MassDOT - Victory Road Depot Improvements Notice of Intent Application

Submitted to the Boston Conservation Commission

Location:

Victory Road
Dorchester, MA

Applicant:
Massachusetts Department of Transportation Highway Division
10 Park Plaza
Boston, MA 02116

Prepared by:
Stantec Consulting Services Inc.
226 Causeway Street, 6th Floor
Boston, MA 02114

October 23, 2018

Stantec Consulting Services Inc.
226 Causeway Street, Boston, Massachusetts 02114

October 23, 2018
File: 179410756

Attention: Amelia Croteau, Executive Secretary
Boston Conservation Commission
Boston City Hall Room 709
Boston, MA 02201

Dear Ms. Croteau and Members of the Conservation Commission:

Reference: Notice of Intent Application
MassDOT - Victory Road Depot Improvements, Boston, Massachusetts

On behalf of the Massachusetts Department of Transportation (MassDOT), Stantec is re-submitting a Notice of Intent (NOI) Application, initially submitted on August 1, 2018, to redevelop an existing maintenance depot lot between the southbound lanes of Interstate 93 (I-93) and Freeport Street in the Dorchester area of Boston, Massachusetts. This re-submitted NOI Application includes revised project drawings, revised stormwater report, and the Climate Resiliency Checklist.

The existing compacted gravel lot, owned by MassDOT, will be used to construct salt storage facilities, including two salt storage sheds and an associated administrative building, for winter road maintenance operations. Portions of the project work will occur within the 100-year floodplain of the tidally-influenced Dorchester Bay, which qualifies as Land Subject to Coastal Storm Flowage (LSCSF). Details of the proposed work activities are described in the Project Narrative and depicted on the NOI Plans.

A check made payable to the City of Boston in the amount of $2,087.50 for the WPA filing fee was sent previously on August 2, 2018. We understand that the City will coordinate the legal ad and the Boston Herald will bill the MassDOT. An electronic copy of the NOI will be forwarded to you via email/FTP. The previous submission to the MassDEP included a check for $2,062.50; and MassDEP issued file number 006-1608.

Thank you for your consideration of this Application. We look forward to meeting with you at the November 7, 2018 Public Hearing. If you have any questions regarding the proposed project, please feel free to contact me.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Michael Paiewonsky
Phone: (857) 415-3920
Michael.Paiewonsky@stantec.com

Reference: **Notice of Intent Application**
MassDOT - Victory Road Depot Improvements, Boston, Massachusetts

Attachment: NOI Application

c. Susan McArthur, MassDOT,
MassDEP

Table of Contents

List of Appendices

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):

Freeport Street — a. Street Address
Boston — b. City/Town
02122 — c. Zip Code

Latitude and Longitude:
42.297802 — d. Latitude
-71.047875 — e. Longitude

1600252001 — f. Assessors Map/Plat Number
n/a — g. Parcel /Lot Number

2. Applicant:

Susan — a. First Name
McArthur — b. Last Name
Massachusetts Department of Transportation - Highway Division — c. Organization
10 Park Plaza, Room 4260 — d. Street Address
Boston — e. City/Town
MA — f. State
02116 — g. Zip Code
857-368-8807 — h. Phone Number
i. Fax Number
Susan.McArthur@state.ma.us — 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):

Lori — a. First Name
Benoit — b. Last Name
Stantec Consulting Services Inc. — c. Company
136 West Street — d. Street Address
Northamtpon — e. City/Town
MA — f. State
01060 — g. Zip Code
413.387.4516 — h. Phone Number
i. Fax Number
Lori.Benoit@stantec.com — j. Email address

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

$4,150 — a. Total Fee Paid
$2,062.50 — b. State Fee Paid
$2,087.50 — c. City/Town Fee Paid

A. General Information (continued)

6. General Project Description:

The Massachusetts Department of Transportation (MassDOT) Highway Division proposes to redevelop an existing maintenance lot between the southbound lanes of Interstate 93 (I-93) and Freeport Street in Dorchester, Massachusetts, as a salt shed storage facility for winter road maintenance and an administrative building.

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

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

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

1. ☐ Yes ☒ No

If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

2. Limited Project Type

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

8. Property recorded at the Registry of Deeds for:

n/a	n/a
a. County	b. Certificate # (if registered land)
n/a	n/a
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 3. cubic feet of flood storage lost	2. square feet 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	36,000 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 Notice of Intent – 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

   August 2017
   b. Date of map

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

   c. Submit Supplemental Information for Endangered Species Review*

      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)

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

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☒ A portion of the site constitutes redevelopment

      3. ☐ Proprietary BMPs are included in the Stormwater Management System.

   b. ☐ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ☐ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

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

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

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

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

D. Additional Information (cont'd)

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

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

District 6 - Maintenance Storage Building New Salt Sheds and Site Improvements
a. Plan Title

Bayside Engineering
b. Prepared By

Bree D. Sullivan
c. Signed and Stamped by

October 2018
d. Final Revision Date

1"=20'
e. Scale

f. Additional Plan or Document Title

g. Date

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

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

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

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

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

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

571225
2. Municipal Check Number

07/31/2018
3. Check date

571249
4. State Check Number

07/31/2018
5. Check date

Stantec Consulting Services Inc.
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.

Susan McArthur - MassDOT 1. Signature of Applicant	7/30/2018 2. Date
3. Signature of Property Owner (if different)	4. Date
5. Signature of Representative (if any)	7/31/2018 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:

Freeport Street	Boston
a. Street Address	b. City/Town
571249	$2,062.50
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Susan		McArthur	
a. First Name		b. Last Name	
Massachusetts Department of Transportation - Highway Division			
c. Organization			
10 Park Plaza			
d. Mailing Address			
Boston	MA	02116	
e. City/Town	f. State	g. Zip Code	
857-368-8807		Susan.McArthur@state.ma.us	
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
Construction of Salt Buildings (Category 3)	2	$1,050	$2,100
Construction of Admin Building (Category 3)	1	$1,050	$1,050
Parking Lot (Category 2)	1	$500	$500
Storm Drain Discharge (Category 2)	1	$500	$500

Step 5/Total Project Fee: $4,150

Step 6/Fee Payments:

Total Project Fee:	$4,150 (a. Total Fee from Step 5)
State share of filing Fee:	$2,062.50 (b. 1/2 Total Fee **less $**12.50)
City/Town share of filling Fee:	$2,087.50 (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.)

APPENDIX A PROJECT NARRATIVE

1 INTRODUCTION

The Massachusetts Department of Transportation (MassDOT) Highway Division is submitting this Notice of Intent (NOI) Application to redevelop an existing maintenance depot lot between the southbound lanes of Interstate 93 (I-93) and Freeport Street in the Dorchester area of Boston, Massachusetts. The existing compacted gravel lot, owned by MassDOT, will be utilized to construct salt storage facilities, including two salt storage sheds and an associated administrative building, for winter road maintenance operations. Additional salt storage in Suffolk County, Massachusetts has been identified as a high priority for MassDOT to minimize both the time and distance of transporting salt to melt snow and ice-covered state and interstate highways.

An NOI is required as portions of the existing maintenance depot lot are mapped within the 100-year floodplain of the tidally-influenced Dorchester Bay, which qualifies as Land Subject to Coastal Storm Flowage (LSCSF). The 100-year floodplain associated with the identified coastal resource area (i.e. LSCSF) is protected under the *Massachusetts Wetlands Protection Act* (*Act*, M.G.L., c. 131, s. 40) and its implementing *Regulations Act Regulations*, 310 CMR 10.00).

A USGS Site Locus and a DEP Priority Resources Map, illustrating the project location and surrounding physical and environmental features are provided in Appendix B. Project Plans are provided in Appendix D. The following sections of this NOI provide a description of the existing site conditions, wetland boundary determination methodology, Wetland Resource Areas, and proposed project, including measures proposed to mitigate the potential impacts to the adjacent stormwater drainage system.

2 EXISTING CONDITIONS

This section provides a site description and resource area characterization for the project area. Land use in the general vicinity of the project area was determined based on staff observations during a site visit on September 13, 2016, in addition to a review of information available through the Massachusetts Geographic Information System (MassGIS) online database.

The existing maintenance depot lot, owned by MassDOT, predominantly consists of densely compacted dirt/gravel, is approximately 48,000 square feet in size, and features entrances from Freeport Street to the west and Victory Road to the north. The lot, formerly leased to two construction companies for storage of construction equipment and materials, is currently in use as a temporary salt storage area for the winter season. (Photo 1, Appendix C).

According to existing survey information, a stormwater outfall (previously a combined sewer) is located under the site. The outfall daylights on the east side of the southeast expressway. A wet depression surrounded by jersey barriers, described in more detail in section 2.1, is located in the center of the lot. Red pine (*Pinus resinosa*) and black locust (*Robinia pseudoacacia*) trees are growing between the project site and Freeport Street.

2.1 METHODOLOGY OF RESOURCE AREA INVESTIGATIONS

An onsite wetland survey was conducted by a Stantec Professional Wetland Scientist on September 13, 2016 using the methodologies outlined in the Massachusetts Department of Environmental Protection's (MassDEP) Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act: A Handbook; the U.S. Army Corps of Engineers' (Corps) 1987 Wetlands Delineation Manual; and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0, January 2012).

An existing isolated surface depression, measuring approximately 3,600 square feet and located in the center of the lot, is dominated by common reed (*Phragmites australis*) (Photo 2, Appendix C). Additional vegetation observed within the depression includes Asiatic bittersweet (*Celastrus orbiculatus*), multiflora rose (*Rosa multiflora*), lamp rush (*Juncus effusus*) and purple loosestrife (*Lythrum salicaria*). The surface depression onsite was determined not to be a federally-jurisdictional vegetated wetland system due to the lack of both hydric soils, as well as any hydraulic connection (piped or natural) to a navigable waterbody. Furthermore, it was determined that the depression does not meet the qualifying criteria of an Isolated Land Subject to Flooding (ILSF) based on its inability to confine standing water to a volume of at least 0.25 acre-feet and to average depth of a minimum of six inches, at least once year (see attached Wetlands Survey Memorandum, Appendix E).

The limits of jurisdictional Wetland Resource Areas within and immediately adjacent to the site were obtained from the most recent Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the project area. Based on a review of the current FEMA FIRM, portions of the existing maintenance depot lot are mapped within Zone AE (Elevation 10) of the 100-year floodplain associated with the tidally influenced Dorchester Bay (i.e. Land Subject to Coastal Storm Flowage). No other wetland resource areas subject to the jurisdiction of the Massachusetts Wetlands Protection Act were identified within the project area. A description of Land Subject to Coastal Storm Flowage is provided below.

2.2 DESCRIPTION OF RESOURCE AREA

Land Subject to Coastal Storm Flowage

Land Subject to Coastal Storm Flowage is defined at 310 CMR 10.04 as land subject to any inundation caused by coastal storms up to and including that caused by the 100-year storm, surge of record or storm of record, whichever is greater.

According to the revised March 16, 2016 FEMA FIRM for Suffolk County, Massachusetts (Map Number 25025C0091J), portions of the maintenance depot lot are designated as Flood Areas in Zone AE. According to the FIRM, the flood elevation proximate to the project area corresponds to elevation 10 NAVD88. The FEMA FIRM is included as Appendix B, Figure 4.

2.3 MA NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM DESIGNATION

According to the 13th Edition of the Massachusetts Natural Heritage Atlas (valid from August 2017) published by the Natural Heritage & Endangered Species Program (NHESP) and the MassGIS database, the project area is not located within the limits of mapped Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife. No Certified Vernal Pools (CVPs) or Potential Vernal Pools (PVPs) are mapped on or within the immediate vicinity of the project area (see note in Appendix B, Figure 3: DEP Priority Resources and Critical Areas Resource Map).

2.4 OTHER PROTECTED ENVIRONMENTAL RESOURCES

According to available MassGIS mapping, the project is not located within any Areas of Critical Environmental Concern (ACEC) or any stormwater critical areas. The Neponset River Estuary ACEC is identified east of the I-93 highway corridor (see Appendix B, Figure 3).

3 PROJECT DESCRIPTION

The existing MWRA treatment building and associated pavement within the maintenance depot lot will be demolished with proposed site redevelopment to include:

- Grading
- Clearing and grubbing
- Installation of stormwater management drainage features
- Construction of two new roofed timber salt sheds (approximately 3,840 sf, each)
- Construction of a new 1,100 sf administration building
- Associated site paving and parking space accommodation

3.1 CONSTRUCTION SEQUENCE

The contractor will be responsible for selecting the means and methods to be used in the construction execution of the project in accordance with the contract documents. However, this NOI application includes a listing of the anticipated construction sequence. The anticipated sequence of construction is as follows:

1. Mobilize equipment, materials, and personnel.
2. Install erosion control measures to mitigate sediment migration outside the limits of work
3. Clearing/grubbing
4. Pavement overlay
5. Implementation of stormwater management drainage features
6. Construction of roofed timber salt shed facilities
7. Construction of administration building
8. Stabilize disturbed areas with loam and seed.
9. Remove erosion and sedimentation controls.

3.2 EROSION/SEDIMENT CONTROLS AND OTHER MITIGATION MEASURES

As shown on the attached design plans, prior to the commencement of any land disturbance work, erosion, and sedimentation control barriers, consisting of compost filter tubes, will be implemented to mitigate sediment migration outside the limits of work. In addition:

- The contractor will be required to maintain a reserve supply of erosion and sediment controls barriers on-site to make repairs, as necessary;

- The contractor will be required to inspect protective measures prior to and after significant precipitation events and repaired, as necessary;
- Erosion and sediment control (i.e. compost filter tubes) will remain in place until the area is stabilized.

Environmental mitigation measures will also include dust control to ensure that generation of on-site dust during work activities will be minimized. Wet suppression shall be used to provide temporary control of dust, as needed.

4 REGULATORY COMPLIANCE

4.1 MASSACHUSETTS WETLANDS PROTECTION ACT

A portion of the project site is mapped within Land Subject to Coastal Storm Flowage (LSCSF). Currently, there are no Performance Standards for work proposed within LSCSF under the Massachusetts Wetlands Protection Act Regulations. This site was selected because it is adjacent to Route 3 and other heavily traveled roadways where salt will be applied in the winter, the site is owned by MassDOT, and it has few residential properties nearby. Relocating the site out of the LSCSF would likely require it to be in a more residential area.

4.2 STORMWATER MANAGEMENT

According to the Massachusetts Stormwater Handbook, the Massachusetts Department of Environmental Protection's (MassDEP's) Stormwater Management Standards are applicable to stormwater runoff from all planned construction projects, which involve site preparation, construction, and redevelopment.

Stormwater management features are proposed within the limits of the existing lot in compliance with MassDEP's Stormwater Management Standards. Proposed measures to capture and infiltrate or detain stormwater include 12-inch wide by 24-inch-deep peastone trenches surrounding the site perimeter, an approximately 300-foot long grass swale on the eastern edge of the site and a combination grass swale and detention basin on the western edge of the site. The design of the peastone trench, grass swale and detention basin will allow for regular removal of accumulated sediments.

The proposed site will be graded to achieve a similar post-construction runoff compared to existing conditions. In general, stormwater runoff from the site will flow over the paved surface to the 12-inch wide by 24-inch deep peastone trenches alongside the perimeter of the paved areas where it is expected to infiltrate into the ground. During larger storm events, stormwater may overflow into the adjacent proposed swales and then infiltrate into the ground there. The proposed project is within a previously-developed site and applicable stormwater standards have been met to the greatest extent practicable. For more detailed information, see Appendix F Stormwater Report and check list.

The proposed project involves more than one acre of earth disturbance and, therefore, a Stormwater Construction General Permit in accordance with EPA's NPDES program will be required. The need for a NPDES Permit also will necessitate the preparation of a Stormwater Pollution Prevention Plan (SWPPP). This Plan will be prepared by the selected Contractor and a copy of the SWPPP will be retained onsite during construction.

5 SUMMARY

In summary, MassDOT is seeking approval from the City of Boston Conservation Commission to redevelop an existing maintenance depot lot between the southbound lanes of Interstate 93 (I-93) and Freeport Street for salt storage operations.

Portions of the maintenance depot lot are mapped within Land Subject to Coastal Storm Flowage (LSCSF), for which there are no applicable performance standards under the Massachusetts Wetlands Protection Act Regulations. Best Management Practices (BMPs) including erosion and sedimentation control barriers, consisting of compost filter tubes, will be implemented to mitigate the potential release of suspended sediment to the adjacent stormwater drainage system. Additionally, the project will provide stormwater BMP's within the existing maintenance depot lot, in compliance with MassDEP's Stormwater Management Standards.

On behalf of the Applicant, Stantec respectfully requests that the Boston Conservation Commission find these measures adequately protective of the interests identified in the Wetlands Protection Act, and issue an Order of Conditions approving the work described in this NOI, and shown on the accompanying plans.

APPENDIX B FIGURES

Document Path: S:\1794\Active\179410385\record\MassDOT Projects\608843_Dorchester_saltshed\gis\dorchester_locus.mxd

Figure 1: Locus Map

Victory Road Depot Improvements Including
Two Salt Sheds Construction
Dorchester, Massachusetts

Scale: 0 180 360 Feet

massDOT
Massachusetts Department of Transportation
Highway Division

Map Source: Office of Geographic and Environmental Information (MassGIS),Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs

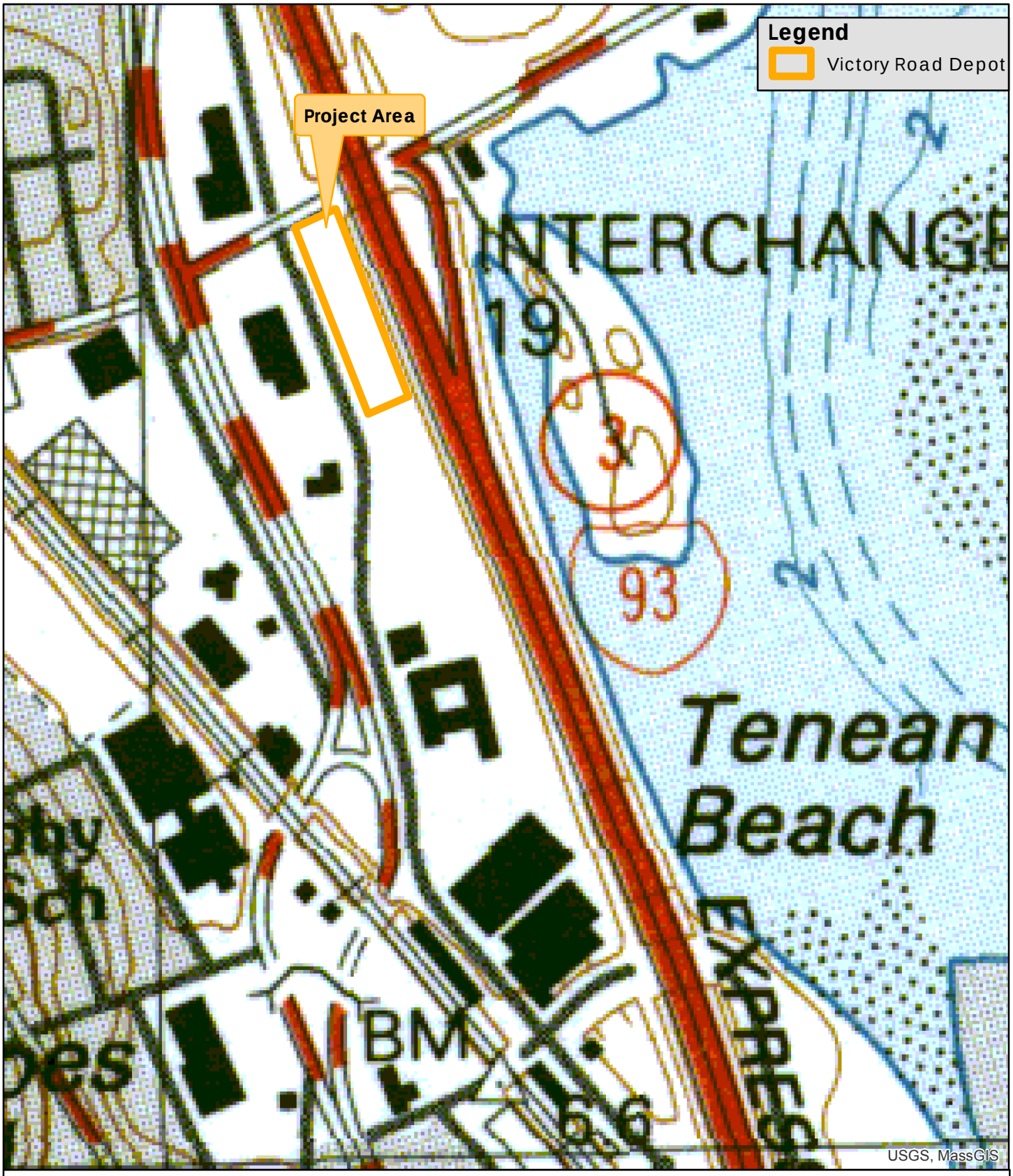

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Figure 2: USGS Locus Map

Victory Road Depot Improvements Including
Two Salt Sheds Construction
Dorchester, Massachusetts

Scale: 0 180 360 Feet

massDOT
Massachusetts Department of Transportation
Highway Division

Map Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs

Document Path: S:\1794\Active\179410385\record\MassDOT Projects\608843_Dorchester_saltshed\gis\dorchester_wetlands_updated.mxd

Figure 3: MassDEP Priority Resources and Critical Areas

Victory Road Depot Improvements Including
Two Salt Sheds Construction
Dorchester, Massachusetts

Scale: 0 180 360 Feet

massDOT
Massachusetts Department of Transportation
Highway Division

Map Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs

National Flood Hazard Layer FIRMette

Legend

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

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

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

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

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

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/30/2018 at 9:45:34 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

APPENDIX C – SITE PHOTOGRAPHS

Photo 1: Gravel lot (Study Area) located in Dorchester. I-93 south is visible on the right side of the photo and the depression is visible behind the loader and jersey barriers on the left side of the photo. Stantec. September 13, 2016.

Photo 2: View of depression area (proposed salt shed location). Stantec. September 13, 2016.

APPENDIX D – PROJECT NOI PLANS

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLANS FOR

DISTRICT 6 - MAINTENANCE STORAGE BUILDING
NEW SALT SHEDS AND SITE IMPROVEMENTS
AT FREEPORT STREET AND VICTORY ROAD

IN THE CITY OF

BOSTON

SUFFOLK COUNTY

WILLIAMSTOWN
924 NEW ASHFORD ROAD

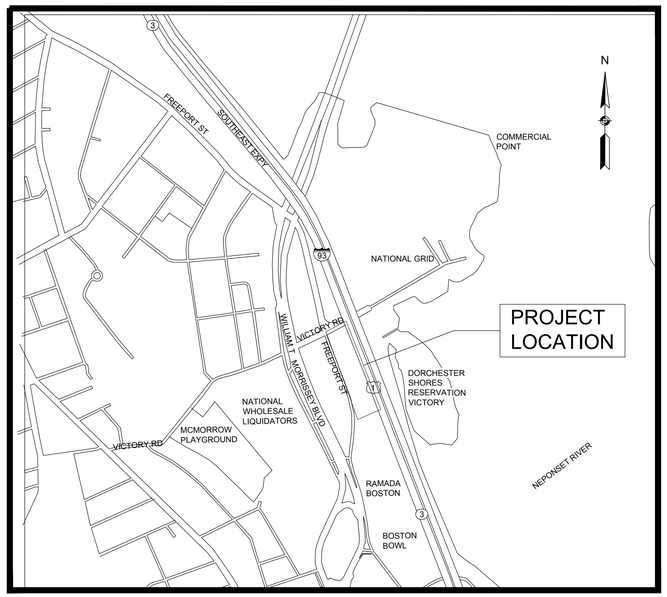
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	1	31
PROJECT FILE NO.	608843		

TITLE SHEET & INDEX

11-Dec-2017

MASSDOT DORCHESTER COVER SHEET 2017-12-11.DWG

INDEX



SCALE

500 0 500 1000 1500 2000 2500

All work under this contract shall be done in conformance with the Standard Specifications for Highways and Bridges dated 1988, the Supplemental Specifications dated July 1, 2015, and the Interim Supplemental Specifications contained in this contract; the 2016 Construction Standard Details, the 1990 Standard Drawings for Signs and Supports; the 1996 Construction and Traffic Standard Details (as relates to the pavement markings details only); the 2015 Overhead Signal Structure and Foundation Standard Drawings, the 2009 Manual on Uniform Traffic Control Devices (MUTCD) with Massachusetts Amendments and the Standard Municipal Traffic Code; the 1968 Standard Drawings for Traffic Signals and Highway Lighting; the latest edition of the American Standard for Nursery Stock; STATE BUILDING, ELECTRICAL AND PLUMBING CODES; THE LATEST EDITION OF ARCHITECTURAL ACCESS BOARD HANDICAP CODES, SECTIONS, the Plans and these Special Provisions.

The Contractor shall meet the requirements of FM Global Plan Review dated August 23, 2017 and shall complete FM Global Form 2688, Checklist for Roofing System (reference Document A00803).

BAYSIDE ENGINEERING
600 UNICORN PARK DRIVE
WOBURN, MA 01801
PHONE: 781-932-3201

RDK ENGINEERS
RDK Engineers
200 Brickstone Square
Andover, MA 01810-1488

MassDOT Massachusetts Department of Transportation Highway Division

RECOMMENDED FOR APPROVAL

CHIEF ENGINEER _____ DATE _____

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR _____ DATE _____

APPROVED

HIGHWAY ADMINISTRATOR _____ DATE _____

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project:	MA DOT Salt Storage Shed Dorchester, MA
Project No:	16.276.NH
Date Start:	12-02-16
Date End:	12-02-16
Sheet	1 of 1
Boring No:	B-1
Location:	See Plan
Approx. Surface Elev:	

	CASING	SAMPLER	Date	GROUNDWATER OBSERVATIONS Depth	Casing At	Stabilization Period
Type	HSA	SS	12-02-16			Groundwater Not Encountered
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		S-1	0.0-1.5	18	13	10	19	50	50/0"		S-1: Brown, dry, very dense, fine to medium sand, trace silt, gravel, concrete and asphalt (urban fill)	
		S-2	2.0-2.5	6	6	50	50/0"				S-2: Brown, dry, very dense, fine to medium sand, gravel, concrete, asphalt, brick, trace ash (urban fill)	
4		S-3	4.0-5.0	12	8	4	6	50/0"			S-3: Brown, dry, medium dense, fine sand, little silt, trace medium sand, gravel, asphalt, ash and cinders (urban fill)	
											Auger Refusal at approximately 5', possible old building foundation.	
8											Moved approximately 5' to the southeast and drilled Boring B-1A	
											BORING TERMINATED AT 5 ft	
12												
16												
20												
24												

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector: D. Ray

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30- VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project:	MA DOT Salt Storage Shed Dorchester, MA
Project No:	16.276.NH
Date Start:	12-02-16
Date End:	12-02-16
Sheet	1 of 1
Boring No:	B-1A
Location:	See Plan
Approx. Surface Elev:	

	CASING	SAMPLER	Date	GROUNDWATER OBSERVATIONS Depth	Casing At	Stabilization Period
Type	HSA	SS	12-02-16			Groundwater Not Encountered
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		-	0.0-4.0	48							-: Drilled directly to a depth of 4' and began split-spoon sampling.	
4		S-1	4.0-5.7	20	12	8	8	5	50/2"		S-1: Dark brown to black, dry, medium dense, fine sand, trace medium sand, trace silt, fine gravel, asphalt, red brick, glass, ash, cinders, pieces of wood (urban fill)	
											Auger Refusal at 6.5', possible old building foundation	
8											BORING TERMINATED AT 6.5 ft	
12												
16												
20												
24												

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector: D. Ray

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30- VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project:	MA DOT Salt Storage Shed Dorchester, MA
Project No:	16.276.NH
Date Start:	12-02-16
Date End:	12-02-16
Sheet	1 of 1
Boring No:	B-2
Location:	See Plan
Approx. Surface Elev:	

	CASING	SAMPLER	Date	GROUNDWATER OBSERVATIONS Depth	Casing At	Stabilization Period
Type	HSA	SS	12-02-16	9.0'	n/a	During Drilling
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.		10.0'	15.0'	Upon Completion
Fall		30"				

Depth/ Elev.	Cas bl/ft	Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		S-1	0.0-2.0	24	16	14	36	35	48		S-1: Brown, dry, very dense, fine to medium sand, little gravel (granular fill)	
		S-2	2.0-4.0	24	17	17	10	7	7		S-2: Dark brown to black, dry, medium dense, fine sand, trace to little silt, fine gravel, coal, asphalt, ash, glass, cinders (urban fill)	
4		S-3	4.0-6.0	24	1	4	5	5	3		S-3: Dark brown to black, dry, loose, fine sand and silt, fine gravel, glass, ash (urban fill)	
8		S-4	7.0-9.0	24	9	4	2	3	2		S-4: Black, dry, loose, coal dust, coal fragments, ash, cinders (urban fill)	
		S-5	9.0-11.0	24	2	2	4	7	7		S-5: Dark brown, black, wet, medium dense, fine sand, trace to little silt, coal fragments, ash, cinders and glass fragments (urban fill)	
12		S-6	11.0-13.0	24	2	6	6	11	45		S-6: Black, wet, medium dense, coal dust, coal fragments, cinders, ash (urban fill). Brown, wet, very fine in tip of split-spoon sampler.	
16		S-7	14.0-16.0	24	18	10	9	9	7		S-7: Brown, wet, medium dense, poorly sorted, fine to coarse sand, gravel, trace silt	
20		S-8	19.0-21.0	24	14	2	2	2	2		S-8: Dark gray, wet, soft, silty clay, thin interbedded layers of fine sand, shell fragments, plant fragments, strong organic odor	
24											BORING TERMINATED AT 21 ft	

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector: D. Ray

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30- VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
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FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project:	MA DOT Salt Storage Shed Dorchester, MA
Project No:	16.276.NH
Date Start:	12-02-16
Date End:	12-02-16
Sheet	1 of 1
Boring No:	B-3
Location:	See Plan
Approx. Surface Elev:	

	CASING	SAMPLER	Date	GROUNDWATER OBSERVATIONS Depth	Casing At	Stabilization Period
Type	HSA	SS	12-02-16	9.0'	n/a	During Drilling
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.		11.5'	15.0'	Upon Completion
Fall		30"				

Depth/ Elev.	Cas bl/ft	Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		S-1	0.0-2.0	24	13	20	14	22	31		S-1: Brown, dry, dense, fine to medium sand, trace coarse sand, gravel (granular fill)	
		S-2	2.0-2.3	3	3	50/3"					S-2: Dark brown, gray, dry, very dense, fine sand and silt, trace gravel, ash, red brick, glass (urban fill)	
4		S-3	4.0-6.0	24	0	5	6	6	6		S-3: No sample recovery	
8		S-4	6.0-8.0	24	0	8	8	5	5		S-4: No sample recovery	
		S-5	9.0-11.0	24	4	9	9	10	5		S-5: Dark brown, wet, medium dense, fine sand, trace to little silt, gravel	
12		S-6	14.0-16.0	24	14	10	3	4	4		S-6: Dark brown, dark gray, wet, soft, silty clay with interbedded fine sand layers, plant fragments, shell fragments	
16		S-7	19.0-21.0	24	12	1	5	4	3		S-7: Dark brown, dark gray, wet, soft, silty clay, plant fragments, shell fragments	
20											BORING TERMINATED AT 21 ft	
24												

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector: D. Ray

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30- VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	2	31
PROJECT FILE NO.	608843		

BORING LOGS

MASSDOT DORCHESTER BUILDING PLAN 2017-12-11.DWG Plotted on 11-Dec-2017 11:37 AM

BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	3	31
PROJECT FILE NO.	608843		

LEGEND, ABBREVIATIONS AND GENERAL NOTES

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER ON BRIDGE OR JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
SP		STEEL POLE
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
GAS	GAS	UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
W	W	UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCE STONE WALL
		GUARD RAIL – STEEL POSTS
		GUARD RAIL – WOOD POSTS
x	x	CHAIN LINK OR METAL FENCE
		WOOD FENCE
		TREE LINE OR LIMIT OF CLEARING AND GRUBBING
		COMPOST FILTER TUBES
		TREE LINE OR LIMIT OF CLEARING AND GRUBBING
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
℄		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW – WHITE
ONLY	ONLY	LEGEND "ONLY" – WHITE
	SL	STOP LINE – 12"
	CW 8'	CROSSWALK – 12" LINES SPACED 8' APART
	SWL	SOLID WHITE LINE – 6"
	SWSHL	SOLID WHITE SHOULDER LINE – 6"
	SYL	SOLID YELLOW LINE – 6"
	BWL	BROKEN WHITE LINE – 6"
	BYL	BROKEN YELLOW LINE – 6"
	DWL	DOTTED WHITE LINE – 6"
	DYL	DOTTED YELLOW LINE – 6"
	DWLEx	DOTTED WHITE LINE EXTENSION – 6"
	DYLEx	DOTTED YELLOW LINE EXTENSION – 6"
	DBWL	DOUBLE WHITE LINE – 2 – 6" LINES
	DYCL	DOUBLE YELLOW CENTERLINE – 2 – 6" LINES

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DW	STEADY DON'T WALK – PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE

ABBREVIATIONS (cont.)

