22.50	22.30	13.95	13.64	18.0	Concrete	0.013	11.0	0.028	17.63	0.77	15.73	16.28
AREA-01	DMH-05	6.000	6.120	0.900	5.508	5.800	32.20	22.20	22.95	14.90	14.73	36.0	Concrete	0.013	42.0	0.004	42.43	6.60	17.37	10.23
AREA-2	DMH-03	54.000	4.017	0.900	3.615	2.220	8.09	21.84	22.70	16.97	16.56	36.0	Concrete	0.013	104.0	0.004	41.88	4.58	17.49	33.79
CB-03	DMH-02	6.000	0.230	0.900	0.207	5.800	1.21	21.10	21.33	16.60	15.99	12.0	Concrete	0.013	6.0	0.102	11.36	9.42	16.97	10.15
CB-02	DMH-02	6.000	0.264	0.900	0.238	5.800	1.39	21.10	21.33	16.60	15.99	12.0	Concrete	0.013	6.0	0.102	11.36	9.81	16.97	9.97
CB-E	FE-B	6.000	3.424	0.588	2.013	5.800	11.77	18.00	14.55	15.00	14.55	24.0	Concrete	0.013	104.0	0.004	14.88	5.25	15.78	3.11

Conduit FlexTable: pipe properties – 25 year Storm event

Start Node	Stop Node	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)	Diameter (in)	Material	Cover (Start) (ft)	Cover (Stop) (ft)	Velocity (ft/s)	Manning's n	Length (User Defined) (ft)
CB-A	WQI-A	18.80	18.90	12.0	Concrete	2.15	2.33	2.62	0.013	24.0
WQI-A	FE-A	18.90	14.60	18.0	Concrete	1.83	-1.50	3.35	0.013	242.0
CB-B	WQI-A	19.00	18.90	12.0	Concrete	2.27	2.33	2.84	0.013	41.0
DMH-03	DMH-02	22.70	21.33	36.0	Concrete	3.14	2.34	4.65	0.013	146.0
DMH-02	DMH-01	21.33	20.10	36.0	Concrete	2.34	1.57	4.85	0.013	114.0
DMH-01	WQI-01	20.10	20.00	36.0	Concrete	1.57	2.05	4.83	0.013	145.0
WQI-01	FE-1	20.00	14.70	36.0	Concrete	2.05	-3.00	4.95	0.013	63.0
DMH-10	DMH-11	21.18	21.30	48.0	Concrete	3.99	4.15	7.58	0.013	10.0
DMH-16	DMH-15	22.15	25.00	30.0	Concrete	4.64	8.02	4.97	0.013	134.0
CB-08	DMH-16	21.32	22.15	18.0	Concrete	4.47	5.64	5.79	0.013	17.0
CB-C	DMH-11	20.50	21.30	18.0	Concrete	5.45	6.65	0.96	0.013	111.0
DMH-11	DMH-12	21.30	20.80	48.0	Concrete	4.15	3.83	7.70	0.013	44.0
CB-D	DMH-12	20.50	20.80	18.0	Concrete	5.65	6.33	1.49	0.013	50.0
DMH-12	WQI-C	20.80	21.00	48.0	Concrete	3.83	4.12	7.91	0.013	21.0
WQI-C	FE-C	21.00	12.75	48.0	Concrete	4.12	-4.00	7.65	0.013	33.0
DMH-07	DMH-08	23.80	22.71	48.0	Concrete	5.70	4.96	8.00	0.013	89.0
DMH-15	DMH-14	25.00	23.18	30.0	Concrete	8.02	6.88	4.99	0.013	168.0
CB-01	WQI-01	19.00	20.00	12.0	Concrete	2.50	4.05	9.19	0.013	11.0
CB-04	DMH-03	22.60	22.70	18.0	Concrete	4.40	4.64	3.12	0.013	33.0
DMH-04	DMH-05	22.90	22.95	30.0	Concrete	5.59	5.72	0.58	0.013	20.0
CB-05	DMH-04	22.85	22.90	12.0	Concrete	5.90	7.09	1.64	0.013	13.0
CB-06	DMH-04	22.85	22.90	18.0	Concrete	5.85	6.59	0.91	0.013	29.0
DMH-05	DMH-06	22.95	23.60	48.0	Concrete	4.22	5.19	7.95	0.013	80.0
DMH-06	DMH-07	23.60	23.80	48.0	Concrete	5.19	5.70	8.08	0.013	77.0
DMH-08	DMH-09	22.71	22.00	48.0	Concrete	4.96	4.56	7.26	0.013	76.0
DMH-09	DMH-10	22.00	21.18	48.0	Concrete	4.56	3.99	7.57	0.013	63.0
DMH-13	DMH-09	22.30	22.00	30.0	Concrete	6.16	6.06	5.14	0.013	49.0
DMH-14	DMH-13	23.18	22.30	30.0	Concrete	6.88	6.16	4.90	0.013	41.0
CB-07	DMH-13	22.50	22.30	18.0	Concrete	7.05	7.16	0.77	0.013	11.0
AREA-01	DMH-05	22.20	22.95	36.0	Concrete	4.30	5.22	6.60	0.013	42.0
AREA-2	DMH-03	21.84	22.70	36.0	Concrete	1.87	3.14	4.58	0.013	104.0
CB-03	DMH-02	21.10	21.33	12.0	Concrete	3.50	4.34	9.42	0.013	6.0
CB-02	DMH-02	21.10	21.33	12.0	Concrete	3.50	4.34	9.81	0.013	6.0
CB-E	FE-B	18.00	14.55	24.0	Concrete	1.00	-2.00	5.25	0.013	104.0

FlexTable: Conduit Table - 100 year Storm event

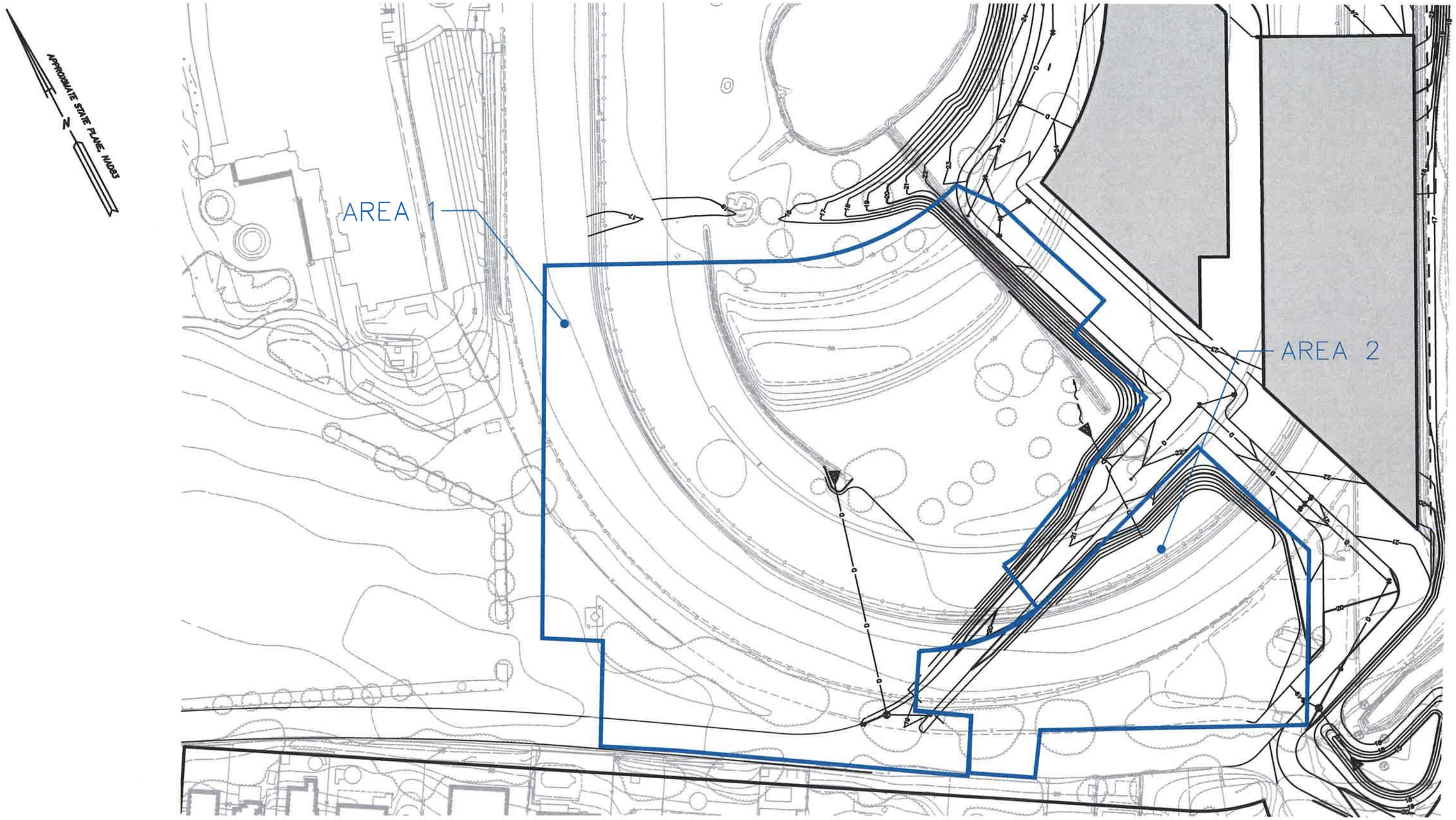
Start Node	Stop Node	System Flow Time (min)	Upstream Inlet Area (acres)	Upstream Inlet C	System CA (acres)	System Intensity (in/h)	Flow (cfs)	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)	Invert (Start) (ft)	Invert (Stop) (ft)	Diameter (in)	Material	Manning's n	Length (Unified) (ft)	Slope (Calculated) (ft/ft)	Capacity (Full Flow) (cfs)	Velocity (ft/s)	Hydraulic Grade Line (Out) (ft)	Capacity (Excess Full Flow) (cfs)
CB-A	WQI-A	6.000	0.197	0.900	0.177	7.300	1.30	18.80	18.90	15.65	15.57	12.0	Concrete	0.013	24.0	0.003	2.06	2.77	16.23	0.75
WQI-A	FE-A	6.228	(N/A)	(N/A)	0.368	7.232	2.68	18.90	14.60	15.57	14.60	18.0	Concrete	0.013	242.0	0.001	6.65	3.56	15.22	3.97
CB-B	WQI-A	6.000	0.212	0.900	0.191	7.300	1.40	19.00	18.90	15.73	15.57	12.0	Concrete	0.013	41.0	0.004	2.23	3.00	16.23	0.82
DMH-03	DMH-02	54.352	(N/A)	(N/A)	3.877	2.869	11.21	22.70	21.33	16.56	15.99	36.0	Concrete	0.013	146.0	0.004	41.67	5.00	17.11	30.46
DMH-02	DMH-01	54.838	(N/A)	(N/A)	4.322	2.855	12.44	21.33	20.10	15.99	15.53	36.0	Concrete	0.013	114.0	0.004	42.37	5.21	16.64	29.93
DMH-01	WQI-01	55.203	(N/A)	(N/A)	4.322	2.844	12.39	20.10	20.00	15.53	14.95	36.0	Concrete	0.013	145.0	0.004	42.18	5.19	16.13	29.79
WQI-01	FE-1	55.669	(N/A)	(N/A)	4.789	2.830	13.66	20.00	14.70	14.95	14.70	36.0	Concrete	0.013	63.0	0.004	42.01	5.31	15.88	28.35
DMH-10	DMH-11	7.684	(N/A)	(N/A)	8.996	6.727	67.29	21.18	21.30	13.19	13.15	48.0	Concrete	0.013	10.0	0.004	90.84	7.91	15.75	23.55
DMH-16	DMH-15	6.046	1.608	0.900	1.776	7.286	13.04	22.15	25.00	15.01	14.48	30.0	Concrete	0.013	134.0	0.004	25.79	5.27	16.20	12.75
CB-08	DMH-16	6.000	0.365	0.900	0.329	7.300	2.42	21.32	22.15	15.35	15.01	18.0	Concrete	0.013	17.0	0.020	14.85	6.19	16.33	12.44
CB-C	DMH-11	6.000	0.321	0.900	0.289	7.300	2.13	20.50	21.30	13.55	13.15	18.0	Concrete	0.013	111.0	0.004	6.31	1.20	15.75	4.18
DMH-11	DMH-12	7.705	(N/A)	(N/A)	9.285	6.718	69.17	21.30	20.80	13.15	12.97	48.0	Concrete	0.013	44.0	0.004	91.87	8.03	15.61	22.70
CB-D	DMH-12	6.000	0.500	0.900	0.450	7.300	3.31	20.50	20.80	13.35	12.97	18.0	Concrete	0.013	50.0	0.008	9.16	1.87	15.61	5.85
DMH-12	WQI-C	7.796	(N/A)	(N/A)	9.735	6.682	71.86	20.80	21.00	12.97	12.88	48.0	Concrete	0.013	21.0	0.004	94.03	8.24	15.55	22.17
WQI-C	FE-C	7.839	(N/A)	(N/A)	9.735	6.665	71.69	21.00	12.75	12.88	12.75	48.0	Concrete	0.013	33.0	0.004	90.15	7.96	15.31	18.46
DMH-07	DMH-08	7.202	(N/A)	(N/A)	6.989	6.919	83.88	23.80	22.71	14.10	13.75	48.0	Concrete	0.013	89.0	0.004	90.07	8.14	16.53	6.19
DMH-15	DMH-14	6.470	(N/A)	(N/A)	1.776	7.159	12.81	25.00	23.18	14.48	13.80	30.0	Concrete	0.013	168.0	0.004	26.09	5.29	16.11	13.28
CB-01	WQI-01	6.000	0.519	0.900	0.467	7.300	3.44	19.00	20.00	15.50	14.95	12.0	Concrete	0.013	11.0	0.050	7.97	9.77	16.13	4.53
CB-04	DMH-03	6.000	0.291	0.900	0.262	7.300	1.93	22.60	22.70	16.70	16.56	18.0	Concrete	0.013	33.0	0.004	6.84	3.33	17.62	4.91
DMH-04	DMH-05	6.424	(N/A)	(N/A)	0.494	7.173	3.57	22.90	22.95	14.81	14.73	30.0	Concrete	0.013	20.0	0.004	25.94	0.73	17.66	22.37
CB-05	DMH-04	6.000	0.245	0.900	0.221	7.300	1.62	22.85	22.90	15.95	14.81	12.0	Concrete	0.013	13.0	0.088	10.55	2.07	17.66	8.93
CB-06	DMH-04	6.000	0.304	0.900	0.274	7.300	2.01	22.85	22.90	15.50	14.81	18.0	Concrete	0.013	29.0	0.024	16.20	1.14	17.66	14.19
DMH-05	DMH-06	6.882	(N/A)	(N/A)	6.002	7.035	77.70	22.95	23.60	14.73	14.41	48.0	Concrete	0.013	80.0	0.004	90.84	8.12	17.43	13.14
DMH-06	DMH-07	7.046	1.096	0.900	6.989	6.981	84.32	23.60	23.80	14.41	14.10	48.0	Concrete	0.013	77.0	0.004	91.14	8.23	17.10	6.82
DMH-08	DMH-09	7.384	(N/A)	(N/A)	6.989	6.846	54.52	22.71	22.00	13.75	13.44	48.0	Concrete	0.013	76.0	0.004	91.74	7.61	16.02	37.22
DMH-09	DMH-10	7.551	(N/A)	(N/A)	8.996	6.780	67.77	22.00	21.18	13.44	13.19	48.0	Concrete	0.013	63.0	0.004	90.48	7.90	15.78	22.71
DMH-13	DMH-09	7.131	(N/A)	(N/A)	2.008	6.948	14.06	22.30	22.00	13.64	13.44	30.0	Concrete	0.013	49.0	0.004	26.20	5.43	16.02	12.14
DMH-14	DMH-13	6.999	(N/A)	(N/A)	1.776	7.000	12.53	23.18	22.30	13.80	13.64	30.0	Concrete	0.013	41.0	0.004	25.62	5.19	16.08	13.09
CB-07	DMH-13	6.000	0.258	0.900	0.232	7.300	1.71	22.50	22.30	13.95	13.64	18.0	Concrete	0.013	11.0	0.028	17.63	0.97	16.08	15.92
AREA-01	DMH-05	6.000	6.120	0.900	5.508	7.300	40.53	22.20	22.95	14.90	14.73	36.0	Concrete	0.013	42.0	0.004	42.43	6.83	17.66	1.90
AREA-2	DMH-03	54.000	4.017	0.900	3.615	2.880	10.50	21.84	22.70	16.97	16.56	36.0	Concrete	0.013	104.0	0.004	41.88	4.93	17.62	31.38
CB-03	DMH-02	6.000	0.230	0.900	0.207	7.300	1.52	21.10	21.33	16.60	15.99	12.0	Concrete	0.013	6.0	0.102	11.36	10.07	17.11	9.84
CB-02	DMH-02	6.000	0.264	0.900	0.238	7.300	1.75	21.10	21.33	16.60	15.99	12.0	Concrete	0.013	6.0	0.102	11.36	10.48	17.11	9.61
CB-E	FE-B	6.000	3.424	0.588	2.013	7.300	14.81	18.00	14.55	15.00	14.55	24.0	Concrete	0.013	104.0	0.004	14.88	5.40	15.94	0.07

Conduit FlexTable: pipe properties – 100 year Storm event

Start Node	Stop Node	Elevation Ground (Start) (ft)	Elevation Ground (Stop) (ft)	Diameter (in)	Material	Cover (Start) (ft)	Cover (Stop) (ft)	Velocity (ft/s)	Manning's n	Length (User Defined) (ft)
CB-A	WQI-A	18.80	18.90	12.0	Concrete	2.15	2.33	2.77	0.013	24.0
WQI-A	FE-A	18.90	14.60	18.0	Concrete	1.83	-1.50	3.56	0.013	242.0
CB-B	WQI-A	19.00	18.90	12.0	Concrete	2.27	2.33	3.00	0.013	41.0
DMH-03	DMH-02	22.70	21.33	36.0	Concrete	3.14	2.34	5.00	0.013	146.0
DMH-02	DMH-01	21.33	20.10	36.0	Concrete	2.34	1.57	5.21	0.013	114.0
DMH-01	WQI-01	20.10	20.00	36.0	Concrete	1.57	2.05	5.19	0.013	145.0
WQI-01	FE-1	20.00	14.70	36.0	Concrete	2.05	-3.00	5.31	0.013	63.0
DMH-10	DMH-11	21.18	21.30	48.0	Concrete	3.99	4.15	7.91	0.013	10.0
DMH-16	DMH-15	22.15	25.00	30.0	Concrete	4.64	8.02	5.27	0.013	134.0
CB-08	DMH-16	21.32	22.15	18.0	Concrete	4.47	5.64	6.19	0.013	17.0
CB-C	DMH-11	20.50	21.30	18.0	Concrete	5.45	6.65	1.20	0.013	111.0
DMH-11	DMH-12	21.30	20.80	48.0	Concrete	4.15	3.83	8.03	0.013	44.0
CB-D	DMH-12	20.50	20.80	18.0	Concrete	5.65	6.33	1.87	0.013	50.0
DMH-12	WQI-C	20.80	21.00	48.0	Concrete	3.83	4.12	8.24	0.013	21.0
WQI-C	FE-C	21.00	12.75	48.0	Concrete	4.12	-4.00	7.96	0.013	33.0
DMH-07	DMH-08	23.80	22.71	48.0	Concrete	5.70	4.96	8.14	0.013	89.0
DMH-15	DMH-14	25.00	23.18	30.0	Concrete	8.02	6.88	5.29	0.013	168.0
CB-01	WQI-01	19.00	20.00	12.0	Concrete	2.50	4.05	9.77	0.013	11.0
CB-04	DMH-03	22.60	22.70	18.0	Concrete	4.40	4.64	3.33	0.013	33.0
DMH-04	DMH-05	22.90	22.95	30.0	Concrete	5.59	5.72	0.73	0.013	20.0
CB-05	DMH-04	22.85	22.90	12.0	Concrete	5.90	7.09	2.07	0.013	13.0
CB-06	DMH-04	22.85	22.90	18.0	Concrete	5.85	6.59	1.14	0.013	29.0
DMH-05	DMH-06	22.95	23.60	48.0	Concrete	4.22	5.19	8.12	0.013	80.0
DMH-06	DMH-07	23.60	23.80	48.0	Concrete	5.19	5.70	8.23	0.013	77.0
DMH-08	DMH-09	22.71	22.00	48.0	Concrete	4.96	4.56	7.61	0.013	76.0
DMH-09	DMH-10	22.00	21.18	48.0	Concrete	4.56	3.99	7.90	0.013	63.0
DMH-13	DMH-09	22.30	22.00	30.0	Concrete	6.16	6.06	5.43	0.013	49.0
DMH-14	DMH-13	23.18	22.30	30.0	Concrete	6.88	6.16	5.19	0.013	41.0
CB-07	DMH-13	22.50	22.30	18.0	Concrete	7.05	7.16	0.97	0.013	11.0
AREA-01	DMH-05	22.20	22.95	36.0	Concrete	4.30	5.22	6.83	0.013	42.0
AREA-2	DMH-03	21.84	22.70	36.0	Concrete	1.87	3.14	4.93	0.013	104.0
CB-03	DMH-02	21.10	21.33	12.0	Concrete	3.50	4.34	10.07	0.013	6.0
CB-02	DMH-02	21.10	21.33	12.0	Concrete	3.50	4.34	10.48	0.013	6.0
CB-E	FE-B	18.00	14.55	24.0	Concrete	1.00	-2.00	5.40	0.013	104.0

Suffolk Downs

Boston, Massachusetts



BEALS + THOMAS
Civil Engineers + Landscape Architects +
Land Surveyors + Planners +
Environmental Specialists

B+T Drawing No.285403P049A-004 Date: 12/27/2017 Scale: 1" = 100'

Contributing Watershed Area

Master Plan Design

Appendix F
Site Owner's Manual

Site Owner's Manual

Suffolk Downs Redevelopment Phase 1

Boston, MA

Prepared for:
The McClellan Highway Development Company, LLC
c/o The HYM Investment Group, LLC
One Congress Street, 11th Floor
Boston, Massachusetts, 02114

Presented by:

BEALS + THOMAS
BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772-2104

January 3, 2018

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FIGURES

APPENDICES

1.0 INTRODUCTION

The Site Owner's Manual complies with the Long-Term Pollution Prevention Plan (Standard 4) and the Long-Term Operation and Maintenance Plan (Standard 9) requirements of the 2008 Massachusetts Department of Environmental Protection (MassDEP) Stormwater Handbook. The Manual outlines source control and pollution prevention measures and maintenance requirements of stormwater best management practices (BMPs) associated with the proposed development.

2.0 SITE OWNER'S AGREEMENT

2.1 Operation and Maintenance Compliance Statement

Site Owner: The McClellan Highway Development Company, LLC
c/o The HYM Investment Group, LLC
One Congress Street, 11th Floor
Boston, Massachusetts, 02114

Responsible Party: TBD

The McClellan Highway Development Company, LLC or their successors shall maintain ownership of the on-site stormwater management system as well as the responsibility for operation and maintenance during the post-development stages of the project. The site has been inspected for erosion and appropriate measures have been taken to permanently stabilize any eroded areas. All aspects of stormwater best management practices (BMPs) have been inspected for damage, wear and malfunction, and appropriate steps have been taken to repair or replace the system or portions of the system so that the stormwater at the site may be managed in accordance with the Stormwater Management Standards. Future responsible parties shall be notified of their continuing legal responsibility to operate and maintain the BMPs. The operation and maintenance plan for the stormwater BMPs is being implemented.

_____ _____
Responsible Party Signature Date

2.2 Stormwater Maintenance Easements

There are no off-site areas utilized for stormwater control, therefore no stormwater management easements are required. The Site Owner will have access to all stormwater practices for inspection and maintenance, including direct maintenance access by heavy equipment to structures requiring regular maintenance.

2.3 Record Keeping

The Site Owner shall maintain a rolling log in which all inspections and maintenance activities for the past three years shall be recorded. The Operation and Maintenance Log includes information pertaining to inspections, repairs, and disposal relevant to the Phase 1 Project's stormwater management system. The Log is located in Appendix A.

The Operation and Maintenance Log shall be made available to the Conservation Commission and the MassDEP upon request. The Conservation Commission and the MassDEP shall be allowed to enter and inspect the premises to evaluate and ensure that the responsible party complies with the maintenance requirements for each BMP.

2.4 Training

Employees involved in grounds maintenance and emergency response will be educated on the general concepts of stormwater management and groundwater protection. The Site Owner's Manual will be reviewed with the maintenance staff. The staff will be trained on the proper course of action for specific events expected to be incurred during routine maintenance or emergency situations.

3.0 LONG-TERM POLLUTION PREVENTION PLAN

In compliance with Standard 4 of the 2008 MassDEP Stormwater Management Handbook, this section outlines source control and pollution prevention measures to be employed on-site after construction.

3.1 Storage of Materials and Waste

The Phase 1 Project Site shall be kept clear of trash and debris at all times.

3.2 Vehicle Washing

No commercial vehicle washing shall take place on site.

3.3 Routine Inspections and Maintenance of Stormwater BMPs

See Section 4.0 Long-Term Operation and Maintenance Plan, for routine inspection and maintenance requirements for all proposed stormwater BMPs.

3.4 Spill Prevention and Response

A contingency plan shall be implemented to address the spill or release of petroleum products and hazardous materials and will include the following measures:

1. Equipment necessary to quickly attend to inadvertent spills or leaks shall be stored on-site in a secure but accessible location. Such equipment shall include but not be limited to the following: safety goggles, chemically resistant gloves and overshoe boots, water and chemical fire extinguishers, sand and shovels, suitable absorbent materials, storage containers and first aid equipment (i.e. Indian Valley Industries, Inc. 55-gallon Spill Containment kit or approved equivalent).

2. Spills or leaks shall be treated properly according to material type, volume of spillage and location of spill. Mitigation shall include preventing further spillage, containing the spilled material in the smallest practical area, removing spilled material in a safe and environmentally-friendly manner, and remediation of any damage to the environment.

3. For large spills, MassDEP Hazardous Waste Incident Response Group shall be notified immediately at (617) 792-7653 and an emergency response contractor shall be consulted.

3.5 Maintenance of Lawns, Gardens, and other Landscaped Areas

Lawns, gardens, and other landscaped areas shall be maintained regularly by the site owner. Vegetated and landscaped BMPs will be maintained as outlined in Section 4.0.

3.6 Storage and Use of Fertilizers, Herbicides, and Pesticides

All fertilizers, herbicides, and pesticides shall be stored in accordance with local, state, and federal regulations. The application rate and use of fertilizers, herbicides, and pesticides on the Phase 1 Project Site shall at no time exceed local, state, or federal specifications.

3.7 Pet Waste Management

Pet owners shall be required to pick up after their animals and dispose of waste in the trash.

3.8 Operation and Management of Septic Systems

The proposed development will be serviced by City sewer and there are no proposed septic systems.

3.9 Snow and Deicing Chemical Management

Snow removal and use of deicing chemicals at the Phase 1 Project Site shall comply with the following requirements:

- Plowed snow shall be placed in the areas designated on the site plans and/or outside of wetland boundaries and stormwater best management practices. The following maintenance measures shall be undertaken at all snow disposal sites:
  - Debris shall be cleared from an area prior to using it for snow disposal.
  - Debris and accumulated sediments shall be cleared from the site and properly disposed of at the end of the snow season and no later than May 15.
- Salt and other deicing chemicals shall be stored in accordance with Massachusetts General Law. Per Massachusetts General Laws, Chapter 85, Section 7A, salt and other de-icing chemicals will be stored at an indoor location.
- Sand piles shall be contained and stabilized to prevent the discharge of sand to wetlands or water bodies, and, where feasible, covered.
- Salt storage piles shall be located outside of the 100-year floodplain.
- The application of salt on the proposed parking areas and driveway shall at no time exceed state or local requirements.

3.10 Nutrient Management Plan

A nutrient management plan is required if a Total Maximum Daily Load (TMDL) has been developed that indicates that use of fertilizers containing nutrients or other specific pollutants must be reduced. The Phase 1 Project is located within the Boston Harbor watershed, which has a draft TMDL issued for pathogen indicators (i.e. fecal coliform, E. coli, and enterococcus bacteria). Urban runoff, combined sewer overflows, sewer overflows and heavy industrial activity have impaired Boston Harbor. Through implementing stormwater treatment BMPs, and source control measures and pollution prevention measures outlined in this manual the Phase 1 Project will not have any further impact on Boston Harbor.

4.0 LONG-TERM OPERATION AND MAINTENANCE PLAN

This section outlines the stormwater best management practices (BMPs) associated with the proposed stormwater management system and identifies the long-term inspection and maintenance requirements for each BMP.

4.1 Stormwater Management System Components

The following table outlines the type and quantity of the BMPs and their general location. Please reference the site plan(s) provided in the Figures section for exact location. All basins are accessible for maintenance.

BMP Type	Location
Deep Hooded Sump Catch Basin	Throughout Paved Areas
Proprietary Separators	Near infiltration basins
Infiltration Basins	Adjacent to the Cul-de-sac; and Adjacent to the Suffolks Downs subway station

4.2 Inspection and Maintenance Schedules

4.2.1 General Maintenance for Mosquito Control

If necessary to minimize mosquito breeding, a licensed pesticide applicator shall apply larvicides, such as Bacillus sphaericus (Bs) to all catch basins sumps, and water quality inlets. Larvicides shall be applied in compliance with all pesticide label requirements, and will be applied during or immediately after wet weather, unless the product used can withstand extended dry periods. Ensure all manhole covers, and inspection ports are secure to reduce the likelihood of mosquitoes laying eggs in standing water.

4.2.2 Deep Sump and Hooded Catch Basins

Catch basins shall be inspected four times per year, including after the foliage season. Other inspection and maintenance requirements include:

- Units shall be cleaned (organic material, sediment and hydrocarbons removed) four times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the basin.
  - Cleanout shall always occur after street sweeping.
- If any evidence of hydrocarbons is found during inspection, the material shall be immediately removed using absorbent pads or other suitable measures and disposed of legally.
- Remove other accumulated debris as necessary.

- Transport and disposal of accumulated sediment off-site shall be in accordance with applicable local, state and federal guidelines and regulations.

4.2.3 Area Drains and Drop Inlets

Area drains and drop inlets shall be inspected and/or cleaned at least once per year.

4.2.4 Proprietary Separators

Maintenance of proprietary separators shall be performed according to the recommendations set forth by the manufacturer (see Appendix C. Proprietary Separator Technical Manual for complete installation, operation and maintenance procedures). Inspection and maintenance procedures for proprietary devices are provided below:

- Units shall be inspected post-construction, prior to being put into service.
- Units shall be inspected not less than twice per year following installation and no less than once per year thereafter.
- Units shall be inspected immediately after any oil, fuel or chemical spill.
- All inspections shall include checking the oil level and sediment depth in the unit.
- Removal of sediments/oils shall occur per manufacturer recommendations.
- A licensed waste management company shall remove captured petroleum waste products from any oil, chemical or fuel spills and dispose.
- OSHA confined space entry protocols shall be followed if entry into the unit is required.

4.2.5 Infiltration Basins

Infiltration basins shall be inspected and maintained after major storm events (rainfall totals greater than 2.5 inches in 24 hours) during the first three months of operation and twice a year and when there are discharges through the outlet control structure thereafter. Additionally, all pretreatment BMPs shall be inspected in accordance with the minimal requirements specified for those practices and after all major storm events. Inspections shall include the following measures:

- During and after major storm events, the length of time standing water remains in the basin shall be recorded.
    - If the time is greater than 72 hours, thoroughly inspect the basin for signs of clogging.
    - A corrective action plan shall be developed by a qualified professional to restore infiltrative function. The Site Owner shall take immediate action to implement these corrective measures.

- Examine the outlet structure for evidence of clogging or outflow release velocities that are greater than the design velocity.
- Identify areas of sediment accumulation, differential settlement, cracking, and erosion within the basin.
- Inspect embankments for leakage and tree growth.
- Examine the health of the vegetation within the basin and on the embankments.

Corrective measures shall be taken immediately as warranted by the inspections. If any evidence of hydrocarbons is found during inspection, the material shall be immediately removed using absorbent pads or other suitable measures and legally disposed.

Preventative maintenance shall include the following activities:

- Mow the buffer area and basin bottom and side slopes, if vegetated.
- Remove trash, debris, and accumulated organic matter.
- Remove clippings after mowing.

4.2.6 Stormwater Outfalls

Flared end sections and associated riprap spillways shall be inspected at least once per year and after major storm events (rainfall totals greater than 2.5 inches in 24 hours) to ensure that the stability of the outlet area is maintained. The outfall area shall be kept clear of debris such as trash, branches, and sediment. Repairs shall be made immediately if riprap displacement or downstream channel scour is observed.

Figures

FOR NOTES AND REFERENCED SEE SHEET C1.0.

BEALS AND THOMAS, INC. SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, OR PROCEDURES UTILIZED BY THE CONTRACTOR, AND FOR THE SAFETY OF PERSONS OR CONSTRUCTION OPERATIONS, OR FOR THE FAILURE OF THE CONTRACTOR TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

MATCHLINE A-A

CONNECT TO EXISTING ELECTRIC

TEMPORARY ELECTRIC CONDUITS

LIMIT OF WORK

MATCHLINE A-A

NOTE:

THIS PLAN IS A REDUCED VERSION OF THE ORIGINAL PLAN AND IS NOT TO SCALE.

LIMIT OF WORK

APPROXIMATE STATE PLANE, NAD83

TEMPORARY ELECTRIC CONDUITS

TELE/DATA CONDUITS

ELECTRICAL CONDUITS

16" DICL

DMH-04

CB-05

CB-06

CB-07

DMH-12

DMH-13

FE-A

FE-B

FE-C

GRADE TO DRAIN

PROPOSED CONNECTION TO EXISTING FORCE MAIN.

DMH-02

CB-03

DMH-03

CB-04

CB-02

DMH-01

CB-01

WQI-01

PROPOSED CONNECTION TO EXISTING ELECTRICAL CONDUIT.

PROPOSED CONNECTION TO TELE/DATA.

STORMWATER BASIN 1

STORMWATER BASIN 2

CONNECT TO EXISTING FORCE MAIN.

12" ROOF DRAIN

DMH-15

DMH-16

CB-08

(2) 3" PVC FORCE MAIN

(2) 15" HDPE DRAIN PIPE

LIMIT OF WORK

ECB

PROPOSED CONNECTION TO EXISTING WATER MAIN.

PROPOSED CONNECTION TO EXISTING GAS MAIN.

BRUSH

REVISIONS

#	DATE	DESCRIPTION
0	01/03/2018	ISSUED FOR NOTICE OF INTENT

PHASE 1

525 William F McClellan Hwy, Boston, MA 02128

HYM
617 248 8905
1 Congress Street, Floor 11
Boston, MA 02114

cbt
617 262 4354 cbtarchitects.com
110 canal street boston, ma 02114

BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road
Southborough, Massachusetts 01772-2104
T 508.366.0560 | www.bealsandthomas.com

CIVIL

MEP / FSP

GENERAL NOTES

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

TITLE: NOTICE OF INTENT

VOLUME

DRAWING TITLE: GRADING, DRAINAGE AND UTILITIES PLAN

NORTH

FEET

B&T DWG. NO. 285403P058A-003

SCALE 1" = 40'

PROJECT # 174106

DATE ISSUED 01.03.18

C4.0

Appendices

Appendix A

Operation and Maintenance Log

OPERATION AND MAINTENANCE LOG

This template is intended to comply with the operation and maintenance log requirements of the 2008 MassDEP Stormwater Management Handbook. Copies of this log should be made for all inspections and kept on file for three years from the inspection date.

Name/Company of Inspector:
Date/Time of Inspection:
Weather Conditions: (Note current weather and any recent precipitation events)

Stormwater BMP	Inspection Observations	Actions Required

Appendix B

List of Emergency Contacts

List of Emergency Contacts

- Massachusetts DEP Hazardous Waste Incident Response Group
  (617) 792-7653

- The McClellan Highway Development Company, LLC
  c/o The HYM Investment Group, LLC
  One Congress Street, 11th Floor
  Boston, Massachusetts, 02114
  (617) 248-8905

- Boston Fire Department Engine 56 Ladder 21
  1 Ashley Street
  Boston, MA 02128
  (617) 343-3550

- Boston Police District A-7
  69 Paris Street
  Boston, MA 02128
  (617) 343-4220

- Boston Water Sewer Commission
  980Harrison Ave.
  Boston, MA 02119
  (617) 989-7000

Appendix C

Proprietary Separator Technical Manual

CONTECH®
ENGINEERED SOLUTIONS

CDS® Inspection and Maintenance Guide

CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	y^3	m^3
CDS1515	3	0.9	3.0	0.9	0.5	0.4
CDS2015	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3025	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, earth stabilization and wastewater treament products. For information, visit www.ContechES.com or call 800.338.1122

CONTECH ENGINEERED SOLUTIONS

800.925.5240
www.ContechES.com

CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

Appendix G
Stormwater Pollution Prevention Plan

EPA Construction General Permit

SUFFOLK DOWNS REDEVELOPMENT PHASE 1

Boston, MA

Prepared for:
The McClellan Highway Development Company, LLC
c/o The HYM Investment Group, LLC
One Congress Street, 11th Floor
Boston, Massachusetts, 02114

Presented by:

BEALS + THOMAS
Beals and Thomas, Inc.
Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, MA 01772-2104

January 3, 2018

285402RP005A

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LIST OF APPENDICES

1.0 CONTACT INFORMATION/RESPONSIBLE PARTIES

1.1 OPERATOR(S)/ SUBCONTRACTORS

Operator(s)

Company:	The McClellan Highway Development Company, LLC c/o The HYM Investment Group, LLC				
Name:					
Address:	One Congress Street, 11th Floor				
City:	Boston	State:	MA	02114	
Telephone:		Email:			

Company:	TBD				
Name:					
Address:					
City:		State:		ZIP Code:	
Telephone:		Email:			

Subcontractor(s)

Company:	TBD				
Name:					
Address:					
City:		State:		ZIP Code:	
Telephone:		Email:			
Area of Control:		Site Work Contractor			

24-Hour Emergency Contact

Company:	TBD
Name:	
Telephone:	

1.2 STORMWATER TEAM

SWPPP Preparer

Company:	Beals and Thomas, Inc.				
Name:	Elizabeth Ennis, PE				
Address:	144 Turnpike Road				
City:	Southborough	State:	MA	ZIP Code:	01772
Telephone:	508-366-0560	Email:	eennis@bealsandthomas.com		

Personnel Responsible for Installation & Maintenance of Stormwater BMPs

Company:	TBD				
Name:					
Address:					
City:		State:		ZIP Code:	
Telephone:		Email:			

Inspection Personnel

Company:	TBD				
Name:					
Address:					
City:		State:		ZIP Code:	
Telephone:		Email:			

Personnel Responsible for Taking Corrective Actions

Company:	TBD				
Name:					
Address:					
City:		State:		ZIP Code:	
Telephone:		Email:			

2.0 SITE EVALUATION, ASSESSMENT AND PLANNING

2.1 PROJECT/SITE INFORMATION

Project/Site Name:	Suffolk Downs Redevelopment				
Project Street/Location:	525 McClellan Highway				
City:	Boston and Revere	State:	MA	ZIP Code:	02128-1035
County or Similar Subdivision:		Suffolk			

Latitude:	N 42° 23’ 39”	Longitude:	W 70° 59’ 52”
Method for Determining Latitude/Longitude: ☐ USGS Topographic Map (specify scale: _____) ☐ EPA Website ☐ GPS ☒ Other (please specify): Google Earth Pro			
Horizontal Reference Datum: ☐ NAD 27 ☐ WGS 84 ☒ NAD 83 ☐ Unknown			

Is the project located on Indian country lands, or located on a property of religious of cultural significance to an Indian tribe? ☐ Yes ☒ No

If yes, provide the name of the Indian tribe associated with the area of Indian country (including the name of Indian reservation if applicable), or if not in Indian country, provide the name of the Indian tribe associated with the property:

_____

Is this project considered a federal facility? ☐ Yes ☒ No

Are you applying for permit coverage as a “federal operator” as defined in Appendix A of the 2017 CGP? ☐ Yes ☒ No

NPDES project or permit tracking number: TBD

2.1.1 Emergency-Related Projects

Is this project in response to a public emergency? ☐ Yes ☒ No

If yes, document the cause of the public emergency *(e.g., natural disaster, extreme flooding conditions)*, information substantiating its occurrence *(e.g., state disaster declaration)*, and a description of the construction necessary to reestablish effective public services:

2.2 NATURE AND SEQUENCE OF CONSTRUCTION ACTIVITY

2.2.1 Function of the Construction Activity

The project entails the construction of a 500,000± SF commercial office building and associated roadways, utilities and stormwater.

Function of the construction activity:

☐ Single-Family Residential ☒ Commercial
☐ Multi-Family Residential ☐ Industrial
☐ Institutional ☐ Highway or Road Construction
☐ Utility ☐ Other (please specify):_____

2.2.2 Building Demolition

Will there be demolition of any structure built or renovated before January 1, 1980? ☐ Yes ☒ No

If yes, do any of the structures being demolished have at least 10,000 square feet of floor space? ☐ Yes ☐ No

2.2.3 Agricultural Land

Was the pre-development land used for agriculture? ☐ Yes ☒ No

2.2.4 Estimated Project Dates

Estimated Project Start Date: TBD
Estimated Project Completion Date: TBD

Estimated Timeline of Activity	Construction Activity and BMP Descriptions
TBD-TBD	***Before any site grading activities begin*** 1. Stake Limit of Construction. Workers shall be informed that no construction activity is to occur beyond this limit at any time. 2. Delineate the limit of the natural buffer to be maintained with flags, tape or other similar device. 3. Clear vegetation as necessary within the limits of construction. A stockpile of wood chips from tree cutting shall be left on site for stabilization. 4. Grub the areas where silt fence is required, removing stumps and roots as necessary. The existing ground surface shall be disturbed as little as possible prior to the start of construction. 5. Install silt fence and straw bales as shown on the plans. An adequate stockpile of erosion control materials shall be on site at all times for emergency or routine replacement and shall include materials to repair silt fences, straw bales, or any other devices planned for use during construction. 6. Install storm drain inlet protection. 7. Construct stabilized construction exits. 8. Construct staging and materials storage area. 9. Install temporary sanitary facilities and dumpsters.
TBD-TBD	***Site grading*** 1. Begin site clearing and grubbing operations. 2. Commence excavation of stormwater management basins to act as temporary sedimentation basins during construction. 3. Commence construction of temporary drainage channels to direct runoff to sedimentation basin(s) during construction. Check dams shall be installed along the temporary drainage channels to reduce velocities and collect sediment. 4. Begin overall site grading and topsoil stripping. 5. Establish topsoil stockpile. 6. Install silt fences around stockpile and cover stockpiles. 7. Disturbed areas where construction will cease for more than 7 days shall be stabilized with erosion controls.
TBD-TBD	***Infrastructure (utilities, parking lot, etc.)*** 1. Construct temporary concrete washout area. 2. Install utilities, storm drains, sanitary sewers, and water services. 3. Install gutters, curbs, and prepare pavement subgrade.

TBD-TBD	***Building Construction*** 1. Begin construction of building foundation and structure. 2. Parking lot paved, exterior building constructed. 3. Remove temporary concrete washout area. 4. Implement winter stabilization procedures.
TBD-TBD	***Final stabilization and landscaping*** 1. Finalize pavement activities. 2. Convert temporary sediment basin(s) to (a) permanent basin. 3. Remove all temporary control BMPs and stabilize any areas disturbed by their removal with erosion controls. 4. Prepare final seeding and landscaping. 5. Monitor stabilized areas until final stabilization is reached.

2.3 SOILS, SLOPES, VEGETATION, AND CURRENT DRAINAGE PATTERNS

Soil type(s): The soils within the racetrack consist of Udorthents with wet substratum. These soils are located in areas that were previously tidal marshes, river floodplains, bays, harbors, and swamps. The fill consists of rubble, refuse, and mixed soil material, typically, sand, gravel, and channel dredgings. The parking area are listed as Urban land with wet substratum. These soils consist of developed areas within Udorthents, wet substratum. No hydrologic soil class is assigned to these soil types, but permeability is typically low.

Small areas of Newport silt loam line the southern boundary of the Phase 1 Project Site. This is a deep, well-drained soil with moderate permeability, and typically shallow groundwater. It is classified as hydrologic soil class B. The soils along the eastern boundary of the Phase 1 Project Site consist of Ipswich mucky peat, which is a very poorly drained, nearly level soil in tidal marshes. It is listed as hydrologic soil class A/D.

Test pits performed on the overall Project Site in 2012 by Haley and Aldrich, Inc., indicated consistent material generally throughout the Project Site, consisting of fill. The top 24-inches of soil are classified as either poorly graded sand or silty sand. Below 24-inches the soil is mostly unclassified fill, poorly graded sand, silty sand, or clayey sand. Groundwater was found on average 2 to 7-feet below existing grade.

Slopes: Within the vicinity of the racetrack, the topography of the Project Site is generally flat, ranging from elevations 12 feet to 20 feet Boston City Base (BCB). There is a high point near the Tomasello Road at approximate elevation 21 feet BCB. The Project Site slopes downhill from Tomasello Road to the northeast boundary of the Project Site. There is a second high point located within the racetrack infield at approximate elevation 20 feet BCB.

Drainage Patterns: Currently the stormwater within the Phase 1 Project Site disturbed area drains to two primary locations:

The area on the western side of the Phase 1 Project Site drains to an intermittent stream located along the eastern perimeter of the site and eventually discharges into Sales Creek. The area in the center of the Phase 1 Project Site drains to the infield pond and eventually discharges into Sales Creek.

A small area on the northeast side of the Phase 1 Project Site drains directly to Sales Creek. Sales Creek flows southeasterly through the Project Site, passing through twin 96-inch culverts under the racetrack to an open channel traversing the racetrack infield where it flows under the back straight via twin 96-inch drains and discharges to an open channel between the track and Bennington Street immediately east of the Property.

Vegetation: The infield of the track contains areas of lawn, singular trees, and several clusters of trees. Areas of reeds line Sales Creek. To the south of the property is an intermittent stream surrounded by brush vegetation.

2.4 CONSTRUCTION SITE ESTIMATES

Total property area:	161.252± acres
Total construction site area to be disturbed:	xx± acres
Maximum area to be disturbed at one time:	TBD acres
Percentage impervious area before construction:	xx%
Runoff coefficient before construction:	xx
Percentage impervious area after construction:	TBD %
Runoff coefficient after construction:	TBD

2.5 DISCHARGE INFORMATION

2.5.1 Description of Receiving Storm Sewer Systems

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☒ Yes ☐ No

Several agreements with the Commonwealth of Massachusetts are in place for the maintenance of the portion of Sales Creek located on the Project Site. The Department of

Conservation and Recreation (DCR) has an easement for the portion of Sales Creek that traverses the Project Site, and is responsible for its maintenance. DCR also owns and maintains the culverts within Sales Creek on the Project Site, as well as the Belle Isle tide gates and pump station. Discharges from the drainage structures associated with the above infrastructure are regulated under DCR's Municipal Separate Storm Sewer Systems (MS4) NPDES Permit MARO43001.

2.5.2 Receiving Waters

The stormwater runoff ultimately flows to Sales Creek which ultimately discharges to Boston Harbor.

2.5.3 Impaired Waters/ TMDLs

Has the surface water been listed as "impaired?" ☒ Yes ☐ No

If yes, list the pollutant(s) causing the impairment: Pathogens

Describe the method(s) used to determine whether or not your project site discharges to an impaired water:

Has a TMDL been completed? ☐ Yes ☒ No

If yes, list the title of the TMDL document: Draft Pathogen TMDL for the Boston Harbor Watershed (excluding the Neponset River sub-basin)

List the pollutant(s) for which there is a TMDL: Pathogens

2.5.4 Tier 2, 2.5, or 3 Waters

Is this surface water designated as a Tier 2, 2.5 or 3 water? ☐ Yes ☒ No

If yes specify which Tier the surface water is designated as:
☐ Tier 2 ☐ Tier 2.5 ☐ Tier 3

2.6 UNIQUE SITE FEATURES AND SENSITIVE AREAS

The Phase 1 Project Site contains an intermittent stream located along the southern property line. Sales Creek flows southeasterly through the overall Project Site passing through twin 96-inch culverts under the racetrack to an open channel traversing the racetrack infield where it flows under the back straight via twin 96-inch drains and discharges to an open channel between the track and Bennington Street immediately east of the Project Site.

The Massachusetts Surface Water Quality Standards (314 CMR 4.00) list both Sales Creek and the intermittent stream as Class SA Outstanding Resource Waters (ORW). These waters are designated as an excellent habitat for fish, other aquatic life, and wildlife and shall have an excellent aesthetic value.

Sales Creek ultimately discharges to Belle Isle Marsh, which consists of approximately 241-acres and is part of the larger Rumney Marsh Area of Critical Environmental Concern (ACEC). Belle Isle Marsh is designated as a shellfish growing area by the Division of Marine Fisheries but is currently listed as an area where shellfish growing is prohibited

Both ORWs and shellfish growing areas are classified as critical areas.

2.7 CONSTRUCTION SUPPORT ACTIVITIES

Construction support activities are not required for the Phase 1 Project.

2.8 POTENTIAL SOURCES OF POLLUTION

2.8.1 Potential Sources of Sediment

- Clearing and grubbing operations
- Grading and site excavation operations
- Vehicle tracking
- Topsoil stripping and stockpiling
- Landscaping operations

2.8.2 Potential Sources of Non-Sediment Pollutants

- Combined Staging Area — small fueling activities, minor equipment maintenance, sanitary facilities, and hazardous waste storage.
- Materials Storage Area — general building materials, solvents, adhesives, paving materials, paints, aggregates, trash, and so on.
- Construction Activity — paving, curb/gutter installation, concrete pouring/mortar/stucco, and building construction
- Concrete Washout Area

Material/ Chemical	Physical Description	Stormwater Pollutants	Location[1]
Pesticides	Various colored to colorless liquid, powder, pellets, or grains	Chlorinated hydrocarbons, organophosphates, carbamates, arsenic	Herbicides used for noxious weed control
[2]Fertilizer	Liquid or solid grains	Nitrogen, phosphorous	Newly seeded areas
Cleaning solvents	Colorless, blue, or yellow-green liquid	Perchloroethylene, methylene chloride, trichloroethylene, petroleum distillates	No equipment cleaning allowed in project limits
Asphalt	Black solid	Oil, petroleum distillates	Streets, parking areas, and roofing
Glue/ adhesives	White or yellow liquid	Polymers, epoxies	Building construction
Paints	Various colored liquids	Metal oxides, stoddard solvent, talc, calcium carbonate, arsenic	Building construction
Curing compounds	Creamy white liquid	Naphtha	Curb and gutter, walkways
Wood preservatives	Clear amber or dark brown liquid	Stoddard solvent, petroleum distillates, arsenic, copper, chromium	Timber pads and building construction
Hydraulic oil/fluids	Brown oily petroleum hydrocarbon	Mineral oil	Leaks or broken hoses from equipment
Gasoline	Colorless, pale brown or pink petroleum hydrocarbon	Benzene, ethyl benzene, toluene, xylene, MTBE	Secondary containment/staging area
Diesel Fuel	Clear, blue-green to yellow liquid	Petroleum distillate, oil & grease, naphthalene, xylenes	Secondary containment/staging area
Kerosene	Pale yellow liquid petroleum hydrocarbon	Coal oil, petroleum distillates	Secondary containment/staging area
Antifreeze/ coolant	Clear green/yellow liquid	Ethylene glycol, propylene glycol, heavy metals (copper, lead, zinc)	Leaks or broken hoses from equipment
Sanitary toilets	Various colored liquid	Bacteria, parasites, and viruses	Staging area

[1] Area where material/chemical is used on-site.
[2] Use of fertilizers containing nitrogen and/ or phosphorus in ratios greater than recommended by the manufacture must be documented.

2.9 SITE PLANS

The Topographic Plan shows the undeveloped site and its current features. The Site Plans show the developed site, or the major phases of development.

These Site Plans include:

- ☐ Delineation of construction phasing, if applicable
- ☒ Areas of soil disturbance and areas that will not be disturbed
- ☐ Direction(s) of stormwater flow and approximate slopes before and after major grading activities
- ☒ Natural features to be preserved
- ☒ Locations of major structural and non-structural BMPs identified in the SWPPP
- ☐ Location(s) of sediment, soil or other construction materials will be stockpiled
- ☐ Locations of stabilization measures
- ☐ Locations of off-site material, waste, borrow, or equipment storage areas
- ☒ Location of all waters of the U.S., including wetlands on or near the site. Indicate if water bodies are listed as impaired, or are identified as Tier 2, 2.5 or 3 waters.
- ☐ Boundary lines of any natural buffers,
- ☒ Locations where stormwater discharges or allowable non-stormwater to surface water(s)
- ☒ Locations of storm drain inlets and stormwater control measures on the site and in the immediate vicinity of the site
- ☐ Locations of all pollutant-generating activities
- ☐ Locations where polymers, flocculants, or other treatment chemicals will be used and stored
- ☐ Areas of federally-listed critical habitat for endangered or threatened species

See Appendix B: Site Plans

3.0 COMPLIANCE WITH APPLICABLE FEDERAL & STATE REQUIREMENTS

3.1 ENDANGERED SPECIES CERTIFICATION

Are endangered or threatened species and critical habitats on or near the project area?
☒ Yes ☐ No

Describe how this determination was made:
According to Massachusetts Bureau of Geographic Information (MassGIS) information accessed on October 31, 2017, the Phase 1 Project Site is not located within Natural Heritage and Endangered Species Program (NHESP)-designated Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife. There are no mapped potential or certified vernal pools on the Phase 1 Project Site.

Additionally, the Property is not currently mapped as containing winter hibernacula or maternity roost trees associated with the Northern Long-eared Bat (*Myotis septentrionalis*). According to the Information for Planning and Conservation tool published by the U.S. Fish and Wildlife Service, three species of threatened or endangered birds may be affected by activities in the Project vicinity: Piping Plover (*Charadrius melodus*), Red Knot (*Calidris canutus rufa*), and Roseate Tern (*Sterna dougallii dougallii*).

If yes, describe the species and/or critical habitat:

See above

If yes, describe or refer to documentation that determines the likelihood of an impact on the identified species and/or habitat and the steps taken to address that impact.
TBD

3.2 HISTORIC PRESERVATION

Step 1
Will stormwater controls that require subsurface earth disturbance be installed on the site?
☒ Yes ☐ No

Step 2
If you answered yes in Step 1, have prior surveys or evaluations conducted on the site already determined that historic properties do not exist, or that prior disturbances at the site have precluded the existence of historic properties?
☐ Yes ☐ No

Step 3

If you answered no in Step 2, has it been determined that the installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties?

☐ Yes ☐ No

Step 4

If you answered no in Step 3, did the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Office (THPO), or other tribal representative (whichever applies) respond within 15 calendar days to indicate whether the subsurface earth disturbances caused by the installation of stormwater controls affect historic properties?

☐ Yes ☐ No

If no, no further documentation is required. If yes, describe the nature of their response and include documentation in the Appendix:

☐ Written indication that adverse effects to historic properties from the installation of stormwater controls can be mitigated by agreed upon actions.

☐ No agreement has been reached regarding measures to mitigate effects to historic properties from the installation of stormwater controls.

☐ Other:

3.3 SAFE DRINKING WATER ACT UNDERGROUND INJECTION CONTROL REQUIREMENTS

Do you plan to install any of the following controls?

☐ Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

☐ Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow

☐ Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system)

If yes, attach documentation of contact between you and the applicable state agency or EPA Regional Office responsible for implementing the requirements for underground injection wells in the Safe Drinking Water Act and EPA's implementing regulations at 40 CFR Parts 144-147.

3.4 APPLICABLE STATE OR LOCAL PROGRAMS

This SWPPP complies with the requirements of Standard 8 of the Massachusetts Department of Environmental Protection Stormwater Handbook, which states:

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 plans) shall be developed and implemented.

4.0 EROSION AND SEDIMENT CONTROL BMPS

This SWPPP contains a listing of the erosion and sediment control best management practices (BMPs) that will be implemented to control pollutants in stormwater discharges. The BMPs are categorized under one of the areas of BMP activity as described below:

- Natural Buffers or Equivalent Sediment Controls
- Minimize disturbed area and protect natural features and soil
- Phased construction activity
- Control stormwater flowing onto and through the project
- Stabilize soils
- Protect slopes
- Protect storm drain inlets
- Establish perimeter controls and sediment barriers
- Retain sediment on-site and control dewatering practices
- Establish stabilized construction exits

4.1 NATURAL BUFFERS OR EQUIVALENT SEDIMENT CONTROLS

Are there any surface waters located within 50 feet of your construction disturbances that receive stormwater discharges from the site? ☒ Yes ☐ No

If yes, check the compliance alternative that applies:

☐ A 50-foot undisturbed natural buffer will be maintained. The 50-foot buffer is shown on the attached site plans and will be clearly marked off with flags, tape, or a similar marking device prior to the commencement of earth disturbing activities.

☒ An undisturbed natural buffer of x-feet will be provided along with supplemental erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer. The estimated sediment removal calculations are included in the appendixes of this report and have been calculated using the applicable tables included in Appendix G of the 2017 Construction General Permit **or** site-specific calculations were performed to estimate the sediment removal of a 50-buffer zone and the efficiency of the reduced buffer zone and supplemental erosion control measures.

Description of Controls:
Provide a description of the additional erosion and sediment controls proposed, including the model or other tool used to estimate the sediment load reductions and the results from the calculation.

☐ It is infeasible to provide and maintain an undisturbed natural buffer of any size, therefore erosion and sediment controls will be implemented that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer. The estimated sediment removal calculations are included in the appendixes of this report and have been calculated using the applicable tables included in Appendix G of the 2017 Construction General Permit **or** site-specific calculations were performed to estimate the sediment removal of a 50-buffer zone and the efficiency of the reduced buffer zone and supplemental erosion control measures.

☐ The project qualifies for one of the exceptions in Part 2.1.2.1.e. of the 2012 Construction General Permit. Specifically:

☐ There is no discharge of stormwater to surface waters through the area between the disturbed portions of the site and any surface waters located within 50 feet of the site. This includes situations where control measures have been implemented such as a berm or other barrier that will prevent such discharges.

☐ No natural buffer exists due to preexisting development disturbances, such as impervious surfaces or structures that were constructed prior to the initiation of planning for this project.

☐ For a "linear project," site constraints (e.g., limited right-of-way) make it infeasible for the site to meet any of the CGP Part 2.1.2.1.a compliance alternatives

☐ The project qualifies as "small residential lot" construction, and complies with:

4.2 MINIMIZE DISTURBED AREA AND PROTECT NATURAL FEATURES AND SOIL

4.2.1 Preserve Existing Vegetation

Description:	The preserved area of existing vegetation shall be as identified on the Site Plans and Sitework Specifications.
Installation Schedule:	The preserved area of existing vegetation shall be surrounded with the orange-colored plastic mesh fence, and trees shall be marked before construction begins at the site.
Maintenance and Inspection:	The area shall be inspected weekly to ensure the temporary fence is intact and the trees are clearly marked. During construction, preserved areas of existing vegetation shall be surrounded by the orange-colored mesh fence and clearly marked at all times.

4.2.2 Stockpiling Topsoil

Description:	Topsoil stripped from the immediate construction area shall be stockpiled as identified on the Site Plans and Sitework Specifications or as approved by the SWPPP preparer. Stockpiles shall be located outside of any natural buffers and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated.
Installation Schedule:	Topsoil stockpiles shall be established during grading activities. The silt fence and temporary erosion controls shall be installed immediately after the stockpile has been established. For piles that will be unused for 7 or more days provide cover over the stockpile or temporary stabilization to avoid direct contract with precipitation and wind. Install a sediment barrier along all downgradient perimeter areas of stockpiles.
Maintenance and Inspection:	The area shall be inspected weekly for erosion and immediately after storm events. Areas on or around the stockpile that have eroded shall be stabilized immediately with erosion controls. See following Silt Fence section for Maintenance and inspection procedures.

4.3 PHASED CONSTRUCTION ACTIVITY

The proposed Phase 1 Project is the first phase of the Master Plan for the redevelopment of Suffolk Downs. To minimize erosion during grading activities, grading and site work shall be conducted during periods of predicted dry weather. The areas of the Phase 1 Project Site that will remain vegetated after construction shall be graded first and stabilized with hydromulch or seeding immediately after grading activities are completed. All other areas of the construction site shall be stabilized if site work is not planned for more than 7 days. To minimize potential erosion from the Phase 1 Project Site, only areas necessary to construct the grass drainage channels, sediment basin, and construction entrances/exits shall be disturbed initially. These areas shall be cleared, grubbed, and graded and the above measures shall be installed. These areas shall be stabilized immediately after construction but no later than 7 days after construction ceases. Overall grubbing, clearing, grading shall be conducted over a 2-week period to limit erosion from the Phase 1 Project Site. Areas graded during this time period shall be stabilized with hydromulch immediately after construction but no later than 7 days after construction ceases.

4.4 CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT

4.4.1 Grass Drainage Channels

Description:	A grass drainage channel shall be installed as indicated on the site plans. The channel shall convey runoff to storm drain inlets and temporary sediment basins, as appropriate or at locations shown on plans. Some grass drainage channels shall remain as a permanent stormwater structure after construction is complete.
Installation Schedule:	The grass drainage channel shall be installed after clearing and grubbing operations are completed at the site.
Maintenance and Inspection:	The channel shall be inspected weekly and immediately after storm events for erosion and structural failures. Before vegetation has been established in the channel, inspect erosion control blankets, embankments, and beds for erosion and accumulation of debris and sediment. Remove debris, sediment, and repair erosion control blankets, fiber rolls and embankments immediately.

Design Specifications

1. The channel shall have a positive drainage to convey runoff to the storm drain inlets and temporary sediment basins.

4.5 STABILIZE SOIL

4.5.1 Temporary Stabilization

Description:	Initiation of temporary vegetative cover shall occur immediately where construction will cease for more than 7 days. It shall be established using hydroseeding for areas of exposed soil (including stockpiles).
Installation Schedule:	Temporary stabilization measures shall be initiated immediately where construction activities will temporarily cease for more than 7 days.
Maintenance and Inspection:	Stabilized areas shall be inspected weekly and after storm events until a dense cover of vegetation has become established. If failure is noticed at the seeded area, the area shall be reseeded, fertilized, and mulched immediately.

4.5.2 Mulching

Description:	Hydromulching shall provide immediate protection to exposed soils during short periods of disturbance. Hydromulch shall also be applied in areas that have been seeded for temporary or permanent stabilization.
Installation Schedule:	Hydromulch shall be applied to exposed soils during short periods of construction and seeded areas.
Maintenance and Inspection:	Mulched areas shall be inspected weekly and after storm events to check for movement of mulch or erosion. If washout, breakage, or erosion occurs, the surface shall be repaired, and new mulch shall be applied to the damaged area.

4.5.3 Permanent Stabilization

Description:	Initiation of permanent stabilization measures shall occur immediately after the final design grades are achieved and earth moving activities cease. Native species of plants shall be used to establish vegetative cover on exposed soils. Permanent stabilization shall be completed in accordance with the procedures outlined in the Final Stabilization section of this report.
Installation Schedule:	Portions of the Phase 1 Project Site where construction activities have permanently ceased shall be stabilized, as soon as possible.
Maintenance and Inspection:	All seeded areas shall be inspected weekly during construction activities and after storm events until a dense cover of vegetation has been established. If failure is noticed at the seeded area, the area shall be reseeded, fertilized, and mulched immediately. Care shall be taken to avoid compacting newly placed topsoil. After construction is completed at the Phase 1 Project Site, permanently stabilized areas shall be monitored until final stabilization is reached.

4.5.4 Dust Control

Description:	Dust from the Phase 1 Project Site shall be controlled by using a mobile pressure-type distributor truck to apply water to disturbed areas. The mobile unit shall apply water at a rate of 300 gallons per acre and minimized as necessary to prevent runoff and ponding.

Installation Schedule:	Dust control shall be implemented as needed once site grading has been initiated and during windy conditions (forecasted or actual wind conditions of 20 mph or greater) while site grading is occurring. Spraying of water shall be performed no more than three times a day during the months of May–September and once per day during the months of October–April or whenever the dryness of the soil warrants it.
Maintenance and Inspection:	At least one mobile unit shall be available at all times to distribute water to control dust on the Phase 1 Project Site. Each mobile unit shall be equipped with a positive shutoff valve to prevent over watering of the disturbed area.

4.6 PROTECT SLOPES

4.6.1 Erosion Control Blanket

Description:	Erosion control blankets shall be used to provide stabilization for the slopes in the grass drainage channels and sediment basins, and on slopes greater than 3:1 throughout the Phase 1 Project Site.
Installation Schedule:	The erosion control blankets shall be installed once the slopes of the grass drainage channel and sediment basin have reached final grade.
Maintenance and Inspection:	The erosion control blanket shall be inspected weekly and immediately after storm events to determine if cracks, tears, or breaches have formed in the fabric; if so, the blanket shall be repaired or replaced immediately. Good contact with the soil shall be maintained and erosion shall not occur under the blanket. Any areas where the blanket is not in close contact with the ground shall be repaired or replaced.

4.7 PROTECT STORM DRAIN INLETS

4.7.1 Filter Bags

☐ Permanent ☒ Temporary

Description:	Filter bag manufactured specifically for controlling sediment flow into all storm drain inlets to prevent coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area.

Installation Schedule:	Filter bags shall be installed prior to clearing and grubbing.
Maintenance and Inspection:	Storm drain inlet protection shall be inspected weekly and following storms. Clogged filter bags shall be cleaned or replaced. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, you must remove the deposited sediment by the end of the same work day it is found or by the following work day if removal the same day is not feasible. Collected sediments shall NOT be washed into storm drains.

4.8 ESTABLISH PERIMETER CONTROLS AND SEDIMENT BARRIERS

4.8.1 Erosion Control Barrier

☐ Permanent ☒ Temporary

Description:	An erosion control barrier, consisting of entrenched straw bales, straw wattles, compost socks and siltation fencing, shall be installed along the downgradient side of the proposed Phase 1 Project to decrease the velocity of sheet flows and intercept and detain small amounts of sediment from disturbed areas.
Installation Schedule:	Erosion control barrier shall be installed prior to clearing and grubbing.
Maintenance and Inspection:	Erosion control barrier shall be inspected weekly, following storms, and daily during rainy periods. Damaged fencing shall be replaced. Concentrated flows shall be intercepted and rerouted. Sediment accumulations shall be removed when reaching a depth of 6-inches, or one-half of the above ground height of the barrier, whichever is less. Deteriorated fencing material shall be replaced. Used fencing shall be properly disposed of.

4.8.2 Silt Fence

☐ Permanent ☒ Temporary

Description:	Entrenched silt fence shall be installed to decrease the velocity of sheet flows and intercept and detain small amounts of sediment from disturbed areas.
Installation Schedule:	Silt fence shall be installed prior to clearing and grubbing.