GENERAL

LT	LEFT
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
OHW	ORDINARY HIGH WATER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X–SECT	CROSS SECTION

GENERAL NOTES:

1. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING ANY WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

2. NOTIFY MASSACHUSETTS DIG SAFE (1–800–322–4844) AND PROCURE A DIG SAFE NUMBER A MINIMUM OF 72 HOURS PRIOR TO DISTURBING THE GROUND IN ANY WAY.

3. 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 ENGINEER FOR RESOLUTION OF THE CONFLICT.

4. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.

5. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT THEIR OWN EXPENSE.

6. THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, REUSING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).

6. JOINTS BETWEEN NEW BITUMINOUS CONCRETE ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED IN ACCORDANCE WITH MASSDOT STANDARDS.

7. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS INDICATED OTHERWISE ON THE DRAWINGS.

8. DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER CLASS B TRENCH EXCAVATION.

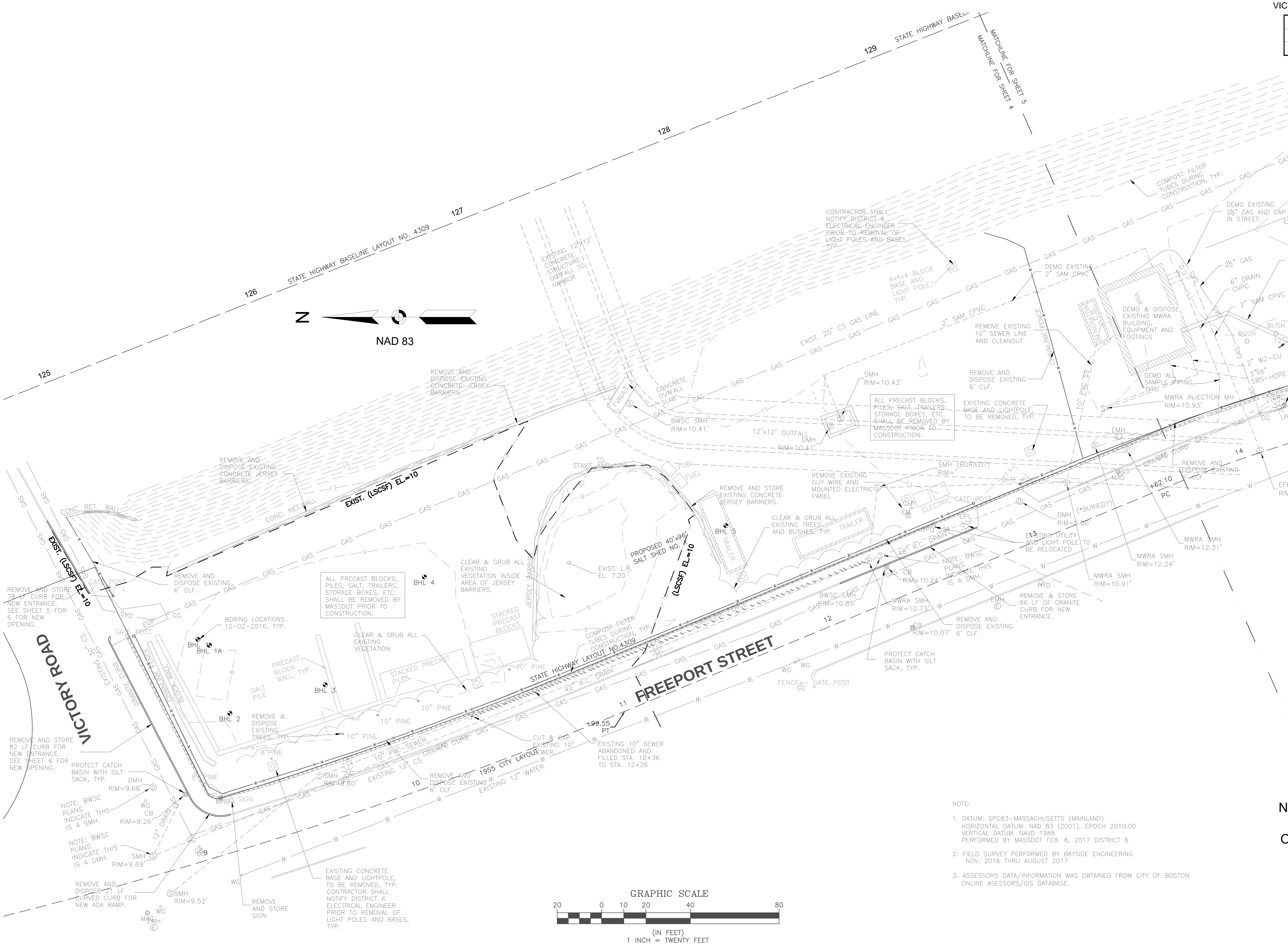
9. FIELD SURVEY CONDUCTED IN PERFORMED NOV 2016 THRU AUGUST 2017 BY BAYSIDE ENGINEERING, INC., 600 UNICORN PARK DRIVE, WOBURN, MA 01801. DATUM: SPC83–MASSACHUSETTS (MAINLAND) HORIZONTAL DATUM: NAD 83 (2001) EPOCH 2010.00 VERTICAL DATUM: NAVD 1988 PERFORMED BY MASSDOT FEB. 6, 2017, DISTRICT 6. ASSESSORS DATA/INFORMATION OBTAINED FROM CITY OF BOSTON ONLINE ASESSORS/GIS DATABASE.

10. ANY PROPERTY PINS OR HIGHWAY BOUNDS DAMAGED OR DESTROYED DURING CONSTRUCTION, MUST BE REPLACED PRIOR TO COMPLETION OF CONSTRUCTION.

BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	4	30
	PROJECT FILE NO.	608843	

EXISTING CONDITIONS
AND DEMOLITION PLAN



NOTE:

1. DATUM: SPC83–MASSACHUSETTS (MAINLAND)
   HORIZONTAL DATUM: NAD 83 (2001), EPOCH 2010.00
   VERTICAL DATUM: NAVD 1988
   PERFORMED BY MASSDOT FEB. 6, 2017 DISTRICT 6
2. FIELD SURVEY PERFORMED BY BAYSIDE ENGINEERING NOV. 2016 THRU AUGUST 2017
3. ASSESSORS DATA/INFORMATION WAS OBTAINED FROM CITY OF BOSTON ONLINE ASESSORS/GIS DATABASE.

COMMONWEALTH OF MASSACHUSETTS
BREE D. SULLIVAN
CIVIL
NO. 48441
REGISTERED PROFESSIONAL ENGINEER

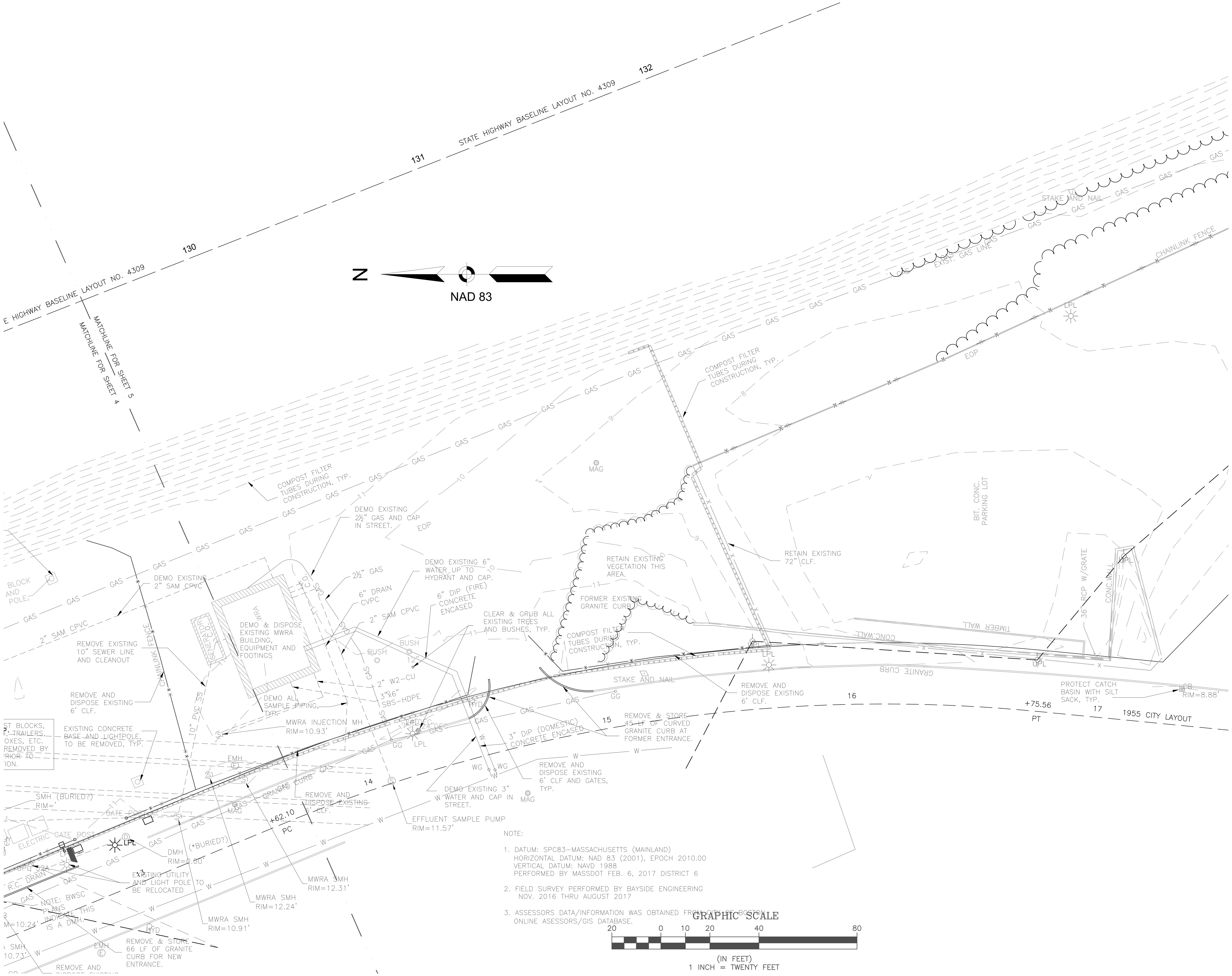
10-22-18

NOTICE OF INTENT
SITE DRAWINGS
OCTOBER 18, 2018

BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	5	30
	PROJECT FILE NO. 608843		

EXISTING CONDITIONS
AND DEMOLITION PLAN



NOTE:

1. DATUM: SPC83-MASSACHUSETTS (MAINLAND)
   HORIZONTAL DATUM: NAD 83 (2001), EPOCH 2010.00
   VERTICAL DATUM: NAVD 1988
   PERFORMED BY MASSDOT FEB. 6, 2017 DISTRICT 6
2. FIELD SURVEY PERFORMED BY BAYSIDE ENGINEERING NOV. 2016 THRU AUGUST 2017
3. ASSESSORS DATA/INFORMATION WAS OBTAINED FROM CITY OF BOSTON ONLINE ASESSORS/GIS DATABASE.

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 INCH = TWENTY FEET

COMMONWEALTH OF MASSACHUSETTS
BREE D. SULLIVAN
CIVIL
NO. 48441
REGISTERED PROFESSIONAL ENGINEER

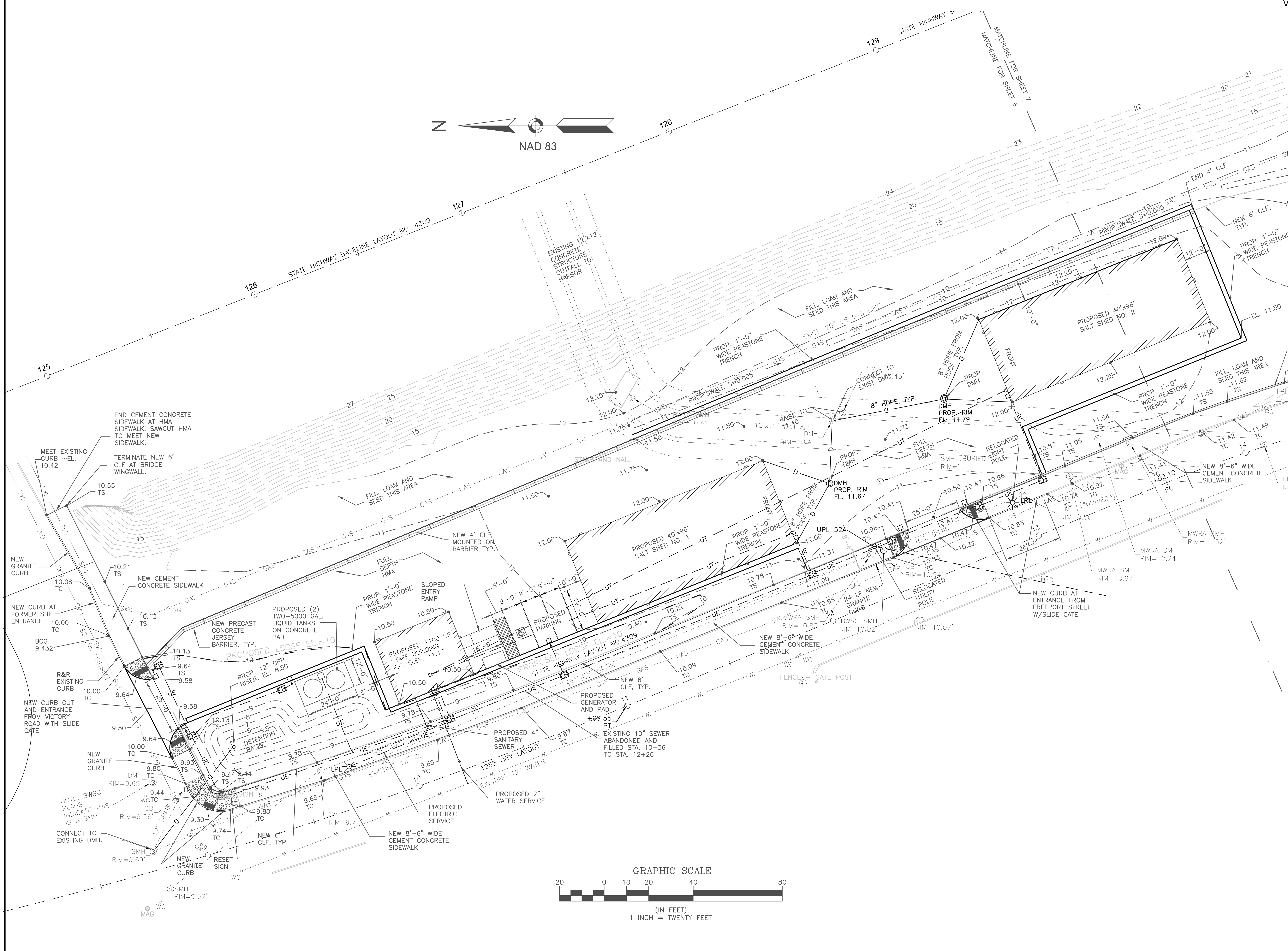
10-22-18

NOTICE OF INTENT
SITE DRAWINGS
OCTOBER 18, 2018

BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	6	30
	PROJECT FILE NO.	608843	

PROPOSED SITE PLAN



COMMONWEALTH OF MASSACHUSETTS
BREE D. SULLIVAN
CIVIL
NO. 48441
REGISTERED
PROFESSIONAL ENGINEER

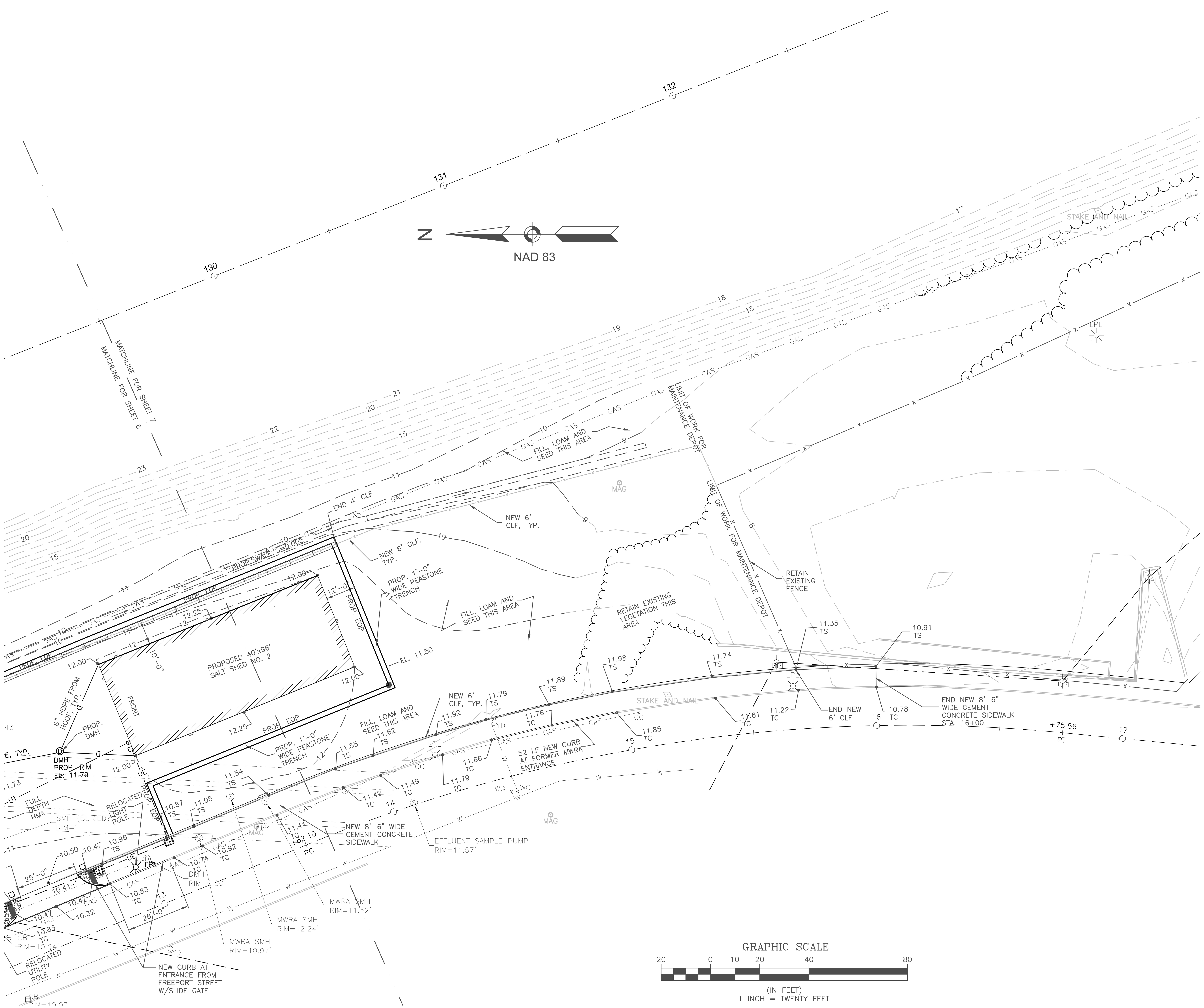
Bree Sullivan
10-22-18

NOTICE OF INTENT
SITE DRAWINGS
OCTOBER 18, 2018

BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	7	30
	PROJECT FILE NO. 608843		

PROPOSED SITE PLAN



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 INCH = TWENTY FEET

COMMONWEALTH OF MASSACHUSETTS
BREE D. SULLIVAN
CIVIL
NO. 48441
REGISTERED
PROFESSIONAL ENGINEER

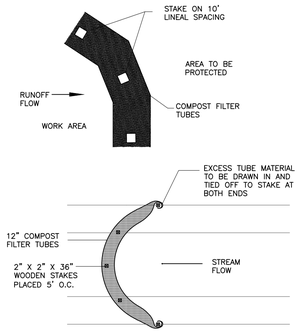
Bree Sullivan
10-22-18

NOTICE OF INTENT
SITE DRAWINGS
OCTOBER 18, 2018

BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	8	30
PROJECT FILE NO.	608843		

SITE DETAILS



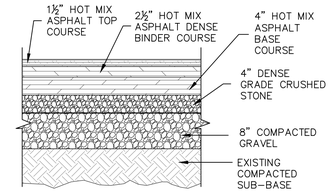
EROSION CONTROL NOTES:

1. PRIOR TO BEGINNING CONSTRUCTION OPERATIONS A SINGLE ROW OF COMPOST FILTER TUBES FILTER TUBES OR EQUAL FOR EROSION CONTROL SHALL BE INSTALLED AS SHOWN ON THIS PLAN. THIS SHALL SERVE AS THE LIMIT OF WORK LINE.
2. COMPOST FILTER TUBES SHOULD BE INSTALLED PARALLEL TO THE BASE OF THE SLOPE OR OTHER DISTURBED AREA.
3. STAKES SHALL BE INSTALLED THROUGH THE MIDDLE OF THE FILTER TUBES AT 10 FT. ON CENTER INTERVALS, USING 2" X 2" X 36" WOODEN STAKES.
4. STAKING DEPTH SHALL BE 12" MINIMUM.
5. THE CONTRACTOR SHALL MAINTAIN THE COMPOST FILTER TUBES IN A FUNCTIONAL CONDITION AT ALL TIMES, INCLUDING INSPECTIONS AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. THE CONTRACTOR SHALL IMMEDIATELY CORRECT ANY DEFICIENCIES.CONTRACTOR SHALL REMOVE SEDIMENT DEPOSITS AS NECESSARY TO MAINTAIN THE FILTERS IN WORKING CONDITION.
6. FILTER TUBES SHALL BE MAINTAINED UNTIL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED, OR AS DETERMINED BY THE ENGINEER.
7. NO WORK MAY PASS THE LINE OF STAKED FILTER TUBES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND LAWFUL DISPOSAL OF ALL EXCAVATED MATERIALS AND DEBRIS NOT OTHERWISE REUSED ON THE SITE FOR GRADING PURPOSES

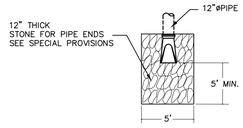
COMPOST FILTER
TUBES DETAIL N.T.S.

CONSTRUCTION SEQUENCING NOTES

1. PRIOR TO BEGINNING EARTH DISTURBANCES AND CONSTRUCTION, INSTALL TEMPORARY EROSION CONTROL DEVICES AS REQUIRED. BEFORE CLEARING AND GRUBBING, STRIP FOREST LITTER AND TOPSOIL FROM THE AREA(S) TO BE WORKED ONLY, AND STOCKPILE FOR FUTURE RESTORATION. ALL STOCKPILES MUST BE SURROUNDED BY SILT FENCING.
2. INSTALL PERMANENT DRAINAGE STRUCTURES BEGINNING AT THE DOWNSTREAM END AND PROCEED UPSTREAM AS SOON AS POSSIBLE. SWALES AND CULVERTS THAT WILL BE CAPABLE OF INTERCEPTING SURFACE DRAINAGE DURING CONSTRUCTION MUST BE PROVIDED WITH ADEQUATE SEDIMENTATION CONTROL.
3. CONSTRUCT ROADS, SITE IMPROVEMENTS, AND STRUCTURES CONCURRENT WITH THE REQUIRED SEDIMENTATION AND EROSION CONTROL DEVICES AS PER PLAN.
4. EROSION CONTROL BARRIERS SHALL BE INSPECTED AFTER EACH SIGNIFICANT RAINFALL AND PROMPTLY REPAIRED OR REPLACED AS NECESSARY.
5. ACCUMULATED SEDIMENT DEPOSITS UPSTREAM OF BARRIERS SHALL BE PROPERLY DISPOSED OF ON A REGULAR BASIS. ALL BARRIERS SHALL BE REMOVED AND PROPERLY DISPOSED OF WHEN NO LONGER NEEDED.
6. WHERE PLACEMENT OF FILL IS REQUIRED FOR STORM WATER CONTROL, FILL SHALL BE PLACED IN AN UNFROZEN STATE UPON UNFROZEN GROUND.
7. ALL DISTURBED AREAS SHALL BE LOAMED, SEEDED, LIMED, AND FERTILIZED. A MINIMUM OF 4" OF LOAM SHALL BE INSTALLED, UNLESS OTHERWISE INDICATED ON THE PLANS.
8. ALL FILL SHALL BE FREE OF STUMPS AND LARGE STONES.
9. ANY STANDING BODIES OF WATER CREATED DURING EXCAVATION SHALL BE ELIMINATED.
10. GEOTEXTILE FABRIC SHALL BE INSTALLED IN ALL DITCHES AND SLOPES AS REQUIRED IMMEDIATELY AFTER SEEDING ON SLOPES GREATER THAN 3:1.
11. SEDIMENT COLLECTION SACKS SHALL BE INSTALLED IN ALL CATCH BASINS IN PAVED AREAS PRIOR TO COMMENCING WORK.
12. THE INSTALLER SHALL MAINTAIN EROSION AND SEDIMENTATION CONTROLS DURING CONSTRUCTION AND UNTIL VEGETATION IS FULLY ESTABLISHED.
13. TEMPORARY GROUND COVER OR EROSION CONTROL SHALL BE ESTABLISHED ON ANY UNDEVELOPED AREAS WHERE REQUIRED BY THE PLANNING BOARD OR CONSERVATION COMMISSION.
14. DISTURBED AREAS SHOWING CHARACTERISTICS OF EROSION SHALL BE HYDROSEEDED OR SEEDED WITH GRASS OR SMALL GRAINS INCLUDING RYE, OATS, OR RYE GRASS. ANY TEMPORARY SLOPES GREATER THAN 3:1 SHALL BE STABILIZED WITH THE APPROPRIATE EROSION CONTROL.

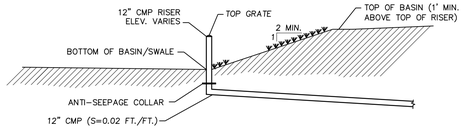


TYPICAL FULL
DEPTH PAVEMENT
NOT TO SCALE

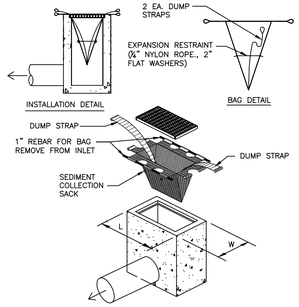


NOTES
1. STONE SHALL BE INSTALLED OVER A 6" THICK BASE LAYER OF ¾"ø CRUSHED STONE.
2. PRIOR TO INSTALLING CRUSHED STONE BASE LAYER, GEOTEXTILE FABRIC FOR PERMANENT EROSION CONTROL SHALL BE PLACED OVER EXISTING SOIL.

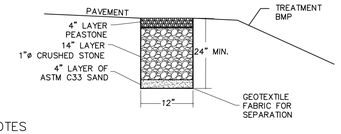
STONE FOR PIPE
END DETAIL N.T.S.



OVERFLOW RISER
DETAIL N.T.S.

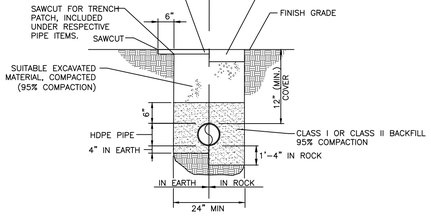


SILT SACK
DETAIL N.T.S.



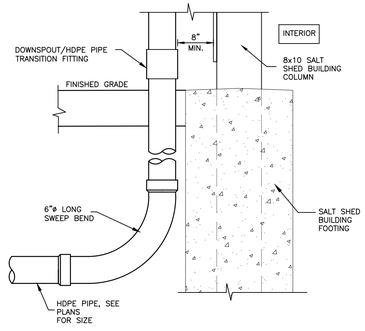
NOTES
1. STONE SHALL BE INSTALLED OVER A 4" THICK BASE LAYER OF ASTM C33 SAND.
2. GEOTEXTILE FABRIC FOR SOIL SEPARATION SHALL BE USED TO LINE THE TRENCH PRIOR TO PLACING STONE. FABRIC SHALL BE MINIMUM 3.5 OZ NON-WOVEN WITH AN AOS EQUAL TO OR LESS THAN 50 SIEVE.
3. GEOTEXTILE FABRIC SHALL BE USE TO SEPARATE THE PEASTONE FROM THE CRUSHED STONE TO FACTILITATE SEDIMENT REMOVAL MAINTENANCE.

PEASTONE DIAPHRAGM
DETAIL N.T.S.



NOTE
ALL PIPES SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS"

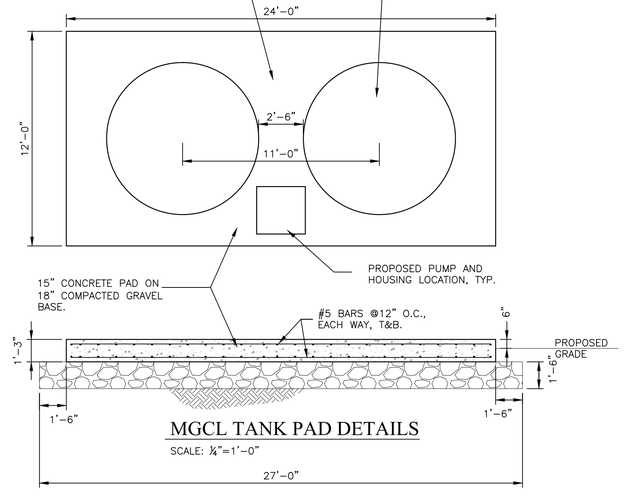
HDPE PIPE
INSTALLATION DETAIL N.T.S.



DOWNSPOUT CONNECTION
DETAIL N.T.S.

CONCRETE TO HAVE SEALER APPLIED AFTER 28 DAY CURING PERIOD. REF. CONSTRUCTION SPECIFICATION SECTION 07 19 00 – CONCRETE SEALING.

EXACT LOCATION OF TANKS ON PADS TO BE COORDINATED WITH MASSDOT AND EQUIPMENT.



MGCL TANK PAD DETAILS
SCALE: ¼"=1'-0"

NEW STAFF BUILDING

CONSTRUCTION TYPE:

Construction classification – Type IIB–UNPROTECTED

Construction Type IIB Unprotected Fire Resistance Rating Requirements (Table 601):

Structural Frame	0
Bearing Walls	
Exterior	2
Interior	0
Nonbearing interior walls and partitions	0
Floor construction including beams and joists	0
Roof Construction including beams and joists	0

Fire–Resistance Rating Requirements for Exterior Walls Based on Fire Separation Distance Table 602):

<5'	=	1 hr Group B
Equal or greater than 5' but less than 10	=	1 hr Group B
Greater than 10	=	0 hrs. Group B
Fire walls and Party walls		3 hrs.
Exit Enclosures (per 1019.1)		1 hr (less than 4 stories)
Exit Passageways (per 1020.1)		1 hr (less than 4 stories)
Storage rooms over 100 sq. ft.		1 hr or auto–extinguisher system
Separation of Mixed Occupancy		Not Applicable

=100 SF Gross: 1080 SF/100 SF/Occupant = 11 Occupants

Table 1015.1: Max Occupant Load: 49 for One Exit or Exit Doorway. Table 1021.2: Stories with one exit, 49 occupants and 75 feet maximum travel distance.

Egress Component Requirements:

Ceiling Heights (1003.2):
7'–6" (refer to actual code for exceptions)

Protruding Objects (1003.3): 80" min. for not more than 50% of area of Means of Egress (refer to actual code for more information and exceptions)

Floor Surface (1003.4):
Shall be slip resistant and securely fastened

Elevation Change (1003.5:
Sloped surfaces shall be used where grade change of 12" or less occurs

Door Encroachment (1005.1): Refer to actual code for more information and exceptions

Illumination required (1006.1):
All means of egress including exit discharge shall be illuminated at appropriate levels and shall have an emergency back up system in the case of an emergency

Doors (refer to section 1008 for complete requirements):

– Min. width shall be 32" clear and large enough to handle occupancy served
– Swings shall be side–hinged with exceptions of private garages, office areas, factory and storage areas with occupancy of 10 or less (or are power–operated, refer to sect. 1008.1.3.2)
– Swing shall be in the direction of travel for occupancy load of 50 or more
– Opening required force shall not exceed 5 pounds
– Landings that are level and are at the same elevation are required at each side of a door (refer to 1008.1.4 for exceptions)
– Minimum length in the direction of travel of 44" is required at landings

Stairways and Handrails (refer to section 1009 for complete requirements):

– Stairway widths shall be min. 44" (36" when serving an occupant load of 50 or less) and large enough to handle occupancy served

– Min. headroom shall be 80" (6'–8") from leading edge of nosing
– Riser heights shall be 7" max. (4" min.)
– Tread depths shall be 11" minimum

Exit Signs (refer to section 1011 for complete requirements): shall be illuminated with a battery back up system

Exit Access (refer to section 1013 for complete requirements):

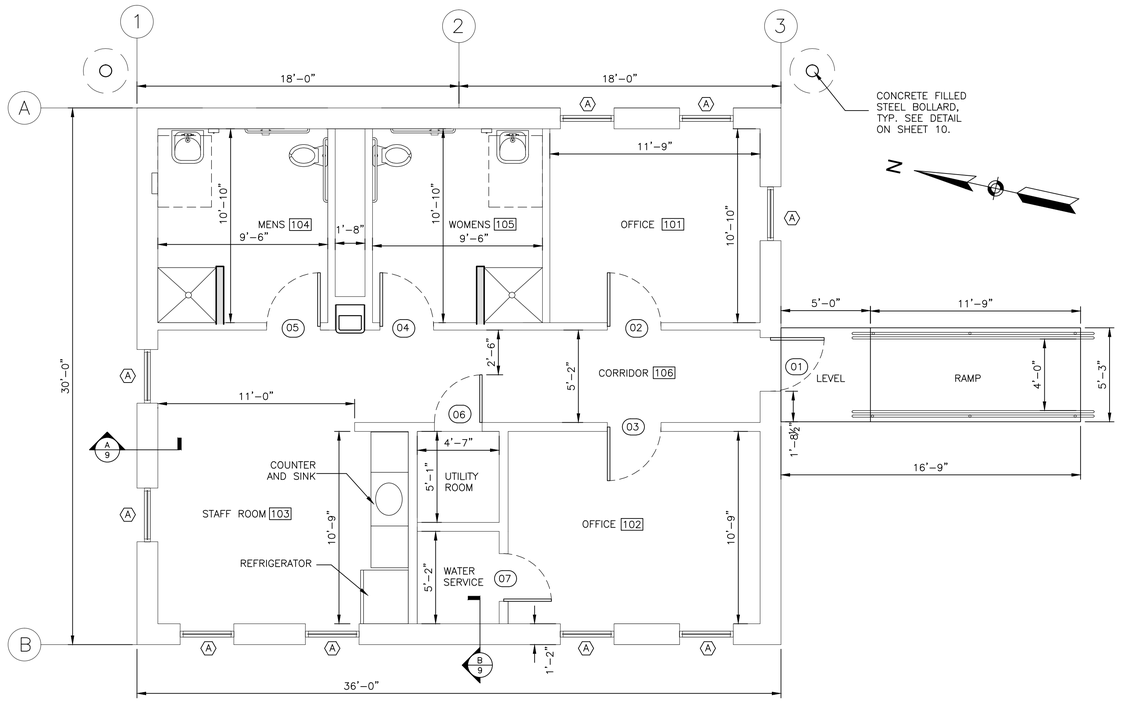
– egress through intervening spaces shall not occur through kitchens, storage rooms, closets or similar spaces.
– common path of travel shall not exceed 75'

Exit and Access Doorways (refer to section 1014 for complete requirements)

– two exits are required (under 500 but over 50 occupants), separated by a distance equal or less than one third the maximum overall diagonal of area being served.

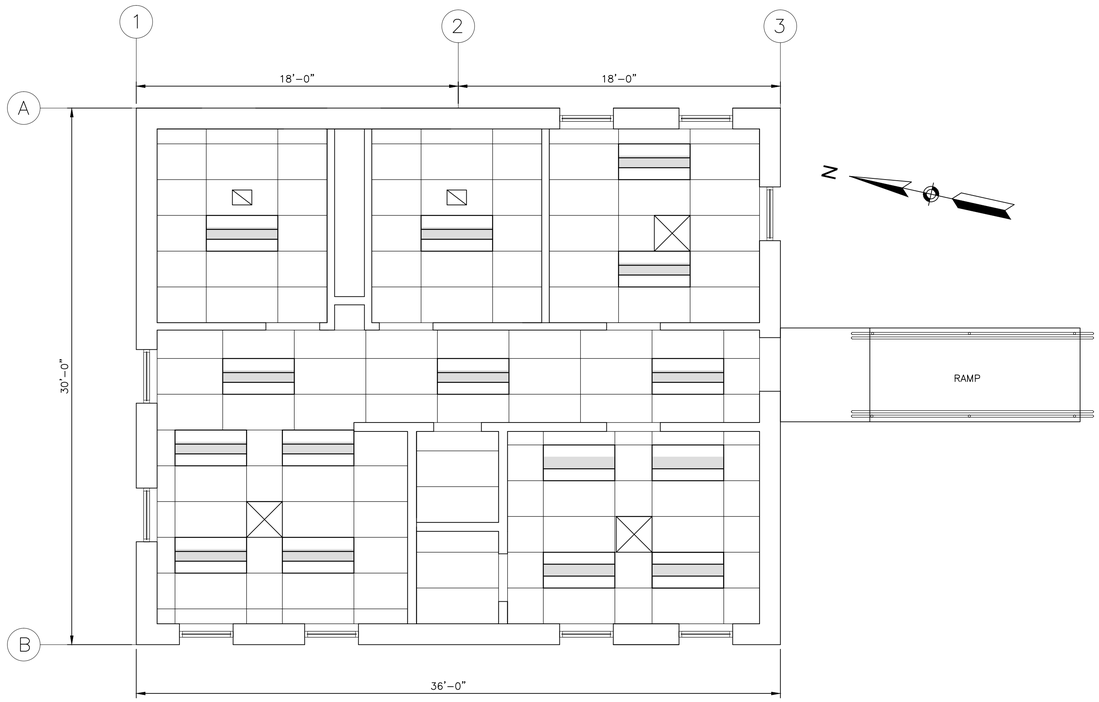
Exit Access Travel Distance (refer to section 1015 for complete requirements): shall be 200 feet without sprinkler system and 300 with a sprinkler system.

Corridors (section 1018): Corridors shall receive a one –hour rating (non–sprinkled) and shall be 44" in min. width. DEad end corridors shall not exceed 20 ft.



STAFF BUILDING FLOOR PLAN

SCALE: ¼"=1'–0"



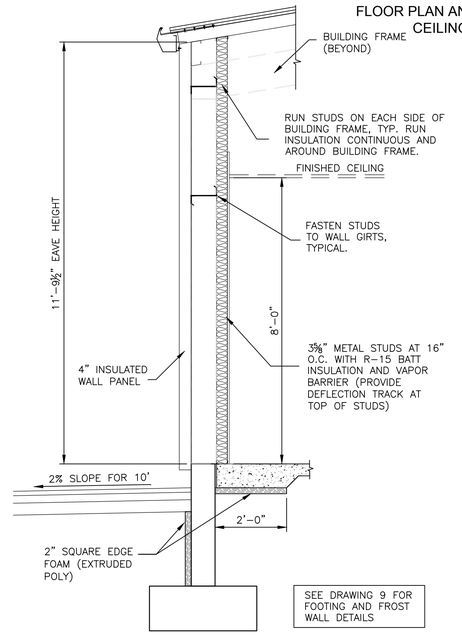
STAFF BUILDING REFLECTED CEILING PLAN

SCALE: ¼"=1'–0"

BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

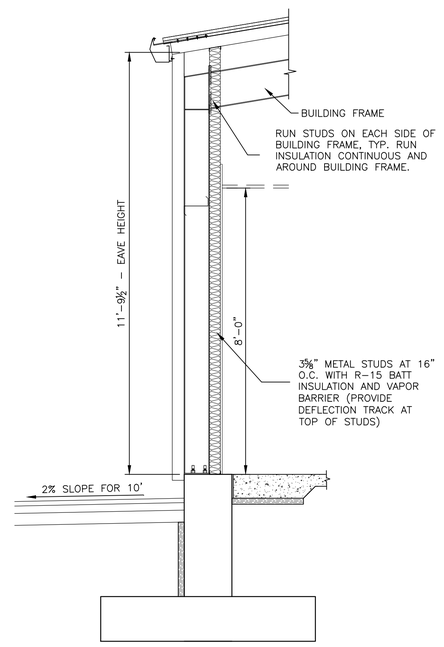
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	9	31
PROJECT FILE NO.	608843		

BUILDING CODE REVIEW SHEET
PROPOSED STAFF BUILDING
FLOOR PLAN AND REFLECTED CEILING PLAN



A/9 TYPICAL EXTERIOR WALL SECTION

SCALE: ½"=1'–0"



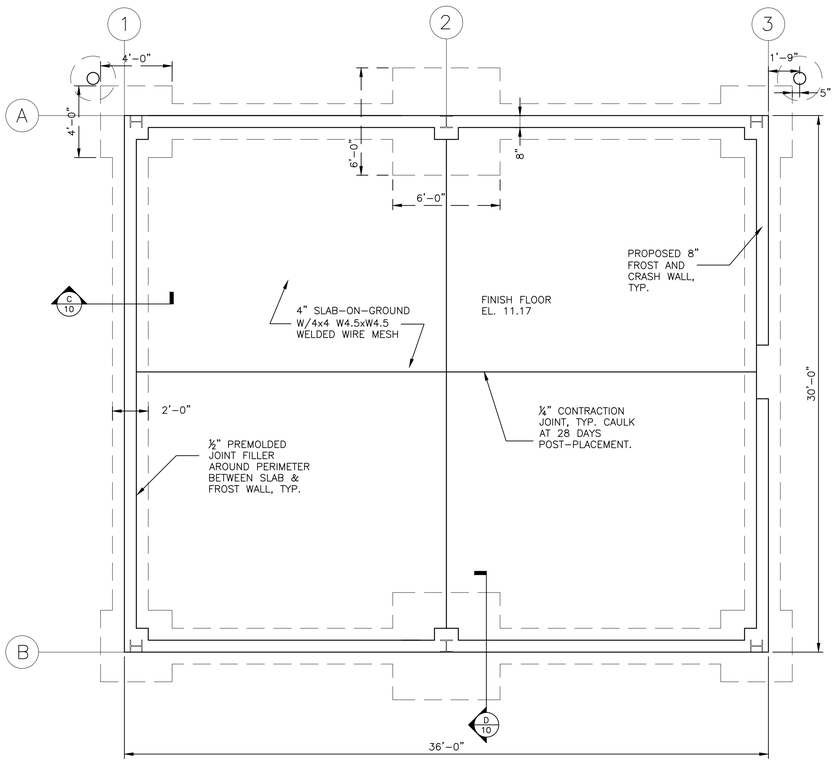
EXTERIOR WALL SECTION AT BUILDING FRAME

B/9 SCALE: ½"=1'–0"

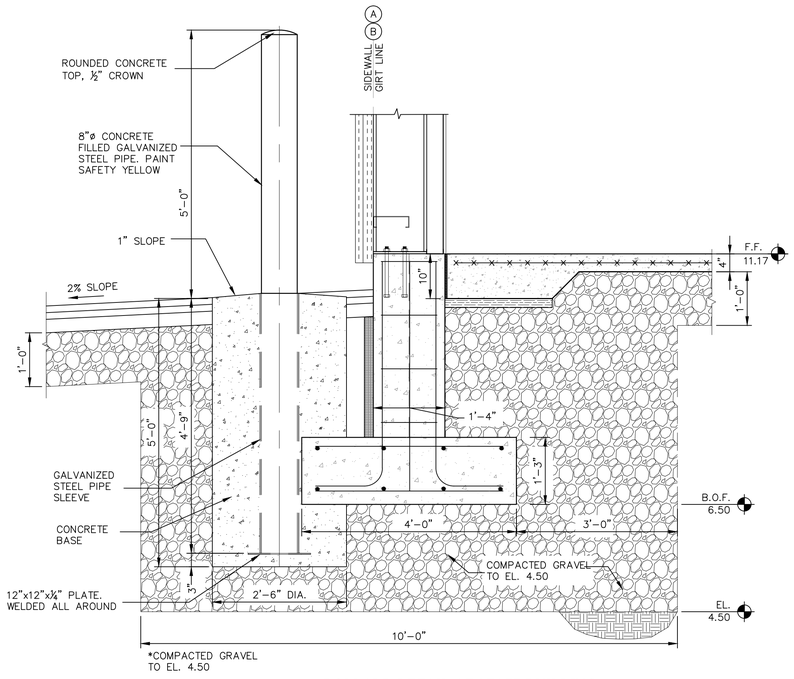
BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	10	31
PROJECT FILE NO.	608843		

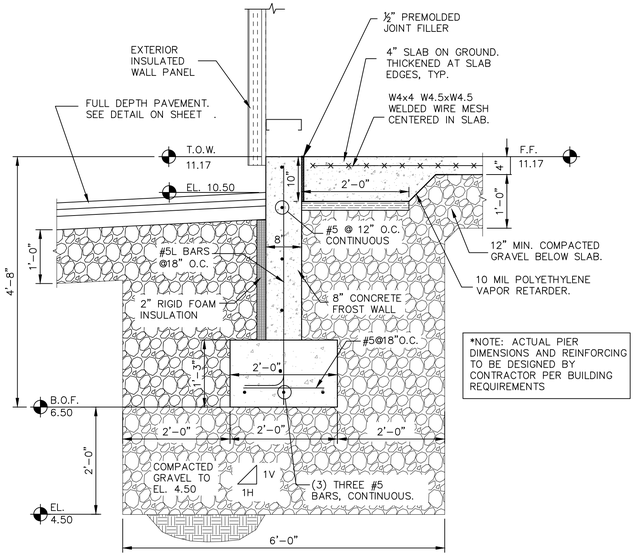
PROPOSED STAFF BUILDING FOUNDATION PLAN AND DETAILS



FOUNDATION PLAN
SCALE: ¼"=1'-0"

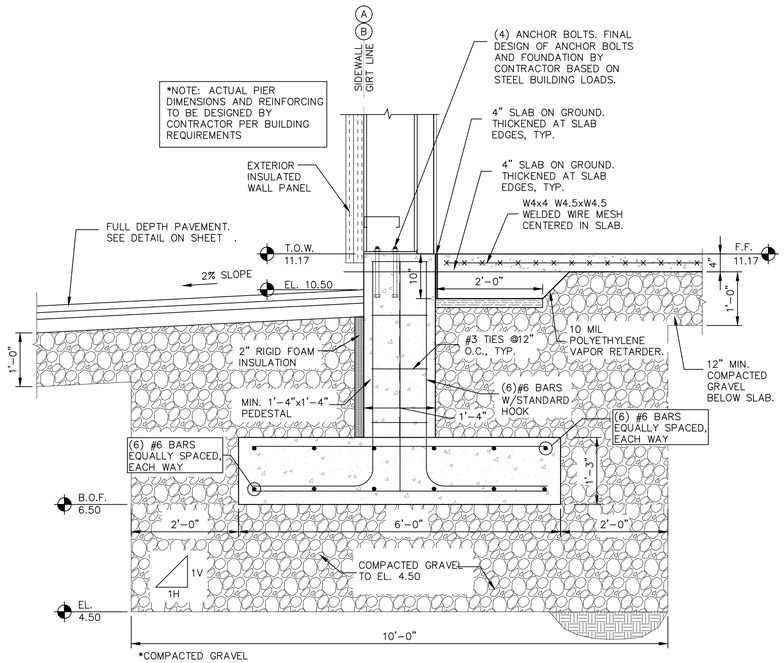


BOLLARD DETAIL AT STAFF BUILDING
SCALE: ¾"=1'-0"



*NOTE: ACTUAL PIER DIMENSIONS AND REINFORCING TO BE DESIGNED BY CONTRACTOR PER BUILDING REQUIREMENTS

STAFF BUILDING
C 9 TYPICAL PERIMETER FROST WALL
SCALE: ¾"=1'-0"

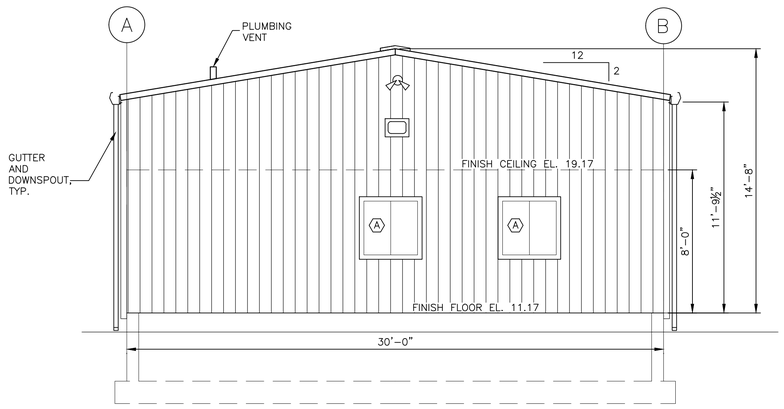


STAFF BUILDING
D 10 SECTION AT A2, B2
SCALE: ¾"=1'-0"

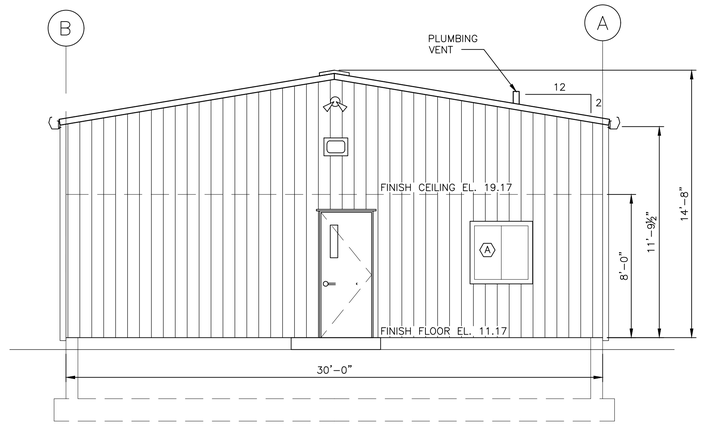
BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	11	31
PROJECT FILE NO.	608843		

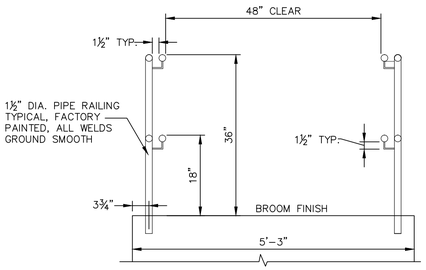
STAFF BUILDING ELEVATIONS



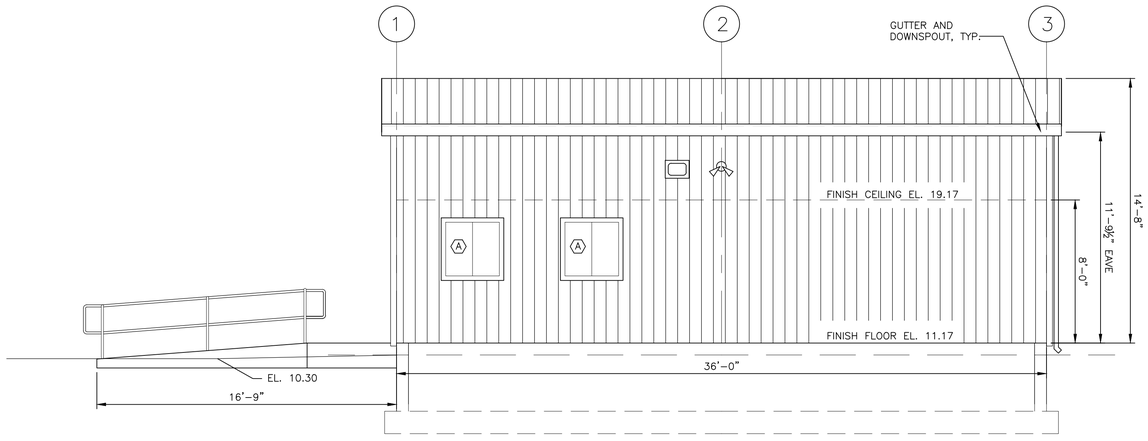
NORTH BUILDING ELEVATION
SCALE: ¼"=1'-0"



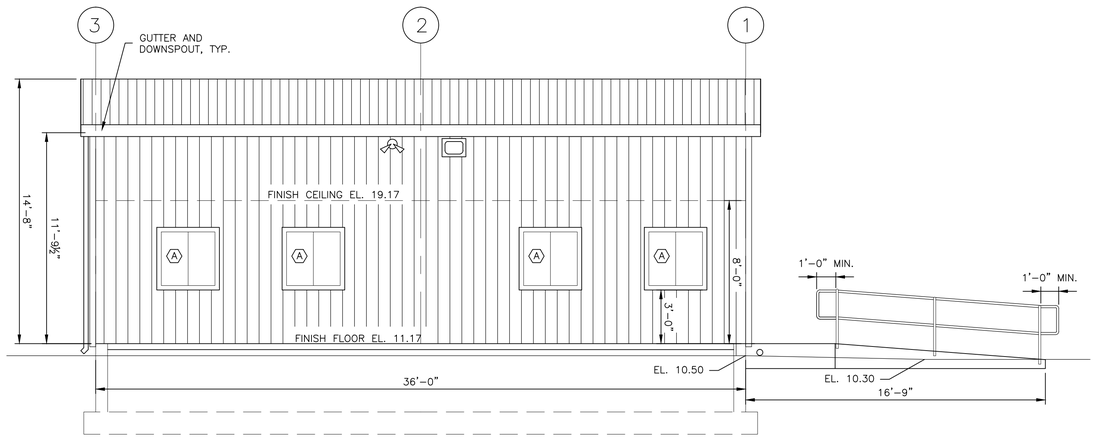
SOUTH BUILDING ELEVATION
SCALE: ¼"=1'-0"



1 RAMP RAILING DETAIL
XX SCALE: ¾"=1'-0"



EAST BUILDING ELEVATION
SCALE: ¼"=1'-0"

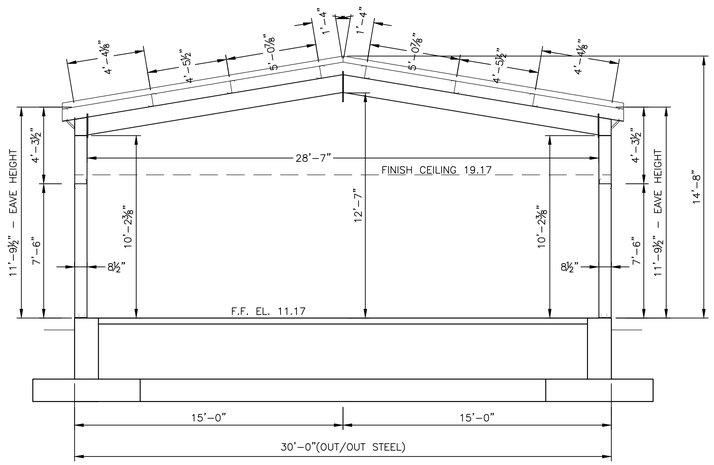


WEST BUILDING ELEVATION
SCALE: ¼"=1'-0"

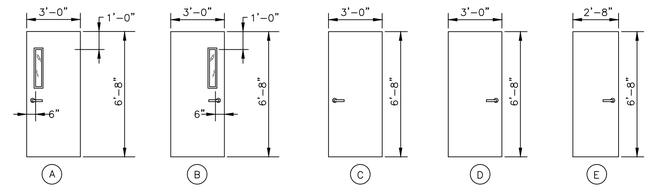
BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	12	31
PROJECT FILE NO.	608843		

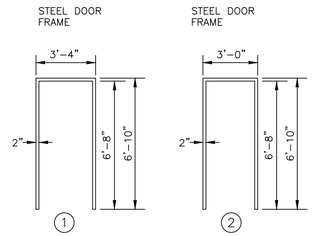
STAFF BUILDING
SECTIONS, DETAILS AND SCHEDULES



E/11 TYPICAL BUILDING FRAME SECTION
SCALE: ¼"=1'-0"



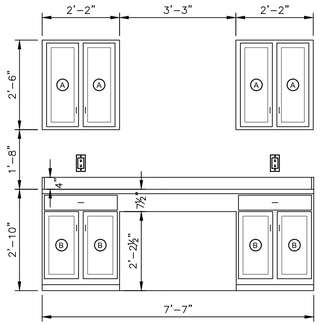
DOOR TYPES
SCALE: N.T.S.