Maintenance and Inspection:	Silt fence shall be inspected weekly, following storms, and daily during rainy periods. Damaged fencing shall be replaced. Concentrated flows shall be intercepted and rerouted. Sediment accumulations shall be removed when reaching a depth of 6-inches. Deteriorated fencing material shall be replaced. Used fencing shall be properly disposed of.

4.9 PREVENT SOIL COMPACTION

4.9.1 Protect Proposed Infiltration Areas

☐ Permanent ☒ Temporary

Description:	An erosion control barrier, consisting of entrenched straw bales and siltation fencing, shall be installed around the perimeter of all proposed infiltration areas to prevent construction vehicles from impacting the area, to decrease the velocity of sheet flows and intercept, and detain small amounts of sediment from disturbed areas.
Installation Schedule:	The erosion control barrier shall be installed after clearing and grubbing.
Maintenance and Inspection:	Silt fence shall be inspected weekly, following storms, and daily during rainy periods. Damaged fencing shall be replaced. Concentrated flows shall be intercepted and rerouted. Sediment accumulations shall be removed when reaching a depth of 6-inches. Deteriorated fencing material shall be replaced. Used fencing shall be properly disposed of.

4.10 RETAIN SEDIMENT ON-SITE

4.10.1 Temporary Sediment Basins

☐ Permanent ☒ Temporary

Description:	Temporary sediment basins are located throughout the Phase 1 Project Site between construction and wetland resource areas. These basins provide 3,600 cubic feet of storage per acre drained, as required by the EPA. Refer to the Temporary Sediment Basin Sizing Calculation located in Appendix N. Several temporary sediment basins will be utilized as sediment forebays following construction.

Installation Schedule:	Temporary sediment basins shall be installed during grading activities.
Maintenance and Inspection:	Temporary sediment basins shall be inspected weekly and following storms. Sediment shall be removed when it reaches a depth of one foot, or half the design capacity whichever is less. Damage to basin embankments and slopes shall be repaired.

4.11 ESTABLISH STABILIZED CONSTRUCTION ENTRANCE/EXIT

☐ Permanent ☒ Temporary

Description:	Temporary gravel or crushed stone construction entrances/exits or other means shall be used to minimize off-site movement of soil with vehicles. Construction access points shall be maintained to minimize tracking of soil onto public roads and existing parking lots to remain. If the rock entrance is not working to keep streets clean, then install wheel wash, sweep streets, or wash streets if wash water can be collected.
Installation Schedule:	Stabilized construction entrance shall be installed prior to clearing and grubbing.
Maintenance and Inspection:	Stabilized construction entrances shall be inspected daily. Gravel or crushed stone shall be added if the pad is no longer in accordance with the specifications. If the rock entrance is not working to keep streets clean, then install wheel wash, sweep streets, or wash streets if wash water can be collected. When sediment has been tracked off of the site, it shall be removed by the end of the same working day, or by the end of the next working day if track-out occurs on a non work day. Remove sediment by sweeping, shoveling or vacuuming roadways were sediment has been tracked-out.

4.12 DEWATERING PRACTICES

Description:	All groundwater or stormwater discharged from excavations, trenches, foundations, vaults, or other similar point shall be treated by sediment basins, sediment traps, sediment socks, dewatering tanks, tube settlers or filtration systems specifically designed to remove sediment from the

	excavations. All dewatering practices shall conform to the following: • Visible floating solids or foam shall not be discharged; • An oil-water separator or suitable filtration device (such as a cartridge filter) that is designed to remove oil, grease, or other products if dewatering water is found to contain these materials shall be used; • To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. In no case will surface waters be considered part of the treatment area; • Velocity dissipaters shall be installed at all points where dewatering activities are discharged to the surface. • With backwash water, either haul it away for disposal or return it to the beginning of the treatment process; and • Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications.
Installation Schedule:	Install settling or filtration methods prior to commencing dewatering. Engineer is required to approve settling of filtration method design prior to installation.
Maintenance and Inspection:	Settling of filtration controls shall be inspected weekly and following storms. Sediment shall be removed when it reaches a depth of one foot, or half the design capacity whichever is less.

5.0 GOOD HOUSEKEEPING BMPS

This SWPPP contains a listing of the good housekeeping best management practices (BMPs) that shall be implemented to control pollutants in stormwater discharges during construction-related work. The BMPs are categorized below:

- Material Handling and Waste Management
- Establish Proper Building Material Staging Areas
- Designate Washout Areas
- Establish Proper Equipment/Vehicle Fueling and Maintenance Practices
- Allowable Non-Stormwater Discharges and Control Equipment/Vehicle Washing
- Spill Prevention and Control Plan

5.1 MATERIAL HANDLING AND WASTE MANAGEMENT

Several management procedures and practices are proposed to prevent and/or reduce the discharge of pollutants to stormwater from solid or liquid wastes that will be generated at the Phase 1 Project Site. These measures are grouped into the following categories: (1) solid or construction waste disposal, (2) recycling, (3) sanitary and septic waste, and (4) hazardous materials.

5.1.1 Solid or Construction Waste Disposal

Description:	All waste materials shall be collected and disposed of into metal trash dumpsters in the materials storage area. Dumpsters shall have a secure watertight lid, be placed away from stormwater conveyances and drains, and meet all federal, state, and municipal regulations. Only trash and construction debris from the Phase 1 Project Site shall be deposited in the dumpster. No construction materials shall be buried on-site unless authorized by a program for recycling/beneficial use. All personnel shall be instructed regarding the correct disposal of trash and construction debris. Notices that state these practices shall be posted in the office trailer and the individual who manages day-to-day operations on the Phase 1 Project Site shall be responsible for seeing that these practices are followed.
Installation Schedule:	Trash dumpsters shall be installed once the materials storage area has been established.
Maintenance and Inspection:	The dumpsters shall be inspected weekly and immediately after storm events. The dumpsters shall be emptied weekly and taken to an approved landfill or recycling facility. If trash and construction debris are exceeding the dumpsters' capacity, the dumpsters shall be emptied more frequently. Waste container lids shall be closed when not in use and at the end of the business day. For waste containers that do not have lids, provide cover or a similarly effective means to minimize the discharge of pollutants.

5.1.2 Recycling

Description:	Wood pallets, cardboard boxes, and other recyclable construction scraps shall be disposed of in a designated dumpster for recycling. The dumpster shall have a secure watertight lid, be placed away from stormwater conveyances and drains and meet all local and state solid-waste management regulations. Only solid recyclable construction scraps from the Phase 1 Project Site shall be deposited in the dumpster. All personnel shall be instructed regarding the

	correct procedure for disposal of recyclable construction scraps. Notices that state these procedures shall be posted in the office trailer, and the individual who manages day-to-day operations on the Phase 1 Project Site shall be responsible for seeing that these procedures are followed.
Installation Schedule:	Designated recycling dumpsters shall be installed once the area has been established.
Maintenance and Inspection:	The recycling dumpster shall be inspected weekly and immediately after storm events. The recycling dumpster shall be emptied weekly and taken to an approved recycling center. If recyclable construction wastes are exceeding the dumpsters' capacity, the dumpsters shall be emptied more frequently.

5.1.3 Sanitary and Septic Waste

Description:	Temporary sanitary facilities (portable toilets) shall be provided at the Phase 1 Project Site throughout the construction phase. The portable toilets shall be located in the staging area, away from concentrated flow paths and traffic flow.
Installation Schedule:	The portable toilets shall be brought to the Phase 1 Project Site once the staging area has been established.
Maintenance and Inspection:	All sanitary waste shall be collected from the portable facilities on a regular basis. The portable toilets shall be inspected weekly for evidence of leaking holding tanks. Toilets with leaking holding tanks shall be removed from the site and replaced with new portable toilets.

5.1.4 Hazardous Materials and Waste

Description:	All hazardous waste materials such as oil filters, petroleum products, paint, and equipment maintenance fluids shall be stored in structurally sound and sealed shipping containers, within the hazardous materials storage area. Hazardous waste materials shall be stored in appropriate and clearly marked containers and segregated from other non-waste materials. Secondary containment shall be provided for all waste materials in the hazardous materials storage area and shall consist of commercially available spill pallets. Additionally, all hazardous waste materials shall be disposed of in accordance with federal, state, and municipal regulations. Hazardous waste materials shall not be disposed of into the on-site dumpsters. All personnel shall be instructed regarding proper procedures for hazardous waste disposal. Notices that state these procedures shall be posted in the office trailer and the individual who manages day-to-day operations on the Phase 1 Project Site shall be responsible for seeing that these procedures are followed.
Installation Schedule:	Shipping containers used to store hazardous waste materials shall be installed once the Phase 1 Project Site materials storage area has been installed.
Maintenance and Inspection:	The hazardous waste material storage areas shall be inspected weekly and after storm events. The storage areas shall be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Material safety data sheets, material inventory, and emergency contact numbers shall be maintained in the office trailer.

5.2 ESTABLISH PROPER BUILDING MATERIAL STAGING AREAS

Description:	Construction equipment and maintenance materials shall be stored at the combined staging area and materials storage areas. A watertight shipping container shall be used to store hand tools, small parts, and other construction materials. Nonhazardous building materials such as packaging material (wood, plastic, and glass), and construction scrap material (brick, wood, steel, metal scraps, and pipe cuttings) shall be stored in a separate covered storage facility adjacent to the shipping container. All hazardous-waste materials such as oil filters, petroleum products, paint, and equipment maintenance fluids shall be stored in structurally sound and sealed containers under cover within the storage area.

	All fertilizers, herbicides, insecticides and pesticides shall be stored in accordance with local, state, and federal regulations. At a minimum these materials shall be covered with plastic sheeting or a temporary roof to prevent contact with rainwater. Very large items, such as framing materials and stockpiled lumber, shall be stored in the open in the materials storage area. Such materials shall be elevated on wood blocks to minimize contact with runoff.
Installation Schedule:	The materials storage area shall be installed after grading and before any infrastructure is constructed at the Phase 1 Project Site.
Maintenance and Inspection:	The storage area shall be inspected weekly and after storm events. The storage area shall be kept clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners shall be repaired or replaced as needed to maintain proper function.

5.4 DESIGNATE WASHOUT AREAS

5.4.1 Concrete Washout

Description:	A designated temporary, above-grade concrete washout area shall be constructed. The temporary concrete washout area shall be constructed with a recommended minimum length and minimum width of 10 feet, but with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations. The washout area shall be lined with plastic sheeting at least 10 mils thick and free of any holes or tears. Signs shall be posted marking the location of the washout area to ensure that concrete equipment operators use the proper facility. Concrete pours shall not be conducted during or before an anticipated storm event. Concrete mixer trucks and chutes shall be washed in the designated area or concrete wastes shall be properly disposed of off-site. When the temporary washout area is no longer needed for the construction project, the hardened concrete and materials used to construct the area shall be removed and disposed of according to the maintenance section below, and the area shall be stabilized.
Installation Schedule:	The washout area shall be constructed before concrete pours occur at the Phase 1 Project Site.
Maintenance and Inspection:	The washout areas shall be inspected daily to ensure that all concrete washing is being discharged into the washout area, no leaks or tears are present, and to identify when concrete wastes need to be removed. The washout areas shall be cleaned out once the area is filled to 75 percent of the holding capacity. Once the area's holding capacity has been reached, the concrete wastes shall be allowed to harden; the concrete shall be broken up, removed, and taken to an approved landfill for disposal or recycled on-site or off-site in accordance with applicable laws. The plastic sheeting shall be replaced if tears occur during removal of concrete wastes from the washout area.

Design Specifications:

1. Temporary concrete washout type Above Grade shall be constructed as shown above, with a recommended minimum length and minimum width of 10 feet.
2. The washout shall be a minimum of 50 feet from storm drain inlets.
3. Plastic lining shall be free of holes, tears, or other defects that compromise the impermeability of the material.

5.4.2 Applicators, Containers and Paint Washout

Description:	A designated temporary, above-grade washout area shall be constructed as needed for the washout and cleanout of stucco, paint, or other non-hazardous construction materials. The temporary washout area shall be a leak-proof container with sufficient volume to contain all liquid and waste generated by washout operations. The temporary washout shall be sited outside of all buffer zones.
Installation Schedule:	The washout area shall be constructed as needed.
Maintenance and Inspection:	The washout areas shall be inspected daily to ensure that all washing is being discharged into the washout area, no leaks or tears are present, and to identify when wastes need to be removed. The washout areas shall be cleaned out once the area is filled to 75 percent of the holding capacity. Liquid wastes shall be disposed of in accordance with applicable Federal and State requirements and shall not be discharged into drainage systems.

5.5 ESTABLISH PROPER EQUIPMENT/VEHICLE FUELING AND MAINTENANCE PRACTICES

Description:	Several types of vehicles and equipment will likely be used on-site throughout the Phase 1 Project, including graders, scrapers, excavators, loaders, paving equipment, rollers, trucks and trailers, backhoes, and forklifts. All major equipment/vehicle fueling and maintenance shall be performed outside of wetland buffer zones. When vehicle fueling must occur on-site, the fueling activity shall occur in the staging area. Only minor equipment maintenance shall occur on-site. All equipment fluids generated from maintenance activities shall be disposed of into designated drums stored on spill pallets in accordance with the Material Handling and Waste Management Section. Absorbent, spill-cleanup materials and spill kits shall be available at the combined staging and materials storage area. Drip pans shall be placed under all equipment receiving maintenance and vehicles and equipment parked overnight.
Installation Schedule:	BMPs implemented for equipment and vehicle maintenance and fueling activities shall begin at the start of the Phase 1 Project.
Maintenance and Inspection:	Inspect equipment/vehicle storage areas weekly and after storm events. Vehicles and equipment shall be inspected on each day of use. Leaks shall be repaired immediately, using dry cleanup measures where possible and eliminating the source of the discharge. Problem vehicle(s) or equipment shall be removed from the Phase 1 Project Site. Keep ample supply of spill-

	cleanup materials on-site and immediately clean up spills and dispose of materials properly. Do not clean surfaces by hosing-down the area

5.6 ALLOWABLE NON-STORMWATER DISCHARGES AND CONTROL EQUIPMENT / VEHICLE WASHING

Description:	All equipment and vehicle washing shall be performed off-site, except as required for wheel washes and concrete washout areas.
Installation Schedule:	N/A
Maintenance and Inspection:	N/A

5.7 SPILL PREVENTION AND CONTROL PROCEDURES

Description:	i. Employee Training: All employees shall be trained as detailed in the Inspection and Maintenance section of this report. ii. Vehicle Maintenance: Vehicles and equipment shall be maintained off-site. All vehicles and equipment including subcontractor vehicles shall be checked for leaking oil and fluids. Vehicles leaking fluids shall not be allowed on-site. iii. Hazardous Material Storage: Hazardous materials shall be stored in accordance with this report and federal and municipal regulations. iv. Spill Kits: Spill kits shall be kept within the materials storage area. Spills: All spills shall be cleaned up immediately upon discovery. Spent absorbent materials and rags shall be hauled off-site immediately after the spill is cleaned up for disposal at an approved landfill. Spills large enough to discharge to surface water or in exceedance of applicable Massachusetts Contingency Plan thresholds shall be reported to the National Response Center at 1-800-424-8802 and MassDEP at 617-792-7653. v. Material safety data sheets: A material inventory and emergency contact information shall be maintained at the on-site project trailer.
Installation Schedule:	The spill prevention and control procedures shall be implemented once construction begins on-site.
Maintenance and Inspection:	All personnel shall be instructed the correct procedures for spill prevention and control. Notices that state these practices shall be posted in the office trailer, and the individual who manages day-to-day operations on the Phase 1 Project Site shall be responsible for seeing that these procedures are followed.

5.8 FERTILIZER DISCHARGE RESTRICTIONS

Description:	Discharges from fertilizers containing nitrogen and phosphorus shall be minimized. Fertilizers shall be applied at rates and amounts consistent with the manufacture's specification, and shall at no time exceed local, state, or federal specifications. See project landscape specifications for acceptable fertilizers that can be used for the project.
Installation Schedule:	Fertilizers shall be applied at an appropriate time of year, timed to coincide as closely as possible to the period of maximum vegetation uptake and growth. Avoid applying fertilizers before heavy rains. Do not apply fertilizers to frozen ground or stormwater conveyance channels flowing with water.
Maintenance and Inspection:	N/A

5.9 ALLOWABLE NON-STORMWATER DISCHARGE MANAGEMENT

Any changes in construction activities that produce other allowable non-stormwater discharges shall be identified, and the SWPPP shall be amended and the appropriate erosion and sediment control shall be implemented.

The following is a list of allowable non-stormwater discharges:

- Water Used to Control Dust
- Uncontaminated Excavation Dewatering
- Landscape Irrigation
- Fire Hydrant Flushing
- Firefighting
- Potable Water including uncontaminated waterline flushing
- Building Wash-Down provided soaps, solvents and detergents are not used and the external surface does not contain hazardous substances (i.e. paint or caulk containing PCBs)
- Pavement Wash-Down provided spills or leaks of toxic substances have not occurred and where soaps, solvents and detergents are not used.
- Non-Detergent Laden Vehicle Wash Water
- Foundation or Footing Drains
- Uncontaminated air conditioning or compressor condensate

Except for water used to control dust and irrigation water, the above discharges shall not be routed to areas of exposed soil.

6.0 POST-CONSTRUCTION BMPS

6.1 INFILTRATION BASIN

Description:	Infiltration basins shall be protected from stormwater runoff from the disturbed site during construction. Riprap spillways shall be constructed as detailed on the site plan.
Design Specifications:	Install according to sitework specifications and details.
Installation Schedule:	Infiltration basins shall be excavated during earthwork construction.
Maintenance and Inspection:	The basins shall be inspected weekly and after storm events greater than 0.5 inches during construction. The area shall be checked for signs of erosion, seepage, and structural damage. Erosion, seepage, and structural damage shall be repaired immediately. The temporary sediment riser shall be checked for any damage or obstructions and any damage found shall be repaired and obstructions removed. Immediately after the completion of construction, the plant material shall be watered for 14 consecutive days unless there is sufficient natural rainfall. The area shall be monitored until final stabilization is reached. Following completion of site construction and final stabilization, maintenance and inspection responsibilities shall be taken over by the Owner in accordance with the Long-Term Pollution Prevention Plan and Long-Term Operation & Maintenance Plan.

6.2 DEEP SUMP AND HOODED CATCH BASINS AND WATER QUALITY STRUCTURES

Description:	Deep sump and hooded catch basins and water quality structures shall be located throughout paved areas on the Phase 1 Project Site. Catch basins and water quality structures shall collect, treat, and convey stormwater runoff from the proposed roadways.
Design Specifications:	Handle and install according to site work specifications. Filter bags shall be installed in all storm drain inlets.
Installation Schedule:	Catch basins and water quality structures shall be installed during utility construction.
Maintenance and Inspection:	Catch basins and water quality structures shall be inspected weekly and after major storm events during construction. See maintenance of Filter Bags for information on maintenance procedures. Following completion of Phase 1 Project Site construction and final stabilization, maintenance and inspection responsibilities shall be taken over by the Owner in accordance with the Long-Term Pollution Prevention Plan and Long-Term Operation & Maintenance Plan.

7.0 FINAL STABILIZATION

In compliance with the Construction General Permit, soil stabilization measures must be implemented immediately whenever earth-disturbing activities are temporarily or permanently ceased on any portion of the Phase 1 Project Site. Earth-disturbing activities are temporarily ceased when clearing, grading, and excavation within any area of a site that will not include a permanent structure will not resume for a period of 7 or more calendar days, but such activities will resume in the future.

In the context of this provision, "immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased. The following activities constitute the initiation of stabilization:

- Preparing the soil for vegetative or non-vegetative stabilization;
- applying mulch or other non-vegetative product to the exposed area;
- seeding or planting the exposed area;
- starting any of the activities listed above on a portion of the area to be stabilized, but not on the entire area; and
- finalizing arrangements to have stabilization product fully installed in compliance with the applicable deadline for completing stabilization.

As soon as practicable, but no later than 7 calendar days after the initiation of soil stabilization measures the following activities are required to be completed:

- For vegetative stabilization, all activities necessary to initially seed or plant the area to be stabilized; and/or
- For non-vegetative stabilization, the installation or application of all such non-vegetative measures.

The following sections detail the management practices proposed to achieve final stabilization of the site.

7.1 PERMANENT SEEDING

Description:	Permanent seeding shall be applied immediately after the final design grades are achieved on portions of the Phase 1 Project Site but no later than 7 days after construction activities have permanently ceased. After the entire Phase 1 Project Site is stabilized, any sediment that has accumulated shall be removed and hauled off-site for disposal at an approved landfill. Construction debris, trash and temporary BMPs (including silt fences, material storage areas, sanitary toilets, and inlet protection) shall also be removed and any areas disturbed during removal

	shall be seeded immediately. Seeding shall be performed in accordance to the Site Plans and Landscape Specifications for the project.
Installation Schedule:	Seeding shall occur at portions of the site where construction activities have permanently ceased shall be stabilized, as soon as possible but no later than 14 days after construction ceases.
Maintenance and Inspection:	All seeded areas shall be inspected weekly during construction activities for failure and after storm events until a dense cover of vegetation has been established. If failure is noticed at the seeded area, the area shall be reseeded, fertilized, and mulched immediately. After construction is completed at the site, permanently stabilized areas shall be monitored until final stabilization is reached.

8.0 INSPECTIONS AND MAINTENANCE

8.1 INSPECTIONS

8.1.1 Inspection Schedule and Procedures

Inspections of the Phase 1 Project Site will be performed once every 7 days and within 24 hours of the end of a storm event of 0.25-inch or greater unless otherwise specified. The inspections will verify that all BMPs required are implemented, maintained, and effectively minimizing erosion and preventing stormwater contamination from construction materials.

Inspections shall include all areas of the Phase 1 Project Site disturbed by construction activity and areas used for storage of materials that are exposed to precipitation. Inspectors shall look for evidence of, or the potential for, pollutants entering the stormwater conveyance system. Sedimentation and erosion control measures identified in the SWPPP shall be observed to ensure proper operation. Discharge locations shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to waters of the United States, where accessible. Where discharge locations are inaccessible, nearby downstream locations shall be inspected to the extent that such inspections are practicable. Locations where vehicles enter or exit the Phase 1 Project Site shall be inspected for evidence of off-site sediment tracking.

Utility line installation, pipeline construction, and other examples of long, narrow, linear construction activities may limit the access of inspection personnel to the areas described in the above paragraph. Inspection of these areas could require that vehicles compromise temporarily or even permanently stabilized areas, cause additional disturbance of soils, and increase the potential for erosion. In these circumstances, controls shall be inspected on the same frequencies as other construction projects, but representative inspections may be performed. For representative inspections, personnel shall inspect controls along the construction site for 0.25 mile above and below each access point where a roadway, undisturbed right-of-way, or other similar feature intersects the construction site and allows access to the areas described above. The conditions of the controls along each inspected 0.25 mile segment may be considered as representative of the condition of controls along that reach extending from the end of the 0.25 mile segment to either the end of the next 0.25 mile inspected segment, or to the end of the project, whichever occurs first.

For detailed inspection procedures, see Sections 4 and 5.

All inspections shall be coordinated with a representative from the HYM Investment Group, LLC. An HYM Investment Group, LLC representative shall accompany the inspector , when possible, during inspections.

Inspection reports are required to be completed within 24-hours of an inspection. If corrective actions are identified by the Inspector during the inspection, he or she shall notify and submit a copy of the inspection report to the Operator(s). For corrective actions identified, the project managers shall be responsible for initiating the corrective action within 24 hours of the report and completing maintenance as soon as possible or before the next storm event. For any corrective actions requiring a SWPPP amendment or change to a stormwater conveyance or control design, the project manager shall notify Owner, as soon as possible, before initiating the corrective action.

For a copy of the inspection report template, see Appendix E.

8.2 REDUCTIONS IN INSPECTION FREQUENCY

Once an area is stabilized, inspections may be reduced to once per month. If construction resumes at the stabilized area the inspection frequency shall increase as outlined in section 8.1.

If earth-disturbing activities are suspended due to frozen conditions inspections can be temporarily suspended until a thaw occurs.

8.3 CORRECTIVE ACTION LOG

The corrective action log describes repairs, replacements, and maintenance of BMPs undertaken as a result of the inspections and maintenance procedures. Additionally, remedies of permit violations and clean and proper disposal of spills, releases other deposits should be recorded.

If it is determined the stormwater controls have not been installed as required, or that they are not functioning adequately corrective action is required within 7 calendar days.

See Appendix F – Corrective Action Log.

9.0 RECORDKEEPING AND TRAINING

9.1 RECORDKEEPING

A copy of the SWPPP, along with all inspection reports and corrective action logs are required to be stored at an accessible location at the Phase 1 Project Site, and shall be made available upon request of the EPA, or state or local agency approving stormwater management plans.

The following records shall be kept at the Phase 1 Project Site and shall be available for inspectors to review. These records shall be retained for a minimum period of at least 3 years after the permit is terminated.

Date(s) when major grading activities occur:
See Appendix I – Grading and Stabilization Activities Log

Date(s) when construction activities temporarily or permanently cease on a portion of the site:
See Appendix I – Grading and Stabilization Activities Log

Date(s) when an area is either temporarily or permanently stabilized:
See Appendix I – Grading and Stabilization Activities Log

9.2 LOG OF CHANGES TO THE SWPPP

The log of changes to the SWPPP is maintained in Appendix G and includes additions of new BMPs, replacement of failed BMPs, significant changes in the activities or their timing on the project, changes in personnel, changes in inspection and maintenance procedures and update to site plans.

9.3 TRAINING

Prior to the commencement of earth-disturbing activities or pollutant-generating activities, whichever occurs first, training on the pollution prevention measures outlined in this SWPPP shall be provided to staff and subcontractors.

9.3.1 Individual(s) Responsible for Training

Company/Organization: TBD

Name: TBD

9.3.2 Description of Training Conducted

Informal training shall be conducted for all staff, including subcontractors, on the site. The training shall be conducted primarily via tailgate sessions and shall focus on avoiding damage to stormwater BMPs and preventing illicit discharges. The tailgate sessions shall be conducted biweekly and shall address the following topics: Erosion Control BMPs, Sediment Control BMPs, Non-Stormwater BMPs, Waste Management and Materials Storage BMPs, and Emergency Procedures specific to the construction site. (See Appendix J – Training Log)

Formal training shall be provided to all staff and subcontractors with specific stormwater responsibilities, such as installing and maintaining BMPs. The formal training shall cover all design and construction specifications for installing the BMPs and proper procedures for maintaining each BMP. Formal training shall occur before any BMPs are installed on the site. (See Appendix J – Training Log)

10.0 CERTIFICATION AND NOTIFICATION

10.1 SIGNATURE, PLAN REVIEW, AND MAKING PLANS AVAILABLE

A copy of the SWPPP (including a copy of the Construction General Permit, NOI, and acknowledgement letter from EPA shall be retained at the Phase 1 Project Site (or other location easily accessible during normal business hours to EPA, a state, tribal or local agency approving sediment and erosion plans, grading plans, or stormwater management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service) from the date of commencement of construction activities to the date of final stabilization. A copy of the SWPPP shall be available at a central location on-site for the use of all those identified as having responsibilities under the SWPPP. If an on-site location is unavailable to store the SWPPP when no personnel are present, notice of the plan's location shall be posted near the main entrance at the Phase 1 Project Site.

10.2 NOTICE OF PERMIT COVERAGE

A sign must be posted at a safe, publicly accessible location in close proximity to the Phase 1 Project Site detailing the permit coverage. The notice must be located so that it is visible from the public road that is nearest to the active part of the Phase 1 Project Site, and it must use a font large enough to be readily viewed from a public right-of-way. At a minimum, the notice must include:

- The NPDES Permit Tracking Number,
- A contact name and phone number for obtaining additional construction site information,
- The Uniform Resource Locator (URL) for the SWPPP (if available), or the following statement: "If you would like to obtain a copy of the Stormwater Pollution Prevention Plan (SWPPP) for this site, contact the EPA Regional 1 Office at (617) 918-1038,
- The following statement "If you observe indicators of stormwater pollutants in the discharge or in the receiving waterbody, contact the EPA through the following website: https://www.epa.gov/enforcement/report-environmental-violations."

10.3 OWNER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:_____ Title:_____

Signature:_____ Date:_____

10.4 OPERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:_____ Title:_____

Signature:_____ Date:_____

APPENDICES

Appendix A

General Location Map

Appendix B

Site Plans

Appendix C

Construction General Permit

https://www.epa.gov/sites/production/files/2017-02/documents/2017_cgp_final_permit_508.pdf

Appendix D

NOI and Acknowledgement Letter from EPA

Appendix E

Inspection Reports

Inspections under this SWPPP shall be conducted in accordance with each installed BMPs recommended maintenance requirements. This inspection frequency may be reduced to at least once every month if: a) the entire site is temporarily stabilized, b) runoff is unlikely due to winter conditions (e.g. site is covered with snow, ice, or the ground is frozen), or c) construction is occurring during seasonal arid periods in arid areas and semi-arid areas. If an inspection report is filed according to this modified schedule it shall be noted at the end of the report under the "NOTES" section.

The following four pages should be copied and completed for each inspection. All inspection forms should be compiled in a binder to prove compliance with this SWPPP.

Stormwater Pollution Prevention Plan: Inspection Checklist

General Information			
Project Name			
NPDES Tracking No.		**Location**	
Date of Inspection		**Start/End Time**	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Inspector's Qualifications			
Describe present phase of construction			
Type of Inspection: ❑ Regular ❑ Pre-storm event ❑ During storm event ❑ Post-storm event			
Weather Information			
Has there been a storm event since the last inspection? ❑Yes ❑No **If yes, provide:** Storm Start Date & Time: Storm Duration (hrs): Approx. Amount of Precipitation (in):			
Weather at time of this inspection? ❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snowing ❑ High Winds ❑ Other: Temperature:			
Have any discharges occurred since the last inspection? ❑Yes ❑No **If yes, describe:**			
Are there any discharges at the time of inspection? ❑Yes ❑No **If yes, describe:**			

Site-specific BMPs

- *Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.*
- *Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.*

BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action Needed and Notes
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	
	❑Yes ❑No	❑Yes ❑No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
Are all slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No	❑Yes ❑No	
Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	❑Yes ❑No	❑Yes ❑No	
Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	❑Yes ❑No	❑Yes ❑No	
Are discharge points and receiving waters free of any sediment deposits?	❑Yes ❑No	❑Yes ❑No	
Are storm drain inlets properly protected?	❑Yes ❑No	❑Yes ❑No	
Is the construction exit preventing sediment from being tracked into the street?	❑Yes ❑No	❑Yes ❑No	
Is trash/litter from work areas collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No	
Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	❑Yes ❑No	❑Yes ❑No	
Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No	❑Yes ❑No	

BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
Are materials that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No	❑Yes ❑No	
Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No	
(Other)	❑Yes ❑No	❑Yes ❑No	

Non-Compliance

Describe any incidents of non-compliance not described above:

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title:

_____

Signature:_____

Date:_____

Appendix F

Corrective Action Log

Corrective Action Log

Use this form to note the date and activity for accurate record keeping (make additional copies as necessary). Examples include the restaking or reinforcement of the erosion control barrier, site watering to prevent dust erosion, street sweeping, equipment and machinery repair, etc.

Date	Activity Description	Additional Action Items

Appendix G

SWPPP Amendment Log

The SWPPP, including the site plans, shall be amended whenever there is a change in design, construction, operation, or maintenance at the construction site that has or could have a significant effect on the discharge of pollutants to the waters of the United States that has not been previously addressed in the SWPPP.

The SWPPP shall be amended if during inspections or investigations by site staff, or by local, state, tribal or federal officials, it is determined that the SWPPP is ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the construction site.

Based on the results of an inspection, the SWPPP shall be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP shall be completed within seven (7) calendar days following the inspection. Implementation of these additional or modified BMPs shall be accomplished as described in Subpart 3.6B of the Construction General Permit (located in Appendix C).

SWPPP Amendment Log

Amendment No.	Description of the Amendment	Date of Amendment	Amendment Prepared by (Name(s) and Title)

Appendix H

Subcontractor Certifications/Agreements

Sample Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

_____

_____

Signature: _____

Title: _____

Date: _____

Appendix I

Grading and Stabilization Activities Log

Site Plans in Appendix B should be annotated to indicate areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.

The following records are to be kept by each Site Operator throughout the construction period and maintained in the SWPPP. Insert additional documentation for record keeping as necessary.

Grading and Stabilization Activities Log

Date	Location on Property	Description

Appendix J

Training Log

Training Log

Date	Training Topic	Attendee	Signature of Training Coordinator

Appendix K

Delegation of Authority

Sample Delegation of Authority Form

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the _____ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)
_____ (company)
_____ (address)
_____ (city, state, zip)
_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in Appendix I of EPA's Construction General Permit (CGP), and that the designee above meets the definition of a "duly authorized representative" as set forth in Appendix I.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____

Company: _____

Title: _____

Signature: _____

Date: _____

Appendix L

Endangered Species Documentation

Appendix M

Historic Preservation Documentation

Appendix N

Temporary Sediment Basin Sizing Calculations

Appendix O

Natural Buffer Equivalency Calculations

Section 5.0
Wetland Boundary Documentation

Order of Resource Area Delineation
MassDEP File No. 006-1546
Issued September 20, 2017

CITY OF BOSTON
THE ENVIRONMENT DEPARTMENT

Boston City Hall, Room 709 • Boston, MA 02201 • 617/635-3850 • FAX: 617/635-3435

September 28, 2017

Thomas O'Brien
The McClellan Highway Development Company, LLC
c/o HYM Investment Group, LLC
One Congress Street, 11th Floor
Boston, MA 02114

HAND DELIVERED: September 28, 2017

RE: Order of Resource Area Delineation from Beals and Thomas, Inc. on behalf of the McClellan Highway Development Company, LLC to confirm the limit and regulatory status of the wetland resource areas located at 525 McClellan Highway, East Boston, MA

Dear Mr. O'Brien,

Pursuant to the Massachusetts Wetlands Protection Act, G.L. c. 131, § 40 (the "Act"), I have enclosed the Order of Resource Area Delineation for the above referenced project, as voted by the Conservation Commission at the September 6, 2017 public hearing. The delineated area of Bordering Vegetated Wetlands, Bank, Riverfront and Land Subject to Coastal Storm Flowage, was deemed accurate by the Commission.