DOOR FRAME TYPES
SCALE: N.T.S.

WINDOW AND LOUVER SCHEDULE			
TYPE	SIZE	QUANTITY	REMARKS
A	3'-0"x3'-0"	9	ALUMINUM WINDOW SET IN METAL BUILDING
B			
C			

NEW DOOR SCHEDULE							
	SIZE	DOOR				FRAME	
NO.		MATERIAL	FINISH	COLOR	ELEV	MATERIAL	ELEV
01	3'-0"x6'-8"x1¾"	MTL	PAINTED	*	A	HM	1
02	3'-0"x6'-8"x1¾"	MTL	PAINTED	*	A	HM	1
03	3'-0"x6'-8"x1¾"	MTL	PAINTED	*	B	HM	1
04	3'-0"x6'-8"x1¾"	MTL	PAINTED	*	C	HM	1
05	3'-0"x6'-8"x1¾"	MTL	PAINTED	*	D	HM	1
06	2'-8"x6'-8"x1¾"	MTL	PAINTED	*	E	HM	2
07	2'-8"x6'-8"x1¾"	MTL	PAINTED	*	E	HM	2

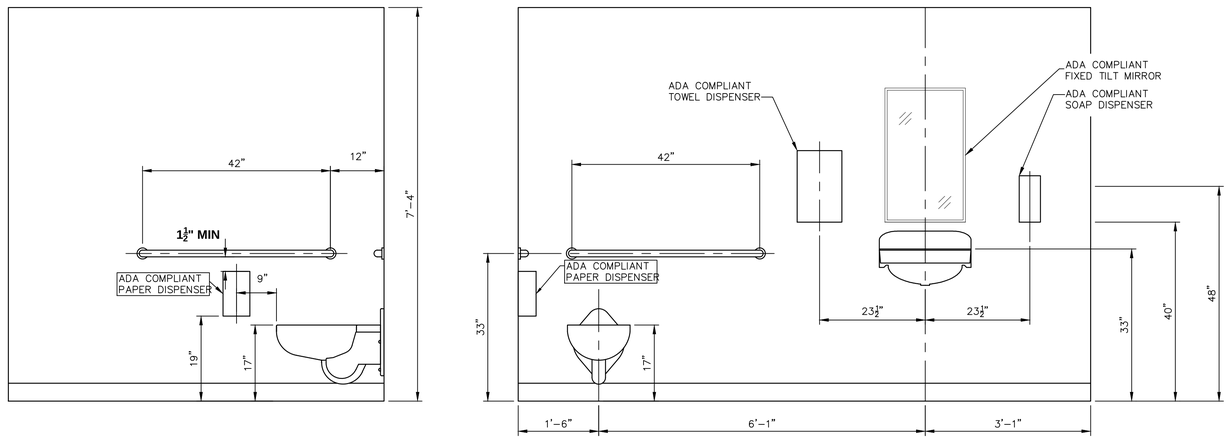


STAFF ROOM CABINET ELEVATION
SCALE: N.T.S.

KITCHEN CABINET SCHEDULE			
TYPE	SIZE	QUANTITY	REMARKS
A	2'-2"x2'-6"x15"	2	PLASTIC LAMINATED PLYWOOD
B	2'-2"x2'-10"x2'-4"	2	PLASTIC LAMINATED PLYWOOD W/ ONE (1) DRAWER

ROOM FINISH SCHEDULE								
ROOM NAME	FLOOR	BASE	WALLS				CEILING	REMARKS
			NORTH	EAST	SOUTH	WEST		
OFFICE 101	VCT	VB	PNT	PNT	PNT	PNT	ACT	
OFFICE 102	VCT	VB	PNT	PNT	PNT	PNT	ACT	
STAFF ROOM 103	VCT	VB	PNT	PNT	PNT	PNT	ACT	
MENS ROOM 104	CET	CET	PNT	PNT	PNT	PNT	ACT	
WOMENS ROOM 105	CET	CET	PNT	PNT	PNT	PNT	ACT	
CORRIDOR 106	VCT	VB	PNT	PNT	PNT	PNT	ACT	

ACT–ACOUSTICAL CEILING TILE
CET–CERAMIC TILE
PNT – PAINT
VB–VINYL BASE
VCT–VINYL COMPOSITION TILE



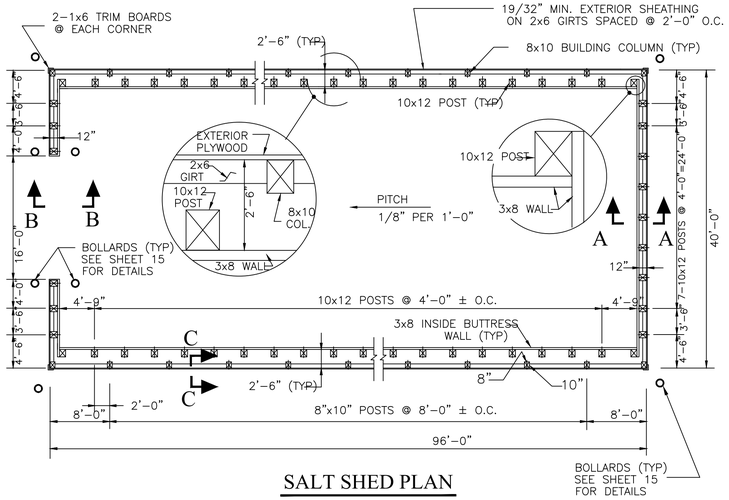
BATH ELEVATION
SCALE: N.T.S.

MASSDOT DORCHESTER BUILDING PLAN 2017-12-11.DWG Plotted on 11-Dec-2017 11:39 AM

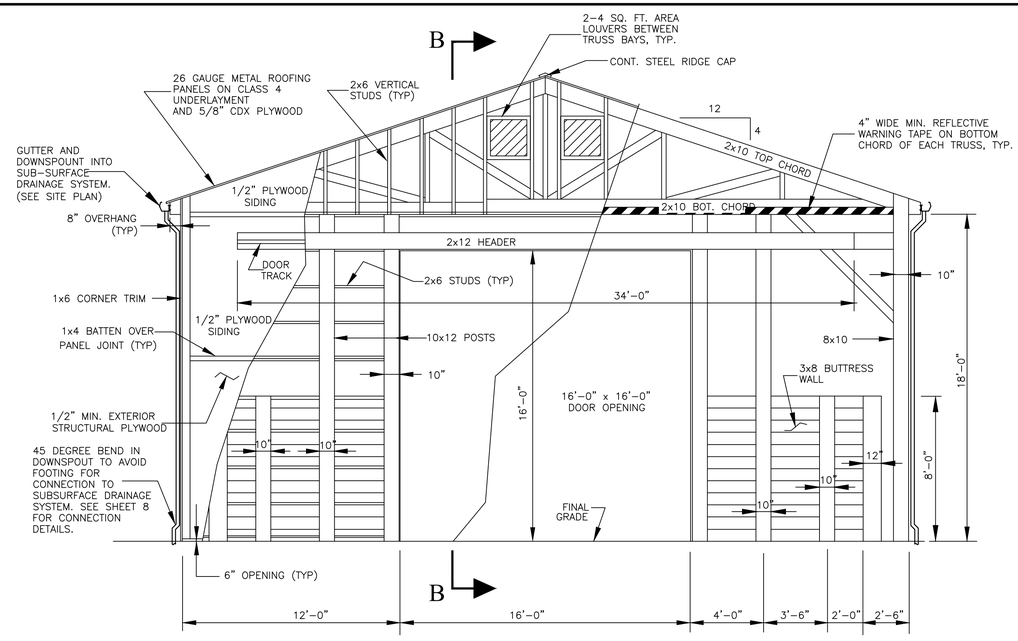
BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	13	31
PROJECT FILE NO.	608843		

PROPOSED SALT SHED PLANS



SALT SHED PLAN
NOT TO SCALE

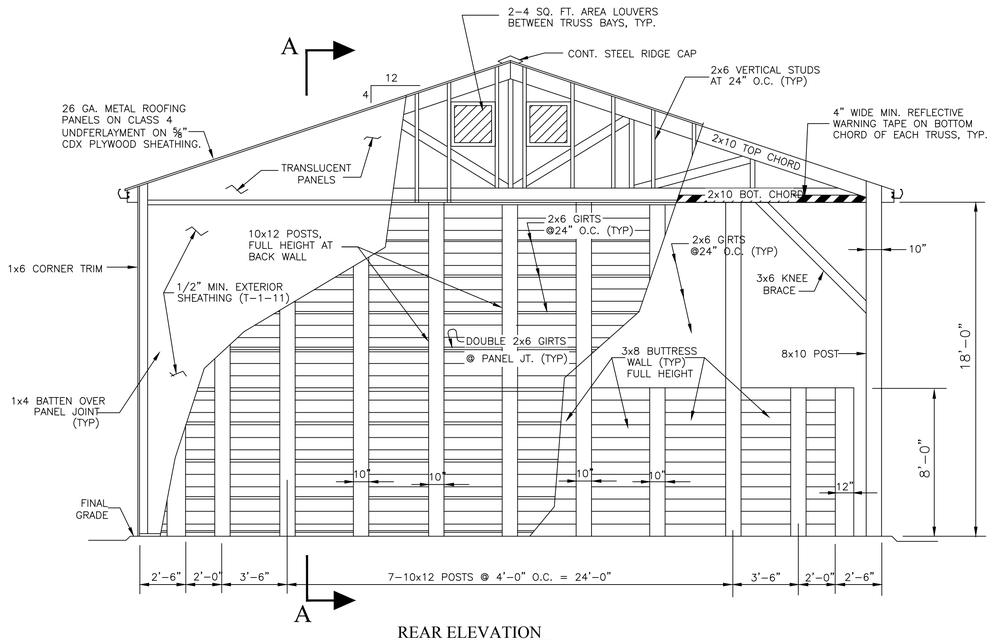


FRONT ELEVATION
NOT TO SCALE

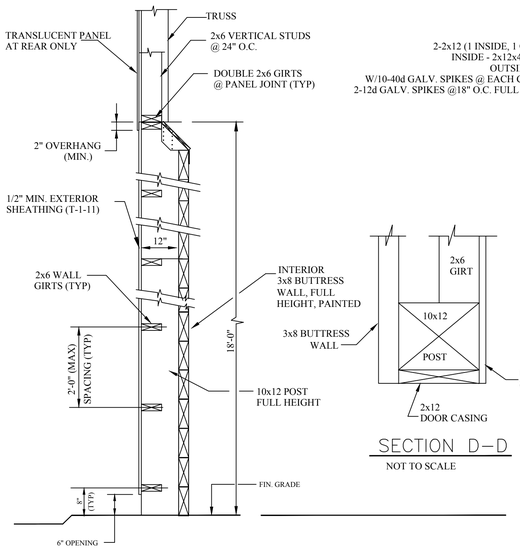
NOTE :
ALL WOOD CONSTRUCTION EXCEPT AS NOTED

SHED NO. 2 CONSTRUCTION NOTES

1. SHED NO. 2 TO BE CONSTRUCTED AS PER THESE DRAWINGS AND THE STANDARD MASSDOT STATEWIDE TIMBER SALT STORAGE SHED DRAWINGS ISSUED IN AUGUST OF 2015.
2. THE SHED CONSTRUCTION SHALL CONFORM TO THE DRAWINGS AND SPECIFICATIONS FOR THE STANDARD TIMBER SALT STORAGE SHED AND ALL APPLICABLE BUILDING CODES.

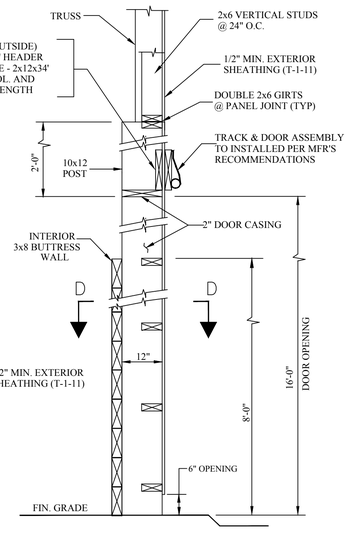


REAR ELEVATION
NOT TO SCALE

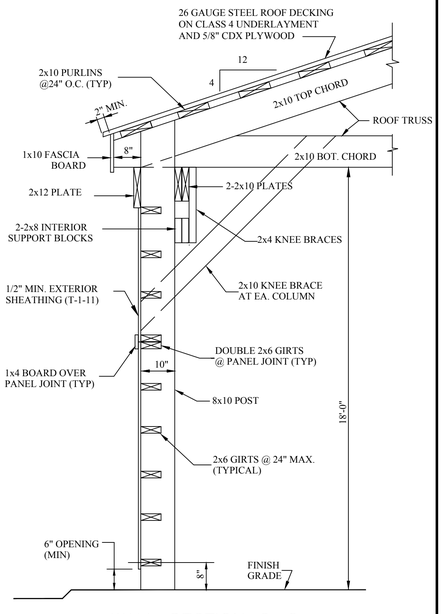


SECTION A–A
NOT TO SCALE
BACK WALL SECTION

SECTION D–D
NOT TO SCALE



SECTION B–B
NOT TO SCALE
FRONT WALL SECTION

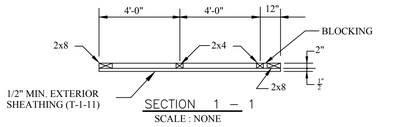


WALL SECTION C–C
SCALE : NONE

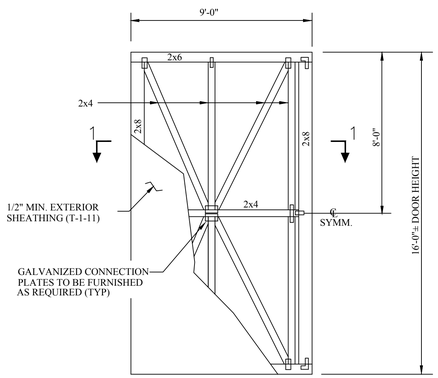
BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	14	31
PROJECT FILE NO.	608843		

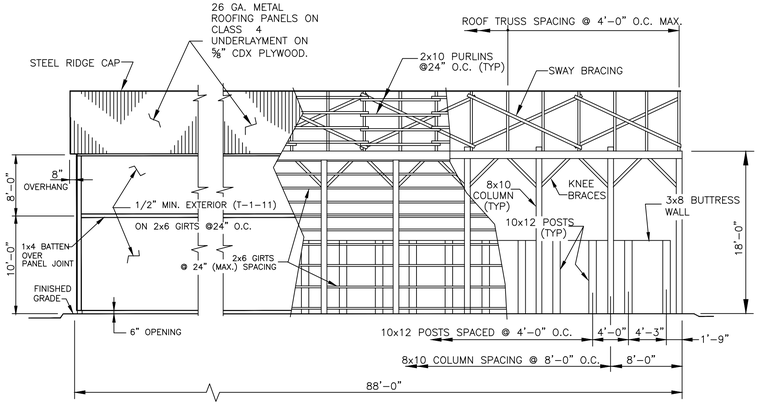
SALT SHED DETAILS



SECTION 1 – 1
SCALE : NONE



TYPICAL DOOR DETAIL
SCALE : NONE

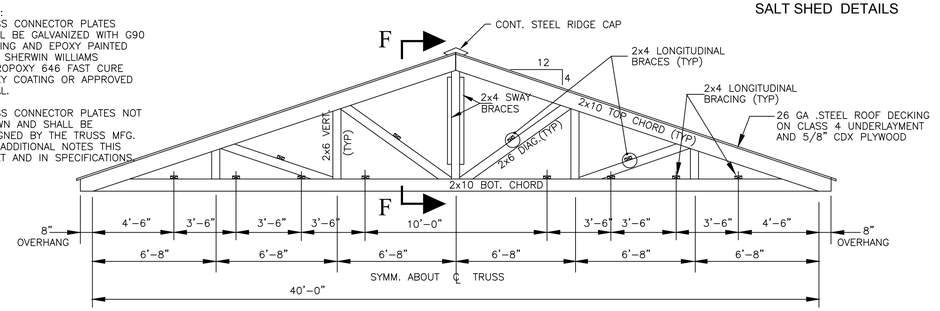


NOTE :
ALL WOOD CONSTRUCTION EXCEPT AS NOTED ON DWGS

SIDE ELEVATION
SCALE : NONE

NOTE:
TRUSS CONNECTOR PLATES SHALL BE GALVANIZED WITH G90 COATING AND EPOXY PAINTED WITH SHERWIN WILLIAMS MACROPOXY 646 FAST CURE EPOXY COATING OR APPROVED EQUAL.

TRUSS CONNECTOR PLATES NOT SHOWN AND SHALL BE DESIGNED BY THE TRUSS MFG. SEE ADDITIONAL NOTES THIS SHEET AND IN SPECIFICATIONS.

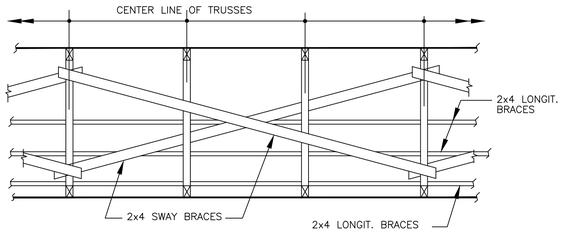


NOTES

1. 2–12d NAILS AT EACH INTERSECTION OF BRACES OR RUNNERS AND MEMBERS OF THE TRUSS.

PROPOSED TRUSS GEOMETRY & LONGITUDINAL TRUSS BRACING

NOT TO SCALE



SECTION F - F
SIDE VIEW-TRUSS BRACING
SCALE: NONE

DIMENSION LUMBER

DIMENSION LUMBER SHALL BE STRESS RATED, 18% MAX. M.C., WITH THE FOLLOWING MINIMUM GRADES AND PROPERTIES:

PURLINS, TRUSS MEMBERS & BRACING: HEM–FIR, NO. 1& BETTEF
Fb=1100 psi Fc=1350 psi E=1,500,000 psi

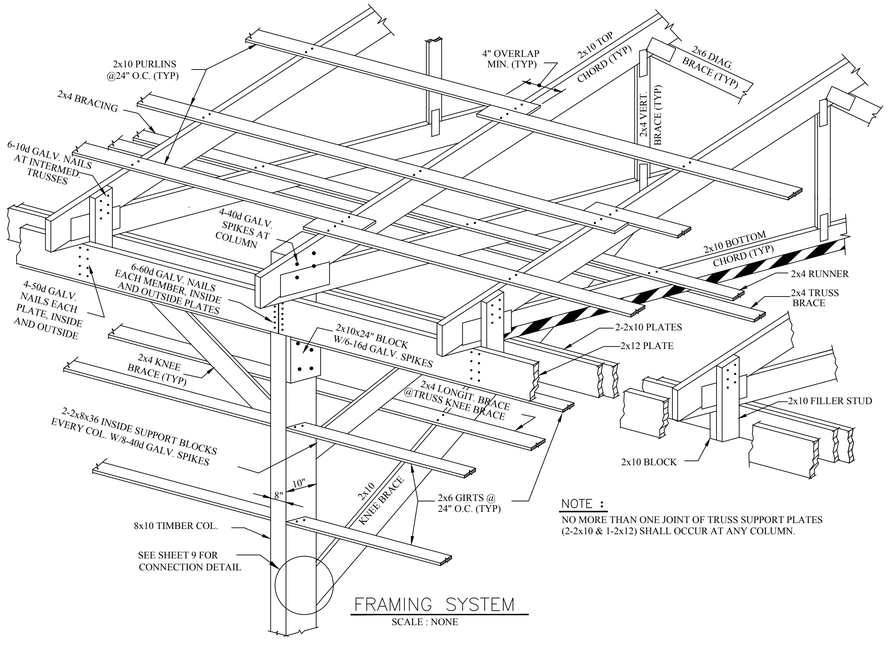
POSTS & GIRTS: HEM–FIR, NO. 1& BETTER
Fb=1100 psi Fc=1350 psi E=1,500,000 psi

STUDS: SPRUCE–PINE–FIR, STUD GRADE OR BETTER
Fc =725 psi Fv=135 psi E=1,200,000 psi

ROOF TRUSSES

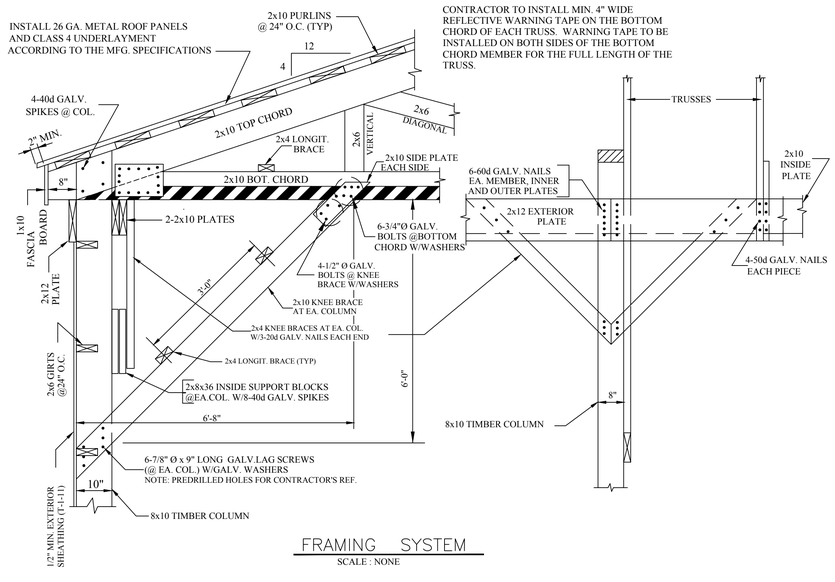
1. TRUSSES AND CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE TRUSS PLATE INSTITUTE (TPI) AND THE WOOD TRUSS COUNCIL OF AMERICA (WTCA). TRUSSES SHALL BE DESIGNED BY THE TRUSS MANFACTURER AND SHALL SUBMIT STAMPED CALCULATIONS AND SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.

2. TRUSSES AND CONNECTIONS SHALL BE INSTALLED AND BRACED IN ACCORDANCE WITH THE REQUIREMENTS OF THE TRUSS PLATE INSTITUTE (TPI) AND BUILDING COMPONENT SAFETY INFORMATION (BCSI) "GUIDE TO GOOD PRACTICE FOR HANDLING, INSTALLING, RESTRAINING & BRACING OF METAL PLATE CONNECTED WOOD TRUSSES" PUBLISHED JOINTLY BY TPI AND WTCA, 2009 EDITIC



NOTE :
NO MORE THAN ONE JOINT OF TRUSS SUPPORT PLATES (2-2x10 & 1-2x12) SHALL OCCUR AT ANY COLUMN.

FRAMING SYSTEM
SCALE : NONE



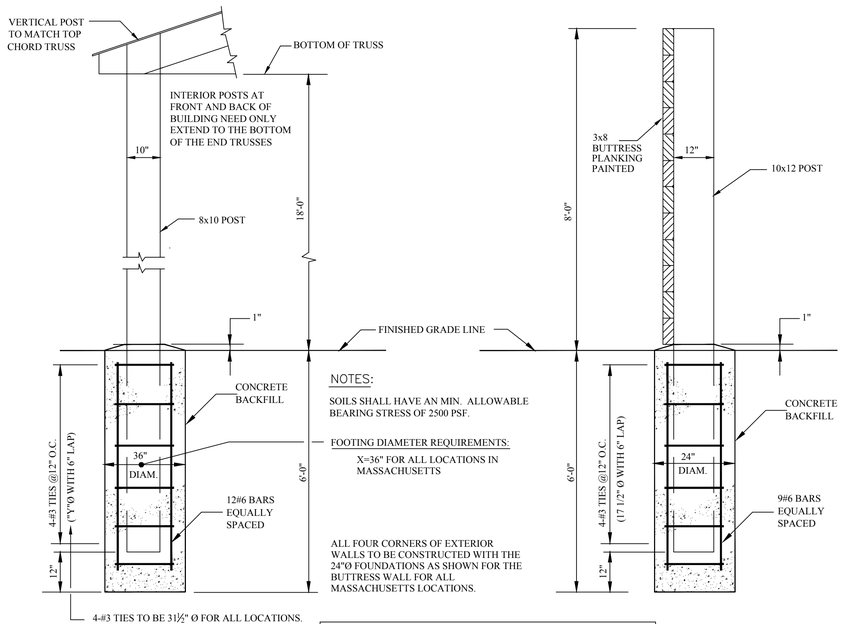
FRAMING SYSTEM
SCALE : NONE

MASSDOT DORCHESTER SALT SHED DRAWINGS 2017-12-11.DWG 11-Dec-2017

BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	15	31
PROJECT FILE NO.	608843		

SALT SHED DETAILS



NOTES:

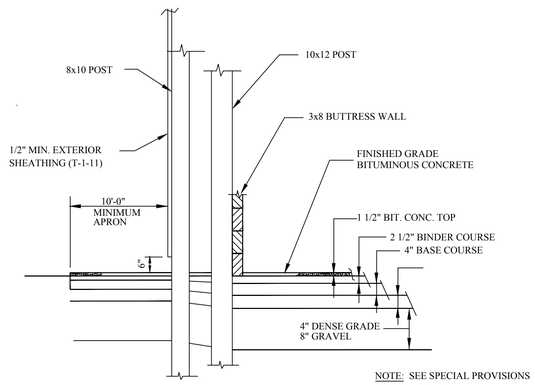
SOILS SHALL HAVE AN MIN. ALLOWABLE BEARING STRESS OF 2500 PSF.

FOOTING DIAMETER REQUIREMENTS:

X=36" FOR ALL LOCATIONS IN MASSACHUSETTS

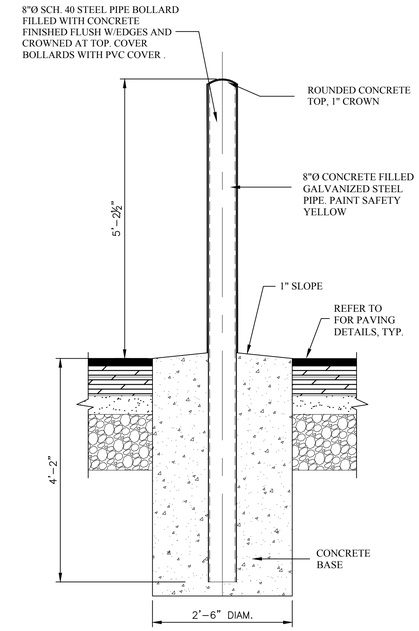
ALL FOUR CORNERS OF EXTERIOR WALLS TO BE CONSTRUCTED WITH THE 24"Ø FOUNDATIONS AS SHOWN FOR THE BUTTRESS WALL FOR ALL MASSACHUSETTS LOCATIONS.

NOTE: EXISTING SUB-SOIL TO BE REMOVED 2'-0" MIN. BELOW PROPOSED BOTTOM OF FOOTING AT ALL LOCATIONS. REFERENCE SHEETS 16 AND 17 FOR TIERED EXCAVATION LIMITS FOR SALT SHED FOUNDATIONS.

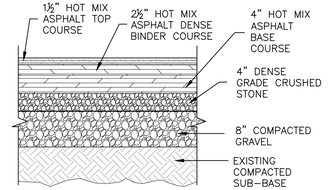


NOTE: SEE SPECIAL PROVISIONS FOR PAVING DETAILS

TYPICAL SECTION AT SHED WALL SHOWING PAVEMENT
SCALE : NONE



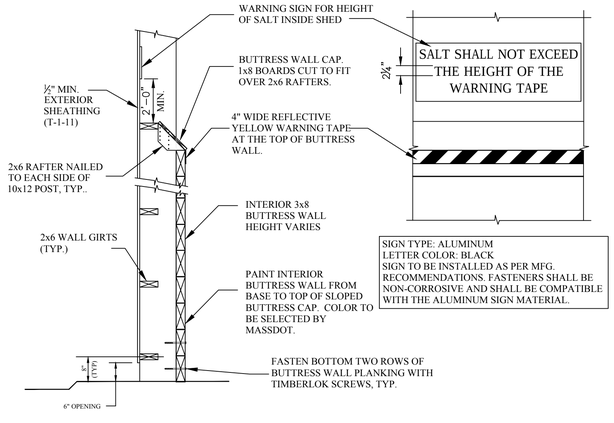
BOLLARD DETAIL
NOT TO SCALE



TYPICAL FULL DEPTH PAVEMENT AT NEW SALT SHEDS
NOT TO SCALE

SCHEDULE OF SCREWS AND NAILS FOR FRAMING AND SHEATHING CHEMICAL STORAGE SHEDS

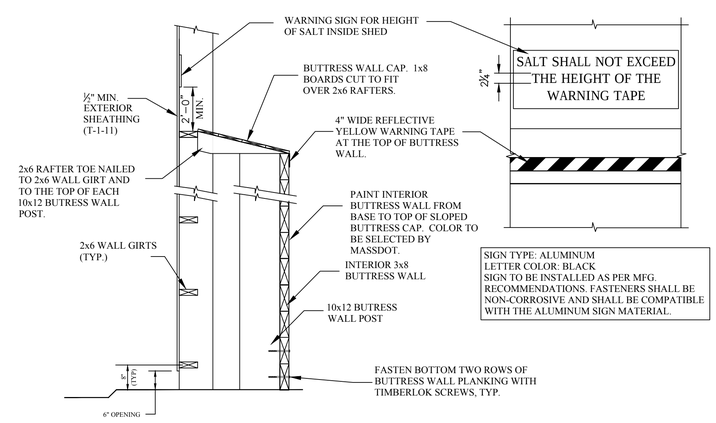
JOINING	NAILING METHOD	NO.	SIZE	PLACEMENT
26 GA. Metal Roofing to 5/8" Roof Sheathing	Per Manufacturer's Specifications			
5/8" CDX Roof Sheathing to Roof Purlins	Facenail	—	8d	6"O.C. Edge 12"O.C. Intermediate
Purlin To Truss	Facenail	—	12d	At Each Truss
Truss To Top Plate	(See Plan Detail)	—	—	—
Fascia Board To Truss Rafter	Facenail	3	16d	At Each Rafter
2"x6" Strapping to Post	Toenail	4	16d	At Each Post
2"x12" Casing To Post	Facenail	2	20d	12" On Center
2"x12" Horizontal Casing to 2"x12" Vertical Casing	Facenail	2	20d	—
2"x12" Horizontal Casing to 2"x12" Header	Facenail	1	20d	12" O.C.
3"x8" Buttress Planking to Buttress Post	Facenail	2 (or 3)	40d	Each Post (@ Corner Post)
Truss to 8"x10" Post	(See Plan Detail)	—	—	—
Truss to 2"x10" Blocking	Facenail	6	10d	Each Intermediate Truss
Bearing Plates To Columns	Facenail	6	60d	Inside & Outside Each Member
Bearing Plates to Blocking	(See Plan Detail)	—	—	—
Exterior Plywood to Studs	Facenail	—	8d	6"O.C. Edge 12"O.C. Intermediate
2x10 Truss Knee Braces	(See Plan Detail on Sheet 9)	—	—	—
1"x6" Trim Thru Sheathing to 2"x6" Strapping	Facenail	2	10d	24" O.C.
Door Framing	Through Plates	4	5d	Each Member at Each Connection



SIGN TYPE: ALUMINUM
LETTER COLOR: BLACK
SIGN TO BE INSTALLED AS PER MFG. RECOMMENDATIONS. FASTENERS SHALL BE NON-CORROSIVE AND SHALL BE COMPATIBLE WITH THE ALUMINUM SIGN MATERIAL.

TYPICAL FRONT AND *BACK WALL WITH BUTTRESS WALL CAP

* BACK WALL BUTTRESS WALL IS FULL HEIGHT OF REAR WALL.



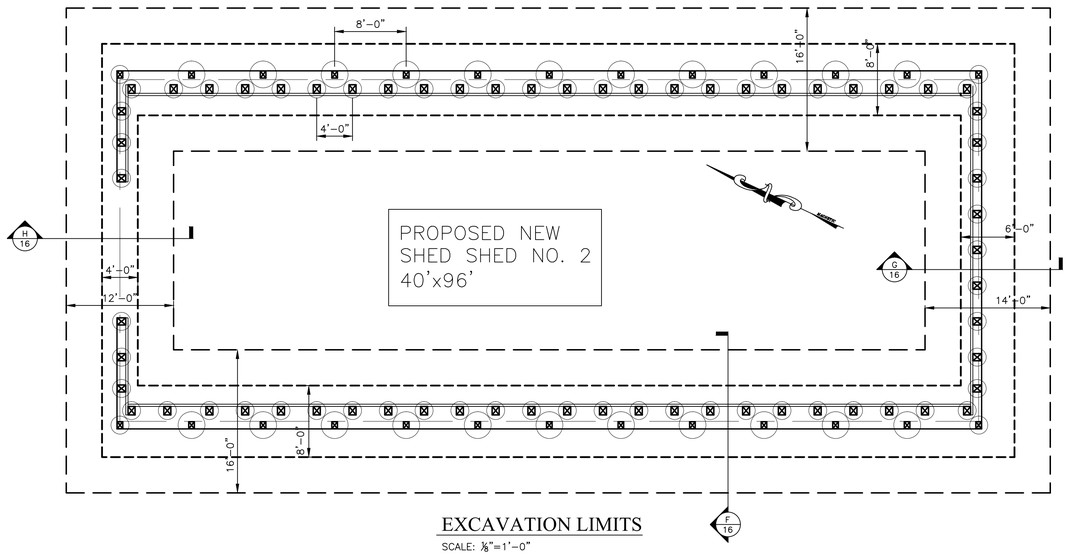
SIGN TYPE: ALUMINUM
LETTER COLOR: BLACK
SIGN TO BE INSTALLED AS PER MFG. RECOMMENDATIONS. FASTENERS SHALL BE NON-CORROSIVE AND SHALL BE COMPATIBLE WITH THE ALUMINUM SIGN MATERIAL.

TYPICAL SIDE WALL WITH BUTTRESS WALL CAP

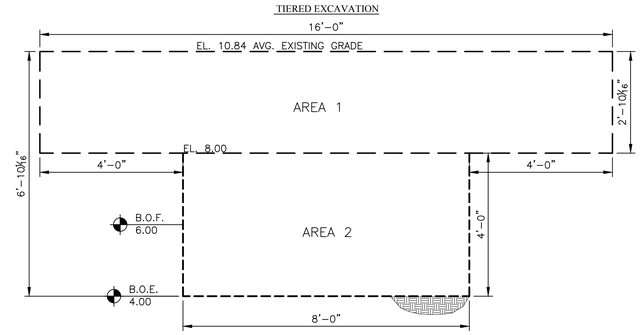
BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	16	31
PROJECT FILE NO.	608843		

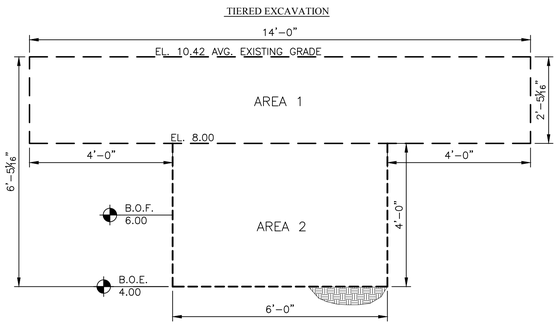
SALT SHED NO. 2
EXCAVATION LIMITS



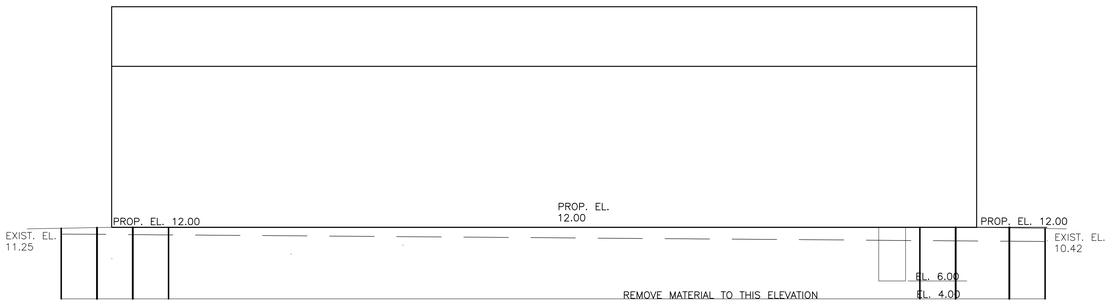
EXCAVATION LIMITS
SCALE: ⅛"=1'-0"



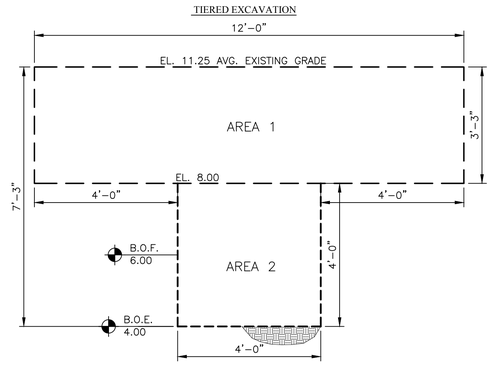
SALT SHED NO. 2 FOOTING
EXCAVATION CROSS-SECTION
F/16 SCALE: ½"=1'-0"



SALT SHED NO. 2 FOOTING
EXCAVATION CROSS-SECTION
G/16 SCALE: ½"=1'-0"



EXCAVATION LIMITS
SCALE: ⅛"=1'-0"



SALT SHED NO. 2 FOOTING
EXCAVATION CROSS-SECTION
H/16 SCALE: ½"=1'-0"

MASSDOT DORCHESTER SALT SHED DRAWINGS 2017-12-11.DWG 11-Dec-2017

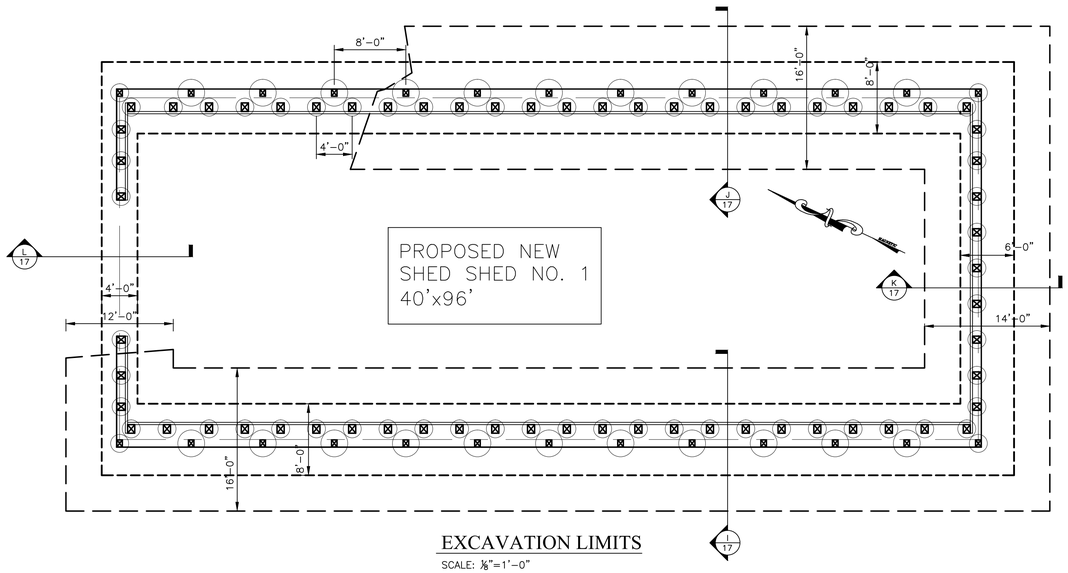
BOSTON
VICTORY ROAD DEPOT IMPROVEMENTS

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	N/A	17	31
PROJECT FILE NO.	608843		

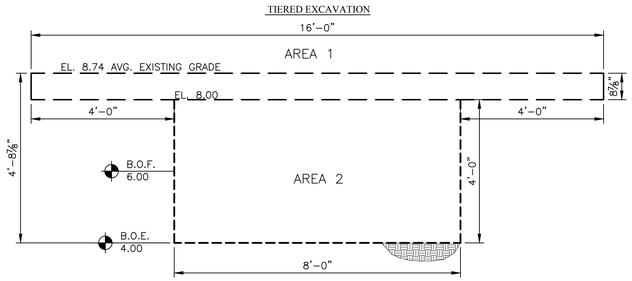
SALT SHED NO. 1
EXCAVATION LIMITS

11-Dec-2017

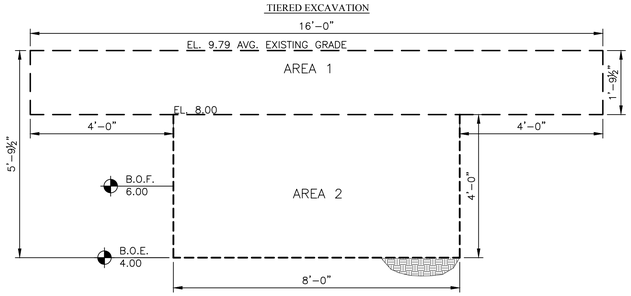
MASSDOT DORCHESTER SALT SHED DRAWINGS 2017-12-11.DWG



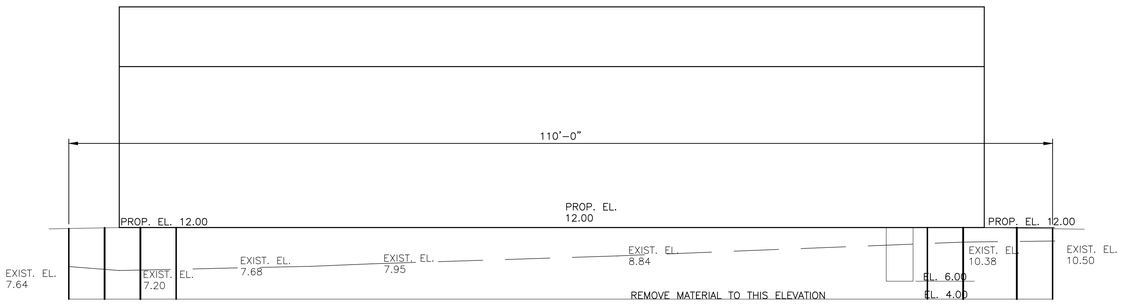
EXCAVATION LIMITS
SCALE: 1/8"=1'-0"



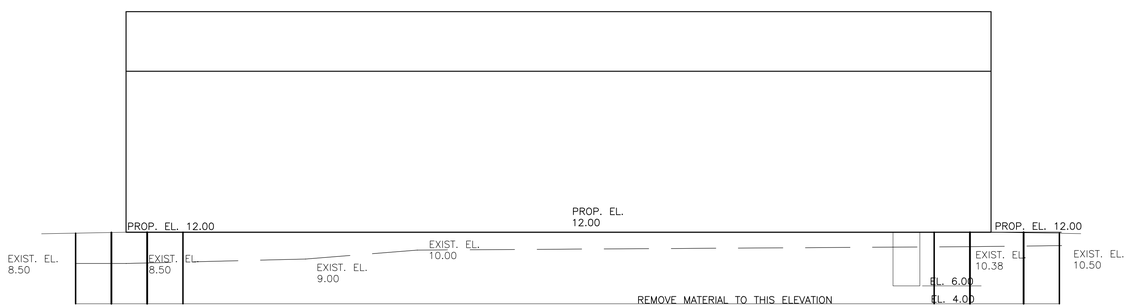
SALT SHED NO. 1 FOOTING
J/17 EXCAVATION CROSS-SECTION-EAST
SCALE: 1/2"=1'-0"



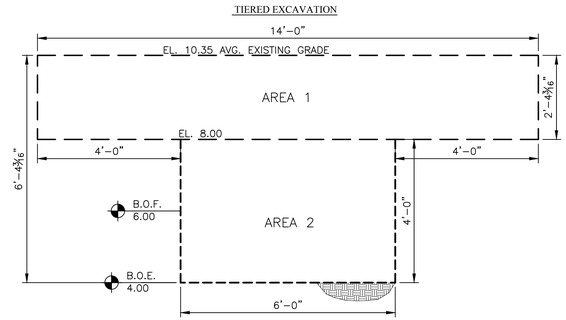
SALT SHED NO. 1 FOOTING
J/17 EXCAVATION CROSS-SECTION-WEST
SCALE: 1/2"=1'-0"



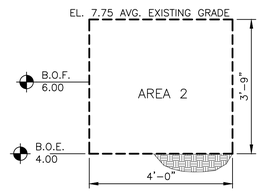
EAST EXCAVATION LIMITS
SCALE: 1/8"=1'-0"



WEST EXCAVATION LIMITS
SCALE: 1/8"=1'-0"



SALT SHED NO. 1 FOOTING
K/17 EXCAVATION CROSS-SECTION-REAR WALL
SCALE: 1/2"=1'-0"



SALT SHED NO. 1 FOOTING
L/17 EXCAVATION CROSS-SECTION FRONT WALL
SCALE: 1/2"=1'-0"

APPENDIX E – WETLANDS SURVEY MEMORANDUM

Stantec

Memo

To:	Sean Ross Stantec Consulting Services Inc. Boston, MA	From:	Katelin Nickerson Stantec Consulting Services Inc. Topsham, ME
File:	Mass DOT, 179410385	Date:	September 26, 2016

Reference: Massachusetts Department of Transportation
Proposed salt shed location
Dorchester, MA

On September 13, 2016, Stantec conducted a site visit and wetland survey at the location of a proposed Massachusetts Department of Transportation (MassDOT) salt shed on a parcel between the southbound lanes of Interstate 93 (I-93) and Freeport Street in Dorchester, MA. MassDOT is proposing to fill a depression within the lot to construct a salt shed for winter road maintenance. This site visit was conducted to assess whether the depression is a jurisdictional wetland under the Massachusetts Wetlands Protection Act and implementing regulations (WPA; 310 CMR 10.00) and federal Clean Water Act (CWA) and to identify permitting that may be required pursuant to these regulations to construct the proposed salt shed in this location.

GENERAL SITE DESCRIPTION

The site consists of a gravel lot, owned by MassDOT, and is approximately 36,500 square feet, with entrances from Freeport Street and Victory Road. The lot is currently used to store construction equipment and materials (Photo 1, Attachment A). The depression, located in the center of the lot, measures approximately 3,600 square feet and is dominated by common reed (*Phragmites australis*) (Photo 2, Attachment A). Additional vegetation observed within the depression includes Asian bittersweet (*Celastrus orbiculatus*), rambler rose (*Rosa multiflora*), lamp rush (*Juncus effuses*) and purple loosestrife (*Lythrum salicaria*).

Land surrounding the site is highly developed. Paved roads and buildings occur to the, south and west and I-93 is located to the east. A gravel lot owned by MassDOT exists north of the site on the opposite side of Victory Road. Red pine (*Pinus resinosa*) and black locust (*Robinia pseudoacacia*) trees are growing between the gravel lot and Freeport Street.

SURVEY METHODS

The wetland survey was conducted by a Stantec Professional Wetland Scientist using the methodologies outlined in the Massachusetts Department of Environmental Protection's (MassDEP) Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act: A Handbook; the U.S. Army Corps of Engineers' (Corps) 1987 Wetlands Delineation Manual; and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0, January 2012).

SURVEY RESULTS

The depression was determined not to be a Bordering Vegetated Wetland (BVW) due to the lack of a connection (piped or natural) to waterbody. The depression does not meet the criteria to be an Isolated Land Subject to Flooding (ILSF) based on its storage capacity and does not meet the

Reference: **Massachusetts Department of Transportation**
Proposed salt shed location
Dorchester, MA

definition of a wetland under the CWA due to the lack of hydric soils. A review of current Federal Emergency Management Agency (FEMA) mapping for the site revealed that the entire lot falls within Zone AE (EL 10) of the 100-year floodplain. As the flood zone is associated with Dorchester Bay, this would likely qualify the area as Land Subject to Coastal Storm Flowage (LSCSF), a WPA-regulated resource area.

RECOMMENDATION

Since the depression appears to qualify as LSCSF, a filing under the WPA with the Boston Conservation Commission (Commission) would be required to conduct work that may alter this area. Through recent conversations with Commission staff, Stantec learned that similar projects in the past few months have been approved through the submission of a Request for Determination of Applicability (RDA). Stantec recommends that MassDOT file an RDA with the Commission prior to initiating construction activities.

Please contact me if you have questions regarding the content of this memorandum.

Sincerely,

Stantec Consulting Services Inc.

Katelin Nickerson, PWS
Project Scientist
Phone: 207-713-4185
katelin.nickerson@stantec.com

Attachment: A – Site Photos

Reference: **Massachusetts Department of Transportation**
Proposed salt shed location
Dorchester, MA

Photo 1: Gravel lot (Study Area) located in Dorchester. I-93 south is visible on the right side of the photo and the depression is visible behind the loader and jersey barriers on the left side of the photo. Stantec. September 13, 2016.

Reference: **Massachusetts Department of Transportation**
Proposed salt shed location
Dorchester, MA

Photo 2: View of depression area (proposed salt shed location). Stantec. September 13, 2016.

APPENDIX F – STORMWATER REPORT (separate cover)

APPENDIX G – CLIMATE RESILIENCY REPORT SUMMARY

Boston Planning & Development Agency

Climate Resiliency Report Summary

Submitted: 10/23/2018 12:33:44

A.1 - Project Information

Project Name:	MassDOT - Victory Road Depot Improvements			
Project Address:	Corner of Freeport Street and Victory Road, Dorchester, MA			
Filing Type:	Initial (PNF, EPNF, NPC or other substantial filing)			
Filing Contact:	Michael Paiewonsky	Stantec	Michael.paiewonsky@Stantec.com	857.415.3920
Is MEPA approval required?	No	MEPA date:		

A.2 - Project Team

Owner / Developer:	MassDOT
Architect:	Bayside Engineering
Engineer:	Bayside Engineering
Sustainability / LEED:	N/A
Permitting:	Stantec/MassDOT
Construction Management:	MassDOT/Bayside Engineering

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Staff Office Building
List the First Floor Uses:	Meeting Room, Offices and Bathrooms with Showers
List any Critical Site Infrastructure and or Building Uses:	N/A

Site and Building:

Site Area (SF):	75800	Building Area (SF):	1080
Building Height (Ft):	14.83	Building Height (Stories):	1
Existing Site Elevation – Low (Ft BCB):	13.65	Existing Site Elevation – High (Ft BCB):	18.70
Proposed Site Elevation – Low (Ft BCB):	16.46	Proposed Site Elevation – High (Ft BCB):	18.70
Proposed First Floor Elevation (Ft BCB):	17.62	Below grade spaces/levels (#):	0

Article 37 Green Building:

LEED Version - Rating System:	N/A	LEED Certification:	No

Boston Planning & Development Agency
Climate Resiliency Report Summary

Proposed LEED rating:		Proposed LEED point score (Pts.):	N/A

Building Envelope:

When reporting R values, differentiate between R discontinuous and R continuous. For example, use "R13" to show R13 discontinuous and use R10c.i. to show R10 continuous. When reporting U value, report total assembly U value including supports and structural elements.

Roof:	R32	Exposed Floor :	R0.70
Foundation Wall:	R11.35	Slab Edge (at or below grade):	R11.70

Vertical Above-grade Assemblies (%'s are of total vertical area and together should total 100%):

Area of Opaque Curtain Wall & Spandrel Assembly:	0	Wall & Spandrel Assembly Value:	N/A
Area of Framed & Insulated / Standard Wall:	N/A	Wall Value:	R32
Area of Vision Window:	5.0	Window Glazing Assembly Value:	0.29
		Window Glazing SHGC:	SHGC
Area of Doors:	1.2	Door Assembly Value :	0.14

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	Annual Energy Loads were Not Calculated for this Building. Heating needs for this building were based on the Mass Energy Code. Building will not have a cooling system and is intended for late fall/winter to early spring use only.		
Annual Electric (kWh):		Peak Electric (kW):	
Annual Heating (MMbtu/hr):		Peak Heating (MMbtu):	
Annual Cooling (Tons/hr):	n/a	Peak Cooling (Tons):	
Energy Use - Below ASHRAE 90.1 - 2013 (%):		Have the local utilities reviewed the building energy performance?:	No
Energy Use - Below Mass. Code (%):		Energy Use Intensity (kBtu/SF):	

Back-up / Emergency Power System

Electrical Generation Output (kW):	45	Number of Power Units:	1
System Type (kW):	45	Fuel Source:	diesel

Emergency and Critical System Loads (in the event of a service interruption)

Electric (kW):	30	Heating (MMbtu/hr):	
		Cooling (Tons/hr):	

B – Greenhouse Gas Reduction and Net Zero / Net Positive Carbon Building Performance

Reducing greenhouse gas emissions is critical to avoiding more extreme climate change conditions. To achieve the City's goal of carbon-neutrality by 2050 the performance of new buildings will need to progressively improve to carbon net zero and net positive.

B.1 – GHG Emissions - Design Conditions

For this filing - Annual Building GHG Emissions (Tons):

For this filing - describe how building energy performance has been integrated into project planning, design, and engineering and any supporting analysis or modeling:

Energy Modeling was not Performed for this building. The building will be used seasonally during winter months as an ancillary facility to the salt shed operations.

Describe building specific passive energy efficiency measures including orientation, massing, building envelop, and systems:

Building is situated on the site to accommodate salt storage and equipment access operations.

Describe building specific active energy efficiency measures including high performance equipment, controls, fixtures, and systems:

Describe building specific load reduction strategies including on-site renewable energy, clean energy, and storage systems:

Describe any area or district scale emission reduction strategies including renewable energy, central energy plants, distributed energy systems, and smart grid infrastructure:

Describe any energy efficiency assistance or support provided or to be provided to the project:

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 building will have heating only (no a/c) and used seasonally.

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 (Deg.):		Temperature Range - High (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° (#):		Days - Above 100° (#):	
Number of Heatwaves / Year (#):		Average Duration of Heatwave (Days):	

Describe all building and site measures to reduce heat-island effect at the site and in the surrounding area:

The surrounding urban area contains an interstate highway and local roadway system.

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:

Energy Modeling was not Performed for this building. The building will be used seasonally during winter months as an ancillary facility to the salt shed operations.

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:

Building will not have a cooling system and intended for late fall winter to early spring use only

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

What is the project design precipitation level? (In. / 24 Hours)	4.90

Describe all building and site measures for reducing storm water run-off:

Infiltration/Detention Basin, Grassed Swales, Peastone Diaphragms

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):

Infiltration of stormwater is provided to the extent practicable due to soil type and limited space to accommodate equipment operations.

E – Sea Level Rise and Storms

Under any plausible greenhouse gas emissions scenario, the sea level 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 Special Flood Hazard Area?	Yes	What Zone:	AE
What is the current FEMA SFHA Zone Base Flood Elevation for the site (Ft BCB)?			16.45
Is any portion of the site in the BPDA Sea Level Rise Flood Hazard Area (see SLR-FHA online map)?	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 by the Sea Level Rise Flood Hazard Area (SLR-FHA), which includes 3.2' of sea level rise above 2013 tide levels, an additional 2.5" to account for subsidence, and the 1% Annual Chance Flood. After using the SLR-FHA to identify a project's Sea Level Rise Base Flood Elevation, proponents should calculate the Sea Level Rise Design Flood Elevation by

adding 12" of freeboard for buildings, and 24" of freeboard for critical facilities and infrastructure and any ground floor residential units.

What is the Sea Level Rise - Base Flood Elevation for the site (Ft BCB)?	25.55		
What is the Sea Level Rise - Design Flood Elevation for the site (Ft BCB)?	26.55	First Floor Elevation (Ft BCB):	17.62
What are the Site Elevations at Building (Ft BCB)?	16.95	What is the Accessible Route Elevation (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.:

The existing and proposed site will be below the expected SLR.

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.:

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:

No occupants.

Describe any strategies that would support rapid recovery after a weather event:

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.:

Describe future building adaptation strategies for raising the Sea Level Rise Design Flood Elevation and further protecting critical systems, including permanent and temporary measures:

Thank you for completing the Boston Climate Change Checklist!

For questions or comments about this checklist or Climate Change best practices, please contact:
John.Dalzell@boston.gov

MassDOT - Victory Road Depot Improvements Supplemental Information Revised Project Narrative Notice of Intent

Submitted to the Boston Conservation Commission

Location:
Victory Road
Dorchester, MA

Applicant:
Massachusetts Department of Transportation Highway Division
10 Park Plaza
Boston, MA 02116

Prepared by:
Stantec Consulting Services Inc.
226 Causeway Street, 6th Floor
Boston, MA 02114

October 24, 2018

Table of Contents

List of Appendices

APPENDIX A PROJECT NARRATIVE

1.0 INTRODUCTION

The Massachusetts Department of Transportation (MassDOT) Highway Division is submitting this Notice of Intent (NOI) Application to redevelop an existing maintenance depot lot between the southbound lanes of Interstate 93 (I-93) and Freeport Street in the Dorchester area of Boston, Massachusetts. The existing compacted gravel lot, owned by MassDOT, will be utilized to construct salt storage facilities, including two salt storage sheds and an associated administrative building, for winter road maintenance operations. Additional salt storage in Suffolk County, Massachusetts has been identified as a high priority for MassDOT to minimize both the time and distance of transporting salt to melt snow and ice-covered state and interstate highways.

An NOI is required as portions of the existing maintenance depot lot are mapped within the 100-year floodplain of the tidally-influenced Dorchester Bay, which qualifies as Land Subject to Coastal Storm Flowage (LSCSF). The 100-year floodplain associated with the identified coastal resource area (i.e. LSCSF) is protected under the *Massachusetts Wetlands Protection Act* (*Act*, M.G.L., c. 131, s. 40) and its implementing *Regulations Act Regulations*, 310 CMR 10.00).

A USGS Site Locus and a DEP Priority Resources Map, illustrating the project location and surrounding physical and environmental features are provided in Appendix B. Project Plans are provided in Appendix D. The following sections of this NOI provide a description of the existing site conditions, wetland boundary determination methodology, Wetland Resource Areas, and proposed project, including measures proposed to mitigate the potential impacts to the adjacent stormwater drainage system.

2.0 EXISTING CONDITIONS

This section provides a site description and resource area characterization for the project area.

Land use in the general vicinity of the project area was determined based on staff observations during a site visit on September 13, 2016, in addition to a review of information available through the Massachusetts Geographic Information System (MassGIS) online database.

The existing maintenance depot lot, owned by MassDOT, predominantly consists of densely compacted dirt/gravel, is approximately 48,000 square feet in size, and features entrances from Freeport Street to the west and Victory Road to the north. The lot, formerly leased to two construction companies for storage of construction equipment and materials, is currently in use as a temporary salt storage area for the winter season. (Photo 1, Appendix C).