This Order of Resource Area Delineation determines that the boundaries of those resource areas noted above, have been delineated and approved by the Conservation Commission and are binding as to all decisions rendered pursuant to the Massachusetts Wetlands Protection Act (M.G.L. c.131, § 40) and its regulations (310 CMR 10.00).

If you should have any questions regarding the Order I may be contacted at 617-635-4416.

For the Commission,

Amelia Croteau, Executive Secretary
Boston Conservation Commission

Enclosure: WPA Form 4B

CC: Stacy Minihane, Beals and Thomas

5

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

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

Provided by MassDEP:
006-1546
MassDEP File Number

eDEP Transaction Number

City/Town

A. General Information

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.

From: Boston
1. Conservation Commission

2. This Issuance is for (check one):

a. ☒ Order of Resource Area Delineation

b. ☐ Amended Order of Resource Area Delineation

3. Applicant:

Thomas — a. First Name
O'Brien — b. Last Name
ct# 133905
The McClellan Highway Development Company, LLC — c. Organization
c/o HYM Investment Group, LLC, One Congress St., 11th Floor — d. Mailing Address
Boston — e. City/Town
MA — f. State
02114 — g. Zip Code

4. Property Owner (if different from applicant):

a. First Name
b. Last Name
c. Organization
d. Mailing Address
e. City/Town
f. State
g. Zip Code

5. Project Location:

525 McClellan Highway — a. Street Address
East Boston — b. City/Town
02128 — c. Zip Code
0102524000 — d. Assessors Map/Plat Number
NA — e. Parcel/Lot Number

Latitude and Longitude (in degrees, minutes, seconds):
42° d 23' m 39.0162" — f. Latitude
-71° d 0' m 1.026" — g. Longitude

6. Dates:
August 23, 2017 — a. Date ANRAD filed
September 6, 2017 — b. Date Public Hearing Closed
September 20, 2017 — c. Date of Issuance

7. Title and Date (or Revised Date if applicable) of Final Plans and Other Documents:

ANRAD Plan 525 William F. McClellan Highway, East Boston, MA in 7 sheets — a. Title
August 18, 2017 — b. Date
c. Title
d. Date

Deed Book 57996, Page 314 filed in Doc. 870416

REGISTERED LAND

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

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

Provided by MassDEP:
006-1546
MassDEP File Number

eDEP Transaction Number

City/Town

B. Order of Delineation

1. The Conservation Commission has determined the following (check whichever is applicable):

a. ☒ **Accurate**: The boundaries described on the referenced plan(s) above and in the Abbreviated Notice of Resource Area Delineation are accurately drawn for the following resource area(s):

1. ☒ Bordering Vegetated Wetlands
2. ☐ Other resource area(s), specifically:

a. Bank: 3,250 linear feet, Riverfront: 700 linear feet
Land Subject to Coastal Storm Flowage: 14,680 linear feet

b. ☐ **Modified**: The boundaries described on the plan(s) referenced above, as modified by the Conservation Commission from the plans contained in the Abbreviated Notice of Resource Area Delineation, are accurately drawn from the following resource area(s):

1. ☐ Bordering Vegetated Wetlands
2. ☐ Other resource area(s), specifically:

a. _____

c. ☐ **Inaccurate**: The boundaries described on the referenced plan(s) and in the Abbreviated Notice of Resource Area Delineation were found to be inaccurate and cannot be confirmed for the following resource area(s):

1. ☐ Bordering Vegetated Wetlands
2. ☐ Other resource area(s), specifically:

3. ☐ The boundaries were determined to be inaccurate because:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

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

Provided by MassDEP:
006-1546
MassDEP File Number

eDEP Transaction Number

City/Town

C. Findings

This Order of Resource Area Delineation determines that the boundaries of those resource areas noted above, have been delineated and approved by the Commission and are binding as to all decisions rendered pursuant to the Massachusetts Wetlands Protection Act (M.G.L. c.131, § 40) and its regulations (310 CMR 10.00). This Order does not, however, determine the boundaries of any resource area or Buffer Zone to any resource area not specifically noted above, regardless of whether such boundaries are contained on the plans attached to this Order or to the Abbreviated Notice of Resource Area Delineation.

This Order must be signed by a majority of the Conservation Commission. The Order must be sent by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate DEP Regional Office (see http://www.mass.gov/eea/agencies/massdep/about/contacts/find-the-massdep-regional-office-for-your-city-or-town.html).

D. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate DEP Regional Office to issue a Superseding Order of Resource Area Delineation. When requested to issue a Superseding Order of Resource Area Delineation, the Department's review is limited to the objections to the resource area delineation(s) stated in the appeal request. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order of Resource Area Delineation will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order or Determination, or providing written information to the Department prior to issuance of a Superseding Order or Determination.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act, (M.G.L. c. 131, § 40) and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal bylaw or ordinance, and not on the Massachusetts Wetlands Protection Act or regulations, the Department of Environmental Protection has no appellate jurisdiction.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

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

Provided by MassDEP:
006 - 1546
MassDEP File Number

eDEP Transaction Number

City/Town

9/20/2017
Date of Issuance

E. Signatures

Please indicate the number of members who will sign this form. 4
1. Number of Signers

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

This Order is valid for three years from the date of issuance.

If this Order constitutes an Amended Order of Resource Area Delineation, this Order does not extend the issuance date of the original Final Order, which expires on unless extended in writing by the issuing authority.

This Order is issued to the applicant and the property owner (if different) as follows:

2. ☐ By hand delivery on

a. Date

3. ☒ By certified mail, return receipt requested on 9/28/2017

a. Date

87708

DOC No: 00877008

SUFFOLK LAND COURT
REGISTRY DISTRICT

** RECEIVED FOR REGISTRATION **
On: Nov 28,2017 at 11:11A
Document Fee: 75.00 Rec Total:$75.00

CERTIFICATE No: 133905 BK 00665 PG 105

ALSO NOTED ON:

REGISTERED LAND

Attested hereto
Stephen J. Murphy
Asst. Recorder of Land Court

REGISTERED LAND

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

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

Provided by MassDEP:
006-1546
MassDEP File Number

eDEP Transaction Number

City/Town

A. General Information

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

From: Boston
1. Conservation Commission

2. This Issuance is for (check one):

a. ☒ Order of Resource Area Delineation

b. ☐ Amended Order of Resource Area Delineation

3. Applicant:

Thomas — a. First Name
O'Brien — b. Last Name
cf # 133905
The McClellan Highway Development Company, LLC — c. Organization
c/o HYM Investment Group, LLC, One Congress St., 11th Floor — d. Mailing Address
Boston — e. City/Town
MA — f. State
02114 — g. Zip Code

4. Property Owner (if different from applicant):

a. First Name
b. Last Name
c. Organization
d. Mailing Address
e. City/Town
f. State
g. Zip Code

5. Project Location:

525 McClellan Highway — a. Street Address
East Boston — b. City/Town
02128 — c. Zip Code
0102524000 — d. Assessors Map/Plat Number
NA — e. Parcel/Lot Number
Latitude and Longitude (in degrees, minutes, seconds):
42° d 23' m 39.0702" — f. Latitude
-71° d 0' m 1.026" — g. Longitude

6. Dates:
August 23, 2017 — a. Date ANRAD filed
September 6, 2017 — b. Date Public Hearing Closed
September 20, 2017 — c. Date of Issuance

7. Title and Date (or Revised Date if applicable) of Final Plans and Other Documents:

ANRAD Plan 525 William F. McClellan Highway, East Boston, MA — a. Title
August 18, 2017 — b. Date
in 7 sheets

c. Title
d. Date

Deed Book 57916, Page 314 filed in Dec. 8704116

REGISTERED LAND

REGISTERED LAND

2017 00877008
Cert#: 133905 Bk: 00665 Pg: 105
Doc: ORD 11/28/2017 11:11 AM SF
ATTEST:Stephen J. Murphy, Register
Suffolk County Registry of Deeds

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

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

Provided by MassDEP:
006-1546
MassDEP File Number

eDEP Transaction Number

City/Town

B. Order of Delineation

1. The Conservation Commission has determined the following (check whichever is applicable):

a. ☒ **Accurate**: The boundaries described on the referenced plan(s) above and in the Abbreviated Notice of Resource Area Delineation are accurately drawn for the following resource area(s):

1. ☒ Bordering Vegetated Wetlands
2. ☐ Other resource area(s), specifically:

a. Bank: 3,250 linear feet, Riverfront: 700 linear feet
Land Subject to Coastal Storm Flowage: 14,680 linear feet

b. ☐ **Modified**: The boundaries described on the plan(s) referenced above, as modified by the Conservation Commission from the plans contained in the Abbreviated Notice of Resource Area Delineation, are accurately drawn from the following resource area(s):

1. ☐ Bordering Vegetated Wetlands
2. ☐ Other resource area(s), specifically:

a.

c. ☐ **Inaccurate**: The boundaries described on the referenced plan(s) and in the Abbreviated Notice of Resource Area Delineation were found to be inaccurate and cannot be confirmed for the following resource area(s):

1. ☐ Bordering Vegetated Wetlands
2. ☐ Other resource area(s), specifically:

3. ☐ The boundaries were determined to be inaccurate because:

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

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

Provided by MassDEP:
00b-154b
MassDEP File Number

eDEP Transaction Number

City/Town

C. Findings

This Order of Resource Area Delineation determines that the boundaries of those resource areas noted above, have been delineated and approved by the Commission and are binding as to all decisions rendered pursuant to the Massachusetts Wetlands Protection Act (M.G.L. c.131, § 40) and its regulations (310 CMR 10.00). This Order does not, however, determine the boundaries of any resource area or Buffer Zone to any resource area not specifically noted above, regardless of whether such boundaries are contained on the plans attached to this Order or to the Abbreviated Notice of Resource Area Delineation.

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D. Appeals

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Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 4B – Order of Resource Area Delineation

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

Provided by MassDEP:
006 - 1546
MassDEP File Number

eDEP Transaction Number

City/Town

9/20/2017
Date of Issuance

E. Signatures

Please indicate the number of members who will sign this form. 4
1. Number of Signers

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

Signature of Conservation Commission Member

This Order is valid for three years from the date of issuance.

If this Order constitutes an Amended Order of Resource Area Delineation, this Order does not extend the issuance date of the original Final Order, which expires on unless extended in writing by the issuing authority.

This Order is issued to the applicant and the property owner (if different) as follows:

2. ☐ By hand delivery on

a. Date

3. ☒ By certified mail, return receipt requested on 9/28/2017

a. Date

877008

Doc No: 00877008

SUFFOLK LAND COURT
REGISTRY DISTRICT

** RECEIVED FOR REGISTRATION **
On: Nov 28,2017 at 11:11A

Document Fee: 75.00 Rec Total:$75.00

CERTIFICATE No: 133905 BK 00665 PG 105

ALSO NOTED ON:

Attested hereto
Stephen J. Murphy
Asst. Recorder of Land Court

REGISTERED LAND

REGISTERED LAND

877008

Section 6.0
Surcharge Information

HALEY & ALDRICH, INC.
465 Medford Street, Suite 2200
Boston, MA 02129
617.886.7400

MEMORANDUM

21 December 2017
File No. 129513-005

TO: Doug Manz
The McClellan Highway Development Company, LLC

FROM: Haley & Aldrich, Inc.
Nathan A. Sherwood, P.E. and Michael J. Weaver, P.E.

SUBJECT: Preliminary Surcharge Recommendations
Parcel B-12 Phase 1
McClellan Highway
Boston, Massachusetts

This memorandum presents preliminary surcharge recommendations for the Phase 1 development on the southwest portion of the property in Boston, Massachusetts. This memorandum should be considered supplementary to our geotechnical report[1].

The recommendations presented herein are considered preliminary and for use in early construction pricing and project planning only, and are not considered final for construction.

BACKGROUND

The planned finished grades for the proposed development range from 1 to 10 ft above the current site grades. As indicated in our referenced geotechnical report, the site is underlain by variable thicknesses of compressible Organic and Marine Clay deposits that will consolidate and settle under the planned raise-in-grade. We estimate that consolidation settlements ranging from 6 to 14 in are possible under the planned raise-in-grades. Because settlements of the magnitude described above are not tolerable to the planned utilities and other associated infrastructure, we recommend that a surcharging program be undertaken along the roadway areas to limit the long-term settlements of the roadways, sidewalks, and utilities.

The recommendations presented herein are based on the results of the recent subsurface investigation program and our current understanding of the proposed site grades as reported on the attached Figure 1. These recommendations are considered preliminary, because at the time this memorandum was

[1] "Summary of Subsurface Investigations and Geotechnical Recommendations, Parcel B-12 Phase 1", Haley & Aldrich, Inc., 14 December 2017.

submitted, the results of site-specific consolidation testing on samples of the organic soils were not available. Final design recommendations will be provided once the testing has been completed and the construction sequence/schedule is defined.

PRELIMINARY PLANNING AND PRICING ASSUMPTIONS

For planning and cost estimating purposes, we recommend the following preliminary surcharge details:

- The surcharge area limits shown on the attached Figure 1 indicate the top of slope.
- The surcharge embankment should be constructed as is shown on Section A-A of Figure 1.
- The top of the surcharge embankment should be at least 3 ft higher than the planned finished grades shown on Figure 1.
- The minimum surcharge duration is estimated to be 6 months after completion of the surcharge embankment to its full height.
- Settlement will be measured by use of settlement platforms (provided, installed, and monitored by the Owner).
- The Contractor shall protect and maintain the settlement monitoring platforms (see Figure 1) during construction.

CONSTRUCTION CONSIDERATIONS

Sequencing

The placement of the surcharge embankments as shown on Figure 1, should be conducted as early in the construction sequence as possible to allow for the consolidation of the compressible materials under the loading from the planned raise-in-grades. Utilities and other site features (roadways, sidewalks, light poles, landscape features, etc.) should not be installed until the surcharging has been completed as determined by a review of the settlement platform readings by the Geotechnical Engineer. For preliminary planning purposes, we estimate a duration of 6 months will be required to complete the surcharge program.

In general, surcharging and material placement for roadways will need to be coordinated and sequenced with installation of the new buildings, utilities, and other structures since a portion of the foundation piles and caps will be below the partial basement level and a portion of the piles and caps will be at a higher elevation under the portions of the building that do not have the partial basement level. Based on the current construction schedule and sequencing, we recommend that consideration be given to raising the grades and adding material to surcharge the compressible soils following the installation of the foundation piles and erection of the lowest level floor slab and basement walls along with the first floor slab. Once the walls and ground slab have sufficiently cured, material could be placed along the perimeters of the buildings. Sequencing of the pile installation and raise in grade in the areas without the partial basement will be required.

Surcharge Material Placement Requirements

- Material for embankments should consist of suitable common fill as described below, except for materials specified for pavement sections, utility backfills, or other structures as shown on the civil drawings. Material shall consist predominately of mineral sandy or gravelly soil having physical properties, including moisture content, such that it can be readily spread and compacted to the project requirements in a reasonable period of time. Material shall have gradation within the following limits, unless otherwise acceptable to the Geotechnical Engineer:

Sieve Size (ASTM D422)	Percent Smaller by Weight
8 in	100
6 in	90 to 100
2 in	70 to 90
No. 4	30 to 80
No. 40	10 to 50
No. 200	0 to 30

- Remove vegetation, debris, any standing water/ice, and any other unsuitable materials from the surcharge area prior to material placement.

- Prior to placement of material, subgrades shall be proof-compacted to a firm condition with at least two passes of a heavy vibratory roller imparting a dynamic force of at least 30,000 lbs. For subgrades within 4 ft depth beneath the final finished grades, firm subgrades acceptable to the Geotechnical Engineer shall be established prior to filling by compaction, removal and replacement of soft or weak material, and/or other methods as required.

- During material placement, maximum loose thickness for lifts are as follows:
    - 4 ft or greater beneath final finished grade: 18 in
    - Within 4 ft of final finished grade: 12 in
    - Surcharge material above final finished grade: 18 in

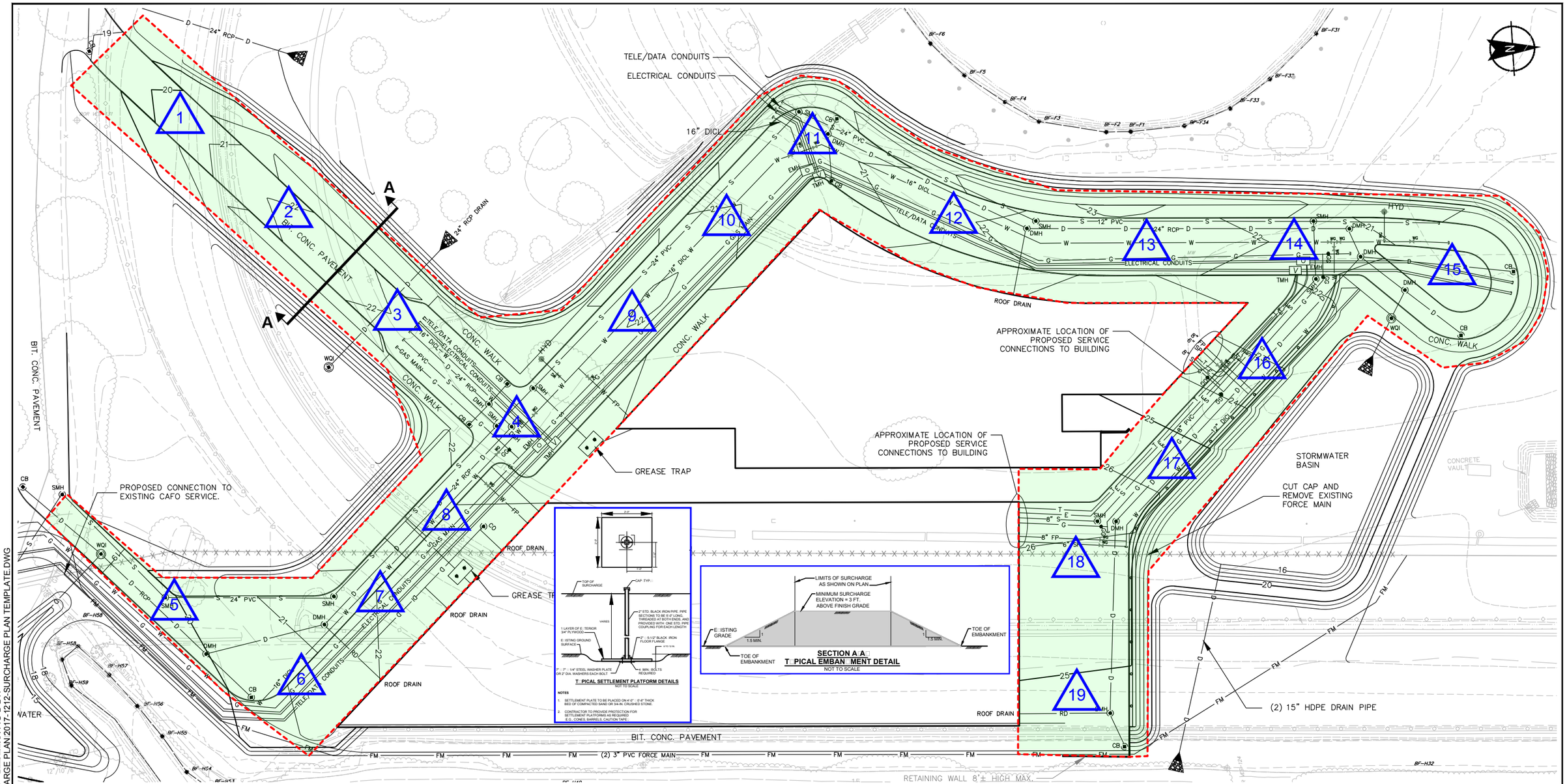
- Compact each lift up to the final finished grade with a minimum of four passes of a self-propelled heavy vibratory roller to at least the required degree of compaction, expressed as a percentage of the maximum dry density at optimum moisture content as determined by ASTM D1557 Method C.
    - Within 4 ft of final finished grade: 95 percent
    - Between 4 ft and 6 ft of final finished grade: 92 percent
    - Greater than 6 ft below final finished grade: compact to firm state as determined by the Geotechnical Engineer
    - Compact each lift of surcharge material (above final finished grade) with a minimum of two passes with tires or treads of earth moving equipment, or as required to facilitate a stable working grade for construction equipment, if required.

- The final lift shall be sealed with a smooth vibratory roller and pitched to sides of the embankment for drainage.

- Where Civil Engineer requires removal of existing utilities, backfill and compaction requirements are as indicated above.

- Maximum particle size for all material and backfill including surcharge is 2/3 of the loose lift thickness.

Attachment:
Figure 1 – Preliminary Surcharge Program



LEGEND

PRELIMINARY SURCHARGE LIMITS

PRELIMINARY LOCATION OF SETTLEMENT MONITORING PLATFORM

NOTES

1. THE MINIMUM SURCHARGE DURATION IS 6 MONTHS AFTER COMPLETION OF FILL PLACEMENT.
2. THE MINIMUM SURCHARGE HEIGHT ELEVATION SHALL BE 3 FT ABOVE THE PLANNED FINISH GRADE WHERE THE SURCHARGE IS PLACED.
3. BASE PLAN AND PROPOSED GRADING TAKEN FROM ELECTRONIC CAD FILE "285402D005D.dwg", PROVIDED BY BEALS AND THOMAS, INC., VIA EMAIL ON 1 DECEMBER 2017.
4. ELEVATIONS ARE IN FEET AND REFER TO BOSTON CITY BASE (BCB).
5. SURCHARGE AREA LIMITS SHOWN INDICATE TOP OF SLOPE. REFER TO SECTION A-A'.
6. CONTRACTOR SHALL PROTECT AND MAINTAIN SETTLEMENT MONITORING PLATFORMS THROUGHOUT THE SURCHARGE CONSTRUCTION AND MONITORING PERIOD. SETTLEMENT MONITORING PLATFORMS THAT ARE DAMAGED AT ANY TIME SHALL BE REPLACED IMMEDIATELY AT NO COST TO THE OWNER.
7. FOR DETAILS REGARDING THE PLACEMENT OF FILL, SEE HALEY & ALDRICH, INC. PRELIMINARY SURCHARGE MEMORANDUM, DATED 14 DECEMBER 2017.

HALEY ALDRICH

PARCEL B-12 PHASE 1
BOSTON, MASSACHUSETTS

PRELIMINARY SURCHARGE PROGRAM

SCALE: AS SHOWN
DECEMBER 2017

FIGURE 1

Section 7.0
Example Buffer Zone Plantings

100’ BUFFER TREES - Wetland Species

Black Tupelo - *Nyssa sylvatica*
Water : Medium - Wet
Sun : Full Sun - Part Shade

American Elm - *Ulmus americana*
Water : Medium
Sun : Full Sun

River Birch - *Betula nigra*
Water : Medium - Wet
Sun : Full Sun - Part Shade

Paper Birch - *Betula papyrifera*
Water : Medium - Wet
Sun : Part Shade

Sugar Maple - *Acer saccharum*
Water : Medium
Sun : Full Sun - Part Shade

Balsam Fir - *Abies balsamea*
Water : Medium
Sun : Full Sun - Part Shade

Tulip Tree - *Liriodendron tulipifera*
Water : Medium
Sun : Full Sun

Black Willow - *Salix nigra*
Water : Medium to Wet
Sun : Full Sun - Part Shade

BUFFER SHRUBS - Close proximity to wetland

Tufted Hair Grass - *Deschampia cespitosa*
Water : Medium
Sun : Part Shade

Swamp Milkweed - *Asclepias incarnata*
Water : Medium - Wet
Sun : Full Sun

Sweet Flag - *Acorus calamus 'Variegatus'*
Water : Medium - Wet
Sun : Full - Part Shade

Witherod viburnum - *Viburnum cassinoides*
Water : Medium - Wet
Sun : Full - Part Shade

Black Elderberry - *Sambucus canadensis*
Water : Medium - Wet
Sun : Full - Part Shade

Common Winterberry - *Ilex verticillata*
Water : Medium - Wet
Sun : Full - Part Shade

Pussy Willow - *Salix discolor*
Water : Medium - Wet
Sun : Full - Part Shade

Silky Dogwood - *Cornus amomum*
Water : Medium - Wet
Sun : Full - Part Shade

BUFFER SHRUBS - Highland hedge plants

Beach Plum - *Prunus americana*
Water : Dry - Medium
Sun : Full - Part Shade

Sweet Gale Bayberry - *Myrica pensylvanica*
Water : Dry - Medium
Sun : Full - Part Shade

New England Aster - *Symphyotrichum novae-angliae*
Water : Medium
Sun : Full Sun

Forsythia 'Happy Centennial' - *Forsythia*
Water : Medium
Sun : Full Sun - Part Shade

Cottoneaster - *Cotoneaster apiculatus*
Water : Low - Medium
Sun : Full Sun

Butterfly Bush - *Buddleja davidii*
Water : Low - Medium
Sun : Full Sun

Mock Orange- *Philadelphus 'Avalanche'*
Water : Low - Medium
Sun : Full Sun - Part Shade

Smokebrush - *Cotinus coggygria*
Water : Low - Medium
Sun : Full Sun

Section 8.0
Climate Change Preparedness and Resiliency Checklist

boston planning & development agency

Climate Resiliency Checklist

NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

A.1 - Project Information

Project Name:	Suffolk Downs Redevelopment: Phase 1 Project			
Project Address:	525 William F. McClellan Highway			
Project Address Additional:	Boston, MA 02128			
Filing Type (*select*)	*Notice of Intent*			
Filing Contact	*Stacy Minihane*	*Beals and Thomas, Inc.*	*sminihane@bealsandthomas.com*	*(508) 366-0560*
Is MEPA approval required	*Yes*		*EENF submitted 11/30/18*	

A.2 - Project Team

Owner / Developer:	The McClellan Highway Development Company, LLC, c/o The HYM Investment Group, LLC
Architect:	CBT Architects
Engineer:	Beals and Thomas, Inc. (site); AKF (building systems)
Sustainability / LEED:	ARUP USA Inc
Permitting:	VHB (MEPA, BPDA); Beals and Thomas, Inc. (Conservation Commission)
Construction Management:	John Moriarty & Associates

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Office
List the First Floor Uses:	Loading, lobby, support
List any Critical Site Infrastructure and or Building Uses:	

Site and Building:

Site Area:	*4,756,315 SF (existing parcel area)*	Building Area:	*B1/264,122 SF B2/288,553 SF*
Building Height:	*125 Ft measured in accordance with the Boston Zoning Code*	Building Height:	*B1/6 – B2/7 stories*
Existing Site Elevation – Low:	*12.4± Ft BCB*	Existing Site Elevation – High:	*21.2± Ft BCB*
Proposed Site Elevation – Low:	*13.0± Ft BCB*	Proposed Site Elevation – High:	*25.5± Ft BCB*
Proposed First Floor Elevation:	*B1 – 22 Ft BCB B2 – 24'-4" BCB*	Below grade levels:	*1 story*

Article 37 Green Building:

LEED Version - Rating System :	V4 LEED-CS	LEED Certification:	*Yes*
Proposed LEED rating:	*Currently at Silver with a goal to reach GOLD.*	Proposed LEED point score:	*54 Pts with 19 maybe points.*

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	Preliminary energy modeling was conducted using IES-VE software, version 2016 and calculations were conducted for peak loads.		
Annual Electric:	*3,180,652 (kWh)*	Peak Electric:	*(kW)*
Annual Heating:	*13.5 (MMbtu/hr)*	Peak Heating:	*9.7 (MMbtu)*
Annual Cooling:	*142 (Tons/hr)*	Peak Cooling:	*880 (Tons)*
Energy Use - Below ASHRAE 90.1 - 2013:	*24%*	Have the local utilities reviewed the building energy performance?:	*NO, not to date*
Energy Use - Below Mass. Code:	*24%*	Energy Use Intensity:	*44.4 (kBtu/SF)*

Back-up / Emergency Power System

Electrical Generation Output:	*500 (kW)*	Number of Power Units:	2
System Type:	Standard/ Emergency	Fuel Source:	Diesel

Emergency and Critical System Loads (in the event of a service interruption)

Electric:	*675 (kW)*	Heating:	*12 (MMbtu/hr)*
		Cooling:	*(Tons/hr)*

B – Greenhouse Gas Reduction and Net Zero / Net Positive Carbon Building Performance

Reducing GHG emissions is critical to avoiding more extreme climate change conditions. To achieve the City's goal of carbon neutrality by 2050 new buildings performance will need to progressively improve to net carbon zero and positive.

B.1 – GHG Emissions - Design Conditions

For this Filing - Annual Building GHG Emissions:	*1,988 (Tons)*

For this filing - describe how building energy performance has been integrated into project planning, design, and engineering and any supporting analysis or modeling:

Preliminary energy modeling has been completed for the Phase 1 project to demonstrate the energy savings of the proposed design.

Describe building specific passive energy efficiency measures including orientation, massing, envelop, and systems:

Portions of the building envelope exceed prescriptive code requirements. The roof R-value is proposed at R-40(vs. R-30 baseline) and the glazing U-value is proposed at .035 (vs. 0.42 baseline) and SHGC at 0.25 (vs. 0.40 baseline). The buildings will self-shade each other for portions of the day.

Describe building specific active energy efficiency measures including equipment, controls, fixtures, and systems:

Use of high efficiency condensing boilers, Turbocor oil free magnetic bearing compressors, EC fan technology and cooling beams.

Describe building specific load reduction strategies including on-site renewable, clean, and energy storage systems:

Currently, no renewable energy or storage systems are planned. The buildings will be solar ready and the financial feasibility of installing Solar PV on the roof areas will continue to be assessed during the design phase.

Describe any area or district scale emission reduction strategies including renewable energy, central energy plants, distributed energy systems, and smart grid infrastructure:

A district energy study is being undertaken as part of the master plan project.

Describe any energy efficiency assistance or support provided or to be provided to the project:

Outreach to Eversource and National Grid will be made at the appropriate stage of the project to discuss energy efficiency strategies and available/applicable incentives for energy efficiency measures planned to be implemented.

B.2 - GHG Reduction - Adaptation Strategies

Describe how the building and its systems will evolve to further reduce GHG emissions and achieve annual carbon net zero and net positive performance (e.g. added efficiency measures, renewable energy, energy storage, etc.) and the timeline for meeting that goal (by 2050):

The Phase 1 Project is committed to constructing a building that exceeds minimum stretch energy code and will not preclude the advancement toward net zero, as technology becomes available over the life span of the project. The Project is currently being designed and constructed towards this goal by reducing energy demand through incorporation of an efficient building envelope and systems, such as a well-insulated building envelope including an R-40 roof, active chilled beam system with dedicated outdoor air system and advanced energy metering to be able to track and monitor end use energy consumption.

The Phase 1 Project is also working toward the goal of net zero by evaluating on-site renewables solar PV and solar thermal systems. The Project is also evaluating “solar ready” meaning the structure would be designed to accommodate a future system and space for conduit routing for interconnection would be provided.

In addition, the Project will incorporate best management practices by developing tenant design guidelines to explain the sustainable design strategies in the base building design that can contribute to the tenant fit out energy efficiency as well as make recommendations for an energy efficient fit out.

As technology becomes available, and operational processes are refined, the Phase 1 Project will evaluate opportunities for improving efficiency during equipment and system life cycles and upgrades with favorable ROIs for energy efficiency retrofits.

C - Extreme Heat Events

Annual average temperature in Boston increased by about 2˚F in the past hundred years and will continue to rise due to climate change. By the end of the century, the average annual temperature could be 56° (compared to 46° now) and the number of days above 90° (currently about 10 a year) could rise to 90.

C.1 – Extreme Heat - Design Conditions

Temperature Range - Low:	7.5 *Deg.*	Temperature Range - High:	95 *Deg.*
Annual Heating Degree Days:		Annual Cooling Degree Days	

What Extreme Heat Event characteristics will be / have been used for project planning

Days - Above 90°:	30# - 2030	Days – Above 100°:	2# - 2030
Number of Heatwaves / Year:	3#	Average Duration of Heatwave (Days):	3#

Describe all building and site measures to reduce heat-island effect at the site and in the surrounding area:

High reflective paving materials, shade trees & shrubs, vegetated roofs

C.2 - Extreme Heat – Adaptation Strategies

Describe how the building and its systems will be adapted to efficiently manage future higher average temperatures, higher extreme temperatures, additional annual heatwaves, and longer heatwaves:

The building envelope is higher performing that the baseline to mitigate heat gains into the building. Landscape and light colored paving and a white roof all will contribute to lower heat island effects. Mechanical systems will be designed to a peak of 95 degrees to handle higher temperatures. At end of life for equipment, adding additional cooling capacity will be evaluated.

Describe all mechanical and non-mechanical strategies that will support building functionality and use during extended interruptions of utility services and infrastructure including proposed and future adaptations:

Basic life safety systems (safety lighting, exit signs, fire pumps, fire alarm systems, etc.) will be on an emergency generator system, and will be located above the flood level.

D - Extreme Precipitation Events

From 1958 to 2010, there was a 70 percent increase in the amount of precipitation that fell on the days with the heaviest precipitation. Currently, the 10-Year, 24-Hour Design Storm precipitation level is 5.25". There is a significant probability that this will increase to at least 6" by the end of the century. Additionally, fewer, larger storms are likely to be accompanied by more frequent droughts.

D.1 – Extreme Precipitation - Design Conditions

10 Year, 24 Hour Design Storm:	*6 In.*

Describe all building and site measures for reducing storm water run-off:

Compliance with MassDEP Stormwater requirements; see Section 4. Vegetated roofs.

D.2 - Extreme Precipitation - Adaptation Strategies

Describe how site and building systems will be adapted to efficiently accommodate future more significant rain events (e.g. rainwater harvesting, on-site storm water retention, bio swales, green roofs):

On-site retention systems & ponds, infiltration galleries & areas, vegetated water capture systems, vegetated roofs

---

E – Sea Level Rise and Storms

Under any plausible greenhouse gas emissions scenario, sea levels in Boston will continue to rise throughout the century. This will increase the number of buildings in Boston susceptible to coastal flooding and the likely frequency of flooding for those already in the floodplain.

Is any portion of the site in a FEMA SFHA?	*Yes*	What Zone:	A, **AE,** AH, AO, AR, A99, V, VE
		Current FEMA SFHA Zone Base Flood Elevation:	*17.46 Ft BCB*

Is any portion of the site in a BPDA Sea Level Rise - Flood Hazard Area? Use the online BPDA SLR-FHA Mapping Tool to assess the susceptibility of the project site.	*Yes*

If you answered YES to either of the above questions, please complete the following questions.
Otherwise you have completed the questionnaire; thank you!

E.1 – Sea Level Rise and Storms – Design Conditions

Proposed projects should identify immediate and future adaptation strategies for managing the flooding scenario represented on the BPDA Sea Level Rise - Flood Hazard Area (SLR-FHA) map, which depicts a modeled 1% annual chance coastal flood event with 40 inches of sea level rise (SLR). Use the online BPDA SLR-FHA Mapping Tool to identify the highest Sea Level Rise - Base Flood Elevation for the site. The Sea Level Rise - Design Flood Elevation is determined by adding either 24" of freeboard for critical facilities and infrastructure and any ground floor residential units OR 12" of freeboard for other buildings and uses.

Sea Level Rise - Base Flood Elevation:	*19.5 Ft BCB*		
Sea Level Rise - Design Flood Elevation:	*20.5 Ft BCB*	First Floor Elevation:	*24.0 Ft BCB*
Site Elevations at Building:	*18 –25.5 Ft BCB*	Accessible Route Elevation:	*21-25.5 Ft BCB*

Describe site design strategies for adapting to sea level rise including building access during flood events, elevated site areas, hard and soft barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Transformer set above 40" sea level rise elevation, stormwater management system designed with consideration of a more intense design storm, roads adjacent to building raised to provide protection and egress upon completion of the master plan

Describe how the proposed Building Design Flood Elevation will be achieved including dry / wet flood proofing, critical systems protection, utility service protection, temporary flood barriers, waste and drain water back flow prevention, etc.:

Critical power systems are raised above design flood elevations

Describe how occupants might shelter in place during a flooding event including any emergency power, water, and waste water provisions and the expected availability of any such measures:

The building and critical power systems are raised above design flood elevations.

Describe any strategies that would support rapid recovery after a weather event:

Critical power systems are raised above design flood elevations

E.2 – Sea Level Rise and Storms – Adaptation Strategies

Describe future site design and or infrastructure adaptation strategies for responding to sea level rise including future elevating of site areas and access routes, barriers, wave / velocity breaks, storm water systems, utility services, etc.:

The majority of the site is raised at or above the elevation required to accommodate 40" SLR with the exception of areas which must be lowered to meet existing adjacent elevations.

Describe future building adaptation strategies for raising the Sea Level Rise Design Flood Elevation and further protecting critical systems, including permanent and temporary measures:

The Phase 1 project meets or exceeds 2070 design flood elevations

A pdf and word version of the Climate Resiliency Checklist is provided for informational use and off-line preparation of a project submission. NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

For questions or comments about this checklist or Climate Change best practices, please contact: John.Dalzell@boston.gov

Section 9.0
Figures and Plans

Figure 1 USGS Map
Figure 2 Locus Map

UNDER SEPARATE COVER:
Prepared by Beals and Thomas, Inc., in 11 sheets, dated January 17, 2018
C1.0 Notes, References and Legend
TP-1 Topographic Plan
C2.0 Site Preparation and Erosion Control Plan
C3.0 Layout and Materials Plan
C4.0 Grading, Drainage and Utilities Plan
C5.0 – 5.5 Site Details

Prepared by Stoss Landscape Urbanism, in 8 sheets, dated January 17, 2017
L110 Landscape Layout Plan
L111 Landscape Planting Plan
L112 Landscape Grading Plan
L120 B1 Materials Plan
L130 B2 Materials Plan
L300 Site Sections
L500 Site Details

Digital USGS Maps of Boston North and Lynn, MA, dated 1985, provided by the Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services.

PROJECT: **Suffolk Downs Redevelopment: Phase 1 Office Building**
East Boston, Massachusetts

PREPARED FOR:
The McClellan Highway Development Company, LLC
c/o The HYM Investment Group, LLC
One Congress Street, 11th Floor
Boston, MA 02114

Locus Map

Figure 1

Scale: 1" = 2,000'

Date: 01/11/2018

Source File 285403P061A.mxd

B+T Project No. 2854.03

BEALS+THOMAS

Digital orthophotograph, dated 2013, provided by the Bureau of Geographic Information (MassGIS), Commonwealth of Massachusetts, Executive Office of Technology and Security Services.

PROJECT: **Suffolk Downs Redevelopment: Phase 1 Office Building**
East Boston, Massachusetts

PREPARED FOR:
The McClellan Highway Development Company, LLC
c/o The HYM Investment Group, LLC
One Congress Street, 11th Floor
Boston, MA 02114

Aerial Map

Figure 2

Scale: 1" = 600'

Date: 01/11/2018

Source File 285403P062A.mxd

B+T Project No. 2854.03

BEALS+THOMAS

GENERAL NOTES

THE CONTRACTOR SHALL MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY CONSTRUCTION PERMITS. THE CONTRACTOR SHALL ALSO PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH THE SAME, AND COORDINATE WITH THE ENGINEER AND ARCHITECT AS REQUIRED.

CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR JOB SITE SAFETY AND ALL CONSTRUCTION MEANS AND METHODS.

LIMIT OF WORK SHALL BE EROSION CONTROL BARRIERS, LIMIT OF GRADING AND SITE PROPERTY LINES AND/OR AS INDICATED ON DRAWINGS.

PORTIONS OF THE ROADWAY, SIDEWALK AND ROADSIDE AREA DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO THEIR CONDITIONS PRIOR TO DISTURBANCE.

CONTRACTOR TO VERIFY UTILITY STUB LOCATIONS AND ELEVATIONS IN THE FIELD PRIOR TO COMMENCING WORK.

ANY ALTERATION TO THESE DRAWINGS MADE IN THE FIELD DURING CONSTRUCTION SHALL BE RECORDED BY THE CONTRACTOR ON RECORD DOCUMENTS.

ANY AREA OUTSIDE THE LIMIT OF WORK THAT IS DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO COST TO OWNER.

EXISTING TREES AND SHRUBS OUTSIDE THE LIMITS OF GRADING SHALL BE REMOVED ONLY UPON PRIOR APPROVAL OF THE OWNER.

FOR DRAWING LEGIBILITY, ALL EXISTING TOPOGRAPHIC FEATURES, EXISTING UTILITIES, PROPERTY BOUNDARIES, EASEMENTS, ETC. MAY NOT BE SHOWN ON ALL DRAWINGS. REFER TO ALL REFERENCED DRAWINGS AND OTHER DRAWINGS IN THIS SET FOR ADDITIONAL INFORMATION.

ALL EXCAVATORS OR CONTRACTORS MUST REFER TO 520 CMR 14.00 TO OBTAIN A TRENCH PERMIT PRIOR TO ANY CONSTRUCTION RELATED TRENCHES ON SITE.

EROSION CONTROL AND SEDIMENTATION NOTES

AN EROSION CONTROL BARRIER SHALL BE INSTALLED ALONG THE EDGE OF PROPOSED DEVELOPMENT AS INDICATED IN THE PLAN PRIOR TO THE COMMENCEMENT OF DEMOLITION OR CONSTRUCTION OPERATIONS.

CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES DURING ENTIRE CONSTRUCTION PERIOD.

ANY SEDIMENT TRACKED ONTO PUBLIC RIGHT-OF-WAYS SHALL BE SWEPT AT THE END OF EACH WORKING DAY.

ALL STOCKPILE AREAS SHALL BE LOCATED WITHIN LIMIT OF WORK LINE AND STABILIZED TO PREVENT EROSION.

ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF SITE.

PROVIDE CRIBBING AS NECESSARY TO PROTECT EXISTING UTILITY LINES DURING CONSTRUCTION.

SITE ELEMENTS TO REMAIN MUST BE PROTECTED FOR DURATION OF PROJECT.

ALL TOPSOIL ENCOUNTERED WITHIN WORK AREA SHALL BE STRIPPED TO ITS FULL DEPTH AND STOCKPILED FOR REUSE. EXCESS TOPSOIL SHALL BE DISPOSED OF ON SITE AS DIRECTED BY OWNER. TOPSOIL PILES SHALL REMAIN SEGREGATED FROM EXCAVATED SUBSURFACE SOIL MATERIALS.

ADDITIONAL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED AS CONDITIONS WARRANT OR AS DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE.

ALL POINTS OF CONSTRUCTION EGRESS OR INGRESS SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADS.

TEMPORARY DIVERSION DITCHES, PERMANENT DITCHES, CHANNELS, EMBANKMENTS AND ANY DENUDED SURFACE WHICH WILL BE EXPOSED FOR A PERIOD OF ONE MONTH OR MORE SHALL BE CONSIDERED CRITICAL VEGETATION AREAS. THESE AREAS SHALL BE MULCHED WITH STRAW. MULCH SHALL BE SPREAD UNIFORMLY IN A CONTINUOUS BLANKET OF SUFFICIENT THICKNESS TO COMPLETELY HIDE THE SOIL FROM VIEW.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED ON A DAILY BASIS DURING CONSTRUCTION TO INSURE THAT CHANNELS, DITCHES AND PIPES ARE CLEAR OF DEBRIS AND THAT THE EROSION CONTROL BARRIERS ARE INTACT.

CONTRACTOR SHALL PROVIDE DUST CONTROL FOR CONSTRUCTION OPERATIONS AS APPROVED BY OWNER.

DUST SHALL BE CONTROLLED BY SPRINKLING OR OTHER APPROVED METHODS AS NECESSARY, OR AS DIRECTED BY THE OWNER OR HIS REPRESENTATIVE.

STRAW BALE CHECK DAMS SHALL BE PROVIDED AROUND ALL EXISTING DRAIN INLETS PRIOR TO CONSTRUCTION ACTIVITIES AND AROUND ALL PROPOSED DRAIN INLETS PRIOR TO PERMANENT PAVEMENT TO CONTROL SILTATION.

STRAW BALE CHECK DAMS ARE TO BE PROVIDED ON TWO HUNDRED (200) FOOT SPACINGS WITHIN ALL DRAINAGE SWALES AND DITCHES AND AT UPSTREAM SIDES OF ALL DRAINAGE INLETS.

ADDITIONAL STRAW BALES SHALL BE LOCATED AS CONDITIONS WARRANT OR AS DIRECTED BY THE OWNER OR HIS REPRESENTATIVE.

CLEAN AND MAINTAIN EROSION CONTROL BARRIER AS REQUIRED DURING CONSTRUCTION OPERATIONS TO ENSURE ITS CONTINUED FUNCTIONALITY.

LAYOUT AND MATERIALS NOTES

ALL LINES AND DIMENSIONS ARE PARALLEL OR PERPENDICULAR TO THE LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE INDICATED.

COORDINATE THE LOCATION OF ALL SITE LIGHT STANDARDS WITH IMPROVEMENTS SHOWN ON THESE DRAWINGS.

CONTRACTOR SHALL REPORT SIGNIFICANT CONFLICTS TO THE OWNER AND THE ENGINEER FOR RESOLUTION.

DIMENSIONS OF PARKING SPACES AND DRIVEWAYS ARE FROM FACE OF CURB TO FACE OF CURB.

DIMENSIONS FROM BUILDING ARE FROM FACE OF BUILDING TO FACE OF CURB. CONTRACTOR SHALL VERIFY ALL CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES TO THE ENGINEER. THE CONTRACTOR SHALL STAKE OUT BUILDING FROM THE LATEST ARCHITECTURAL DRAWINGS.

THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN SITE PLAN DIMENSIONS AND BUILDING PLANS BEFORE PROCEEDING WITH ANY PORTION OF SITE WORK WHICH MAY BE AFFECTED SO THAT PROPER ADJUSTMENTS TO THE SITE LAYOUT CAN BE MADE IF NECESSARY.

SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND ALL DETAIL CONTIGUOUS TO THE BUILDING, LIGHTING, ENTRANCE PATIO, DOORWAY PADS, LOADING DOCK DETAILS, ETC.

ACCESSIBLE RAMPS SHALL BE PER MASSACHUSETTS STATE CODE AND THE AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES (WHICHEVER IS MORE STRINGENT).

EACH HANDICAP PARKING SPACE SHALL BE IDENTIFIED BY A SIGN SIX (6) FEET IN HEIGHT LOCATED AT THE FACE OF THE CURBLINE. THE SIGN SHALL CONTAIN THE INTERNATIONAL SYMBOL OF ACCESSIBILITY AS DESCRIBED IN THE AMERICANS WITH DISABILITIES ACT, PUBLIC LAW 101-336, (SEE DETAIL).

PROTECT EXISTING PROPERTY MONUMENTS AND ABUTTING PROPERTIES DURING CONSTRUCTION ACTIVITIES.

GRADING, DRAINAGE AND UTILITY NOTES

UNDERGROUND UTILITIES WERE COMPILED FROM AVAILABLE RECORD PLANS OF UTILITY COMPANIES AND PUBLIC AGENCIES, ARE APPROXIMATE AND ASSUMED. BEFORE COMMENCING SITE WORK IN ANY AREA, CONTACT "DIG SAFE" AT 1-888-344-7233 TO ACCURATELY LOCATE UNDERGROUND UTILITIES. ANY DAMAGE TO EXISTING UTILITIES OR STRUCTURES SHALL BE THE CONTRACTOR'S RESPONSIBILITY. NO EXCAVATION SHALL BE DONE UNTIL UTILITY COMPANIES ARE PROPERLY NOTIFIED IN ADVANCE.

ALL SITE WORK SHALL MEET OR EXCEED THE SITE WORK SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER PRIOR TO INSTALLATION OF ANY PORTION OF THE SITE WORK WHICH WOULD BE AFFECTED.

ALL WORK PERFORMED AND ALL MATERIALS FURNISHED SHALL CONFORM WITH THE LINES, GRADES AND OTHER SPECIFIC REQUIREMENTS OR SPECIFICATIONS OF THE CITY OF BOSTON AND CITY OF BOSTON DPW.

AT ALL LOCATIONS WHERE EXISTING CURBING OR PAVEMENT ABUTS NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAW CUT TO A CLEAN, SMOOTH EDGE. BLEND NEW PAVEMENT, CURBS AND EARTHWORK SMOOTHLY INTO EXISTING BY MATCHING LINES, GRADES AND JOINTS. PITCH EVENLY BETWEEN SPOT GRADES. GRADE ALL AREAS TO DRAIN.

THE CONTRACTOR SHALL VERIFY EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES, AS REQUIRED. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER AND ENGINEER FOR RESOLUTION.

ALL UTILITY COVERS, GRATES, ETC. SHALL BE ADJUSTED TO BE FLUSH WITH THE PAVEMENT FINISH GRADE UNLESS OTHERWISE NOTED. RIM ELEVATIONS OF DRAINAGE STRUCTURES AND SANITARY SEWER MANHOLES ARE APPROXIMATE.

INSTALL ALL UTILITIES (INCLUDING CONCRETE PADS) PER UTILITY COMPANY AND DPW STANDARDS.

ALL DRAINAGE PIPES SHALL REINFORCED CONCRETE PIPE (RCP) CLASS III EXCEPT WHERE NOTED OTHERWISE.

ALL SANITARY PIPE SHALL BE SDR-35 PVC UNLESS OTHERWISE NOTED.

WATER LINE SHALL BE CLASS 56 CEMENT LINED AND ZINC COATED DUCTILE IRON PIPE. WATER PIPE SHALL CONFORM WITH THE REQUIREMENTS OF SECTION C1 OF BOSTON WATER AND SEWER COMMISSION'S STANDARD SPECIFICATIONS.

INSULATE SANITARY PIPES WHERE DEPTH OF EARTH COVER IS LESS THAN FOUR (4) FEET BELOW FINISHED GRADE.

CONTRACTOR SHALL PROTECT ALL UNDERGROUND DRAINAGE, SEWER AND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY DAMAGE TO THESE FACILITIES RESULTING FROM CONSTRUCTION LOADS WILL BE RESTORED TO ORIGINAL CONDITION.

ALL WATER WORKS SHALL CONFORM TO CITY OF BOSTON, WATER DIVISION SPECIFICATIONS, DETAILS, RULES AND REGULATIONS AND HAVE FIVE (5) FEET OF MINIMUM COVER. GAS, ELECTRIC, TELEPHONE AND FIRE ALARM CONNECTION LOCATIONS AND ROUTING ARE SUBJECT TO REVIEW AND APPROVAL BY APPROPRIATE UTILITY COMPANIES AND FIRE DEPARTMENT.

EXCAVATION REQUIRED WITHIN THE PROXIMITY OF EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER.

PITCH EVENLY BETWEEN SPOT GRADES. ALL PAVED AREAS MUST PITCH TO DRAIN AT A MINIMUM OF 1/8" PER FOOT UNLESS SPECIFIED. ANY DISCREPANCIES NOT ALLOWING THIS MINIMUM PITCH SHALL BE REPORTED TO THE ENGINEER PRIOR TO CONTINUING WORK.

THE CONTRACTOR SHALL SCHEDULE HIS WORK TO ALLOW THE FINISHED SUBGRADE ELEVATIONS TO DRAIN PROPERLY WITHOUT PUDDLING. SPECIFICALLY, ALLOW WATER TO ESCAPE WHERE PROPOSED CURB MAY RETAIN RUNOFF PRIOR TO APPLICATION OF THE FINISH SUBGRADE AND/OR SURFACE PAVING. PROVIDE TEMPORARY POSITIVE DRAINAGE AS REQUIRED.

UNLESS OTHERWISE INDICATED, ABANDONED EXISTING UTILITY LINES SHALL BE CAPPED AND ABANDONED IN PLACE UNLESS THEY CONFLICT WITH PROPOSED IMPROVEMENTS. CAP REMAINING PORTIONS WHERE PARTIALLY REMOVED. COORDINATE ABANDONMENT WITH UTILITY COMPANY.

IN ADDITION TO THE WORK DETAILED ON THESE DRAWINGS THE SCOPE OF WORK SHALL INCLUDE:

- RESTRIPING FULL LENGTH OF TOMASELLO ROAD.
- BOLTED DOWN SEWER MANHOLE COVERS FOR ALL SEWER MANHOLES INSTALLED LOWER THAN ELEVATION 20.9.

EXISTING CONDITIONS NOTES

1) UNDERGROUND UTILITIES ARE TAKEN IN PART FROM ELECTRONIC FILE 9180.1_TOPO1.dwg (SEE NOTE 3), RECORD PLANS OF MUNICIPAL AND PUBLIC UTILITY PROVIDERS AND SURFACE EVIDENCE. BEFORE CONSTRUCTION CALL "DIG SAFE" 1-888-344-7233.
2) ALL ELEVATIONS REFER TO BOSTON CITY BASE.
3) THIS PLAN IS BASED IN PART FROM AN ELECTRONIC FILE ENTITLED 9180.1_TOPO1.DWG AND DATED FEBRUARY 3, 2014 AND PREPARED BY NITSCH ENGINEERING, INC. AS WELL AS AN ON THE GROUND SURVEY PERFORMED BY BEALS AND THOMAS, INC. USING TOTAL STATION METHODS ON OR BETWEEN JANUARY 18, 2017 AND DECEMBER 20, 2017.
4) APPROXIMATE WETLAND RESOURCE AREAS TAKEN FROM A PLAN PREPARED BY ELKUS MANFREDI ARCHITECTS AND NITSCH ENGINEERING, INC. ENTITLED "TOPOGRAPHIC PLAN OF LAND", SCALE: 1"=40', DATED: JULY 31, 2014.
5) WETLAND RESOURCE AREAS DELINEATED BY BEALS AND THOMAS, INC. ON JUNE 29, 2017, JULY 6, 2017 AND DECEMBER 4, 2017.
6) WETLAND RESOURCE AREA FLAGS LOCATED BY TOTAL STATION METHODS BY BEALS AND THOMAS, INC. ON OR BETWEEN JULY 11, 2017 AND DECEMBER 13, 2017.
7) A PORTION OF THE PREMISES IS LOCATED IN ZONE AE (SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD; BASE FLOOD ELEVATIONS DETERMINED), AS SHOWN ON "FLOOD INSURANCE RATE MAP, SUFFOLK COUNTY, MASSACHUSETTS (ALL JURISDICTIONS) PANELS 19 AND 38 OF 176", MAP NUMBERS 25025C0038J AND 25025C0019J, EFFECTIVE DATE MARCH 16, 2016.
8) THE PROPERTY BOUNDARY ALONG SALES CREEK IS SUBJECT TO CHANGE DUE TO NATURAL CAUSES AND IT MAY OR MAY NOT REPRESENT THE ACTUAL LOCATION OF THE LIMIT OF TITLE.
9) THE CITY LINE BETWEEN BOSTON AND REVERE IS THE FORMER CENTERLINE OF BELLE ISLE INLET. THE DIVISION LINE SHOWN IS TAKEN FROM PLAN ENTITLED "CITY OF BOSTON BOUNDARY LINE BETWEEN BOSTON AND REVERE" DATED JANUARY 6, 1936 AND IS ON FILE WITH THE CITY OF BOSTON ENGINEERING DEPARTMENT AS PLAN L-7388.
10) THIS PLAN WAS BASED IN PART FROM AN ACTUAL SURVEY MADE ON THE GROUND USING TOTAL STATION METHODS ON OR BETWEEN 03/01/2017 AND 12/13/2017.
11) A PORTION OF THE PREMISES IS LOCATED IN THE RUMNEY MARSHES AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC). THE EXTENT OF THE ACEC IS DEPICTED IN ACCORDANCE WITH THE DOCUMENT: "DESIGNATION OF PORTIONS OF THE CITIES OF BOSTON, LYNN, AND REVERE, AND THE TOWNS OF SAUGUS AND WINTHROP AS THE RUMNEY MARSHES AREA OF CRITICAL ENVIRONMENTAL CONCERN WITH SUPPORTING FINDINGS" ISSUED BY THE SECRETARY OF ENVIRONMENTAL AFFAIRS ON AUGUST 22, 1988.

ZONING INFORMATION

SUFFOLK DOWNS ECONOMIC DEVELOPMENT AREA OF THE EAST BOSTON NEIGHBORHOOD DISTRICT, WHICH IS GOVERNED BY ARTICLE 53 OF THE BOSTON ZONING CODE;
ALSO WITHIN A SPECIAL STUDY OVERLAY DISTRICT ESTABLISHED BY SECTION 53-43 OF THE BOSTON ZONING CODE.

CITY OF BOSTON ZONING INFORMATION
ZONING DISTRICT-EAST BOSTON NEIGHBORHOOD DISTRICT, SUFFOLK DOWNS ECONOMIC DEVELOPMENT AREA

DIMENSIONAL REQUIREMENTS

DIMENSION	REQUIRED
MINIMUM LOT SIZE (S.F.):	NONE
MINIMUM LOT WIDTH (FT):	NONE
MINIMUM LOT FRONTAGE (FT):	NONE
MINIMUM FRONT YARD (FT):	NONE
MINIMUM SIDE YARD (FT):	NONE
MINIMUM REAR YARD (FT):	20
USABLE OPEN SPACE:	
MAXIMUM FAR:	2.0
MAXIMUM BUILDING HEIGHT (FT):	45

PLANNED DEVELOPMENT DISTRICT 1, WHICH IS GOVERNED BY SECTION 17.22 OF THE ZONING ORDINANCES OF THE CITY OF REVERE; PORTIONS OF THE PROPERTY ARE ALSO WITHIN THE FLOOD PLAIN DISTRICT UNDER SECTION 17.46 OF THE ZONING ORDINANCES OF THE CITY OF REVERE.

CITY OF REVERE ZONING INFORMATION
ZONING DISTRICT-PLANNED DEVELOPMENT DISTRICT 1

DIMENSIONAL REQUIREMENTS

DIMENSION	REQUIRED
LOT AREA (S.F.):	130,000
LOT FRONTAGE (FT):	150
MINIMUM FRONT YARD (FT):	50
MINIMUM SIDE YARD (FT):	30
MINIMUM REAR YARD (FT):	50
MAXIMUM BUILDING HEIGHT (FT):	180
MAXIMUM STORIES:	18
MAXIMUM FAR:	2.0
MAXIMUM LOT COVERAGE:	50%
MAXIMUM OPEN SPACE:	15%

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LEGEND AND ABBREVIATIONS

EXISTING	PROPOSED	
S SMH	S SMH	SEWER LINE/MANHOLE
D DMH	D	DRAIN LINE
RD	RD	ROOF DRAIN LINE
CB FE/INV	CB FE	CATCH BASIN
GG	GG	FLARED END/INVERT
GC	G	GAS LINE/GATE
WC	W GV	WATER LINE/GATE
HYD	HYD	HYDRANT
TMH	T TMH	TELEPHONE LINE/MANHOLE
EMH	E EMH	ELECTRIC LINE/MANHOLE
OHW	LP LP	OVERHEAD WIRE
LP		LIGHT POLE
UP		UTILITY POLE
GW		GUY WIRE
S	S	SIGN
P	P	POST
B	B	BOLLARD POST
HH	HH	HAND HOLE
CLF		CHAIN LINK FENCE
GC	GC	GRANITE CURB
BCB		BITUMINOUS CONCRETE BERM
T		TREE
		BUILDING
124	124	MINOR CONTOUR
130	130	MAJOR CONTOUR
x125.4	x125.4	SPOT ELEVATION
AD	AD	AREA DRAIN
BIT CONC	BIT CONC	BITUMINOUS CONCRETE
BCB	BCB	BITUMINOUS CONCRETE BERM
BM	BM	BENCHMARK
CATV	CATV	CABLE TELEVISION
CLDI	CLDI	CEMENT LINED DUCTILE IRON
CONC	CONC	CONCRETE
EOP	EOP	EDGE OF PAVEMENT
GM	GM	GAS METER
HW		HEAD WALL
	LD	LOADING DOCK
PVC	PVC	POLYVINYL CHLORIDE
(REC.) OR (R)		RECORD INFORMATION
RCP	RCP	REINFORCED CONCRETE PIPE
RD	RD	ROOF DRAIN
ROW	ROW	RIGHT-OF-WAY
SGC	SGC	SLOPED GRANITE CURB
TRANSF	TRANSF	ELECTRIC TRANSFORMER
WQI		WATER QUALITY INLET
SB		STONE BOUND
CB		CONCRETE BOUND
DH	DH	DRILL HOLE
IP	IP	IRON PIN/IRON PIPE
IR	IR	IRON ROD
FND		FOUND
MES-GO-1		MONITORING WELLS
MES-R-4		

PROPOSED DRAINAGE RIM AND INVERT SCHEDULE

STRUCTURE	RIM	INVERT	SIZE AND MATERIAL	DESCRIPTION
STUB 1	R=22.20	I=14.90	36 RCP	TO DMH-05
STUB 2	R=21.84	I=16.97	36 RCP	TO DMH-03
CB-01	R=19.00	I=15.50	12 RCP	TO WQI-01
CB-01A	R=20.00	I=15.53	12 RCP	TO DMH-01
CB-02	R=21.10	I=16.60	12 RCP	TO DMH-02
CB-03	R=21.10	I=16.60	12 RCP	TO DMH-02
CB-04	R=22.60	I=16.70	18 RCP	TO DMH-03
CB-05	R=22.85	I=15.95	12 RCP	TO DMH-04
CB-06	R=22.85	I=15.50	18 RCP	TO DMH-04
CB-07	R=22.50	I=13.95	18 RCP	TO DMH-13
CB-08	R=21.32	I=15.35	18 RCP	TO DMH-16
CB-A	R=18.80	I=15.65	12 RCP	TO WQI-A
CB-B	R=19.00	I=15.73	12 RCP	TO WQI-A
CB-C	R=20.50	I=13.55	18 RCP	TO DMH-11
CB-D	R=20.50	I=13.35	18 RCP	TO DMH-12
CB-E	R=18.00	I=15.00	24 RCP	TO FE-B
DMH-01	R=20.10	I=15.53 I=15.53 I=15.53	36 RCP 12 RCP 36 RCP	FROM DMH-02 FROM CB-01A TO WQI-01
DMH-02	R=21.33	I=15.99 I=15.99 I=15.99 I=15.99	12 RCP 12 RCP 36 RCP 36 RCP	FROM CB-02 FROM CB-03 TO DMH-01 FROM DMH-03
DMH-03	R=22.70	I=16.56 I=16.56 I=16.56	36 RCP 18 RCP 36 RCP	FROM STUB 2 FROM CB-04 TO DMH-02
DMH-04	R=22.90	I=14.81 I=14.81 I=14.81	12 RCP 18 RCP 30 RCP	FROM CB-05 FROM CB-06 TO DMH-05
DMH-05	R=22.95	I=14.73 I=14.73 I=14.73 I=14.41	36 RCP 30 RCP 48 RCP 30 RCP	FROM STUB 1 FROM DMH-04 TO DMH-06 TO DMH-07
DMH-06	R=23.60	I=14.41 I=14.41	48 RCP 48 RCP	FROM DMH-05 TO DMH-07
DMH-07	R=23.80	I=14.10 I=14.10	48 RCP 48 RCP	FROM DMH-06 TO DMH-08
DMH-08	R=22.71	I=13.75 I=13.75	48 RCP 48 RCP	FROM DMH-07 TO DMH-09
DMH-09	R=22.00	I=13.44 I=13.44 I=13.44	48 RCP 48 RCP 30 RCP	FROM DMH-08 TO DMH-10 FROM DMH-13
DMH-10	R=21.18	I=13.19 I=13.19	48 RCP 48 RCP	FROM DMH-09 TO DMH-11
DMH-11	R=21.30	I=13.15 I=13.15 I=13.15	18 RCP 48 RCP 48 RCP	FROM CB-C FROM DMH-10 TO DMH-12
DMH-12	R=20.80	I=12.97 I=12.97 I=12.97	18 RCP 48 RCP 48 RCP	FROM CB-D FROM DMH-11 TO WQI-C
DMH-13	R=22.30	I=13.64 I=13.64 I=13.64	18 RCP 30 RCP 30 RCP	FROM CB-07 TO DMH-09 FROM DMH-14
DMH-14	R=23.18	I=13.80 I=13.80	30 RCP 30 RCP	TO DMH-13 FROM DMH-15
DMH-15	R=25.00	I=14.48 I=14.48	30 RCP 30 RCP	TO DMH-14 FROM DMH-16
DMH-16	R=22.15	I=15.01 I=15.01	18 RCP 30 RCP	FROM CB-08 TO DMH-15
FE-1	R=14.70	I=14.70	36 RCP	FROM WQI-01
FE-A	R=14.60	I=14.60	18 RCP	FROM WQI-A
FE-B	R=14.55	I=14.55	24 RCP	FROM CB-E
FE-C	R=12.75	I=12.75	48 RCP	FROM WQI-C
WQI-01	R=20.00	I=14.95 I=14.95 I=14.95	12 RCP 36 RCP 36 RCP	FROM CB-01 FROM DMH-01 TO FE-1
WQI-A	R=18.90	I=15.57 I=15.57 I=15.57	12 RCP 12 RCP 18 RCP	FROM CB-A FROM CB-B TO FE-A
WQI-C	R=21.00	I=12.88 I=12.88	48 RCP 48 RCP	FROM DMH-12 TO FE-C

REVISIONS

#	DATE	DESCRIPTION
0	01/17/2018	ISSUED FOR NOTICE OF INTENT

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QUICK LINKS

KEY PLAN

GENERAL NOTES

ELIZABETH A. CLARK CIVIL No. 47873 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS
1/17/2018

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

IAN C. WISURI No. 47403 REGISTERED PROFESSIONAL LAND SURVEYOR COMMONWEALTH OF MASSACHUSETTS
1/17/2018

TITLE: NOTICE OF INTENT

VOLUME

DRAWING TITLE: NOTES, REFERENCES AND LEGEND

B&T DWG. NO. 285403P059A-001

SCALE	PROJECT #	DATE ISSUED
N/A	174106	01.17.18

C1.0

FOR NOTES AND REFERENCES SEE SHEET C1.0.

BEALS AND THOMAS, INC. SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, OR PROCEDURES UTILIZED BY THE CONTRACTOR, NOR FOR THE SAFETY OF PUBLIC OR CONTRACTOR'S EMPLOYEES; OR FOR THE FAILURE OF THE CONTRACTOR TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

REVISIONS

#	DATE	DESCRIPTION
0	11/30/2017	SITEWORK BID PACKAGE
1	12/15/2017	SCHEMATIC DESIGN PACKAGE
2	01/17/2018	REVISED FOR NOTICE OF INTENT

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GENERAL NOTES

Wetland Resource Areas confirmed by Order of Resource Area Delineation issued by the Boston Conservation Commission, MassDEP File No. 006-1546, dated September 20, 2017, with the exception of bank flags BF-H60 through BF-H67, which were placed in the field on December 4, 2017 to delineate the far side of the H-Series intermittent stream.