According to existing survey information, a stormwater outfall (previously a combined sewer) is located under the site. The outfall daylights on the east side of the southeast expressway. A wet depression surrounded by jersey barriers, described in more detail in section 2.1, is located in the center of the lot. Red pine (*Pinus resinosa*) and black locust (*Robinia pseudoacacia*) trees are growing between the project site and Freeport Street.

2.1 METHODOLOGY OF RESOURCE AREA INVESTIGATIONS

An onsite wetland survey was conducted by a Stantec Professional Wetland Scientist on September 13, 2016 using the methodologies outlined in the Massachusetts Department of Environmental Protection's (MassDEP) Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act: A Handbook; the U.S. Army Corps of Engineers' (Corps) 1987 Wetlands Delineation Manual; and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0, January 2012).

An existing isolated surface depression, measuring approximately 3,600 square feet and located in the center of the lot, is dominated by common reed (*Phragmites australis*) (Photo 2, Appendix C). Additional vegetation observed within the depression includes Asiatic bittersweet (*Celastrus orbiculatus*), multiflora rose (*Rosa multiflora*), lamp rush (*Juncus effusus*) and purple loosestrife (*Lythrum salicaria*). The surface depression onsite was determined not to be a federally-jurisdictional vegetated wetland system due to the lack of both hydric soils, as well as any hydraulic connection (piped or natural) to a navigable waterbody. Furthermore, it was determined that the depression does not meet the qualifying criteria of an Isolated Land Subject to Flooding (ILSF) based on its inability to confine standing water to a volume of at least 0.25 acre-

feet and to average depth of a minimum of six inches, at least once year (see attached Wetlands Survey Memorandum, Appendix E).

The limits of jurisdictional Wetland Resource Areas within and immediately adjacent to the site were obtained from the most recent Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the project area. Based on a review of the current FEMA FIRM, portions of the existing maintenance depot lot are mapped within Zone AE (Elevation 10) of the 100-year floodplain associated with the tidally influenced Dorchester Bay (i.e. Land Subject to Coastal Storm Flowage). No other wetland resource areas subject to the jurisdiction of the Massachusetts Wetlands Protection Act were identified within the project area. A description of Land Subject to Coastal Storm Flowage is provided below.

2.2 DESCRIPTION OF RESOURCE AREA

Land Subject to Coastal Storm Flowage

LSCSF is defined at 310 CMR 10.04 as land subject to any inundation caused by coastal storms up to and including that caused by the 100-year storm, surge of record or storm of record, whichever is greater.

According to the revised March 16, 2016 FEMA FIRM (Appendix B, Figure 4) for Suffolk County, Massachusetts (Map Number 25025C0091J), portions of the maintenance depot lot are designated as Flood Areas in Zone AE. According to the FIRM, the flood elevation proximate to the project area corresponds to elevation 10 NAVD88, which corresponds to limit of LSCSF that is depicted on Sheet 4 of the Plans (Appendix D). LSCSF within the project area consists of gravel lot, stored jersey barriers, 6' chain link fence on the north and west perimeter, and jersey barriers surrounding a wet depression area described in Section 2.1 of this narrative and in the Wetland Survey Memorandum (Appendix E).

2.3 MA NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM DESIGNATION

According to the 13th Edition of the Massachusetts Natural Heritage Atlas (valid from August 2017) published by the Natural Heritage & Endangered Species Program (NHESP) and the MassGIS database, the project area is not located within the limits of mapped Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife. No Certified Vernal Pools (CVPs) or Potential Vernal

Pools (PVPs) are mapped on or within the immediate vicinity of the project area (see note in Appendix B, Figure 3: DEP Priority Resources and Critical Areas Resource Map).

2.4 OTHER PROTECTED ENVIRONMENTAL RESOURCES

According to available MassGIS mapping, the project is not located within any Areas of Critical Environmental Concern (ACEC) or any stormwater critical areas. The Neponset River Estuary ACEC is identified east of the I-93 highway corridor (see Appendix B, Figure 3).

3.0 PROJECT DESCRIPTION

The existing MWRA treatment building and associated pavement within the maintenance depot lot will be demolished with proposed site redevelopment to include:

- Grading
- Clearing and grubbing
- Installation of stormwater management drainage features
- Construction of two new roofed timber salt sheds (approximately 3,840 sf, each)
- Construction of a new 1,100 sf administration building
- Associated site paving and parking space accommodation

3.1 CONSTRUCTION SEQUENCE

The contractor will be responsible for selecting the means and methods to be used in the construction execution of the project in accordance with the contract documents. However, this NOI application includes a listing of the anticipated construction sequence. The anticipated sequence of construction is as follows:

1. Mobilize equipment, materials, and personnel.
2. Install erosion control measures to mitigate sediment migration outside the limits of work
3. Clearing/grubbing
4. Pavement overlay
5. Implementation of stormwater management drainage features
6. Construction of roofed timber salt shed facilities
7. Construction of administration building
8. Stabilize disturbed areas with loam and seed.
9. Remove erosion and sedimentation controls.

3.2 EROSION/SEDIMENT CONTROLS AND OTHER MITIGATION MEASURES

As shown on the attached design plans, prior to the commencement of any land disturbance work, erosion, and sedimentation control barriers, consisting of compost filter tubes, will be implemented to mitigate sediment migration outside the limits of work. In addition:

- The contractor will be required to maintain a reserve supply of erosion and sediment controls barriers on-site to make repairs, as necessary;
- The contractor will be required to inspect protective measures prior to and after significant precipitation events and repaired, as necessary;
- Erosion and sediment control (i.e. compost filter tubes) will remain in place until the area is stabilized.

Environmental mitigation measures will also include dust control to ensure that generation of on-site dust during work activities will be minimized. Wet suppression shall be used to provide temporary control of dust, as needed.

4.0 REGULATORY COMPLIANCE

4.1 MASSACHUSETTS WETLANDS PROTECTION ACT

A portion of the project site is mapped within Land Subject to Coastal Storm Flowage (LSCSF). Currently, there are no Performance Standards for work proposed within LSCSF under the Massachusetts Wetlands Protection Act Regulations. This site was selected because it is adjacent to Route 3 and other heavily traveled roadways where salt will be applied in the winter, the site is owned by MassDOT, and it has few residential properties nearby. Relocating the site out of the LSCSF would likely require it to be in a more residential area. A descriptive list of impacts within the LCSF resource area is provided here:

LSCSF Area - Site Preparation (Sheet 4, Appendix D)

- Clear and grub all existing vegetation within the wet depression area of jersey barriers. This area is the Phragmites-dominated wet depression that lacks wetland soil and does not qualify as either BVW or Isolated Land Subject to Flooding.
- Clear and grub all existing vegetation within area of 8" and 10" red pine trees in area on northwest side of property. Trees located between the gravel lot and Freeport Street will be removed and disposed of.

- Within the same northwest area of the property, the existing light pole and concrete base will be removed.
- Remove and dispose of existing 6' chain link fence on the north and west sides of the property and around the perimeter of the wet depression area.
- Remove and dispose of the existing concrete jersey barriers on the east perimeter of the property.
- Remove 38 linear feet of curbing on the north side of the property and store for use in constructing new entrance on same side of property.
- Cut and cap the existing 10" sewer line on the western side of the property along Freeport Street. The 10" sewer line south of the cut and cap point will be filled and abandoned.
- As part of the erosion and sediment controls, compost filler tubes will be put in place during construction along the south limit of work and along property lines on Victory Road and Freeport Street. A stabilized construction entrance (stone truck apron) will be installed at either the Victory Road or Freeport Street existing curb cut. Inlet protection will be added to the catch basins on Victory Road and Freeport Street.
- Precast blocks, including those stacked in piles, precast block wall, salt stored in salt pile, trailers, storage, etc., will be removed by Mass DOT prior to construction.
- Approximately 630 cubic yards of clean fill will be deposited and graded to create level construction area.

LSCSF Area - Proposed Victory Road Depot Improvements (Sheet 6, Appendix D)

- Salt Shed #1 will be constructed on the west side of the property along Freeport Street. Approximately 2,700 sf (70% of 3,840 sq.ft.) of the structure will be situated within the LSCSF area. A 1'-wide and 2-ft deep pea stone trench will be constructed along the project area perimeter.
- A 608 sq.ft. asphalt parking area will be constructed on the west side of the property along Freeport Street and adjacent to the north side of Salt Shed #1.
- A new generator and pad will be constructed to the immediate north side of the proposed parking area.
- A new 1,100 sq.ft. staff building will be constructed on the west side of the property and to the north side of the staff building. A 16'-6" sloped ramp will connect the new parking area to the staff building. The ramp will be located east of the new generator location described above.
- New 4" sanitary sewer, 2" water service and electric service will connect to the staff building from the west side of the property.
- Approximately 20' north of the proposed staff building, two (2) 5,000-gallon liquid tanks will be constructed on a concrete pad in a 12' by 24' area. A 1'-wide pea stone trench will be constructed on this area's south side.
- A detention basin, approximately 1,600 sq.ft., will be constructed at the northwest corner of the property. The basin will be constructed adjacent to the liquid tanks area.
- New precast jersey barriers with new 4' chain link fence mounted on top of barriers will be installed along the east side of the property.
- New 6' chain link fence will be installed on north and west sides of the property.

- The area east of the new jersey barriers/chain link fence will be filled, loamed, and seeded.
- Area west of the new jersey barriers/chain link fence and east of new staff building and parking area will be paved with hot mix asphalt (HMA).
- New 8'-6" cement concrete sidewalk with granite curb will be constructed along the north and west sides of the property.
- New curb will be installed at former site entrance on north side of property. New curb will be cut for new entrance at Victory Road with new slide gate installed.

Work in the Project Area outside of LSCSF includes the following:

- Removal of jersey barriers
- Approximately 570 cubic yards of clean fill will be deposited and graded to create level construction area
- Installation of BMP stormwater management features
- Construction of timber salt shed #2, and a portion of salt shed #1
- New precast jersey barriers with new 4' chain link fence mounted on top of barriers will be installed along the east side of the property.
- The area east of the new jersey barriers/chain link fence will be filled, loamed, and seeded.
- Area west of the new jersey barriers/chain link fence and north and east of new salt shed #2 will be paved with hot mix asphalt (HMA).

4.2 STORMWATER MANAGEMENT

According to the Massachusetts Stormwater Handbook, the Massachusetts Department of Environmental Protection's (MassDEP's) Stormwater Management Standards are applicable to stormwater runoff from all planned construction projects, which involve site preparation, construction, and redevelopment.

Stormwater management features are proposed within the limits of the existing lot in compliance with MassDEP's Stormwater Management Standards (See Stormwater Report, Appendix F). Proposed measures to capture and infiltrate or detain stormwater include 12-inch wide by 24-inch-deep peastone trenches surrounding the site perimeter, an approximately 300-foot long grass swale on the eastern edge of the site and a combination grass swale and detention basin on the western edge of the site. The design of the peastone trench, grass swale and detention basin will allow for regular removal of accumulated sediments.

The proposed site will be graded to achieve a similar post-construction runoff compared to existing conditions. In general, stormwater runoff from the site will flow over the paved surface to the 12-inch wide by 24-inch deep peastone trenches alongside the perimeter of the paved areas

where it is expected to infiltrate into the ground. During larger storm events, stormwater may overflow into the adjacent proposed swales and then infiltrate into the ground there. The proposed project is within a previously-developed site and applicable stormwater standards have been met to the greatest extent practicable. For more detailed information, see Appendix F Stormwater Report and check list.

The proposed project involves more than one acre of earth disturbance and, therefore, a Stormwater Construction General Permit in accordance with EPA's NPDES program will be required. The need for a NPDES Permit also will necessitate the preparation of a Stormwater Pollution Prevention Plan (SWPPP). This Plan will be prepared by the selected Contractor and a copy of the SWPPP will be retained onsite during construction.

5.0 SUMMARY

In summary, MassDOT is seeking approval from the City of Boston Conservation Commission to redevelop an existing maintenance depot lot between the southbound lanes of Interstate 93 (I-93) and Freeport Street for salt storage operations.

Portions of the maintenance depot lot and proposed multi-use path alignment are mapped within Land Subject to Coastal Storm Flowage (LSCSF), for which there are no applicable performance standards under the Massachusetts Wetlands Protection Act Regulations. Best Management Practices (BMPs) including erosion and sedimentation control barriers, consisting of compost filter tubes, will be implemented to mitigate the potential release of suspended sediment to the adjacent stormwater drainage system. Additionally, the project will provide stormwater BMP's within the existing maintenance depot lot, in compliance with MassDEP's Stormwater Management Standards.

On behalf of the Applicant, Stantec respectfully requests that the Boston Conservation Commission find these measures adequately protective of the interests identified in the Wetlands Protection Act, and issue an Order of Conditions approving the work described in this NOI, and shown on the accompanying plans.

Stormwater Report

Salt Shed and Administration Building
Site Development

Dorchester, MA
October 25, 2018

COMMONWEALTH OF MASSACHUSETTS
BREE D. SULLIVAN
CIVIL
NO. 48441
REGISTERED PROFESSIONAL ENGINEER

10-25-18

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Introduction

This report has been prepared to provide the stormwater design and analysis associated with the redevelopment of a site in Dorchester, Massachusetts. The proposed design has been developed to provide the necessary buildings and site circulation roadways to support MassDOT highway de-icing operations.

The project is located within the 100-year tidal floodplain of Dorchester Bay, which is regulated under the *Massachusetts Wetlands Protection Act (M.G.L., c. 131, § 40)* and defined as Land Subject to Coastal Storm Flowage (LSCSF). LSCSF is subject to protection as designated under 310 CMR 10.02(1)(d). The entire project will occur on previously developed land.

Existing Conditions

The existing site is located on Freeport Street and consists of compacted gravel on the north two-thirds of the site and a turf grass vegetated area in the southern third of the site. A portion of site was the location of a MWRA treatment building and small paved parking area. The land cover is 7.3% impervious (47.8% impervious including the highly compacted gravel). The structure and pavement has recently been removed in preparation of this project. The site is located directly to the west of the Southeast Expressway.

Runoff flows to three areas. The southerly portion of the site flows south to the adjacent property. A small portion of the site flows west onto Freeport Street and the central and north portion of the site flows into the small depression on site, then onto Victory Rd to the north. All of the stormwater runoff in the vicinity of the site eventually discharges to the mouth of the Neponset River/Marina Bay on the east side of the Southeast Expressway.

The NRCS Soil Map lists the entire site as Urban Land with wet substratum (soil unit#603). Several borings were performed on-site. The borings generally confirmed the soil map description. The soil horizons general consist of various soils including compacted sand and gravel, urban fill/historic fill layer, shallow refusal, sand and gravel and silty marine clay The NRCS Soil Report and test pit logs are included in the appendix.

Proposed Conditions

The proposed site includes two 3,840 square foot salt storage sheds, one 1,100 square foot staff building, miscellaneous deicing operations tanks and paved site circulation roadways. The site was designed to provide necessary work area to support efficient deicing operations. The three general discharge locations have been maintained. The post development site 43.7% impervious.

Regrading is necessary to provide positive drainage to stormwater structures. This will require approximately 630 cubic yards of fill within the LSCSF. This equates to loss of 500 cubic yards of volume available to coastal storm flowage. Storage in depressions and stormwater BMPs under elevation 9 (approx. 130 cubic yards) are presumed to be filled with water at the time of the storm event as a result of rainfall, and are therefore are not counted.

The north end of the site includes a small infiltration trench with a peastone diaphragm pretreatment for pavement runoff and a 12-inch overflow riser connected to the existing DMH at the Victory Road/Freeport Street intersection.

The central and southern portion of the site will discharge runoff to a proposed grass conveyance swale. The swale terminates at the existing southerly limit of work. This is the same runoff discharge location as existing. The removal of the MWRA treatment building and pavement in this catchment helps to offset the impervious area increase as a result of the proposed site circulation roadways.

The proposed salt shed roofs will be connected to the existing stormwater culvert under the site. The culvert daylights at the mouth of the Neponset River/Marina Bay on the east side of the Southeast Expressway. The roof runoff is “clean” and therefore requires no treatment prior to discharging to the culvert.

The proposed drainage design has been engineered to closely replicate the existing runoff patterns, while increasing water quality and infiltration.

Hydrologic and Hydraulic Methodology

Computations were performed using the HydroCAD Stormwater Modeling system. HydroCAD is a computer aided design program, primarily incorporating a hydrograph generating and routing program. HydroCAD incorporates reservoir and valley routing and provides Soil Conservation Services (SCS) TR-20 accuracy with a Graphical User Interface. Hydrographs are generated from the SCS unit hydrograph based on Watershed area, runoff curve number, time of concentration and rainfall amount.

Computations were performed for the 2-year, 10-year, 25-year and 100-year storm events using a local rainfall file generated using the Northeast Regional Climate Center (NRCC) extreme precipitation tables. Drainage subcatchment areas were delineated according to existing localized flow patterns. Using the existing ground cover type and SCS hydrologic soil groups, the permeability characteristics (CN value) of each drainage sub-catchment area was estimated by choosing a representative number that corresponds to the current land use. The soils in the basin are comprised of Types A, and D soils, as classified in the SCS Hydrologic Soil Groups and field observations. Due to the small size of the watershed, the time of concentration for each sub-catchment area was assumed

to be the simulation minimum time-step of 6 minutes. Tc numbers lower than this can produce unstable simulations and inaccurate results.

STORMWATER ANALYSIS

Stormwater flow changes are analyzed and compared at key locations in a project to evaluate the effect the proposed construction will have on drainage and infiltration patterns. The ideal goal is to provide a hydraulically similar pattern after construction. The analysis results provide the necessary data to show that the proposed project will accomplish this goal.

The existing drainage watersheds were analyzed at 3 critical locations: south, central and north. Subcatchment runoff is dependent on the soil classification, type of ground cover present and the direction and slope of the flow of runoff. The sub-catchment areas were delineated based on the flow to the existing catch basins.

Under the existing condition analysis, the north and central catchments flow into existing depressions on-site. The depressions were modeled as “ponds”. The depressions have significant sediment on the bottom and most likely do not appreciably infiltrate runoff and may not completely drain between rain events. Because of this condition, the existing runoff values in the chart from the north and central catchments are listed as if the ponds were completely full at the time of the event (i.e.-direct runoff from the north and central catchments).

The total peak runoff after construction will be no greater than existing.

Flow for the storm simulations are as follows:

North(from North Depression/Infiltration Basin)

	Storm Frequency			
Analysis Point	**2 year**	**10 year**	**25 year**	**100 year**
Existing	*0.1*	*1.4*	*3.2*	*5.8*
Developed	*0.0*	*1.2*	*2.5*	*3.4*
Difference	*-0.1*	*-0.2*	*-0.7*	*-2.4*

West

	Storm Frequency			
Analysis Point	**2 year**	**10 year**	**25 year**	**100 year**
Existing	*0.2*	*0.4*	*0.6*	*1.0*
Developed	*0.3*	*0.5*	*0.6*	*0.9*
Difference	*+0.1*	*+0.1*	*0.0*	*-0.1*

South

	Storm Frequency			
Analysis Point	**2 year**	**10 year**	**25 year**	**100 year**
Existing	*1.2*	*2.4*	*3.5*	*5.6*
Developed	*0.8*	*1.9*	*2.9*	*5.0*
Difference	*-0.4*	*-0.5*	*-0.6*	*-0.6*

Stormwater Best Management Practices

As part of the project and the requirements of the Stormwater Regulations, a best management practices construction period erosion and sedimentation control plan has been developed. Provisions for the replacement and upgrade of drainage system components that are identified as non-functioning as originally intended will be replaced in-kind or as specified in the *Massachusetts Stormwater Handbook*, the *MassHighway Stormwater Handbook for Highways and Bridges*, *MassHighway Project Development and Design Guide*. New BMPs include a small infiltration basin (with peastone diaphragms) and a grass conveyance channel. These structures have been utilized for total suspended solids removal and peak discharge attenuation. Utility locations, existing development/lack of available land and the presence of urban fill and potential contamination limit the possible treatment and infiltration upgrade alternatives.

APPENDICIES

Appendix A – Long-Term Pollution Prevention Plan and Operation & Maintenance Plan

Appendix B – NRCS Soil Data/Test Pit logs

Appendix C – Calculations

Appendix D – Photos

APPENDIX A

LONG-TERM POLLUTION PREVENTION PLAN
AND OPERATION & MAINTENANCE PLAN

OPERATION AND MAINTENANCE AND POLLUTION PREVENTION PLAN

Construction Operations

The operation and maintenance plan for construction operations outlines the installation, inspection, cleaning, and upkeep necessary to keep the siltation and erosion control system in good repair and operating efficiently. It is a critical component to the success of the stormwater best management practices designed for construction work on the site. Construction erosion controls minimize the potential for sedimentation in downstream gradient resource areas and abutting properties.

Construction sediment controls cover a wide range of practices, including stabilizing the construction entrance roadway, installing compost filter tubes, and controlling sediment at catch basins. The guiding principle for construction erosion control for this development is to minimize the volume of runoff and to minimize contact of stormwater with potential pollutants. Accepted construction management practices can reduce these stormwater pollutant loads and quantities.

The following construction best management practices (BMPs) for sediment and erosion control are included in this operation and maintenance plan.

1. Install compost filter tubes as shown on the plans and as required in the field to prevent sediment from leaving the limits of work.
2. Install silt sacks in all existing catch basins within the project limits.
3. Material stockpiles shall be stabilized with erosion control matting or temporary seeding whenever necessary.
4. Inspect and maintain BMPs at least weekly and after every major rainfall event.
5. Erosion control measures shall be maintained, repaired or replaced as required or at the direction of the resident engineer or Town Engineer.
6. During periodic inspections, if sediment is found to be exiting the site, measures shall be taken to ensure sediment does not reach the discharge points.
7. The contractor shall comply with the General and Erosion Control Notes show on the plans and in the contract documents.
8. Measures shall be taken to control dust during construction.
9. Construct and install drainage system improvements with adequate siltation protection.
10. Stabilize unvegetated areas, particularly slopes, which may be prone to erosion by using matting or an erosion control seed mixture.
11. Sediment shall be removed from barriers periodically. Compost filter tubes shall not be used as *de facto* retaining walls.
12. Remove and properly dispose of compost filter tubes and accumulated sediment following construction operations.

Developed Facilities

MassDOT is responsible for the maintenance and upkeep of the stormwater best management practices and will incorporate the maintenance in their normal BMP maintenance program.

The operation and maintenance plan outlines the regular inspection and cleaning schedule necessary to keep the system in good repair and operating efficiently, and is a

critical component of the success of the stormwater runoff erosion control best management practice designed for the proposed development.

Source controls reduce the types and concentrations of contaminants in stormwater runoff, which, in turn, improve water quality. Source controls cover a wide range of practices, including local bylaws and regulations, erosion and sediment controls at construction sites, and comprehensive snow management. The guiding principle for pollution prevention and control is to minimize the volume of runoff and to minimize contact of stormwater with potential pollutants. MassDOT will be responsible for the proper execution of the operation and maintenance plan after the completion of construction activities.

MassDOT has an established roadway and facilities BMP maintenance matrix that details the required tasks to ensure BMPs under their jurisdiction are inspected, maintained and operating as designed. The BMP maintenance at this site will be incorporated into the existing program. The following are methods typically used to inspect and maintain the BMPs at this site.

Source Control

Sweeping

Street sweeping is an effective source control, and implemented on an annual basis. Sweeping efforts are performed during the period immediately following winter snowmelt, when road sand and other accumulated sediment are washed off. MassDOT shall incorporate roadway sweeping as part of their normal roadway maintenance schedule.

Snow and Snow Melt Management

Proper management of snow and snow melt, snow removal and storage, use of deicing compounds, and other practices can minimize major runoff and pollutant loading impacts.

Structural BMPs

Infiltration Basin

Infiltration basins are prone to clogging and failure, so it is imperative to develop and implement aggressive maintenance plans and schedules.

Inspect After every major storm event (storms equal to or greater than 3 inches in 24 hours), otherwise twice per year.

Items to inspect:

- Signs of differential settlement
- Cracking
- Erosion
- Leakage in the embankments
- Tree growth on the embankments

- Condition of riprap/stone for pipe ends
- Sediment accumulation
- Vegetation health

If standing water persists more than 48-72 hours after a storm, the basin surface is likely clogged through compaction, sediment carryover or low spots. Correct this condition by determining the source of sediment carryover (if applicable) and rehabilitate the basin surface.

Clean Remove sediment from the basin as necessary, only when the floor of the basin is thoroughly dry.

Mow Why completely dry, yearly

Rehabilitate/ Reseed Use light equipment to remove the top layer so as to not compact the underlying soil. Deeply till the remaining soil, and revegetate immediately. Preference is to use hydroseed with a tackifier, blanket, or similar practice to ensure that scour does not occur prior to germination and root development.

APPENDIX B

NRCS SOIL DATA/TEST PIT LOGS

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Norfolk and Suffolk Counties, Massachusetts

August 1, 2017

Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,230 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 15 30 60 90

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 12, Sep 15, 2016

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

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

Map Unit Legend

Norfolk and Suffolk Counties, Massachusetts (MA616)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
603	Urban land, wet substratum, 0 to 3 percent slopes	2.4	100.0%
Totals for Area of Interest		**2.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Norfolk and Suffolk Counties, Massachusetts

603—Urban land, wet substratum, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: vkyl
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Parent material: Excavated and filled land over herbaceous organic material and/or alluvium and/or marine deposits

Minor Components

Udorthents

Percent of map unit: 13 percent
Hydric soil rating: Unranked

Beaches

Percent of map unit: 2 percent
Hydric soil rating: Unranked

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: MA DOT Salt Storage Shed
Dorchester, MA
Project No: 16.276.NH
Date Start: 12-02-16
Date End: 12-02-16

Sheet 1 **of** 1
Boring No: B-1
Location: See Plan
Approx. Surface Elev:

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS			
			Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	12-02-16			Groundwater Not Encountered
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		S-1	0.0-1.5	18	13	10	19	50	50/0"		S-1: Brown, dry, very dense, fine to medium sand, trace silt, gravel, concrete and asphalt (urban fill)	
		S-2	2.0-2.5	6	6	50	50/0"				S-2: Brown, dry, very dense, fine to medium sand, gravel, concrete, asphalt, brick, trace ash (urban fill)	
4		S-3	4.0-5.0	12	8	4	6	50/0"			S-3: Brown, dry, medium dense, fine sand, little silt, trace medium sand, gravel, asphalt, ash and cinders (urban fill)	
8											Auger Refusal at approximately 5', possible old building foundation. Moved approximately 5' to the southeast and drilled Boring B-1A BORING TERMINATED AT 5 ft	
12												
16												
20												
24												

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector: D. Ray

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: MA DOT Salt Storage Shed
Dorchester, MA
Project No: 16.276.NH
Date Start: 12-02-16
Date End: 12-02-16

Sheet 1 **of** 1
Boring No: B-1A
Location: See Plan
Approx. Surface Elev:

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS			
			Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	12-02-16			Groundwater Not Encountered
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		-	0.0-4.0	48							-: Drilled directly to a depth of 4' and began split-spoon sampling.	
4		S-1	4.0-5.7	20	12	8	8	5	50/2"		S-1: Dark brown to black, dry, medium dense, fine sand, trace medium sand, trace silt, fine gravel, asphalt, red brick, glass, ash, cinders, pieces of wood (urban fill) Auger Refusal at 6.5', possible old building foundation	
											BORING TERMINATED AT 6.5 ft	
8												
12												
16												
20												
24												

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector: D. Ray

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: MA DOT Salt Storage Shed
Dorchester, MA
Project No: 16.276.NH
Date Start: 12-02-16
Date End: 12-02-16

Sheet 1 **of** 1
Boring No: B-2
Location: See Plan
Approx. Surface Elev:

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS			
			Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	12-02-16	9.0'	n/a	During Drilling
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.		10.0'	15.0'	Upon Completion
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		S-1	0.0-2.0	24	16	14	36	35	48		S-1: Brown, dry, very dense, fine to medium sand, little gravel (granular fill)	
		S-2	2.0-4.0	24	17	17	10	7	7		S-2: Dark brown to black, dry, medium dense, fine sand, trace to little silt, fine gravel, coal, asphalt, ash, glass, cinders (urban fill)	
4		S-3	4.0-6.0	24	1	4	5	5	3		S-3: Dark brown to black, dry, loose, fine sand and silt, fine gravel, glass, ash (urban fill)	
		S-4	7.0-9.0	24	9	4	2	3	2		S-4: Black, dry, loose, coal dust, coal fragments, ash, cinders (urban fill)	
8		S-5	9.0-11.0	24	2	2	4	7	7		S-5: Dark brown, black, wet, medium dense, fine sand, trace to little silt, coal fragments, ash, cinders and glass fragments (urban fill)	
		S-6	11.0-13.0	24	2	6	6	11	45		S-6: Black, wet, medium dense, coal dust, coal fragments, cinders, ash (urban fill). Brown, wet, very fine in tip of split-spoon sampler.	
12												
		S-7	14.0-16.0	24	18	10	9	9	7		S-7: Brown, wet, medium dense, poorly sorted, fine to coarse sand, gravel, trace silt	
16												
		S-8	19.0-21.0	24	14	2	2	2	2		S-8: Dark gray, wet, soft, silty clay, thin interbedded layers of fine sand, shell fragments, plant fragments, strong organic odor	
20												
											BORING TERMINATED AT 21 ft	
24												

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector: D. Ray

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

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100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: MA DOT Salt Storage Shed
Dorchester, MA
Project No: 16.276.NH
Date Start: 12-02-16
Date End: 12-02-16

Sheet 1 **of** 1
Boring No: B-3
Location: See Plan
Approx. Surface Elev:

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS			
			Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	12-02-16	9.0'	n/a	During Drilling
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.		11.5'	15.0'	Upon Completion
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		S-1	0.0-2.0	24	13	20	14	22	31		S-1: Brown, dry, dense, fine to medium sand, trace coarse sand, gravel (granular fill)	
		S-2	2.0-2.3	3	3	50/3"					S-2: Dark brown, gray, dry, very dense, fine sand and silt, trace gravel, ash, red brick, glass (urban fill)	
4		S-3	4.0-6.0	24	0	5	6	6	6		S-3: No sample recovery	
		S-4	6.0-8.0	24	0	8	8	5	5		S-4: No sample recovery	
8												
12		S-5	9.0-11.0	24	4	9	9	10	5		S-5: Dark brown, wet, medium dense, fine sand, trace to little silt, gravel	
		S-6	14.0-16.0	24	14	10	3	4	4		S-6: Dark brown, dark gray, wet, soft, silty clay with interbedded fine sand layers, plant fragments, shell fragments	
16												
		S-7	19.0-21.0	24	12	1	5	4	3		S-7: Dark brown, dark gray, wet, soft, silty clay, plant fragments, shell fragments	
20												
											BORING TERMINATED AT 21 ft	
24												

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector: D. Ray

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES:

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: MA DOT Salt Storage Shed
Dorchester, MA
Project No: 16.276.NH
Date Start: 12-02-16
Date End: 12-02-16

Sheet 1 **of** 1
Boring No: B-4
Location: See Plan
Approx. Surface Elev:

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS			
			Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	12-02-16	9.0'		During Driling
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		S-1	0.0-0.3	3	3	45/3"					S-1: Dark brown, dry, very dense, fine sand, trace medium sand, trace silt, abundant gravel, asphalt (Granular Fill)	(1)
		S-2	2.0-4.0	24	18	26	43	21	16		S-2: Brown, gray, dry, very dense, fine to medium sand and angular gravel (Granular Fill)	
4		S-3	4.0-6.0	24	8	16	12	17	10		S-3: Brown, dark brown, dry, medium dense to dense, fine sand, trace to little silt, trace medium sand, gravel, asphalt, coal, ash and glass (urban fill)	
		S-4	6.0-8.0	24	8	13	9	5	6		S-4: Dark brown, moist, medium dense, fine sand, clay, little silt, trace medium sand, trace gravel, coal fragments, ash, glass, wood (urban fill)	
8												
		S-5	9.0-11.0	24	14	4	5	6	20		S-5: Dark brown, dark gray, medium dense, fine sand, clay, trace silt, gravel, trace coal and ash, trace glass (urban fill)	
12												
16		S-6	14.0-16.0	24	20	1	1	3	5		S-6: Dark brown, wet, soft, silty clay, trace fine sand, trace shell fragments, organic odor	
		S-7	19.0-21.0	24	12	5	4	4	9		S-7: Brown, gray, wet, loose to medium dense, silty clay with interbedded layers of fine sand, trace shell fragments	(2)
20												
											BORING TERMINATED AT 21 ft	
24												

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector: D. Ray

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES: (1) Spoon refusal at a depth of 3", very difficult drilling conditions from 0-2'.
(2) Samples S-6 and S-7 appear to be natural marine tidal deposits.

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

TEST BORING LOG

MILLER ENGINEERING & TESTING, INC.
100 Sheffield Road - Manchester, NH 03103
Ph. (603) 668-6016 - Fax: (603) 668-8641

Project: MA DOT Salt Storage Shed
Dorchester, MA
Project No: 16.276.NH
Date Start: 12-02-16
Date End: 12-02-16

Sheet 1 **of** 1
Boring No: B-5
Location: See Plan
Approx. Surface Elev:

	CASING	SAMPLER	GROUNDWATER OBSERVATIONS			
			Date	Depth	Casing At	Stabilization Period
Type	HSA	SS	12-02-16	9.0'		During Drilling
Size	2-1/4" ID	1-3/8" ID				
Hammer		140 lbs.				
Fall		30"				

Depth/ Elev.	Cas bl/ft	SAMPLE Sample No.	Depth Range	Pen.	Rec.	BLOWS 0-6"	6-12"	12-18"	18-24"	Strata Change	Sample Description	Notes
0		S-1	0.0-2.0	24	10	12	13	12	14		S-1: Brown, dark brown, dry, medium dense, fine to medium sand, fine gravel, asphalt, coal, ash, wood, glass (urban fill)	
		S-2	2.0-4.0	24	13	6	6	6	11		S-2: Brown, dark brown, dry, medium dense, fine to medium sand, trace to little silt, fine gravel, coal, ash, wood fragments, glass (urban fill)	
4		S-3	4.0-4.5	6	3	20	50/0"				S-3: Brown, dark brown, dry, medium dense, fine sand, little silt, trace medium sand, gravel, wood fragments (urban fill)	(1)
		S-4	6.0-8.0	24	10	2	2	8	2		S-4: Brown to dark brown ,dry, loose, fine sand, little silt, trace fine gravel, coal, asphalt, ash, wood fragments, with thin interbedded layer of fine to medium sand (urban fill)	
8		S-5	9.0-11.0	24	8	2	1	1	1		S-5: Dark brown, wet, loose, fine sand, trace to little silt, fine gravel, coal fragments, ash (urban fill)	
12		S-6	14.0-16.0	24	18	2	1	1	2		S-6: Brown to dark brown, wet, loose/soft, silty clay with trace to little fine sand, trace fine gravel, ash, coal and glass fragments (urban fill)	
16												
20		S-7	19.0-21.0	24	24	1	2	2	2		S-7: Dark brown, wet, soft, silty clay, trace fine sand, shell fragments, organic odor	(2)
24											BORING TERMINATED AT 21 ft	

Driller: R. Marcoux
Helper: K. Schwotzer
Inspector: D. Ray

COHESIVE CONSISTENCY (Blows/Foot)
0-2 VERY SOFT
2-4 SOFT
4-8 MEDIUM STIFF
8-15 STIFF
15-30 HARD

COHESIONLESS (Blows/Foot)
0-4 VERY LOOSE
4-10 LOOSE
10-30 MEDIUM DENSE
30-50 DENSE
50+ VERY DENSE

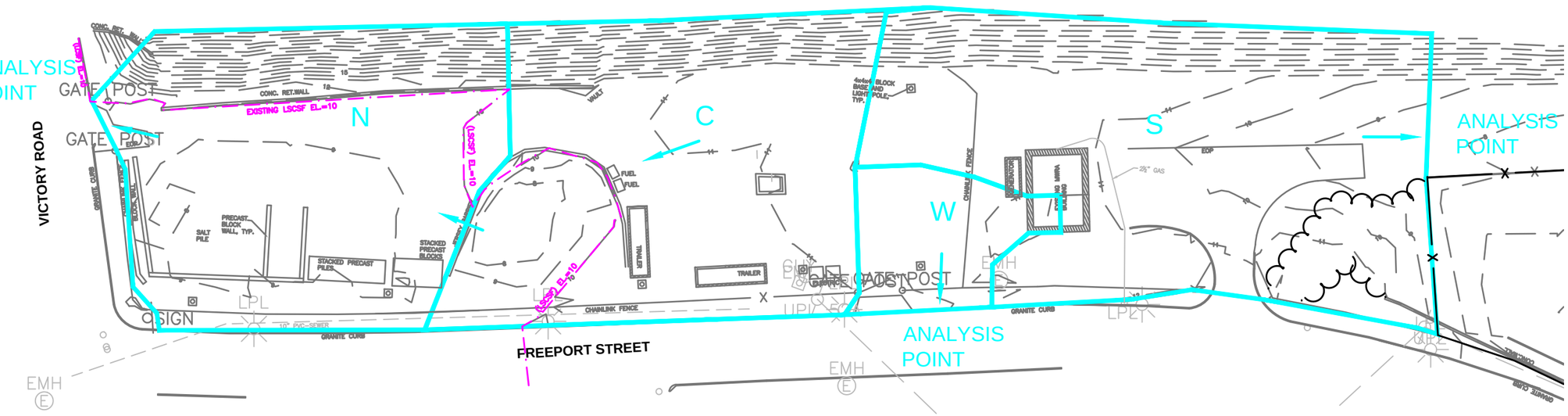
PROPORTIONS USED
TRACE: 0-10%
LITTLE: 10-20%
SOME: 20-35%
AND: 35-50%

NOTES: (1) Spoon bouncing on wood at a depth of 4.5'.
(2) Sample S-7 appears to be natural marine tidal desposits

REMARKS: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITION MAY BE GRADUAL.
WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS.
FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

APPENDIX C

CALCULATIONS

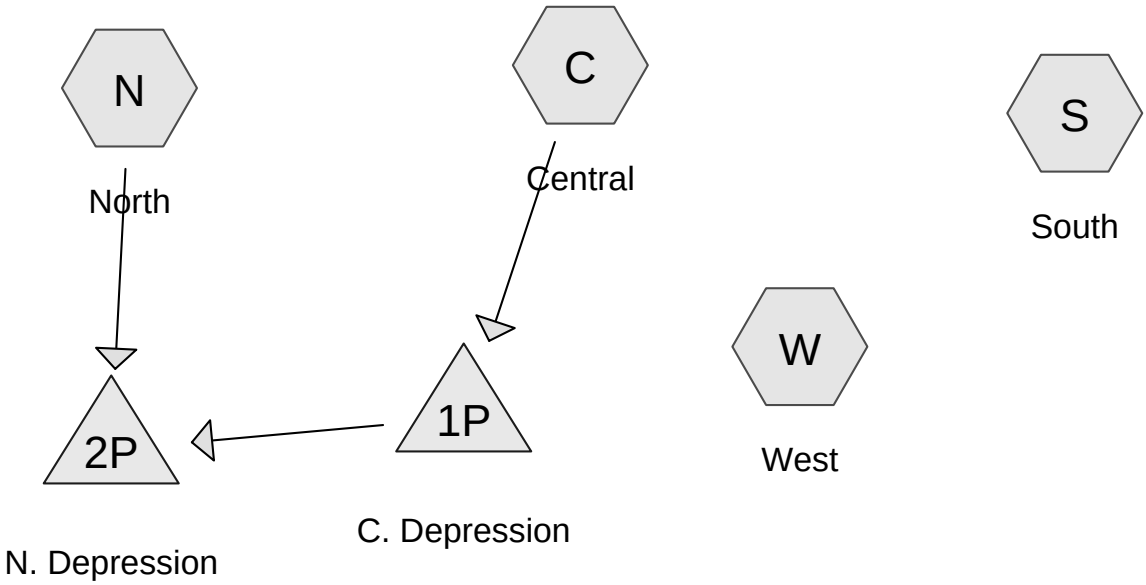


BAYSIDE ENGINEERING
600 Unicorn Park Drive ▲ Woburn, MA 01801
Phone: 781.932.3201 ▲ Fax: 781.932.3413
www.baysideengineering.com

GRAPHIC SCALE
60 0 30 60 120
1 INCH = 60 FEET

Dorchester Salt Sheds
EXISTING DRAINAGE CATCHMENTS

2152024-EC REVISED 2017-09-27.DWG Plotted on 19-Oct-2018 2:10 PM



Subcat Reach Pond Link

Routing Diagram for exist

Prepared by Bree Sullivan, PE - Bayside Engineering, Inc., Printed 10/18/2018

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
6,375	84	50-75% Grass cover, Fair, HSG D (C)
22,551	39	>75% Grass cover, Good, HSG A (C, N, S, W)
21,286	80	>75% Grass cover, Good, HSG D (S)
7,400	96	Gravel surface, HSG A (C, N)
32,140	96	Gravel surface, HSG D (C, N, W)
6,739	98	Paved parking, HSG D (N, S)
278	98	Unconnected roofs, HSG D (W)
96,769	**79**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
29,951	HSG A	C, N, S, W
0	HSG B	
0	HSG C	
66,818	HSG D	C, N, S, W
0	Other	
96,769		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
0	0	0	6,375	0	6,375	50-75% Grass cover, Fair	
22,551	0	0	21,286	0	43,837	>75% Grass cover, Good	
7,400	0	0	32,140	0	39,540	Gravel surface	
0	0	0	6,739	0	6,739	Paved parking	
0	0	0	278	0	278	Unconnected roofs	
29,951	**0**	**0**	**66,818**	**0**	**96,769**	**TOTAL AREA**	

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 C: Central Runoff Area=28,634 sf 0.00% Impervious Runoff Depth>1.59"
Tc=5.0 min CN=82 Runoff=1.27 cfs 3,800 cf

Subcatchment N: North Runoff Area=26,540 sf 0.66% Impervious Runoff Depth>1.52"
Tc=6.0 min CN=81 Runoff=1.09 cfs 3,366 cf

Subcatchment S: South Runoff Area=35,750 sf 18.36% Impervious Runoff Depth>1.08"
Tc=0.0 min CN=74 Runoff=1.18 cfs 3,229 cf

Subcatchment W: West Runoff Area=5,845 sf 4.76% Impervious Runoff Depth>1.26"
Tc=0.0 min UI Adjusted CN=77 Runoff=0.23 cfs 615 cf

Pond 1P: C. Depression Peak Elev=9.00' Storage=2,200 cf Inflow=1.27 cfs 3,800 cf
Outflow=3.24 cfs 5,130 cf

Pond 2P: N. Depression Peak Elev=9.48' Storage=8,250 cf Inflow=3.24 cfs 8,496 cf
Outflow=0.14 cfs 2,990 cf

Total Runoff Area = 96,769 sf Runoff Volume = 11,010 cf Average Runoff Depth = 1.37"
92.75% Pervious = 89,752 sf 7.25% Impervious = 7,017 sf

Summary for Subcatchment C: Central

Runoff = 1.27 cfs @ 12.03 hrs, Volume= 3,800 cf, Depth> 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 2-yr Rainfall=3.27"

Area (sf)	CN	Description
13,959	96	Gravel surface, HSG D
2,600	96	Gravel surface, HSG A
6,375	84	50-75% Grass cover, Fair, HSG D
5,700	39	>75% Grass cover, Good, HSG A
28,634	82	Weighted Average
28,634		100.00% Pervious Area

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

Summary for Subcatchment N: North

Runoff = 1.09 cfs @ 12.04 hrs, Volume= 3,366 cf, Depth> 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 2-yr Rainfall=3.27"

Area (sf)	CN	Description
14,500	96	Gravel surface, HSG D
4,800	96	Gravel surface, HSG A
175	98	Paved parking, HSG D
7,065	39	>75% Grass cover, Good, HSG A
26,540	81	Weighted Average
26,365		99.34% Pervious Area
175		0.66% Impervious Area

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

Summary for Subcatchment S: South

Runoff = 1.18 cfs @ 11.96 hrs, Volume= 3,229 cf, Depth> 1.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 2-yr Rainfall=3.27"

Area (sf)	CN	Description
6,564	98	Paved parking, HSG D
21,286	80	>75% Grass cover, Good, HSG D
7,900	39	>75% Grass cover, Good, HSG A
35,750	74	Weighted Average
29,186		81.64% Pervious Area
6,564		18.36% Impervious Area

Summary for Subcatchment W: West

Runoff = 0.23 cfs @ 11.96 hrs, Volume= 615 cf, Depth> 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 2-yr Rainfall=3.27"

Area (sf)	CN	Adj	Description
278	98		Unconnected roofs, HSG D
3,681	96		Gravel surface, HSG D
1,886	39		>75% Grass cover, Good, HSG A
5,845	78	77	Weighted Average, UI Adjusted
5,567			95.24% Pervious Area
278			4.76% Impervious Area
278			100.00% Unconnected

Summary for Pond 1P: C. Depression

Inflow Area = 28,634 sf, 0.00% Impervious, Inflow Depth > 1.59" for 2-yr event
Inflow = 1.27 cfs @ 12.03 hrs, Volume= 3,800 cf
Outflow = 3.24 cfs @ 0.00 hrs, Volume= 5,130 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.24 cfs @ 0.00 hrs, Volume= 5,130 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 9.00' Surf.Area= 3,000 sf Storage= 2,200 cf
Peak Elev= 9.00' @ 0.00 hrs Surf.Area= 3,000 sf Storage= 2,200 cf

Plug-Flow detention time= 160.0 min calculated for 2,924 cf (77% of inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	6,095 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.00	1,400	0	0
9.00	3,000	2,200	2,200
10.00	4,790	3,895	6,095

Device	Routing	Invert	Outlet Devices
#1	Primary	8.60'	**5.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.24 cfs @ 0.00 hrs HW=9.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 3.24 cfs @ 1.62 fps)

Summary for Pond 2P: N. Depression

Inflow Area = 55,174 sf, 0.32% Impervious, Inflow Depth > 1.85" for 2-yr event
Inflow = 3.24 cfs @ 0.00 hrs, Volume= 8,496 cf
Outflow = 0.14 cfs @ 14.21 hrs, Volume= 2,990 cf, Atten= 96%, Lag= 852.8 min
Primary = 0.14 cfs @ 14.21 hrs, Volume= 2,990 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 9.00' Surf.Area= 8,400 sf Storage= 2,631 cf
Peak Elev= 9.48' @ 14.21 hrs Surf.Area= 14,350 sf Storage= 8,250 cf (5,618 cf above start)

Plug-Flow detention time= 1,431.3 min calculated for 67 cf (1% of inflow)
Center-of-Mass det. time= 339.3 min (1,067.1 - 727.8)

Volume	Invert	Avail.Storage	Storage Description
#1	8.50'	15,643 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.50	2,125	0	0
9.00	8,400	2,631	2,631
9.45	14,350	5,119	7,750
10.00	14,350	7,893	15,643

Device	Routing	Invert	Outlet Devices
#1	Primary	9.47'	**30.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.13 cfs @ 14.21 hrs HW=9.48' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.13 cfs @ 0.28 fps)

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 C: Central Runoff Area=28,634 sf 0.00% Impervious Runoff Depth>2.99"
Tc=5.0 min CN=82 Runoff=2.20 cfs 7,126 cf

Subcatchment N: North Runoff Area=26,540 sf 0.66% Impervious Runoff Depth>2.89"
Tc=6.0 min CN=81 Runoff=1.94 cfs 6,398 cf

Subcatchment S: South Runoff Area=35,750 sf 18.36% Impervious Runoff Depth>2.28"
Tc=0.0 min CN=74 Runoff=2.41 cfs 6,807 cf

Subcatchment W: West Runoff Area=5,845 sf 4.76% Impervious Runoff Depth>2.54"
Tc=0.0 min UI Adjusted CN=77 Runoff=0.44 cfs 1,237 cf

Pond 1P: C. Depression Peak Elev=9.00' Storage=2,200 cf Inflow=2.20 cfs 7,126 cf
Outflow=3.24 cfs 8,438 cf

Pond 2P: N. Depression Peak Elev=9.54' Storage=9,113 cf Inflow=3.49 cfs 14,837 cf
Outflow=1.45 cfs 9,291 cf

Total Runoff Area = 96,769 sf Runoff Volume = 21,569 cf Average Runoff Depth = 2.67"
92.75% Pervious = 89,752 sf 7.25% Impervious = 7,017 sf

Summary for Subcatchment C: Central

Runoff = 2.20 cfs @ 12.03 hrs, Volume= 7,126 cf, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 10-yr Rainfall=4.90"

Area (sf)	CN	Description
13,959	96	Gravel surface, HSG D
2,600	96	Gravel surface, HSG A
6,375	84	50-75% Grass cover, Fair, HSG D
5,700	39	>75% Grass cover, Good, HSG A
28,634	82	Weighted Average
28,634		100.00% Pervious Area

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

Summary for Subcatchment N: North

Runoff = 1.94 cfs @ 12.04 hrs, Volume= 6,398 cf, Depth> 2.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 10-yr Rainfall=4.90"

Area (sf)	CN	Description
14,500	96	Gravel surface, HSG D
4,800	96	Gravel surface, HSG A
175	98	Paved parking, HSG D
7,065	39	>75% Grass cover, Good, HSG A
26,540	81	Weighted Average
26,365		99.34% Pervious Area
175		0.66% Impervious Area

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

Summary for Subcatchment S: South

Runoff = 2.41 cfs @ 11.96 hrs, Volume= 6,807 cf, Depth> 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 10-yr Rainfall=4.90"

Area (sf)	CN	Description
6,564	98	Paved parking, HSG D
21,286	80	>75% Grass cover, Good, HSG D
7,900	39	>75% Grass cover, Good, HSG A
35,750	74	Weighted Average
29,186		81.64% Pervious Area
6,564		18.36% Impervious Area

Summary for Subcatchment W: West

Runoff = 0.44 cfs @ 11.96 hrs, Volume= 1,237 cf, Depth> 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 10-yr Rainfall=4.90"

Area (sf)	CN	Adj	Description
278	98		Unconnected roofs, HSG D
3,681	96		Gravel surface, HSG D
1,886	39		>75% Grass cover, Good, HSG A
5,845	78	77	Weighted Average, UI Adjusted
5,567			95.24% Pervious Area
278			4.76% Impervious Area
278			100.00% Unconnected

Summary for Pond 1P: C. Depression

Inflow Area = 28,634 sf, 0.00% Impervious, Inflow Depth > 2.99" for 10-yr event
Inflow = 2.20 cfs @ 12.03 hrs, Volume= 7,126 cf
Outflow = 3.24 cfs @ 0.00 hrs, Volume= 8,438 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.24 cfs @ 0.00 hrs, Volume= 8,438 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 9.00' Surf.Area= 3,000 sf Storage= 2,200 cf
Peak Elev= 9.00' @ 0.00 hrs Surf.Area= 3,000 sf Storage= 2,200 cf

Plug-Flow detention time= 103.5 min calculated for 6,238 cf (88% of inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	6,095 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.00	1,400	0	0
9.00	3,000	2,200	2,200
10.00	4,790	3,895	6,095

Device	Routing	Invert	Outlet Devices
#1	Primary	8.60'	**5.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.24 cfs @ 0.00 hrs HW=9.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 3.24 cfs @ 1.62 fps)

Summary for Pond 2P: N. Depression

Inflow Area = 55,174 sf, 0.32% Impervious, Inflow Depth > 3.23" for 10-yr event
Inflow = 3.49 cfs @ 12.06 hrs, Volume= 14,837 cf
Outflow = 1.45 cfs @ 12.32 hrs, Volume= 9,291 cf, Atten= 59%, Lag= 15.6 min
Primary = 1.45 cfs @ 12.32 hrs, Volume= 9,291 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 9.00' Surf.Area= 8,400 sf Storage= 2,631 cf
Peak Elev= 9.54' @ 12.32 hrs Surf.Area= 14,350 sf Storage= 9,113 cf (6,482 cf above start)

Plug-Flow detention time= 470.0 min calculated for 6,355 cf (43% of inflow)
Center-of-Mass det. time= 162.0 min (926.7 - 764.7)

Volume	Invert	Avail.Storage	Storage Description
#1	8.50'	15,643 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.50	2,125	0	0
9.00	8,400	2,631	2,631
9.45	14,350	5,119	7,750
10.00	14,350	7,893	15,643

Device	Routing	Invert	Outlet Devices
#1	Primary	9.47'	**30.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.43 cfs @ 12.32 hrs HW=9.54' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.43 cfs @ 0.64 fps)

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 C: Central Runoff Area=28,634 sf 0.00% Impervious Runoff Depth>4.15"
Tc=5.0 min CN=82 Runoff=2.97 cfs 9,900 cf

Subcatchment N: North Runoff Area=26,540 sf 0.66% Impervious Runoff Depth>4.04"
Tc=6.0 min CN=81 Runoff=2.63 cfs 8,941 cf

Subcatchment S: South Runoff Area=35,750 sf 18.36% Impervious Runoff Depth>3.34"
Tc=0.0 min CN=74 Runoff=3.46 cfs 9,941 cf

Subcatchment W: West Runoff Area=5,845 sf 4.76% Impervious Runoff Depth>3.64"
Tc=0.0 min UI Adjusted CN=77 Runoff=0.62 cfs 1,771 cf

Pond 1P: C. Depression Peak Elev=9.00' Storage=2,200 cf Inflow=2.97 cfs 9,900 cf
Outflow=3.24 cfs 11,202 cf

Pond 2P: N. Depression Peak Elev=9.60' Storage=9,894 cf Inflow=4.83 cfs 20,143 cf
Outflow=3.27 cfs 14,568 cf

Total Runoff Area = 96,769 sf Runoff Volume = 30,553 cf Average Runoff Depth = 3.79"
92.75% Pervious = 89,752 sf 7.25% Impervious = 7,017 sf

Summary for Subcatchment C: Central

Runoff = 2.97 cfs @ 12.03 hrs, Volume= 9,900 cf, Depth> 4.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 25-yr Rainfall=6.18"

Area (sf)	CN	Description
13,959	96	Gravel surface, HSG D
2,600	96	Gravel surface, HSG A
6,375	84	50-75% Grass cover, Fair, HSG D
5,700	39	>75% Grass cover, Good, HSG A
28,634	82	Weighted Average
28,634		100.00% Pervious Area

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

Summary for Subcatchment N: North

Runoff = 2.63 cfs @ 12.04 hrs, Volume= 8,941 cf, Depth> 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 25-yr Rainfall=6.18"

Area (sf)	CN	Description
14,500	96	Gravel surface, HSG D
4,800	96	Gravel surface, HSG A
175	98	Paved parking, HSG D
7,065	39	>75% Grass cover, Good, HSG A
26,540	81	Weighted Average
26,365		99.34% Pervious Area
175		0.66% Impervious Area

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

Summary for Subcatchment S: South

Runoff = 3.46 cfs @ 11.95 hrs, Volume= 9,941 cf, Depth> 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 25-yr Rainfall=6.18"

Area (sf)	CN	Description
6,564	98	Paved parking, HSG D
21,286	80	>75% Grass cover, Good, HSG D
7,900	39	>75% Grass cover, Good, HSG A
35,750	74	Weighted Average
29,186		81.64% Pervious Area
6,564		18.36% Impervious Area

Summary for Subcatchment W: West

Runoff = 0.62 cfs @ 11.95 hrs, Volume= 1,771 cf, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 25-yr Rainfall=6.18"

Area (sf)	CN	Adj	Description
278	98		Unconnected roofs, HSG D
3,681	96		Gravel surface, HSG D
1,886	39		>75% Grass cover, Good, HSG A
5,845	78	77	Weighted Average, UI Adjusted
5,567			95.24% Pervious Area
278			4.76% Impervious Area
278			100.00% Unconnected

Summary for Pond 1P: C. Depression

Inflow Area = 28,634 sf, 0.00% Impervious, Inflow Depth > 4.15" for 25-yr event
Inflow = 2.97 cfs @ 12.03 hrs, Volume= 9,900 cf
Outflow = 3.24 cfs @ 0.00 hrs, Volume= 11,202 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.24 cfs @ 0.00 hrs, Volume= 11,202 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 9.00' Surf.Area= 3,000 sf Storage= 2,200 cf
Peak Elev= 9.00' @ 0.00 hrs Surf.Area= 3,000 sf Storage= 2,200 cf

Plug-Flow detention time= 84.1 min calculated for 9,002 cf (91% of inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	6,095 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.00	1,400	0	0
9.00	3,000	2,200	2,200
10.00	4,790	3,895	6,095

Device	Routing	Invert	Outlet Devices
#1	Primary	8.60'	**5.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.24 cfs @ 0.00 hrs HW=9.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 3.24 cfs @ 1.62 fps)

Summary for Pond 2P: N. Depression

Inflow Area = 55,174 sf, 0.32% Impervious, Inflow Depth > 4.38" for 25-yr event
Inflow = 4.83 cfs @ 12.06 hrs, Volume= 20,143 cf
Outflow = 3.27 cfs @ 12.17 hrs, Volume= 14,568 cf, Atten= 32%, Lag= 6.9 min
Primary = 3.27 cfs @ 12.17 hrs, Volume= 14,568 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 9.00' Surf.Area= 8,400 sf Storage= 2,631 cf
Peak Elev= 9.60' @ 12.17 hrs Surf.Area= 14,350 sf Storage= 9,894 cf (7,263 cf above start)

Plug-Flow detention time= 324.4 min calculated for 11,621 cf (58% of inflow)
Center-of-Mass det. time= 121.3 min (894.6 - 773.3)

Volume	Invert	Avail.Storage	Storage Description
#1	8.50'	15,643 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.50	2,125	0	0
9.00	8,400	2,631	2,631
9.45	14,350	5,119	7,750
10.00	14,350	7,893	15,643

Device	Routing	Invert	Outlet Devices
#1	Primary	9.47'	**30.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.22 cfs @ 12.17 hrs HW=9.60' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 3.22 cfs @ 0.84 fps)

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 C: Central Runoff Area=28,634 sf 0.00% Impervious Runoff Depth>6.62"
Tc=5.0 min CN=82 Runoff=4.52 cfs 15,787 cf

Subcatchment N: North Runoff Area=26,540 sf 0.66% Impervious Runoff Depth>6.49"
Tc=6.0 min CN=81 Runoff=3.98 cfs 14,360 cf

Subcatchment S: South Runoff Area=35,750 sf 18.36% Impervious Runoff Depth>5.65"
Tc=0.0 min CN=74 Runoff=5.58 cfs 16,823 cf

Subcatchment W: West Runoff Area=5,845 sf 4.76% Impervious Runoff Depth>6.01"
Tc=0.0 min UI Adjusted CN=77 Runoff=0.97 cfs 2,929 cf

Pond 1P: C. Depression Peak Elev=9.03' Storage=2,287 cf Inflow=4.52 cfs 15,787 cf
Outflow=3.62 cfs 17,071 cf

Pond 2P: N. Depression Peak Elev=9.66' Storage=10,775 cf Inflow=7.48 cfs 31,430 cf
Outflow=5.85 cfs 25,794 cf

Total Runoff Area = 96,769 sf Runoff Volume = 49,899 cf Average Runoff Depth = 6.19"
92.75% Pervious = 89,752 sf 7.25% Impervious = 7,017 sf

Summary for Subcatchment C: Central

Runoff = 4.52 cfs @ 12.02 hrs, Volume= 15,787 cf, Depth> 6.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 100-yr Rainfall=8.80"