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

COMMONWEALTH OF MASSACHUSETTS
IAN C. WASURI No. 47403
REGISTERED LAND SURVEYOR
1/17/2018

TITLE

NOTICE OF INTENT

VOLUME

DRAWING TITLE

TOPOGRAPHIC PLAN

METERS 0 5 10 20
FEET 0 20 40 80 120

B&T DWG. NO. 285403P060A-001

SCALE	PROJECT #	DATE ISSUED
1"=40'	174106	11.30.17

TP-1

FOR NOTES AND REFERENCES SEE SHEET C1.0.

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SITE PREPARATION AND EROSION CONTROL LEGEND

- REMOVE OR SALVAGE
- LIMIT OF WORK
- ECB — EROSION CONTROL BARRIER
- PAVEMENT TO BE MILLED AND OVERLAID
- STABILIZED CONSTRUCTION ENTRANCE

ELECTRIC POLE TO BE REMOVED AND RELOCATED

STABILIZED CONSTRUCTION ENTRANCE

REMOVE TREE (TYP)

REMOVE GUARD RAIL

MILL AND OVERLAY EXISTING BIT. CONC. ROAD

LIMIT OF WORK

MATCHLINE A-A

MATCHLINE A-A

MILL AND OVERLAY EXISTING BIT. CONC. ROAD

REMOVE AND SALVAGE OUTSIDE RAIL FENCE

REMOVE AND SALVAGE INFIELD FENCE

LIMIT OF WORK

REMOVE CONCRETE (TYP)

ESTIMATED LIMIT OF SURCHARGE

REMOVE VEGETATION

REMOVE DRAIN PIPE

REMOVE VEGETATION

REMOVE VEGETATION

REMOVE VEGETATION

ESTIMATED LIMIT OF SURCHARGE

MILL AND OVERLAY EXISTING BIT. CONC. PAVEMENT

REMOVE VEGETATION

CUT CAP AND REMOVE EXISTING FORCE MAIN

REMOVE PAVEMENT

REMOVE LIGHT POLE

RELOCATE AND SALVAGE STARTING GATE PER OWNER

REMOVE AND SALVAGE INFIELD FENCE

REMOVE AND SALVAGE INFIELD FENCE

ECB

REMOVE PLASTIC FENCE

REMOVE AND SALVAGE OUTSIDE RAIL FENCE

SAWCUT PAVEMENT (TYP)

REMOVE TREE (TYP)

REMOVE CHAIN LINK FENCE

LIMIT OF WORK

ECB

ECB

REMOVE AND SALVAGE OUTSIDE RAIL FENCE

REVISIONS

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0	01/17/2018	ISSUED FOR NOTICE OF INTENT

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QUICK LINKS

KEY PLAN

GENERAL NOTES

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

COMMONWEALTH OF MASSACHUSETTS
ELIZABETH A. CLARK
CIVIL
No. 47873
REGISTERED PROFESSIONAL ENGINEER
1-17-18

TITLE

NOTICE OF INTENT

VOLUME

DRAWING TITLE

SITE PREPARATION AND EROSION CONTROL PLAN

METERS 0 5 10 25
FEET 0 20 40 80 120

B&T DWG. NO. 285403P058A-001

SCALE	PROJECT #	DATE ISSUED
1"=40'	174106	01.17.18

C2.0

FOR NOTES AND REFERENCES SEE SHEET C1.0.

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MATCHLINE A-A

LIMIT OF WORK

TEMPORARY CHAIN LINK FENCE

BIT. CONC. WALK

BITUMINOUS CONCRETE PAVEMENT

VGC

BCB

CEMENT CONC. WALK

GUARDRAIL

TERRACED WALKWAY WITH PLANTERS (REFER TO LANDSCAPE PLANS)

STORMWATER BASIN 1

STORMWATER BASIN 2

PERVIOUS PAVEMENT (SEE LANDSCAPE DRAWINGS)

LIMIT OF 100-YEAR FLOOD ELEVATION=17.46 (BCB)

100' BUFFER ZONE

WASHBURN AVENUE (PRIVATE)

REVISIONS

#	DATE	DESCRIPTION
0	01/17/2018	ISSUED FOR NOTICE OF INTENT

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QUICK LINKS

KEY PLAN

GENERAL NOTES

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

COMMONWEALTH OF MASSACHUSETTS
ELIZABETH A. CLARK
CIVIL
No. 47873
REGISTERED PROFESSIONAL ENGINEER
1-17-18

TITLE: NOTICE OF INTENT

VOLUME

DRAWING TITLE: LAYOUT AND MATERIALS PLAN

METERS 0 5 10 25
FEET 0 20 40 80 120

B&T DWG. NO. 285403P058A-002

SCALE	PROJECT #	DATE ISSUED
1"=40'	174106	01.17.18

C1.0

FOR NOTES AND REFERENCES SEE SHEET C1.0.

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MATCHLINE A-A

CONNECT TO EXISTING ELECTRIC

TEMPORARY ELECTRIC CONDUITS

LIMIT OF WORK

MATCHLINE A-A

TEMPORARY ELECTRIC CONDUITS

TEMPORARY CHAIN LINK FENCE

TEMPORARY CHAIN LINK FENCE

PROPOSED CONNECTION TO EXISTING FORCE MAIN.

PROPOSED CONNECTION TO EXISTING ELECTRICAL CONDUIT.

PROPOSED CONNECTION TO TELE/DATA.

PROPOSED CONNECTION TO EXISTING WATER MAIN.

PROPOSED CONNECTION TO EXISTING GAS MAIN.

LIMIT OF WORK

TELE/DATA CONDUITS

ELECTRICAL CONDUITS

16" DICL

DMH-04

CB-05

CB-06

CB-07

DMH-02

CB-03

DMH-03

CB-04

CB-02

DMH-01

CB-01A

WQI-01

CB-01

DMH-12

CB-C

CB-D

WQI-C

DMH-13

DMH-15

CB-08

STORMWATER BASIN 1

STORMWATER BASIN 2

CONNECT TO EXISTING FORCE MAIN:

(2) 3" PVC FORCE MAIN

(2) 15" HDPE DRAIN PIPE

LIMIT OF WORK

ECB

ECB

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

REVISIONS

#	DATE	DESCRIPTION
0	01/17/2018	ISSUED FOR NOTICE OF INTENT

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QUICK LINKS

KEY PLAN

GENERAL NOTES

SEAL

COMMONWEALTH OF MASSACHUSETTS
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CIVIL
No. 47873
REGISTERED PROFESSIONAL ENGINEER
1-17-18

TITLE

NOTICE OF INTENT

VOLUME

DRAWING TITLE

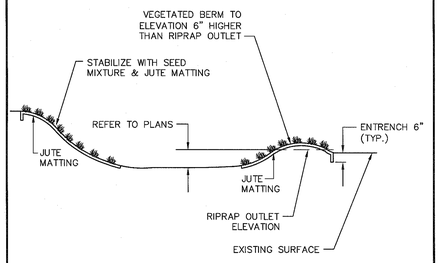
GRADING, DRAINAGE AND UTILITIES PLAN

METERS 0 5 10 25
FEET 0 20 40 80 120

B&T DWG. NO. 285403P058A-003

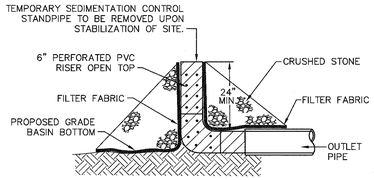
SCALE	PROJECT #	DATE ISSUED
1"=40'	174106	01.17.18

C4.0



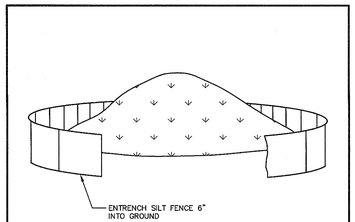
SEDIMENT BASIN CROSS SECTION

NOT TO SCALE



TEMPORARY SEDIMENT BASIN OUTLET

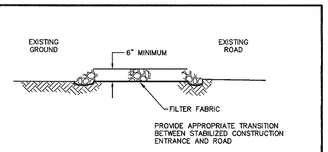
NOT TO SCALE



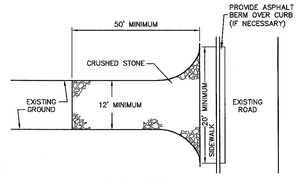
NOTES:
1. CHOOSE DRY AND STABLE AREA FOR STOCKPILE.
2. STOCKPILES SHALL MEET THE REQUIREMENTS OF THE SOIL MANAGEMENT PLAN, PREPARED BY THE ENVIRONMENTAL ENGINEER.

SOIL STOCKPILE

NOT TO SCALE



PROFILE VIEW

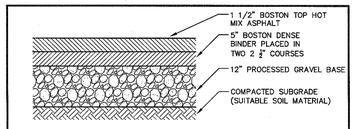


PLAN VIEW

NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO EXISTING ROAD. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO EXISTING ROAD SHALL BE REMOVED IMMEDIATELY.
2. NO PARKING ALLOWED WITHIN 10-FEET OF ALL CONSTRUCTION ENTRANCES. CONTRACTOR TO POST SIGNS ON EXISTING ROAD.
3. PROVIDE DRAINAGE AWAY FROM STABILIZED CONSTRUCTION ENTRANCE TO AN ACCEPTABLE ON-SITE SEDIMENT TRAPPING DEVICE.

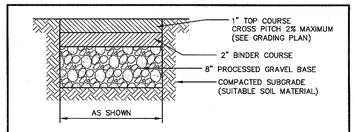
STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



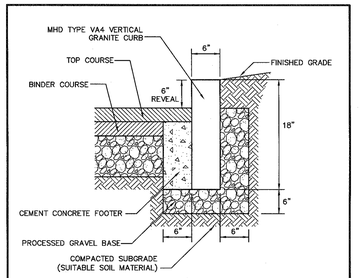
PERMANENT BITUMINOUS CONCRETE PAVEMENT

NOT TO SCALE



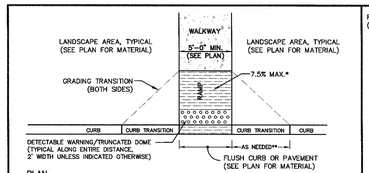
BITUMINOUS CONCRETE WALK

NOT TO SCALE



VERTICAL GRANITE CURB

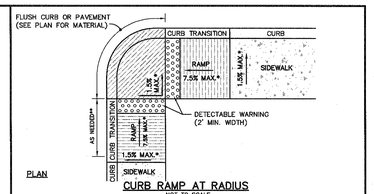
NOT TO SCALE



PLAN

CURB RAMP (PERPENDICULAR)

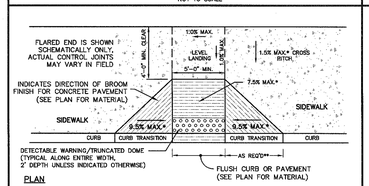
NOT TO SCALE



PLAN

CURB RAMP AT RADIUS

NOT TO SCALE



PLAN

CURB RAMP WITH FLARED SIDES (ALONG SIDEWALK)

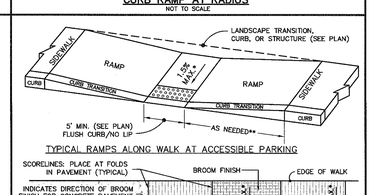
NOT TO SCALE

NOTES:
1. RAMP SURFACE SHALL BE NON-SLIP AND ROUGHENED AS SHOWN IN PLAN.
2. DETECTABLE WARNING/TRUNCATED DOME PER ADA SEC. 4.29.2. (USE RETROFIT TILES BY ADA SOLUTIONS, INC. OR APPROVED EQUAL)

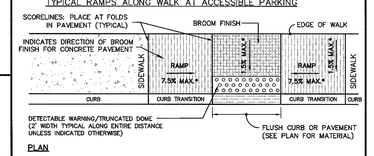
* TOLERANCE FOR CONSTRUCTION ±0.5%
** LENGTH OF CURB TRANSITIONS VARY BASED ON SLOPE OF PAVEMENT AND HEIGHT OF CURB.

CURB RAMP DETAILS

SEE PLAN FOR TYPE AND LOCATIONS



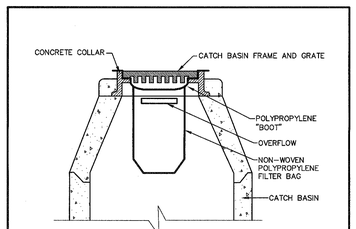
TYPICAL RAMPS ALONG WALK AT ACCESSIBLE PARKING



PLAN

TYPICAL CURB RAMP AT ACCESSIBLE PARKING

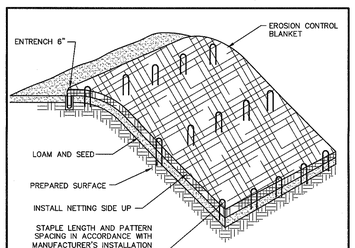
NOT TO SCALE



NOTES:
1. TO BE INSTALLED IN CATCH BASINS IN TRAFFIC AREAS UNTIL COMPLETION OF CONSTRUCTION.
2. BOOT ADAPTER MAY BE TRIMMED TO SIZE.
3. MAINTENANCE SHALL OCCUR WHEN NECESSARY AND IN COMPLIANCE WITH THE 2012 EPA CONSTRUCTION GENERAL PERMIT SILT SACKS SHALL BE CLEANED ONCE THE BAG IS FILLED HALFWAY WITH DEBRIS. CONTRACTOR SHALL REMOVE FILTER BAG AND REPLACE WITH NEW UNIT. DO NOT EMPTY CONTENTS INTO CATCH BASIN.

FILTER BAG

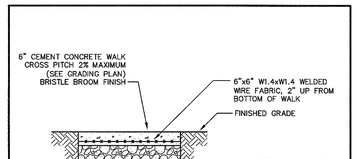
NOT TO SCALE



NOTE: TO BE INSTALLED ON ALL SLOPES STEEPER THAN 3:1 UNLESS OTHERWISE NOTED.

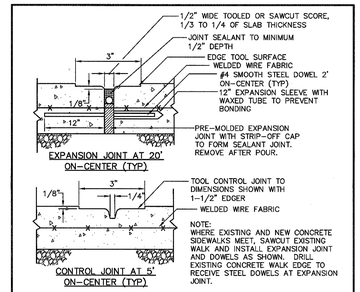
SLOPE STABILIZATION

NOT TO SCALE



CEMENT CONCRETE WALK

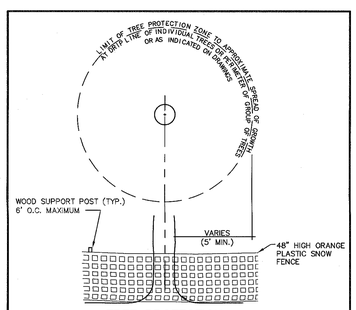
NOT TO SCALE



NOTE:
WHERE EXISTING AND NEW CONCRETE SIDEWALKS MEET, SAWCUT EXISTING WALK AND INSTALL EXPANSION JOINT AND DOWELS AS SHOWN. DRILL EXISTING CONCRETE WALK EDGE TO RECEIVE STEEL DOWELS AT EXPANSION JOINT.

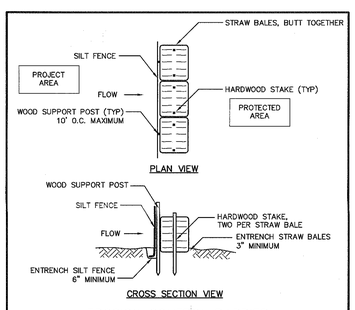
EXPANSION AND CONTROL JOINTS

NOT TO SCALE



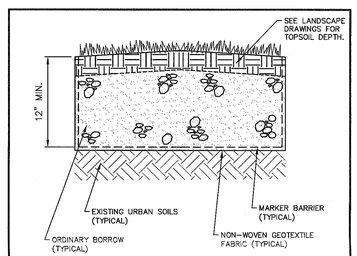
TREE PROTECTION

NOT TO SCALE



EROSION CONTROL BARRIER

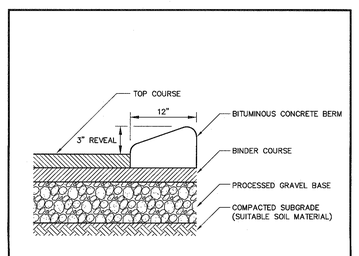
NOT TO SCALE



NOTE: MARKER BARRIER REQUIRED IN ALL PERVIOUS AREAS WITHIN THE LIMIT OF TEMPORARY FENCE.

TYPICAL MARKER BARRIER UNDER LANDSCAPED AREAS

NOT TO SCALE



BITUMINOUS CONCRETE BERM

NOT TO SCALE

BEALS AND THOMAS, INC. SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, OR PROCEDURES UTILIZED BY THE CONTRACTOR, NOR FOR THE SAFETY OF PUBLIC OR CONTRACTOR'S EMPLOYEES, OR FOR THE FAILURE OF THE CONTRACTOR TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

REVISIONS

#	DATE	DESCRIPTION
0	11/30/2017	SITEWORK BID PACKAGE
1	12/15/2017	SCHEMATIC DESIGN PACKAGE
2	01/17/2018	REVISED FOR NOTICE OF INTENT

PHASE 1

525 William F McClellan Hwy, Boston, MA 02128

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Reservoir Corporate Center
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QUICK LINKS

KEY PLAN

GENERAL NOTES

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

COMMONWEALTH OF MASSACHUSETTS
ELIZABETH A. CLARK
CIVIL
No. 47673
REGISTERED PROFESSIONAL ENGINEER
1-17-18

TITLE

NOTICE OF INTENT

VOLUME

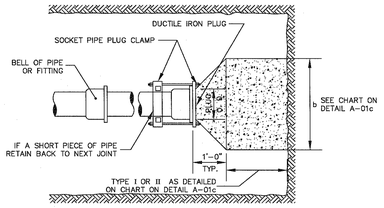
DRAWING TITLE

SITE DETAILS #1

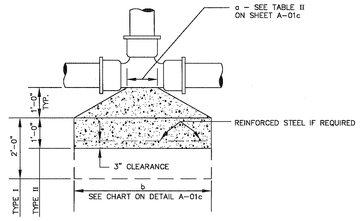
B&T DWG. NO. 285403P059A-002

SCALE	PROJECT #	DATE ISSUED
N/A	174106	11.30.17

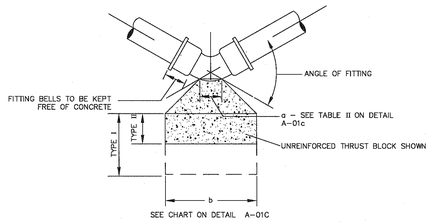
C5.0



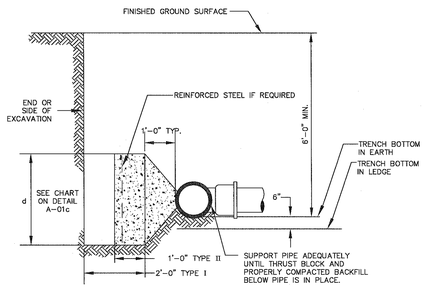
PLAN - DEAD END



PLAN - TEE



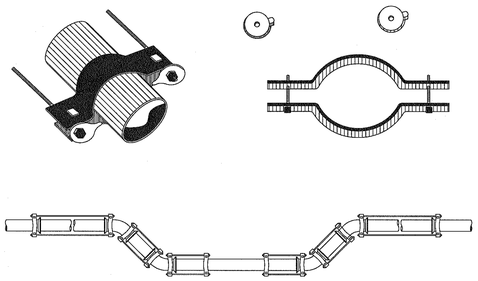
PLAN - BEND



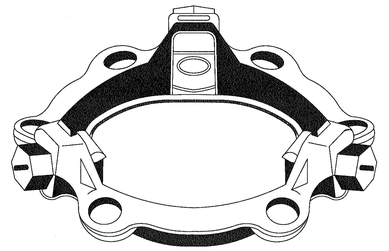
TYPICAL SECTION
(FOR TEES, BENDS & DEAD ENDS)

SCHEDULE OF TIE RODS

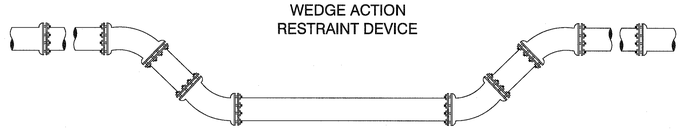
PIPE SIZE	NUMBER OF RODS PER FITTING	DIAMETER OF RODS
4" - 12"	2	3/4"
16"	4	3/4"
20" - 24"	4	1 1/2"
36"	6	1 1/2"



TYPICAL THRUST RESTRAINTS USING
TIE RODS AND FRICTION CLAMPS



WEDGE ACTION
RESTRAINT DEVICE



NOTE :
Devices need to be placed beyond the area of restraints in accordance with manufactures recommendations.

TYPICAL THRUST RESTRAINT USING
WEDGE ACTION RESTRAINT DEVICE

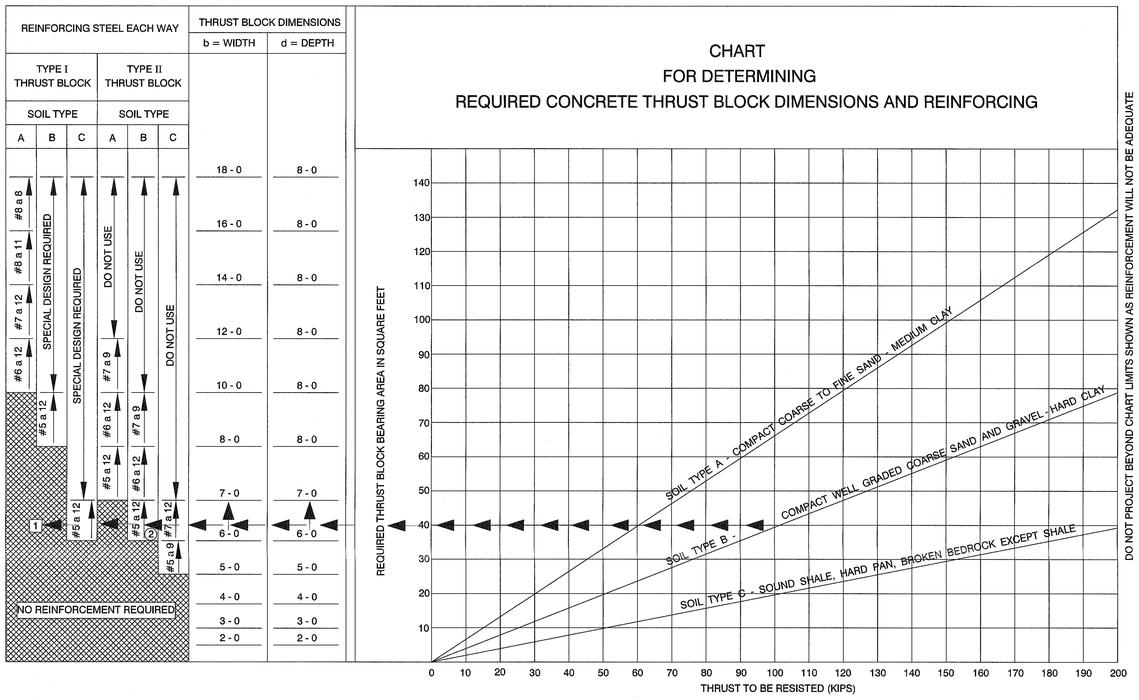
TABLE II - "a" DIMENSION - FEET

PIPE DIAMETER - INCHES	90° FITTING	OTHERS
6, 8, 10 & 12	1 - 6	1 - 0
16 & 20	2 - 0	1 - 6
24" - 30"	3 - 0	2 - 0

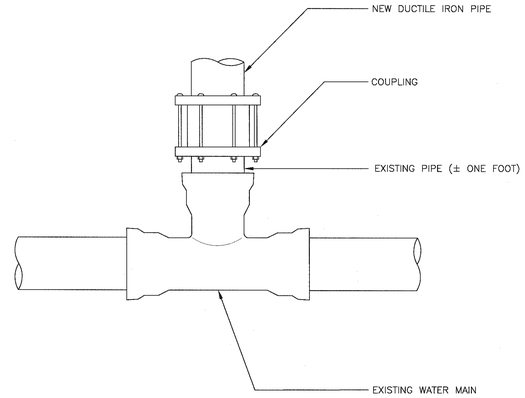
TABLE I - THRUST - KIPS (WATER PRESSURE = 200 P.S.I.)

PIPE DIAMETER INCHES		6	8	10	12	16	20	24	30	36	42
DEAD ENDS AND TEES		5.6	10	15.8	22.6	40.2	62.8	90.4	141.0	203.6	277.0
ANGLE FITTINGS	90°	7.9	14.2	22.4	32.0	56.8	88.8	127.7	199.0	288.0	392.0
	67 1/2°	-	11.1	17.6	25.1	44.7	70.0	100.2	157.0	226.0	308.0
	56 1/4°	-	-	14.9	21.2	37.9	59.2	85.1	133.0	192.0	261.0
	45°	-	-	-	17.3	30.8	48.1	69.0	108.0	156.0	212.0
	33 3/4°	-	-	-	13.1	23.3	36.5	52.5	82.0	118.0	161.0
	22 1/2°	-	-	-	8.8	15.7	24.5	35.2	55.0	79.5	108.0

DESIGN THRUST BLOCKS OR OTHER SUITABLE
ANCHORAGE TO SUIT ACTUAL CONDITIONS



THRUST BLOCK DIMENSIONS
TABLE AND CHART



TYPICAL CONNECTION TO EXISTING FITTING

NOTES :

All fittings shall be anchored by mechanical means or by concrete thrust blocks, or both, if required by the Boston Water and Sewer Commission or as noted on the contract plans.
All exposed metal shall be painted or coated. Concrete shall develop a minimum compressive stress of 3,000 p.s.i. at 28 days.
Reinforcing steel shall be A.S.T.M. A615 Grade 40. Water pressure in Table 1 includes water hammer allowance.

The actual method of restraint must be determined by actual field conditions. These are typical installations to be used as a guide to the designer. Final designs are subject to review by the Boston Water and Sewer Commission.

ILLUSTRATIVE PROBLEM

Design a thrust block for a 67-1/2° bend, a 24-inch diameter water main, carrying a maximum pressure of 200 p.s.i. Soil classified as a well graded compact coarse sand and gravel.

SOLUTION

1. Enter Table I at 24-inch pipe diameter - go vertically down column until opposite 67-1/2° angle fitting. read thrust = 100.2 kips.
2. See chart immediately below Table I - select soil type curve reflecting actual soil classification. Type B for this problem.
3. Enter chart at thrust to be resisted and go vertically to soil type curve selected in 2 above - see chart and follow illustrative problem arrow line from 100.2 kip thrust to soil Type B curve.
4. From this intersection go horizontally following arrow line to intersection with required thrust block bearing area in square feet - 40 square feet minimum is required to resist thrust.
5. Continue horizontally to "thrust block dimensions" column and select dimensions "**b**" and "**d**" immediately above horizontal arrow line projection.
   7' - 0" square thrust block required for this problem.
6. Continue horizontally to "**reinforcing steel - each way**" column, noting columns further classification by soil type and footing type. (see "**thrust block detail**", for type I and type II requirements.)
   Two solutions to illustrative problem are acceptable:
   solution 1 - type I thrust block and soil type B indicate no reinforcement required.
   solution 2 - type II thrust block and soil type B indicate #5 A 12 each way required.

REVISIONS

#	DATE	DESCRIPTION
0	11/30/2017	SITEWORK BID PACKAGE
1	12/15/2017	SCHEMATIC DESIGN PACKAGE
2	01/17/2018	REVISED FOR NOTICE OF INTENT

PHASE 1

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QUICK LINKS

KEY PLAN

GENERAL NOTES

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

COMMONWEALTH OF MASSACHUSETTS
ELIZABETH A. CLARK
CIVIL
No. 47873
REGISTERED PROFESSIONAL ENGINEER
1-17-18

TITLE
NOTICE OF INTENT

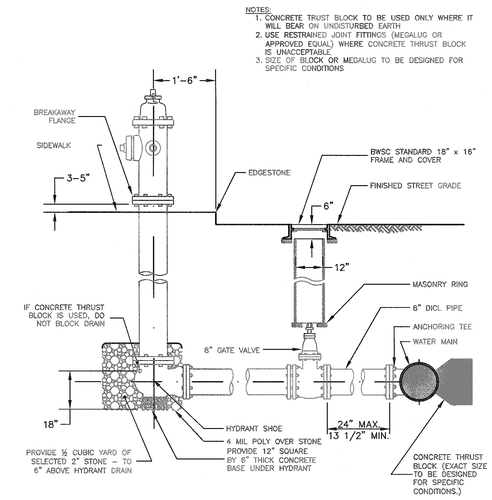
VOLUME

DRAWING TITLE
SITE DETAILS #2

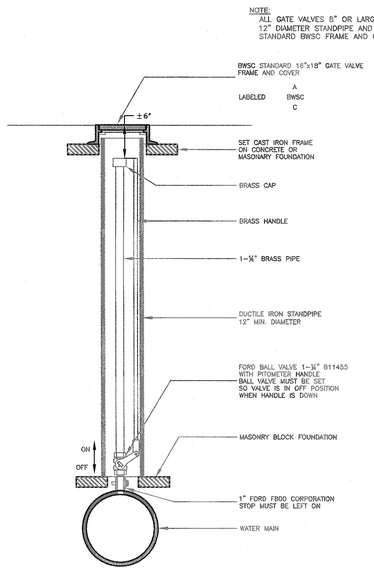
B&T DWG. NO. 285403P059A-003

SCALE	PROJECT #	DATE ISSUED
N/A	174106	11.30.17

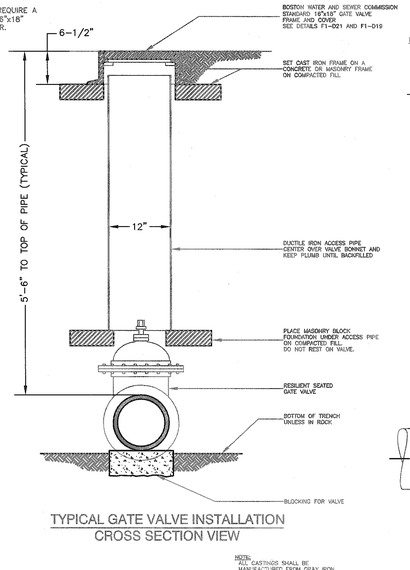
C5.1



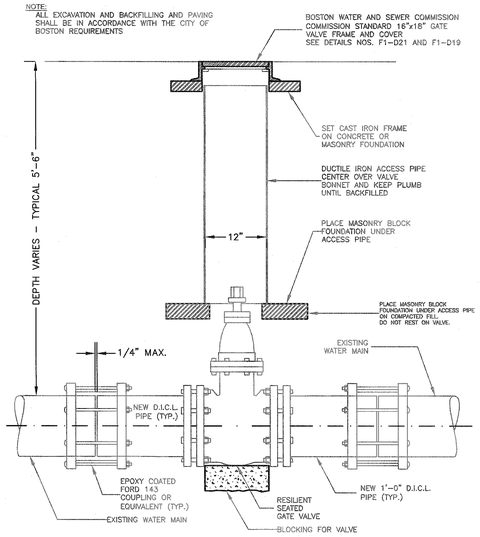
TYPICAL FIRE HYDRANT CONNECTION
FOR HIGH PRESSURE



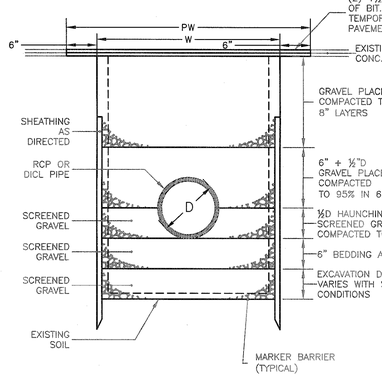
TYPICAL AIR RELEASE VALVE



TYPICAL GATE VALVE INSTALLATION
CROSS SECTION VIEW

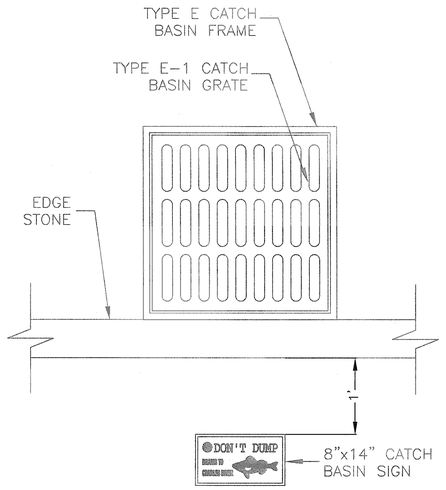


TYPICAL GATE VALVE INSTALLATION
ELEVATION VIEW

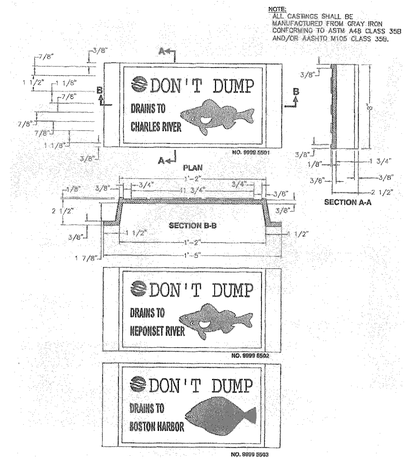


W = MAXIMUM TRENCH WIDTH
PW = MAXIMUM PAVING WIDTH = W+1'-0"
D = OUTSIDE DIAMETER
UNSHEATHED TRENCH: W = D+2'(3'-0" MIN.)
SHEATHED TRENCH: W = D+2'+SHEATHING WIDTH:
4'-2"MIN. W/O WALERS
5'-0" MIN. W/WALERS
TRENCH BOX OR HYDRAULIC SHORING:
W = D+2' + [WALL SHIELD WIDTH ± 8"] + 1' FOR TRENCH BOX

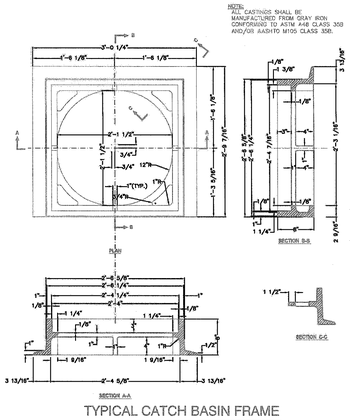
TRENCH DETAIL FOR RCP OR DICL PIPE



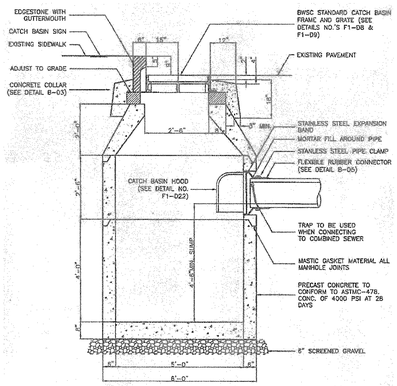
CATCH BASIN SIGN INSTALLATION



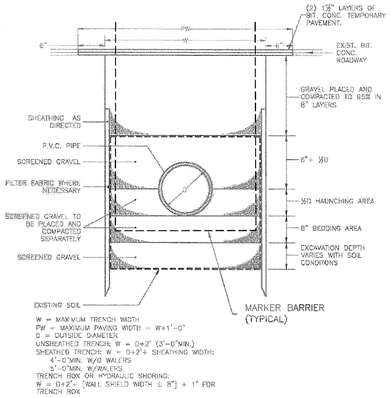
8"x14" CATCH BASIN SIGN



TYPICAL CATCH BASIN FRAME

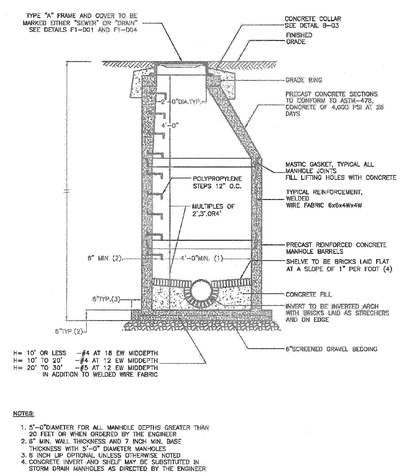


STANDARD CATCH BASIN NO. 5



W = MAXIMUM TRENCH WIDTH
PW = MAXIMUM PAVING WIDTH = W+1'-0"
D = OUTSIDE DIAMETER
UNSHEATHED TRENCH: W = D+2'(3'-0"MIN.)
SHEATHED TRENCH: W = D+2'+ SHEATHING WIDTH:
4'-0"MIN. W/O WALERS
5'-0"MIN. W/WALERS
TRENCH BOX OR HYDRAULIC SHORING:
W = D+2' + [WALL SHIELD WIDTH ± 8"] + 1' FOR TRENCH BOX

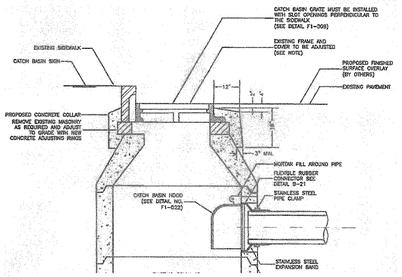
TRENCH DETAIL FOR PVC PIPE



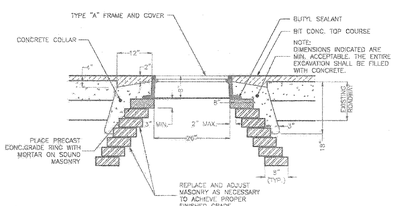
NOTE:
1. 5'-0"DIAMETER FOR ALL MANHOLE DEPTHS GREATER THAN 20 FEET OR WHEN ORDERED BY THE ENGINEER
2. 8" MIN. WALL THICKNESS AND 7 INCH MIN. BASE THICKNESS WITH 5'-0" DIAMETER MANHOLES
3. 6 INCH LIP OPTIONAL UNLESS OTHERWISE NOTED
4. CONCRETE INVERT AND SHELF MAY BE SUBSTITUTED IN STORM DRAIN MANHOLES AS DIRECTED BY THE ENGINEER

TYPICAL PRECAST SEWER CONCRETE MANHOLE

NOTES:
1. ALL CAST IN PLACE CONCRETE TO HAVE A MINIMUM 28 DAY STRENGTH OF 3000 LBS PER SQ. INCH, USING 3/4"MAXIMUM SIZE AGGREGATE
2. REINFORCING STEEL BARS ARE DEFORMED BARS OF BILLET STEEL ASTM A615 GRADE 60
3. WELDED WIRE FABRIC CONFORMS TO ASTM A185
4. CAST IRON FRAME, TYPE "A" AND COVER TYPE "A" FOR DETAILS SEE DETAILS NOS. F1-D01, F1-D04 AND F1-D05 COVERS TO BE MARKED EITHER "SEWER" OR "DRAIN".
5. DESIGN LIVE LOAD – HS 20 – 44
6. MINIMUM COVER FOR REINFORCING IN WALLS OR SLABS POURED AGAINST EARTH SHALL BE 3 INCHES. ALL OTHERS SHALL BE 2 INCHES UNLESS OTHERWISE NOTED
7. USE 2'-0" LENGTHS OF PIPE STUBS AT ALL MANHOLES FOR VC OR AC PIPE. USE 4'-0" MAX. LENGTHS OF PIPE STUBS AT ALL MANHOLES FOR RC, DI OR PVC.
8. THESE MANHOLE DETAILS TO BE USED FOR BOTH SANITARY SEWER AND STORM DRAIN MANHOLES
9. ALL MANHOLES SHALL BE CONSTRUCTED OF REINFORCED CONCRETE SHOP DRAWINGS SUBMITTALS SHALL SHOW ALL REINFORCING DETAILS
10. MWRA OIL AND GREASE SEPARATOR IS USED WITHIN BUILDINGS WHERE REQUIRED BY MWRA (MASSACHUSETTS WATER RESOURCES AUTHORITY) OR DEP (DEPARTMENT OF ENVIRONMENTAL PROTECTION) REGULATION. FOR DETAILS SEE DETAIL NO. B-04. FOR BWSC APPROVED GRIT AND OIL SEPARATORS, SEE DETAIL NOS. B-17 AND B-18.

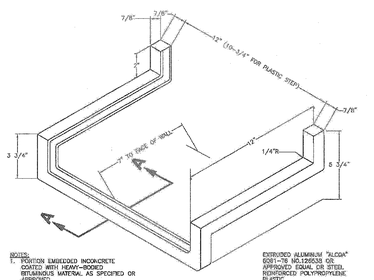


CATCH BASIN ADJUSTMENT TO GRADE



NOTES:
1. APPLY SEALANT TO SURFACE OF COLLAR AND MANHOLE FRAME PRIOR TO PLACING BITUMINOUS CONCRETE TOP
2. ADJACENT TO GASTING, PLACE AND COMPACT BITUMINOUS CONCRETE TOP IN TWO COURSES

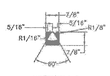
BRICK MANHOLE ADJUSTMENT TO GRADE



NOTES:
1. POSITION EMBEDDED INCONCRETE COATED WITH HEAVY-BODIED BITUMINOUS MATERIAL AS SPECIFIED OR APPROVED
2. MANHOLES GREATER THAN 15 FEET DEPTH SHALL BE CONSTRUCTED WITH-OUT STEPS

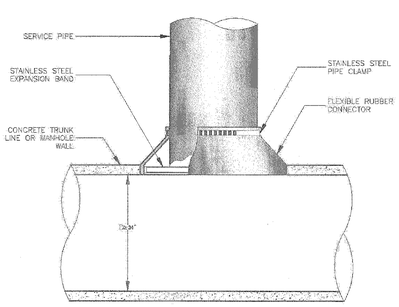
EXTRUDED ALUMINUM "ALOSA" ED11-7B NO.1260536 OR APPROVED EQUAL OR STEEL REINFORCED POLYPROPYLENE PLASTIC.

ALUMINUM MANHOLE STEP



SECTION A-A

ALUMINUM MANHOLE STEP



NOTES:
1. OPENING IN CONCRETE WALL SHALL BE CORED USING HIGH SPEED DIAMOND DRILL
2. ALL METAL FIXTURES SHALL BE OF STAINLESS STEEL
3. SERVICE LINE SHALL BE FLUSH WITH THE INSIDE OF THE CONCRETE PIPE OR WALL
4. IF TRUNK LINE DIAMETER IS LESS THAN 24" THEN A SADDLE TYPE CONNECTION WILL BE USED

TYPICAL FIELD CONNECTION TO LARGE CONCRETE PIPE OR CONCRETE MANHOLE

REVISIONS

#	DATE	DESCRIPTION
0	11/30/2017	SITEWORK BID PACKAGE
1	12/15/2017	SCHEMATIC DESIGN PACKAGE
2	01/17/2018	REVISED FOR NOTICE OF INTENT

PHASE 1

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QUICK LINKS

KEY PLAN

GENERAL NOTES

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

COMMONWEALTH OF MASSACHUSETTS
ELIZABETH A. CLARK
CIVIL
No. 47873
REGISTERED PROFESSIONAL ENGINEER
1-17-18

TITLE: NOTICE OF INTENT

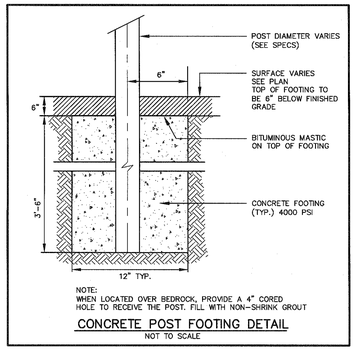
VOLUME:

DRAWING TITLE: SITE DETAILS #3

B&T DWG. NO. 285403P059A-004

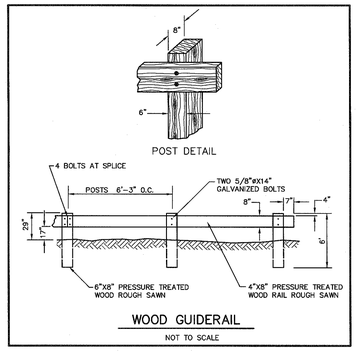
SCALE	PROJECT #	DATE ISSUED
N/A	174106	11.30.17

C5.2

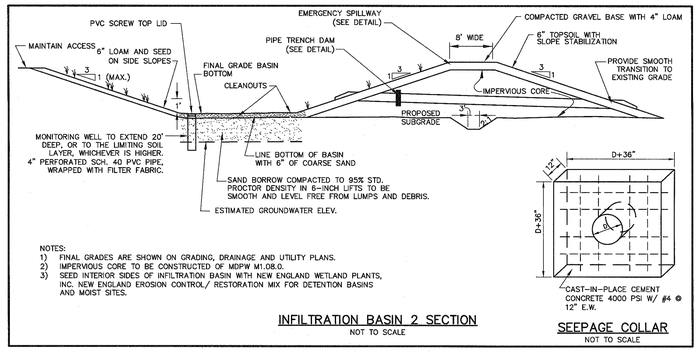


NOTE:
WHEN LOCATED OVER BEDROCK, PROVIDE A 4" CORED HOLE TO RECEIVE THE POST. FILL WITH NON-SHRINK GROUT

CONCRETE POST FOOTING DETAIL
NOT TO SCALE



WOOD GUIDERAIL
NOT TO SCALE

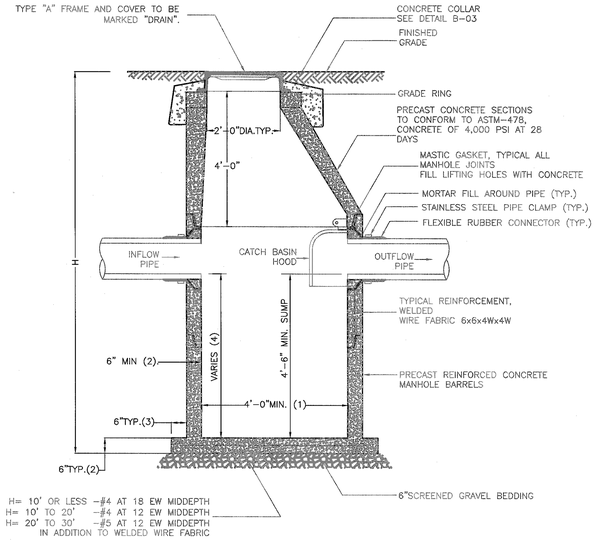


NOTES:
1) FINAL GRADES ARE SHOWN ON GRADING, DRAINAGE AND UTILITY PLANS.
2) IMPERVIOUS CORE TO BE CONSTRUCTED OF MDPW M1.08.0.
3) SEED INTERIOR SIDES OF INFILTRATION BASIN WITH NEW ENGLAND WETLAND PLANTS, INC. NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES.

INFILTRATION BASIN 2 SECTION
NOT TO SCALE

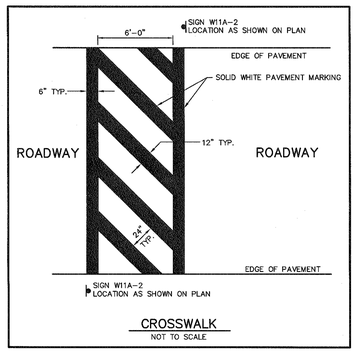
SEEPAGE COLLAR
NOT TO SCALE

NOTES:
1. 5'-0"DIAMETER FOR ALL MANHOLE DEPTHS GREATER THAN 20 FEET OR WHEN ORDERED BY THE ENGINEER
2. 6" MIN. WALL THICKNESS AND 7 INCH MIN. BASE THICKNESS WITH 5'-0" DIAMETER MANHOLES
3. 6 INCH LIP OPTIONAL UNLESS OTHERWISE NOTED
4. IN SOME INSTALLATIONS, THE INFLOW PIPE WILL BE LOWER THAN THE OUTFLOW PIPE, AND THE SUMP DEPTH WILL BE GREATER THAN 4'-6" TO MAINTAIN A MINIMUM DISTANCE OF 2'-6" FROM THE INVERT OF THE INFLOW PIPE TO THE BOTTOM OF THE SUMP

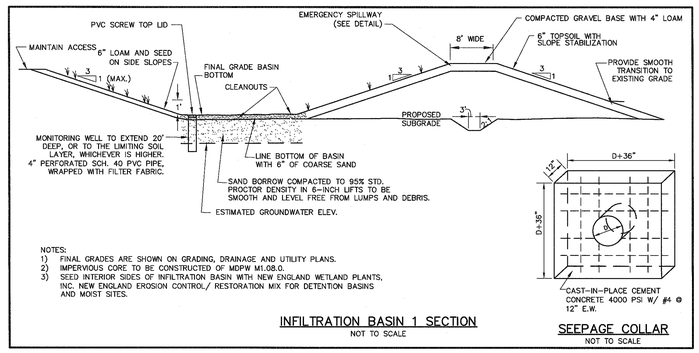


H= 10' OR LESS -#4 AT 18 EW MIDDEPTH
H= 10' TO 20' -#4 AT 12 EW MIDDEPTH
H= 20' TO 30' -#5 AT 12 EW MIDDEPTH
IN ADDITION TO WELDED WIRE FABRIC

TYPICAL DRAIN SUMP MANHOLE



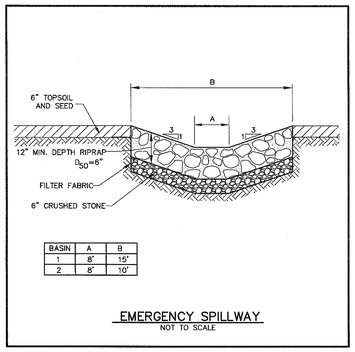
CROSSWALK
NOT TO SCALE



NOTES:
1) FINAL GRADES ARE SHOWN ON GRADING, DRAINAGE AND UTILITY PLANS.
2) IMPERVIOUS CORE TO BE CONSTRUCTED OF MDPW M1.08.0.
3) SEED INTERIOR SIDES OF INFILTRATION BASIN WITH NEW ENGLAND WETLAND PLANTS, INC. NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES.

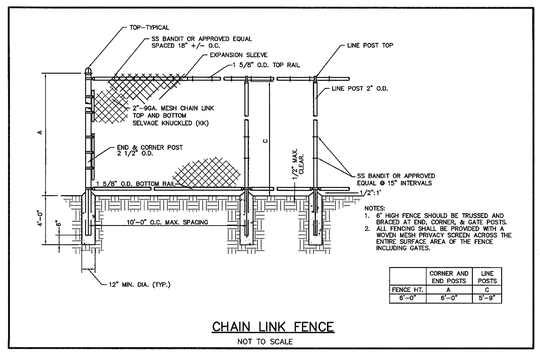
INFILTRATION BASIN 1 SECTION
NOT TO SCALE

SEEPAGE COLLAR
NOT TO SCALE



BASIN	A	B
1	8'	15'
2	8'	10'

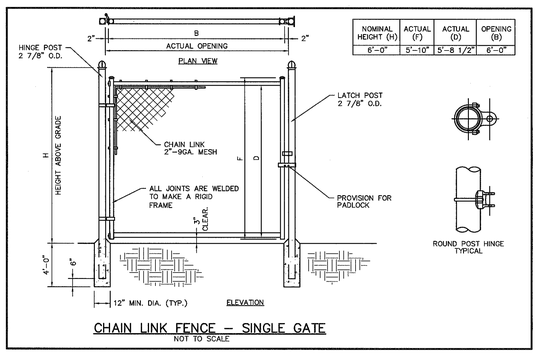
EMERGENCY SPILLWAY
NOT TO SCALE



NOTES:
1. 6' HIGH FENCE SHOULD BE TRUSSED AND BRACED AT END, CORNER, & GATE POSTS.
2. ALL FENCING SHALL BE PROVIDED WITH A WOVEN MESH PRIVACY SCREEN ACROSS THE ENTIRE SURFACE AREA OF THE FENCE INCLUDING GATES.

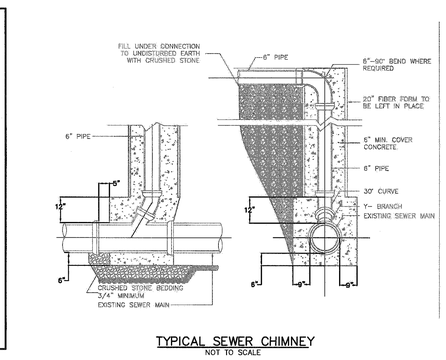
	CORNER AND END POSTS	LINE POSTS
FENCE HT.	A	C
6'-0"	6'-0"	5'-9"

CHAIN LINK FENCE
NOT TO SCALE

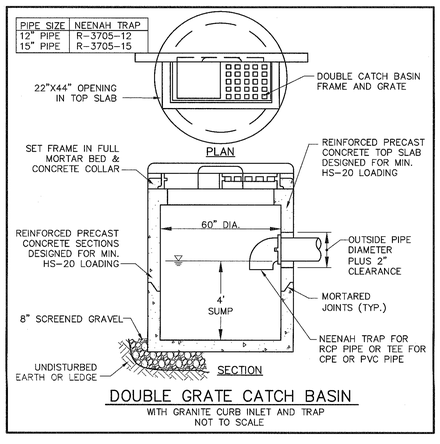


NOMINAL HEIGHT (H)	ACTUAL (F)	ACTUAL (D)	OPENING (B)
6'-0"	5'-10"	5'-8 1/2"	6'-0"

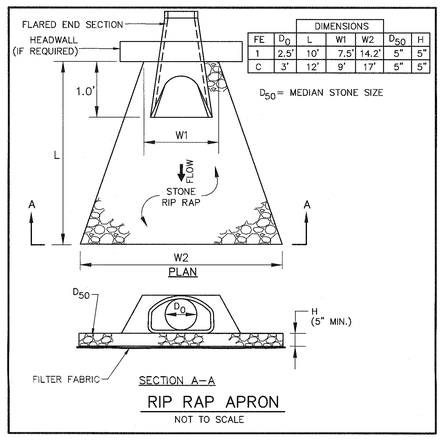
CHAIN LINK FENCE - SINGLE GATE
NOT TO SCALE



TYPICAL SEWER CHIMNEY
NOT TO SCALE



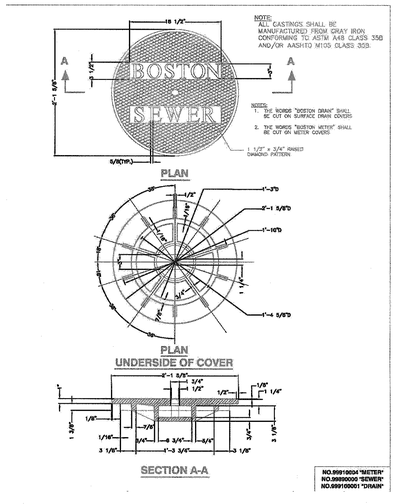
DOUBLE GRATE CATCH BASIN
WITH GRANITE CURB INLET AND TRAP
NOT TO SCALE



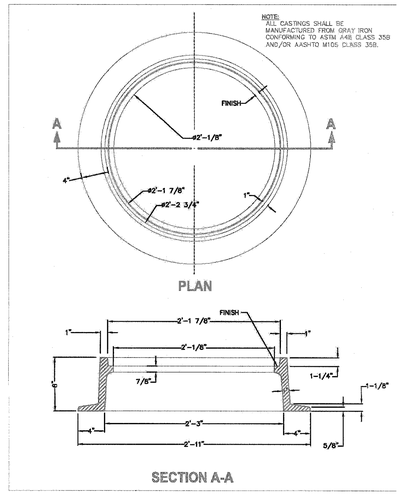
	DIMENSIONS						
FE	D_O	L	W1	W2	D_{50}	H
1	2.5'	10'	7.5'	14.2'	5"	5"
C	3'	12'	9'	17'	5"	5"

D_{50} = MEDIAN STONE SIZE

RIP RAP APRON
NOT TO SCALE



TYPICAL MANHOLE FRAME
NOT TO SCALE



TYPICAL MANHOLE FRAME
NOT TO SCALE

REVISIONS

#	DATE	DESCRIPTION
0	11/30/2017	SITEWORK BID PACKAGE
1	12/15/2017	SCHEMATIC DESIGN PACKAGE
2	01/17/2018	REVISED FOR NOTICE OF INTENT

PHASE 1

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KEY PLAN

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COMMONWEALTH OF MASSACHUSETTS
ELIZABETH A. CLARK
CIVIL
No. 47873
REGISTERED PROFESSIONAL ENGINEER
1-17-18

TITLE: NOTICE OF INTENT

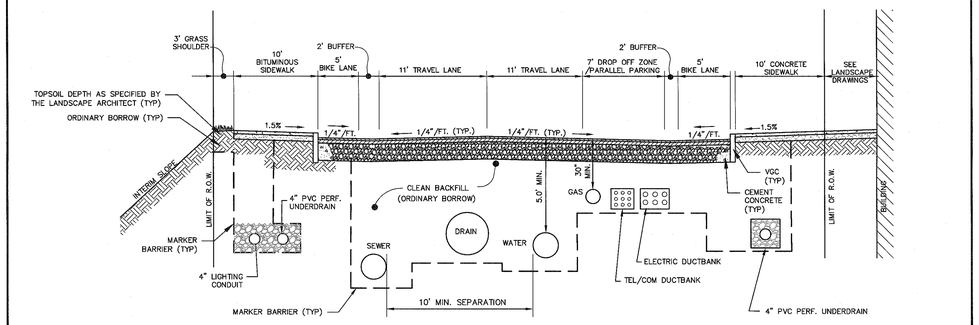
VOLUME

DRAWING TITLE: SITE DETAILS #4

B&T DWG. NO. 285403P059A-005

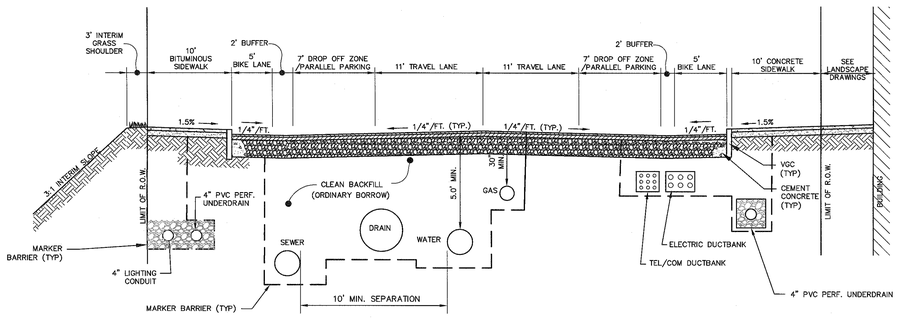
SCALE	PROJECT #	DATE ISSUED
N/A	174106	11.30.17

C5.3



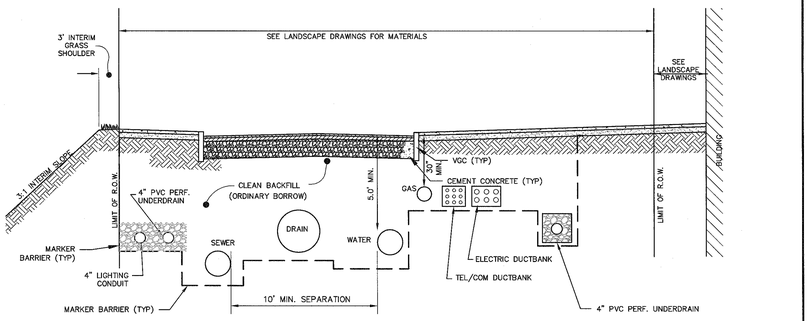
PERMANENT ROAD A
NOT TO SCALE

NOTES:
1. MARKER BARRIER SHALL BE DIRECTLY CONNECTED BETWEEN UTILITY TRENCHES UNLESS THERE IS A MINIMUM OF 6–FEET BETWEEN THE LIMITS OF THE UTILITY TRENCH.



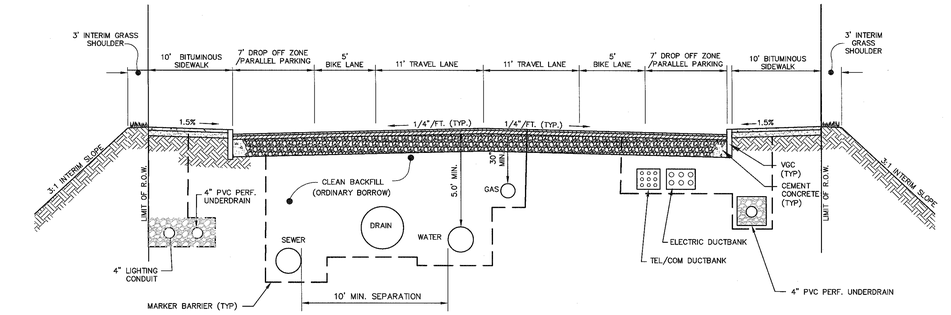
PERMANENT ROAD B
NOT TO SCALE

NOTES:
1. MARKER BARRIER SHALL BE DIRECTLY CONNECTED BETWEEN UTILITY TRENCHES UNLESS THERE IS A MINIMUM OF 6–FEET BETWEEN THE LIMITS OF THE UTILITY TRENCH.



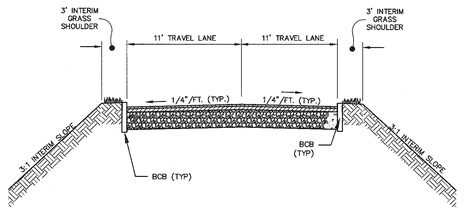
PERMANENT ROAD C
NOT TO SCALE

NOTES:
1. MARKER BARRIER SHALL BE DIRECTLY CONNECTED BETWEEN UTILITY TRENCHES UNLESS THERE IS A MINIMUM OF 6–FEET BETWEEN THE LIMITS OF THE UTILITY TRENCH.
2. 12–INCHES OF CLEAN BACKFILL OVERLYING BARRIER BARRIER REQUIRED IN ALL PERVIOUS AREAS.

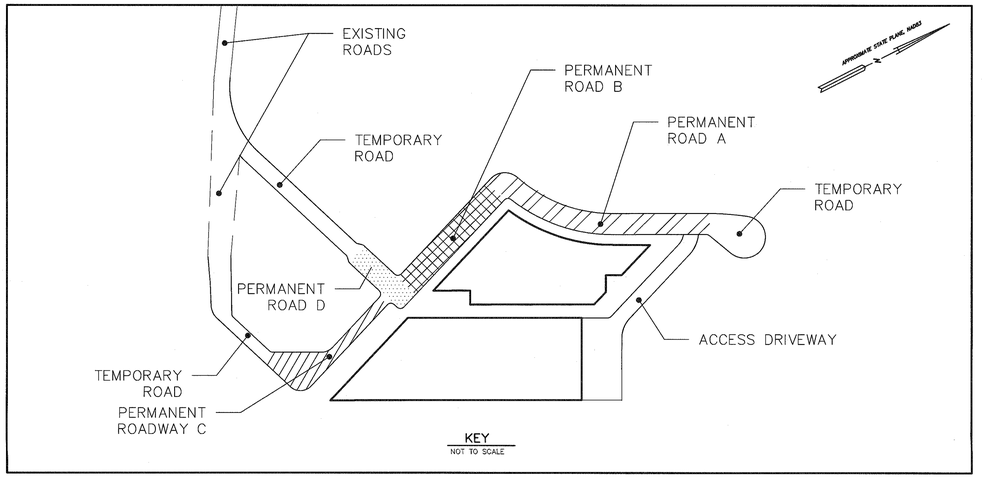


PERMANENT ROAD D
NOT TO SCALE

NOTES:
1. MARKER BARRIER SHALL BE DIRECTLY CONNECTED BETWEEN UTILITY TRENCHES UNLESS THERE IS A MINIMUM OF 6–FEET BETWEEN THE LIMITS OF THE UTILITY TRENCH.
2. 12–INCHES OF CLEAN BACKFILL OVERLYING BARRIER BARRIER REQUIRED IN ALL PERVIOUS AREAS.



TEMPORARY ROAD
NOT TO SCALE



KEY
NOT TO SCALE

REVISIONS

#	DATE	DESCRIPTION
0	11/30/2017	SITEWORK BID PACKAGE
1	12/15/2017	SCHEMATIC DESIGN PACKAGE
2	01/17/2018	REVISED FOR NOTICE OF INTENT

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SEAL

ELIZABETH A. CLARK CIVIL No. 47873 REGISTERED PROFESSIONAL ENGINEER COMMONWEALTH OF MASSACHUSETTS

1-17-18

TITLE: NOTICE OF INTENT

VOLUME

DRAWING TITLE: SITE DETAILS #5

B&T DWG. NO. 285403P059A-006

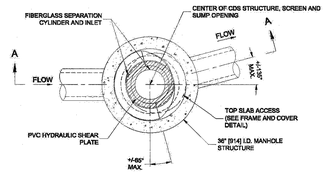
SCALE	PROJECT #	DATE ISSUED
N/A	174106	11.30.17

C5.4

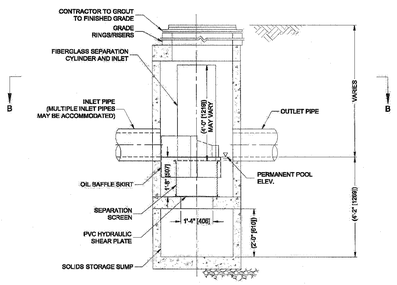
CDS1515-3-C DESIGN NOTES

CDS1515-C RATED TREATMENT CAPACITY IS 1.0 CFS, OR PER LOCAL REGULATIONS.

THE STANDARD CDS1515-3-C CONFIGURATION IS SHOWN.



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID		
WATER QUALITY FLOW RATE (CFS OR L/s)		*
PEAK FLOW RATE (CFS OR L/s)		*
RETURN PERIOD OF PEAK FLOW (YRS)		*
SCREEN APERTURE (2400 OR 4700)		*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

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9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS1515-3-C
ONLINE CDS
STANDARD DETAIL

WATER QUALITY INLET WQI-A
NOT TO SCALE

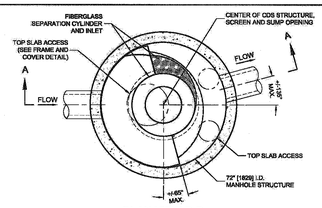
CDS3035-6-C DESIGN NOTES

CDS3035-6-C RATED TREATMENT CAPACITY IS 7.4cfs, OR PER LOCAL REGULATIONS.

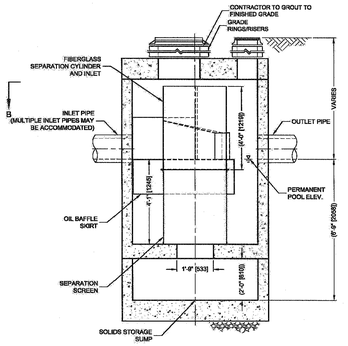
THE STANDARD CDS3035-6-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION

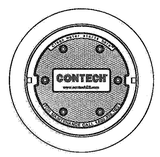
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID		
WATER QUALITY FLOW RATE (CFS OR L/s)		*
PEAK FLOW RATE (CFS OR L/s)		*
RETURN PERIOD OF PEAK FLOW (YRS)		*
SCREEN APERTURE (2400 OR 4700)		*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO H20 AND CASTINGS SHALL MEET H20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

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CDS3035-6-C
INLINE CDS
STANDARD DETAIL

WATER QUALITY INLET WQI-1
NOT TO SCALE

CDS4030-8-C DESIGN NOTES

CDS4030-8-C RATED TREATMENT CAPACITY IS 7.9 CFS OR PER LOCAL REGULATIONS.

THE STANDARD CDS4030-8-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION

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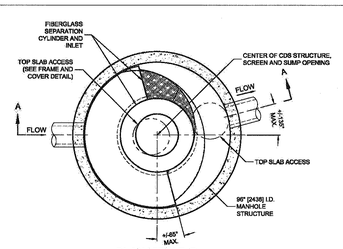
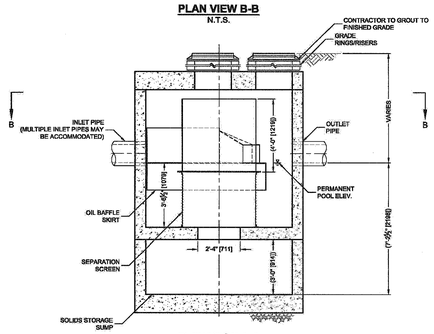
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID		
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PEAK FLOW RATE (CFS OR L/s)		*
RETURN PERIOD OF PEAK FLOW (YRS)		*
SCREEN APERTURE (2400 OR 4700)		*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*

ANTI-FLOTATION BALLAST	WIDTH	HEIGHT
	*	*

NOTES/SPECIAL REQUIREMENTS:

* PER ENGINEER OF RECORD

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CDS4030-8-C
INLINE CDS
STANDARD DETAIL

WATER QUALITY INLET WQI-C
NOT TO SCALE

REVISIONS

#	DATE	DESCRIPTION
0	11/30/2017	SITEWORK BID PACKAGE
1	12/15/2017	SCHEMATIC DESIGN PACKAGE
2	01/17/2018	REVISED FOR NOTICE OF INTENT

PHASE 1

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QUICK LINKS

KEY PLAN

GENERAL NOTES

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

COMMONWEALTH OF MASSACHUSETTS
ELIZABETH A CLARK
CIVIL
No. 47873
REGISTERED PROFESSIONAL ENGINEER
1-17-2018

TITLE
NOTICE OF INTENT

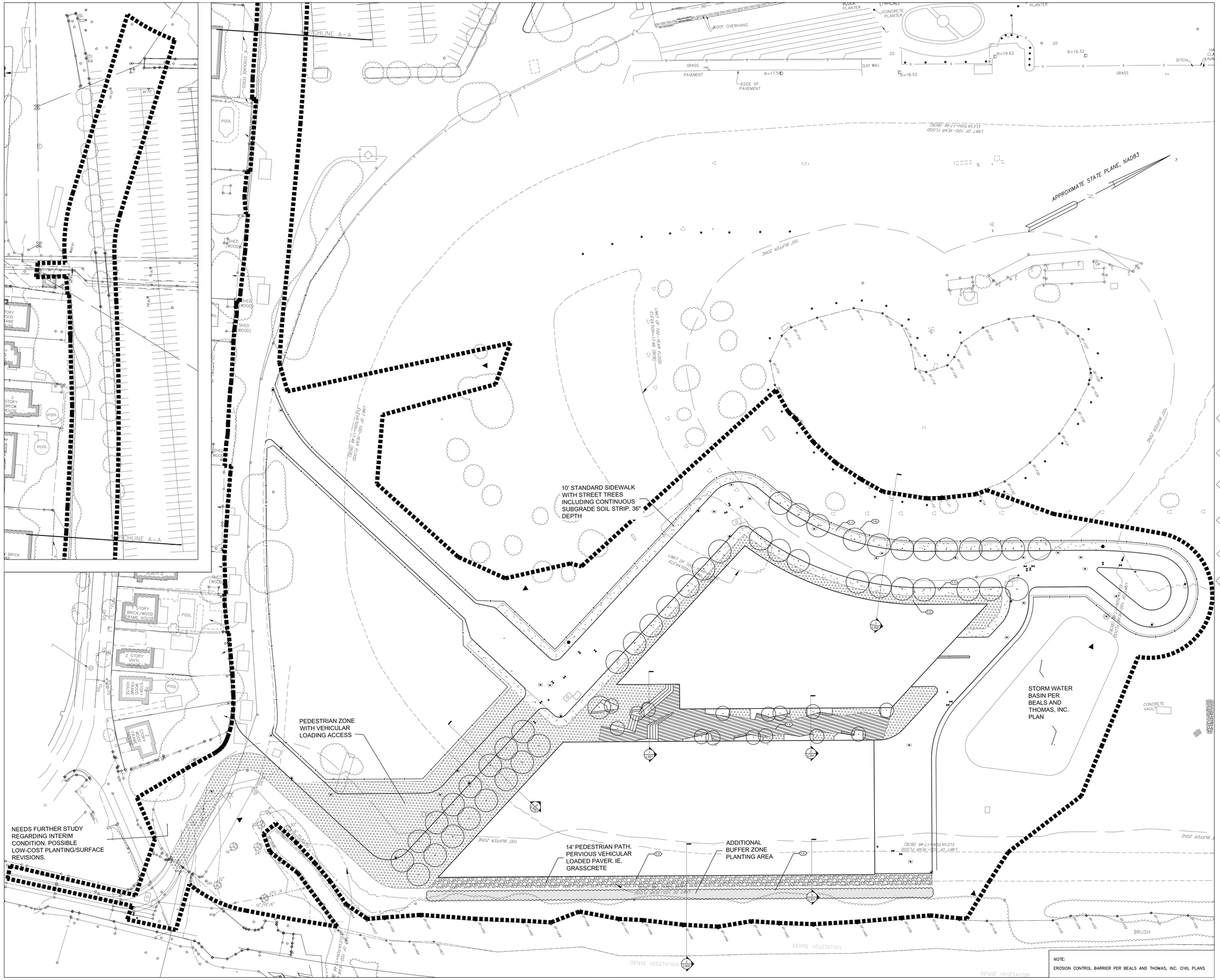
VOLUME

DRAWING TITLE
SITE DETAILS #6

B&T DWG. NO. 285403P059A-007

SCALE	PROJECT #	DATE ISSUED
N/A	174106	11.30.17

C5.5



REVISIONS

#	DATE	DESCRIPTION
0	01/17/2018	ISSUED FOR NOTICE OF INTENT

PHASE 1

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Stoss Landscape Urbanism
54 Old Colony Ave, Third Floor
Boston, Massachusetts 02127
T 617.464.1140 | www.stoss.net

QUICK LINKS

TRUE NORTH

KEY PLAN

B2

B1

GENERAL NOTES

1.1 CEMENT CONCRETE — 1 L500

1.2 CUSTOM PAVER — 2 L500

1.3 PERVIOUS PEDESTRIAN PATH — 3 L500

1.4 WOODEN BOARDWALK

1.5 BUFFER ZONE PLANTING — 4 L500

1.6 TREES — 5 L500

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

MASSACHUSETTS CHRISTOPHER E. REED NO. 1319 REGISTERED LANDSCAPE ARCHITECT

TITLE

NOTICE OF INTENT

VOLUME

DRAWING TITLE

LANDSCAPE LAYOUT PLAN

METERS 0 5 10 25

FEET 0 20 40 80 120

SCALE	PROJECT #	DATE ISSUED
1"=40'	174106	01.17.18

L110

PLANT SCHEDULE

TREES

KEY	QTY	BOTANICAL NAME	COMMON NAME	CAL/HT	POT SIZE	SPACING	COMMENT	PERCENTAGE
UA	22	*Ulmus american*	AMERICAN ELM	3" CAL	B&B	-	UNIFORM CANOPY	-
CF	15	*Cornus florida*	FLOWERING DOGWOOD	-	5 GAL	-	UNIFORM CANOPY	-
NS	23	*Nyssa sylvatica*	BLACK GUM	3" CAL	B&B	-	UNIFORM CANOPY	-
QB	1	*Quercus bicolor*	SWAMP WHITE OAK	3" CAL	B&B	-	SPECIMEN TREE	-

TERRACE PLANTING

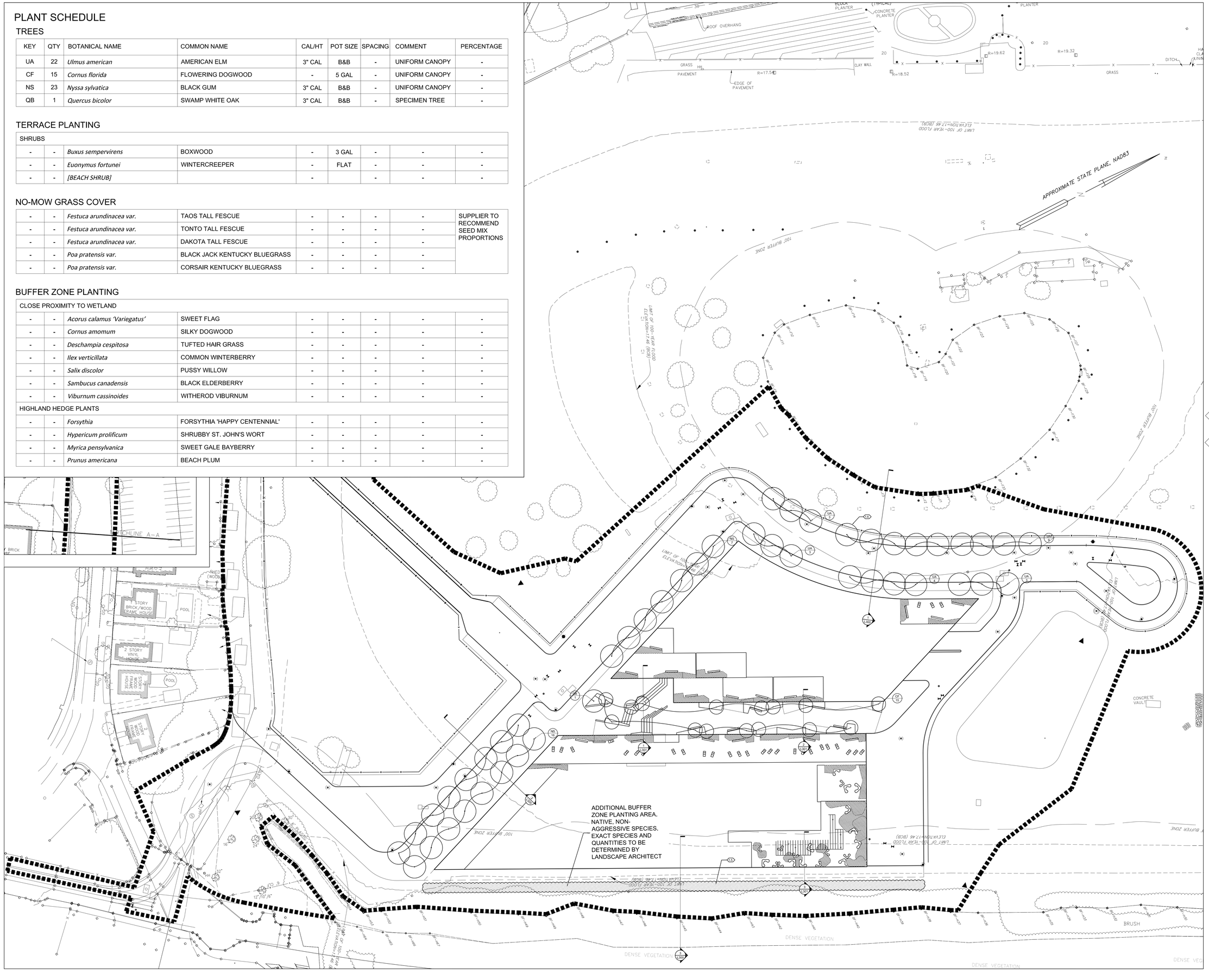
SHRUBS								
-	-	*Buxus sempervirens*	BOXWOOD	-	3 GAL	-	-	-
-	-	*Euonymus fortunei*	WINTERCREEPER	-	FLAT	-	-	-
-	-	*[BEACH SHRUB]*		-		-	-	-

NO-MOW GRASS COVER

-	-	*Festuca arundinacea var.*	TAOS TALL FESCUE	-	-	-	-	SUPPLIER TO RECOMMEND SEED MIX PROPORTIONS
-	-	*Festuca arundinacea var.*	TONTO TALL FESCUE	-	-	-	-	
-	-	*Festuca arundinacea var.*	DAKOTA TALL FESCUE	-	-	-	-	
-	-	*Poa pratensis var.*	BLACK JACK KENTUCKY BLUEGRASS	-	-	-	-	
-	-	*Poa pratensis var.*	CORSAIR KENTUCKY BLUEGRASS	-	-	-	-	

BUFFER ZONE PLANTING

CLOSE PROXIMITY TO WETLAND								
-	-	*Acorus calamus 'Variegatus'*	SWEET FLAG	-	-	-	-	-
-	-	*Cornus amomum*	SILKY DOGWOOD	-	-	-	-	-
-	-	*Deschampia cespitosa*	TUFTED HAIR GRASS	-	-	-	-	-
-	-	*Ilex verticillata*	COMMON WINTERBERRY	-	-	-	-	-
-	-	*Salix discolor*	PUSSY WILLOW	-	-	-	-	-
-	-	*Sambucus canadensis*	BLACK ELDERBERRY	-	-	-	-	-
-	-	*Viburnum cassinoides*	WITHEROD VIBURNUM	-	-	-	-	-
HIGHLAND HEDGE PLANTS								
-	-	*Forsythia*	FORSYTHIA 'HAPPY CENTENNIAL'	-	-	-	-	-
-	-	*Hypericum prolificum*	SHRUBBY ST. JOHN'S WORT	-	-	-	-	-
-	-	*Myrica pensylvanica*	SWEET GALE BAYBERRY	-	-	-	-	-
-	-	*Prunus americana*	BEACH PLUM	-	-	-	-	-



REVISIONS

#	DATE	DESCRIPTION
0	01/17/2018	ISSUED FOR NOTICE OF INTENT

PHASE 1

525 William F McClellan Hwy, Boston, MA 02128

HYM — 617 248 8905, 1 Congress Street, Floor 11, Boston, MA 02114

cbt — 617 262 4354 cbtarchitects.com, 110 canal street boston, ma 02114

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QUICK LINKS

TRUE NORTH

KEY PLAN

B2

B1

GENERAL NOTES

1.5 BUFFER ZONE PLANTING (4 L500)

1.6 TREES (5 L500)

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

MASSACHUSETTS — CHRISTOPHER S. REED — NO. 1219 — REGISTERED LANDSCAPE ARCHITECT

TITLE: NOTICE OF INTENT

VOLUME

DRAWING TITLE: LANDSCAPE PLANTING PLAN

METERS 0 5 10 25
FEET 0 20 40 80 120

SCALE	PROJECT #	DATE ISSUED
1"=40'	174106	01.17.18

L111

REVISIONS

#	DATE	DESCRIPTION
0	01/17/2018	ISSUED FOR NOTICE OF INTENT

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QUICK LINKS

TRUE NORTH

KEY PLAN

B2

B1

GENERAL NOTES

1.6 TREES 5 L500

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

TITLE

NOTICE OF INTENT

VOLUME

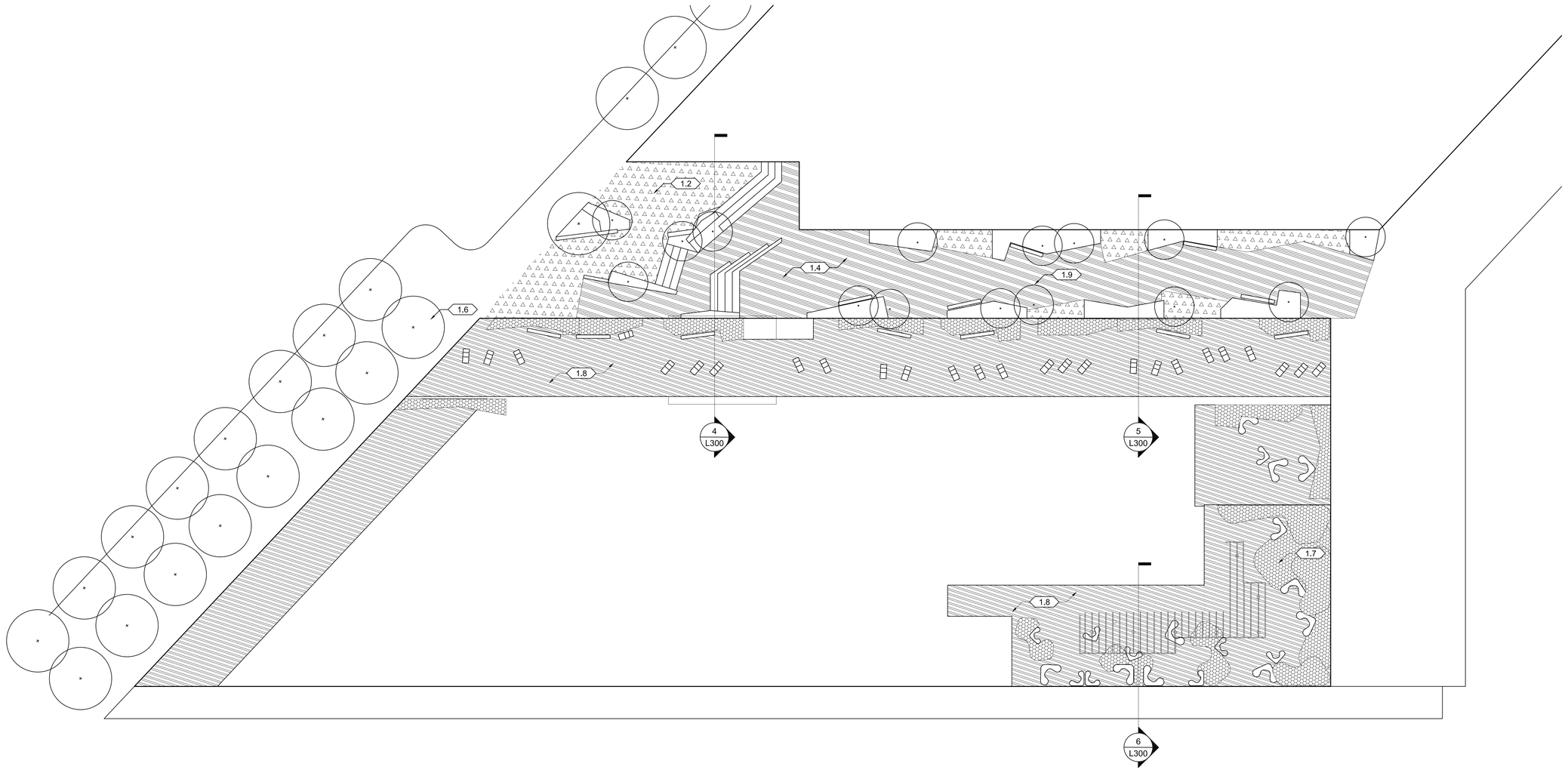
DRAWING TITLE

LANDSCAPE GRADING PLAN

METERS 0 5 10 25
FEET 0 20 40 80 120

SCALE	PROJECT #	DATE ISSUED
1"=40'	174106	01.17.18

L112



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QUICK LINKS

TRUE NORTH

KEY PLAN

B2

B1

GENERAL NOTES

1.2 CUSTOM PAVER 2 L500

1.4 WOODEN BOARDWALK

1.7 TERRACE PLANTING

1.8 WOODEN TERRACE SURFACE

1.6 STREET TREES 5 L500

1.9 MEWS TREES

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

MASSACHUSETTS CHRISTOPHER J. REED NO. 1219 REGISTERED LANDSCAPE ARCHITECT

TITLE

NOTICE OF INTENT

VOLUME

DRAWING TITLE

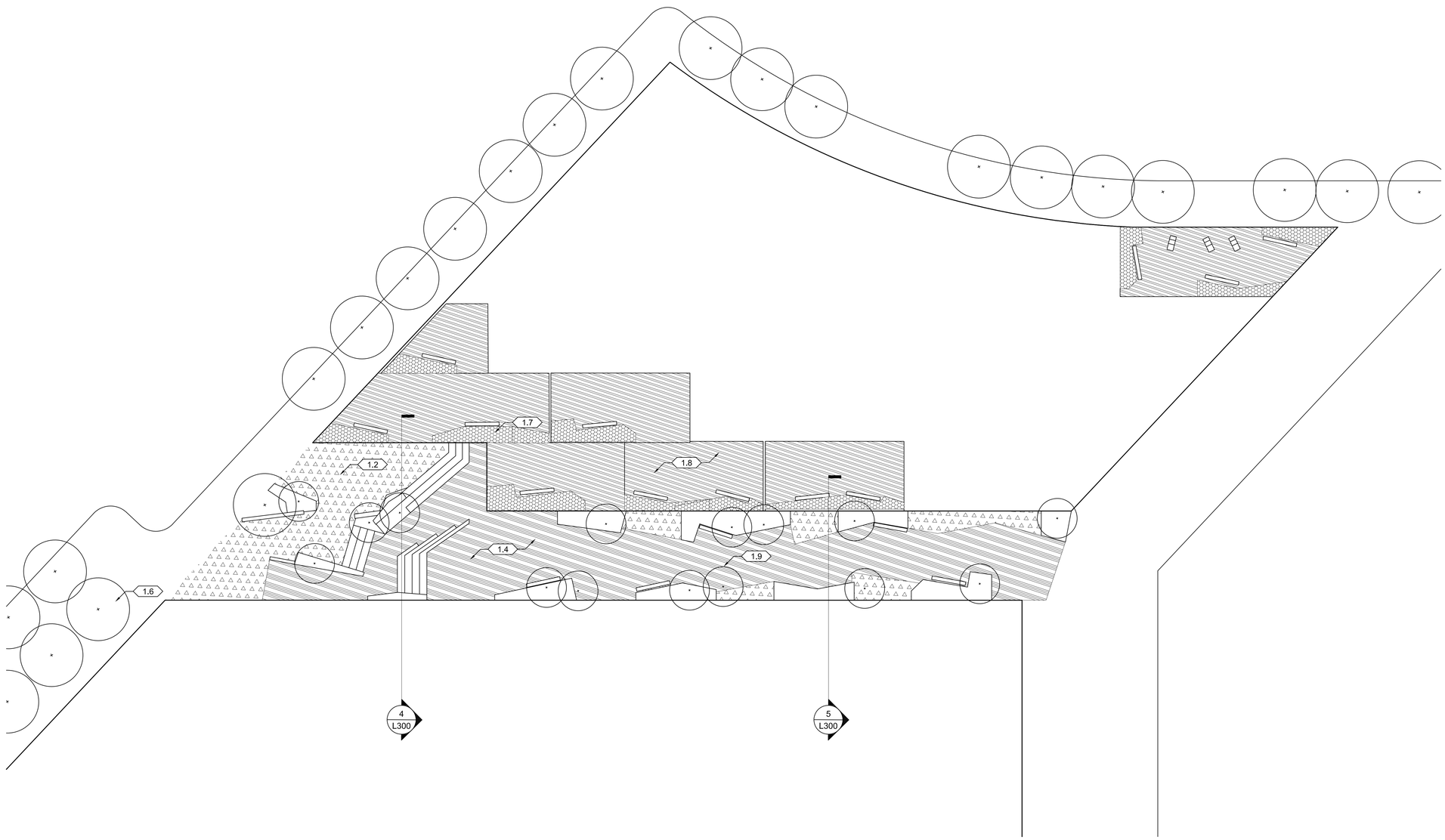
B1 MATERIALS PLAN

SCALE 1" = 20'-0"

PROJECT # 174106

DATE ISSUED 01.17.2018

L120



REVISIONS

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QUICK LINKS

TRUE NORTH

KEY PLAN

B2

B1

GENERAL NOTES

1.2 CUSTOM PAVER (2 L500)

1.4 WOODEN BOARDWALK

1.7 TERRACE PLANTING

1.8 WOODEN TERRACE SURFACE

1.6 STREET TREES (5 L500)

1.9 MEWS TREES

NOT ISSUED FOR CONSTRUCTION

FOR PERMITTING ONLY

SEAL

MASSACHUSETTS CHRISTOPHER R. REED NO. 1319 REGISTERED LANDSCAPE ARCHITECT

TITLE

NOTICE OF INTENT

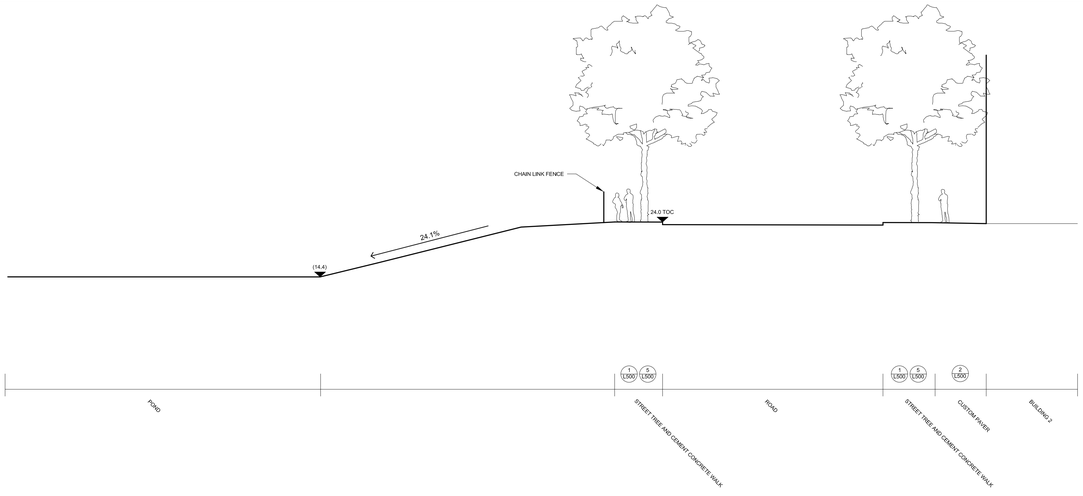
VOLUME

DRAWING TITLE

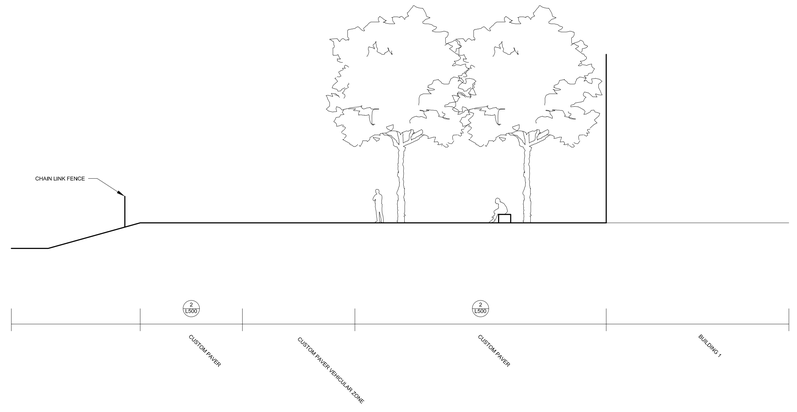
B2 MATERIALS PLAN

SCALE	PROJECT #	DATE ISSUED
1" = 20'-0"	174106	01.17.2018

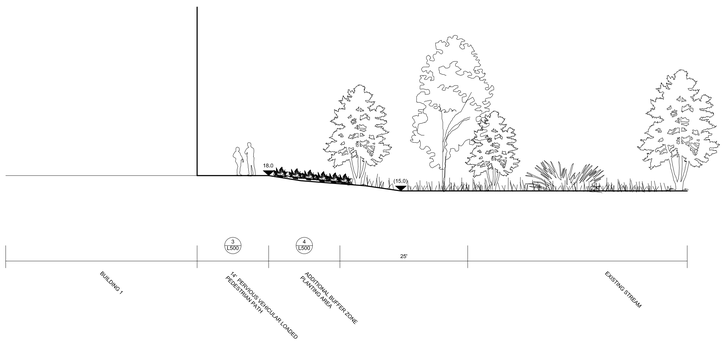
L130



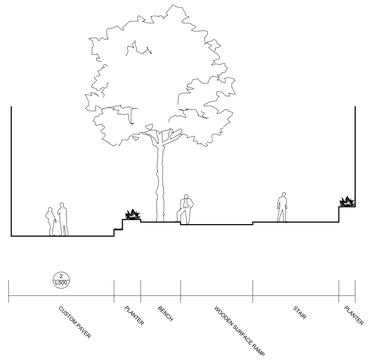
1 L300 SITE SECTION
1" = 1'-0"
ROAD



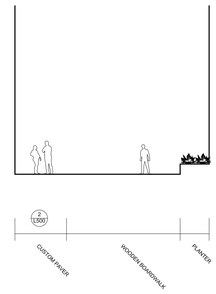
2 L300 SITE SECTION
1" = 1'-0"
PEDESTRIAN ZONE WITH VEHICULAR ACCESS



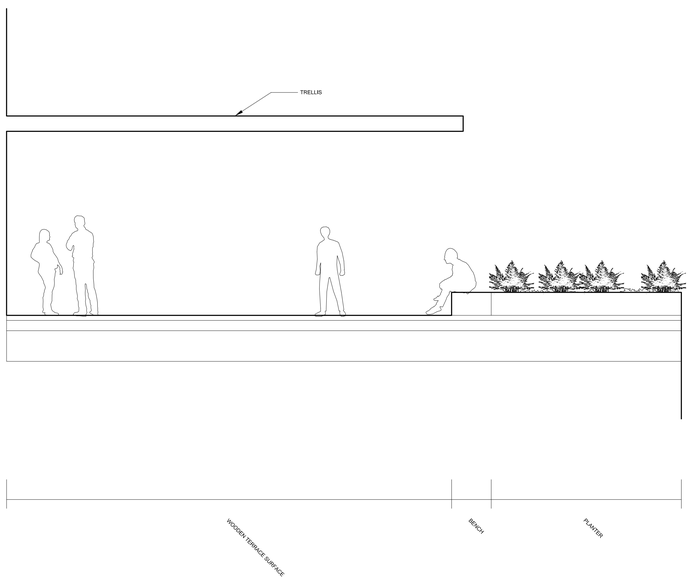
3 L300 SITE SECTION
1" = 1'-0"
VEHICULAR LOADED PEDESTRIAN PATH AND ADDITIONAL BUFFER ZONE PLANTING AREA



4 L300 SITE SECTION
1" = 1'-0"
MEWS



5 L300 SITE SECTION
1" = 1'-0"
MEWS



6 L300 SITE SECTION
3" = 1'-0"
TERRACE

REVISIONS

#	DATE	DESCRIPTION
0	01/17/2018	ISSUED FOR NOTICE OF INTENT

PHASE 1

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SITE SECTIONS

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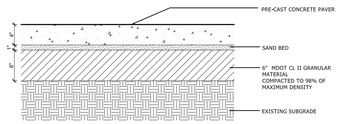
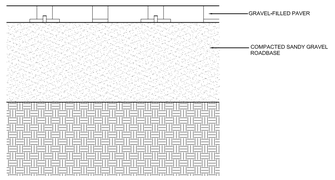
VARIES	174106	01.17.18

L300

REFER TO "CEMENT CONCRETE WALK" DETAIL INCLUDED ON C3.0 IN BEALS AND THOMAS C5.0 PLANS

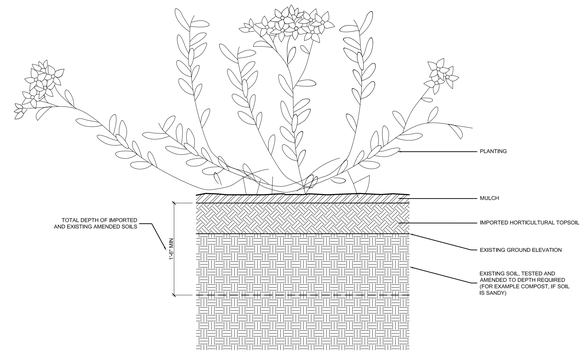


1 L500 CEMENT CONCRETE WALK
1"=1'-0"

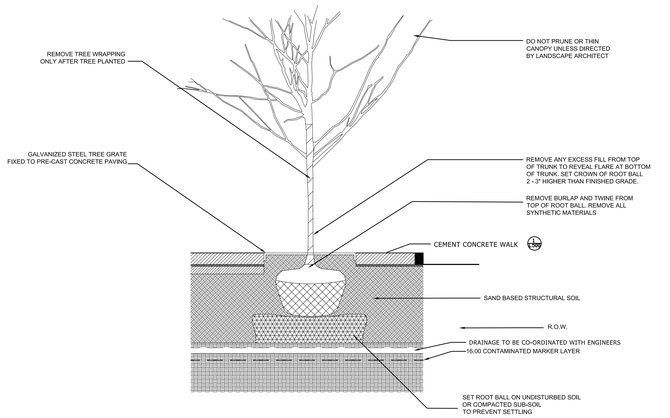


2 L500 CUSTOM PAVER
1"=1'-0"

3 L500 PERVIOUS VEHICULAR LOADED PEDESTRIAN PATH
1"=1'-0"



4 L500 BUFFER ZONE PLANTING
1"=1'-0"



5 L500 STREET TREE
1/32"=1'-0"

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SITE DETAILS

SCALE	PROJECT #	DATE ISSUED
VARIES	174106	01.17.18

L500