Area (sf)	CN	Description
13,959	96	Gravel surface, HSG D
2,600	96	Gravel surface, HSG A
6,375	84	50-75% Grass cover, Fair, HSG D
5,700	39	>75% Grass cover, Good, HSG A
28,634	82	Weighted Average
28,634		100.00% Pervious Area

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

Summary for Subcatchment N: North

Runoff = 3.98 cfs @ 12.04 hrs, Volume= 14,360 cf, Depth> 6.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 100-yr Rainfall=8.80"

Area (sf)	CN	Description
14,500	96	Gravel surface, HSG D
4,800	96	Gravel surface, HSG A
175	98	Paved parking, HSG D
7,065	39	>75% Grass cover, Good, HSG A
26,540	81	Weighted Average
26,365		99.34% Pervious Area
175		0.66% Impervious Area

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

Summary for Subcatchment S: South

Runoff = 5.58 cfs @ 11.95 hrs, Volume= 16,823 cf, Depth> 5.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 100-yr Rainfall=8.80"

Area (sf)	CN	Description
6,564	98	Paved parking, HSG D
21,286	80	>75% Grass cover, Good, HSG D
7,900	39	>75% Grass cover, Good, HSG A
35,750	74	Weighted Average
29,186		81.64% Pervious Area
6,564		18.36% Impervious Area

Summary for Subcatchment W: West

Runoff = 0.97 cfs @ 11.95 hrs, Volume= 2,929 cf, Depth> 6.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 100-yr Rainfall=8.80"

Area (sf)	CN	Adj	Description
278	98		Unconnected roofs, HSG D
3,681	96		Gravel surface, HSG D
1,886	39		>75% Grass cover, Good, HSG A
5,845	78	77	Weighted Average, UI Adjusted
5,567			95.24% Pervious Area
278			4.76% Impervious Area
278			100.00% Unconnected

Summary for Pond 1P: C. Depression

Inflow Area = 28,634 sf, 0.00% Impervious, Inflow Depth > 6.62" for 100-yr event
Inflow = 4.52 cfs @ 12.02 hrs, Volume= 15,787 cf
Outflow = 3.62 cfs @ 12.08 hrs, Volume= 17,071 cf, Atten= 20%, Lag= 3.4 min
Primary = 3.62 cfs @ 12.08 hrs, Volume= 17,071 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 9.00' Surf.Area= 3,000 sf Storage= 2,200 cf
Peak Elev= 9.03' @ 12.08 hrs Surf.Area= 3,051 sf Storage= 2,287 cf (87 cf above start)

Plug-Flow detention time= 62.3 min calculated for 14,871 cf (94% of inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	8.00'	6,095 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.00	1,400	0	0
9.00	3,000	2,200	2,200
10.00	4,790	3,895	6,095

Device	Routing	Invert	Outlet Devices
#1	Primary	8.60'	**5.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=3.55 cfs @ 12.08 hrs HW=9.02' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 3.55 cfs @ 1.68 fps)

Summary for Pond 2P: N. Depression

Inflow Area = 55,174 sf, 0.32% Impervious, Inflow Depth > 6.84" for 100-yr event
Inflow = 7.48 cfs @ 12.06 hrs, Volume= 31,430 cf
Outflow = 5.85 cfs @ 12.13 hrs, Volume= 25,794 cf, Atten= 22%, Lag= 4.8 min
Primary = 5.85 cfs @ 12.13 hrs, Volume= 25,794 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Starting Elev= 9.00' Surf.Area= 8,400 sf Storage= 2,631 cf
Peak Elev= 9.66' @ 12.13 hrs Surf.Area= 14,350 sf Storage= 10,775 cf (8,144 cf above start)

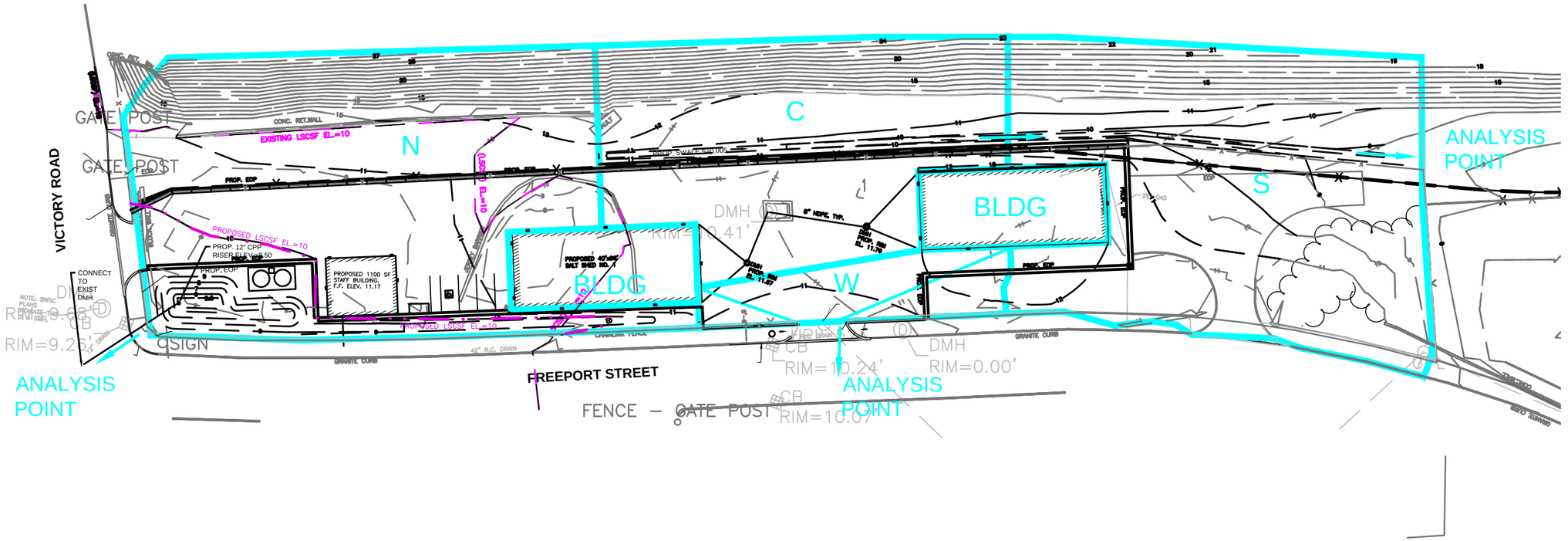
Plug-Flow detention time= 224.9 min calculated for 22,871 cf (73% of inflow)
Center-of-Mass det. time= 86.9 min (863.3 - 776.4)

Volume	Invert	Avail.Storage	Storage Description
#1	8.50'	15,643 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
8.50	2,125	0	0
9.00	8,400	2,631	2,631
9.45	14,350	5,119	7,750
10.00	14,350	7,893	15,643

Device	Routing	Invert	Outlet Devices
#1	Primary	9.47'	**30.0' long x 5.0' 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) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=5.79 cfs @ 12.13 hrs HW=9.66' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 5.79 cfs @ 1.02 fps)



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GRAPHIC SCALE

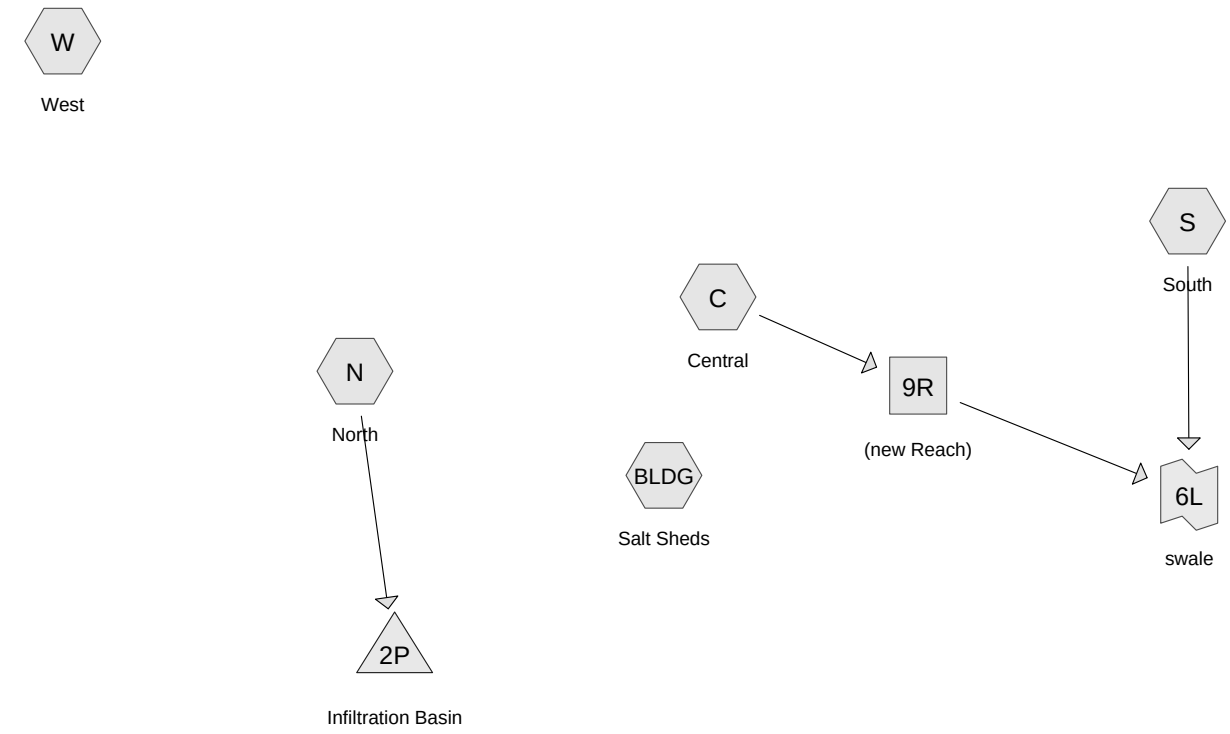
60 0 30 60 120

1 INCH = 60 FEET

Dorchester Salt Sheds

PROPOSED DRAINAGE CATCHMENTS

MASSDOT DORCHESTER SITE PLAN 100 2018-10-16.DWG Plotted on: 19-Oct-2018 2:11 PM



Subcat Reach Pond Link

Routing Diagram for PROPOSED

Prepared by Bree Sullivan, PE - Bayside Engineering, Inc., Printed 10/18/2018

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
29,862	39	>75% Grass cover, Good, HSG A (C, N, S, W)
24,613	80	>75% Grass cover, Good, HSG D (N, S)
34,576	98	Paved parking, HSG D (C, N, S, W)
7,680	98	Unconnected roofs, HSG D (BLDG)
96,731	**75**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
29,862	HSG A	C, N, S, W
0	HSG B	
0	HSG C	
66,869	HSG D	BLDG, C, N, S, W
0	Other	
96,731		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Sub Num
29,862	0	0	24,613	0	54,475	>75% Grass cover, Good	
0	0	0	34,576	0	34,576	Paved parking	
0	0	0	7,680	0	7,680	Unconnected roofs	
29,862	**0**	**0**	**66,869**	**0**	**96,731**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2P	5.50	4.90	60.0	0.0100	0.011	12.0	0.0	0.0

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 BLDG: Salt Sheds Runoff Area=7,680 sf 100.00% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=98 Runoff=0.57 cfs 1,944 cf

Subcatchment C: Central Runoff Area=19,332 sf 44.64% Impervious Runoff Depth=0.63"
Tc=5.0 min CN=65 Runoff=0.26 cfs 1,023 cf

Subcatchment N: North Runoff Area=35,275 sf 58.58% Impervious Runoff Depth=1.39"
Tc=6.0 min CN=79 Runoff=1.31 cfs 4,085 cf

Subcatchment S: South Runoff Area=29,743 sf 5.14% Impervious Runoff Depth=0.87"
Tc=0.0 min CN=70 Runoff=0.74 cfs 2,154 cf

Subcatchment W: West Runoff Area=4,701 sf 79.79% Impervious Runoff Depth=1.90"
Tc=0.0 min CN=86 Runoff=0.29 cfs 743 cf

Reach 9R: (new Reach) Avg. Flow Depth=0.11' Max Vel=0.80 fps Inflow=0.26 cfs 1,023 cf
n=0.030 L=213.0' S=0.0057 '/' Capacity=13.34 cfs Outflow=0.20 cfs 1,023 cf

Pond 2P: Infiltration Basin Peak Elev=8.42' Storage=1,837 cf Inflow=1.31 cfs 4,085 cf
Discarded=0.08 cfs 4,085 cf Primary=0.00 cfs 0 cf Outflow=0.08 cfs 4,085 cf

Link 6L: swale Inflow=0.75 cfs 3,177 cf
Primary=0.75 cfs 3,177 cf

Total Runoff Area = 96,731 sf Runoff Volume = 9,948 cf Average Runoff Depth = 1.23"
56.32% Pervious = 54,475 sf 43.68% Impervious = 42,256 sf

Summary for Subcatchment BLDG: Salt Sheds

Runoff = 0.57 cfs @ 12.04 hrs, Volume= 1,944 cf, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 2-yr Rainfall=3.27"

Area (sf)	CN	Description
7,680	98	Unconnected roofs, HSG D
7,680		100.00% Impervious Area
7,680		100.00% Unconnected

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

Summary for Subcatchment C: Central

Runoff = 0.26 cfs @ 12.04 hrs, Volume= 1,023 cf, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 2-yr Rainfall=3.27"

Area (sf)	CN	Description
8,630	98	Paved parking, HSG D
10,702	39	>75% Grass cover, Good, HSG A
19,332	65	Weighted Average
10,702		55.36% Pervious Area
8,630		44.64% Impervious Area

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

Summary for Subcatchment N: North

Runoff = 1.31 cfs @ 12.04 hrs, Volume= 4,085 cf, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 2-yr Rainfall=3.27"

Area (sf)	CN	Description
20,665	98	Paved parking, HSG D
10,310	39	>75% Grass cover, Good, HSG A
4,300	80	>75% Grass cover, Good, HSG D
35,275	79	Weighted Average
14,610		41.42% Pervious Area
20,665		58.58% Impervious Area

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

Summary for Subcatchment S: South

Runoff = 0.74 cfs @ 11.96 hrs, Volume= 2,154 cf, Depth= 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 2-yr Rainfall=3.27"

Area (sf)	CN	Description
1,530	98	Paved parking, HSG D
20,313	80	>75% Grass cover, Good, HSG D
7,900	39	>75% Grass cover, Good, HSG A
29,743	70	Weighted Average
28,213		94.86% Pervious Area
1,530		5.14% Impervious Area

Summary for Subcatchment W: West

Runoff = 0.29 cfs @ 11.95 hrs, Volume= 743 cf, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 2-yr Rainfall=3.27"

Area (sf)	CN	Description
3,751	98	Paved parking, HSG D
950	39	>75% Grass cover, Good, HSG A
4,701	86	Weighted Average
950		20.21% Pervious Area
3,751		79.79% Impervious Area

Summary for Reach 9R: (new Reach)

Inflow Area = 19,332 sf, 44.64% Impervious, Inflow Depth = 0.63" for 2-yr event
Inflow = 0.26 cfs @ 12.04 hrs, Volume= 1,023 cf
Outflow = 0.20 cfs @ 12.18 hrs, Volume= 1,023 cf, Atten= 23%, Lag= 7.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.80 fps, Min. Travel Time= 4.5 min
Avg. Velocity = 0.31 fps, Avg. Travel Time= 11.5 min

Peak Storage= 57 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 13.34 cfs

Custom cross-section, Length= 213.0' Slope= 0.0057 '/'
Constant n= 0.030 Short grass
Inlet Invert= 9.45', Outlet Invert= 8.23'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	11.50	0.00
3.00	10.50	1.00
5.00	10.50	1.00
8.00	11.50	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.0	0	0.00
1.00	5.0	8.3	1,065	13.34

Summary for Pond 2P: Infiltration Basin

Inflow Area = 35,275 sf, 58.58% Impervious, Inflow Depth = 1.39" for 2-yr event
Inflow = 1.31 cfs @ 12.04 hrs, Volume= 4,085 cf
Outflow = 0.08 cfs @ 14.39 hrs, Volume= 4,085 cf, Atten= 94%, Lag= 140.8 min
Discarded = 0.08 cfs @ 14.39 hrs, Volume= 4,085 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 8.42' @ 14.39 hrs Surf.Area= 1,355 sf Storage= 1,837 cf

Plug-Flow detention time= 317.0 min calculated for 4,085 cf (100% of inflow)
Center-of-Mass det. time= 316.9 min (1,188.8 - 871.9)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	4,378 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.00	227	0	0
7.00	637	432	432
8.00	1,125	881	1,313
9.00	1,668	1,397	2,710
10.00	1,668	1,668	4,378

Device	Routing	Invert	Outlet Devices
#1	Discarded	6.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	8.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	5.50'	**12.0" Round Culvert** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.50' / 4.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.08 cfs @ 14.39 hrs HW=8.42' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=6.00' (Free Discharge)
└**3=Culvert** (Passes 0.00 cfs of 0.95 cfs potential flow)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Link 6L: swale

Inflow Area = 49,075 sf, 20.70% Impervious, Inflow Depth = 0.78" for 2-yr event
Inflow = 0.75 cfs @ 11.96 hrs, Volume= 3,177 cf
Primary = 0.75 cfs @ 11.96 hrs, Volume= 3,177 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 BLDG: Salt Sheds Runoff Area=7,680 sf 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=0.80 cfs 2,985 cf

Subcatchment C: Central Runoff Area=19,332 sf 44.64% Impervious Runoff Depth=1.59"
Tc=5.0 min CN=65 Runoff=0.74 cfs 2,557 cf

Subcatchment N: North Runoff Area=35,275 sf 58.58% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=79 Runoff=2.41 cfs 7,983 cf

Subcatchment S: South Runoff Area=29,743 sf 5.14% Impervious Runoff Depth=1.96"
Tc=0.0 min CN=70 Runoff=1.69 cfs 4,864 cf

Subcatchment W: West Runoff Area=4,701 sf 79.79% Impervious Runoff Depth=3.37"
Tc=0.0 min CN=86 Runoff=0.47 cfs 1,322 cf

Reach 9R: (new Reach) Avg. Flow Depth=0.22' Max Vel=1.14 fps Inflow=0.74 cfs 2,557 cf
n=0.030 L=213.0' S=0.0057 '/' Capacity=13.34 cfs Outflow=0.66 cfs 2,557 cf

Pond 2P: Infiltration Basin Peak Elev=8.74' Storage=2,300 cf Inflow=2.41 cfs 7,983 cf
Discarded=0.09 cfs 5,339 cf Primary=1.23 cfs 2,644 cf Outflow=1.32 cfs 7,983 cf

Link 6L: swale Inflow=1.85 cfs 7,421 cf
Primary=1.85 cfs 7,421 cf

Total Runoff Area = 96,731 sf Runoff Volume = 19,711 cf Average Runoff Depth = 2.45"
56.32% Pervious = 54,475 sf 43.68% Impervious = 42,256 sf

Summary for Subcatchment BLDG: Salt Sheds

Runoff = 0.80 cfs @ 12.04 hrs, Volume= 2,985 cf, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 10-yr Rainfall=4.90"

Area (sf)	CN	Description
7,680	98	Unconnected roofs, HSG D
7,680		100.00% Impervious Area
7,680		100.00% Unconnected

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

Summary for Subcatchment C: Central

Runoff = 0.74 cfs @ 12.03 hrs, Volume= 2,557 cf, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 10-yr Rainfall=4.90"

Area (sf)	CN	Description
8,630	98	Paved parking, HSG D
10,702	39	>75% Grass cover, Good, HSG A
19,332	65	Weighted Average
10,702		55.36% Pervious Area
8,630		44.64% Impervious Area

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

Summary for Subcatchment N: North

Runoff = 2.41 cfs @ 12.04 hrs, Volume= 7,983 cf, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 10-yr Rainfall=4.90"

Area (sf)	CN	Description
20,665	98	Paved parking, HSG D
10,310	39	>75% Grass cover, Good, HSG A
4,300	80	>75% Grass cover, Good, HSG D
35,275	79	Weighted Average
14,610		41.42% Pervious Area
20,665		58.58% Impervious Area

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

Summary for Subcatchment S: South

Runoff = 1.69 cfs @ 11.96 hrs, Volume= 4,864 cf, Depth= 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 10-yr Rainfall=4.90"

Area (sf)	CN	Description
1,530	98	Paved parking, HSG D
20,313	80	>75% Grass cover, Good, HSG D
7,900	39	>75% Grass cover, Good, HSG A
29,743	70	Weighted Average
28,213		94.86% Pervious Area
1,530		5.14% Impervious Area

Summary for Subcatchment W: West

Runoff = 0.47 cfs @ 11.95 hrs, Volume= 1,322 cf, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 10-yr Rainfall=4.90"

Area (sf)	CN	Description
3,751	98	Paved parking, HSG D
950	39	>75% Grass cover, Good, HSG A
4,701	86	Weighted Average
950		20.21% Pervious Area
3,751		79.79% Impervious Area

Summary for Reach 9R: (new Reach)

Inflow Area = 19,332 sf, 44.64% Impervious, Inflow Depth = 1.59" for 10-yr event
Inflow = 0.74 cfs @ 12.03 hrs, Volume= 2,557 cf
Outflow = 0.66 cfs @ 12.12 hrs, Volume= 2,557 cf, Atten= 10%, Lag= 5.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.14 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.39 fps, Avg. Travel Time= 9.0 min

Peak Storage= 123 cf @ 12.07 hrs
Average Depth at Peak Storage= 0.22'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 13.34 cfs

Custom cross-section, Length= 213.0' Slope= 0.0057 '/'
Constant n= 0.030 Short grass
Inlet Invert= 9.45', Outlet Invert= 8.23'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	11.50	0.00
3.00	10.50	1.00
5.00	10.50	1.00
8.00	11.50	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.0	0	0.00
1.00	5.0	8.3	1,065	13.34

Summary for Pond 2P: Infiltration Basin

Inflow Area = 35,275 sf, 58.58% Impervious, Inflow Depth = 2.72" for 10-yr event
Inflow = 2.41 cfs @ 12.04 hrs, Volume= 7,983 cf
Outflow = 1.32 cfs @ 12.17 hrs, Volume= 7,983 cf, Atten= 45%, Lag= 7.6 min
Discarded = 0.09 cfs @ 12.17 hrs, Volume= 5,339 cf
Primary = 1.23 cfs @ 12.17 hrs, Volume= 2,644 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 8.74' @ 12.17 hrs Surf.Area= 1,529 sf Storage= 2,300 cf

Plug-Flow detention time= 230.1 min calculated for 7,983 cf (100% of inflow)
Center-of-Mass det. time= 230.1 min (1,077.2 - 847.1)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	4,378 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.00	227	0	0
7.00	637	432	432
8.00	1,125	881	1,313
9.00	1,668	1,397	2,710
10.00	1,668	1,668	4,378

Device	Routing	Invert	Outlet Devices
#1	Discarded	6.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	8.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	5.50'	**12.0" Round Culvert** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.50' / 4.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.09 cfs @ 12.17 hrs HW=8.74' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=1.17 cfs @ 12.17 hrs HW=8.74' (Free Discharge)
└**3=Culvert** (Passes 1.17 cfs of 6.25 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 1.17 cfs @ 1.59 fps)

Summary for Link 6L: swale

Inflow Area = 49,075 sf, 20.70% Impervious, Inflow Depth = 1.81" for 10-yr event
Inflow = 1.85 cfs @ 11.96 hrs, Volume= 7,421 cf
Primary = 1.85 cfs @ 11.96 hrs, Volume= 7,421 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 BLDG: Salt Sheds Runoff Area=7,680 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=0.98 cfs 3,803 cf

Subcatchment C: Central Runoff Area=19,332 sf 44.64% Impervious Runoff Depth=2.48"
Tc=5.0 min CN=65 Runoff=1.17 cfs 4,000 cf

Subcatchment N: North Runoff Area=35,275 sf 58.58% Impervious Runoff Depth=3.84"
Tc=6.0 min CN=79 Runoff=3.32 cfs 11,290 cf

Subcatchment S: South Runoff Area=29,743 sf 5.14% Impervious Runoff Depth=2.95"
Tc=0.0 min CN=70 Runoff=2.53 cfs 7,309 cf

Subcatchment W: West Runoff Area=4,701 sf 79.79% Impervious Runoff Depth=4.58"
Tc=0.0 min CN=86 Runoff=0.61 cfs 1,794 cf

Reach 9R: (new Reach) Avg. Flow Depth=0.29' Max Vel=1.33 fps Inflow=1.17 cfs 4,000 cf
n=0.030 L=213.0' S=0.0057 '/' Capacity=13.34 cfs Outflow=1.07 cfs 4,000 cf

Pond 2P: Infiltration Basin Peak Elev=8.93' Storage=2,590 cf Inflow=3.32 cfs 11,290 cf
Discarded=0.09 cfs 5,888 cf Primary=2.47 cfs 5,393 cf Outflow=2.56 cfs 11,281 cf

Link 6L: swale Inflow=2.85 cfs 11,309 cf
Primary=2.85 cfs 11,309 cf

Total Runoff Area = 96,731 sf Runoff Volume = 28,196 cf Average Runoff Depth = 3.50"
56.32% Pervious = 54,475 sf 43.68% Impervious = 42,256 sf

Summary for Subcatchment BLDG: Salt Sheds

Runoff = 0.98 cfs @ 12.04 hrs, Volume= 3,803 cf, Depth= 5.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 25-yr Rainfall=6.18"

Area (sf)	CN	Description
7,680	98	Unconnected roofs, HSG D
7,680		100.00% Impervious Area
7,680		100.00% Unconnected

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

Summary for Subcatchment C: Central

Runoff = 1.17 cfs @ 12.03 hrs, Volume= 4,000 cf, Depth= 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 25-yr Rainfall=6.18"

Area (sf)	CN	Description
8,630	98	Paved parking, HSG D
10,702	39	>75% Grass cover, Good, HSG A
19,332	65	Weighted Average
10,702		55.36% Pervious Area
8,630		44.64% Impervious Area

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

Summary for Subcatchment N: North

Runoff = 3.32 cfs @ 12.04 hrs, Volume= 11,290 cf, Depth= 3.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 25-yr Rainfall=6.18"

Area (sf)	CN	Description
20,665	98	Paved parking, HSG D
10,310	39	>75% Grass cover, Good, HSG A
4,300	80	>75% Grass cover, Good, HSG D
35,275	79	Weighted Average
14,610		41.42% Pervious Area
20,665		58.58% Impervious Area

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

Summary for Subcatchment S: South

Runoff = 2.53 cfs @ 11.96 hrs, Volume= 7,309 cf, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 25-yr Rainfall=6.18"

Area (sf)	CN	Description
1,530	98	Paved parking, HSG D
20,313	80	>75% Grass cover, Good, HSG D
7,900	39	>75% Grass cover, Good, HSG A
29,743	70	Weighted Average
28,213		94.86% Pervious Area
1,530		5.14% Impervious Area

Summary for Subcatchment W: West

Runoff = 0.61 cfs @ 11.95 hrs, Volume= 1,794 cf, Depth= 4.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 25-yr Rainfall=6.18"

Area (sf)	CN	Description
3,751	98	Paved parking, HSG D
950	39	>75% Grass cover, Good, HSG A
4,701	86	Weighted Average
950		20.21% Pervious Area
3,751		79.79% Impervious Area

Summary for Reach 9R: (new Reach)

Inflow Area = 19,332 sf, 44.64% Impervious, Inflow Depth = 2.48" for 25-yr event
Inflow = 1.17 cfs @ 12.03 hrs, Volume= 4,000 cf
Outflow = 1.07 cfs @ 12.11 hrs, Volume= 4,000 cf, Atten= 8%, Lag= 4.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.33 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.44 fps, Avg. Travel Time= 8.1 min

Peak Storage= 173 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 13.34 cfs

Custom cross-section, Length= 213.0' Slope= 0.0057 '/'
Constant n= 0.030 Short grass
Inlet Invert= 9.45', Outlet Invert= 8.23'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	11.50	0.00
3.00	10.50	1.00
5.00	10.50	1.00
8.00	11.50	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.0	0	0.00
1.00	5.0	8.3	1,065	13.34

Summary for Pond 2P: Infiltration Basin

Inflow Area = 35,275 sf, 58.58% Impervious, Inflow Depth = 3.84" for 25-yr event
Inflow = 3.32 cfs @ 12.04 hrs, Volume= 11,290 cf
Outflow = 2.56 cfs @ 12.10 hrs, Volume= 11,281 cf, Atten= 23%, Lag= 3.6 min
Discarded = 0.09 cfs @ 12.10 hrs, Volume= 5,888 cf
Primary = 2.47 cfs @ 12.10 hrs, Volume= 5,393 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 8.93' @ 12.10 hrs Surf.Area= 1,629 sf Storage= 2,590 cf

Plug-Flow detention time= 182.6 min calculated for 11,281 cf (100% of inflow)
Center-of-Mass det. time= 182.1 min (1,016.4 - 834.2)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	4,378 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.00	227	0	0
7.00	637	432	432
8.00	1,125	881	1,313
9.00	1,668	1,397	2,710
10.00	1,668	1,668	4,378

Device	Routing	Invert	Outlet Devices
#1	Discarded	6.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	8.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	5.50'	**12.0" Round Culvert** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.50' / 4.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.09 cfs @ 12.10 hrs HW=8.93' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=2.47 cfs @ 12.10 hrs HW=8.93' (Free Discharge)
└**3=Culvert** (Passes 2.47 cfs of 6.47 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 2.47 cfs @ 3.14 fps)

Summary for Link 6L: swale

Inflow Area = 49,075 sf, 20.70% Impervious, Inflow Depth = 2.77" for 25-yr event
Inflow = 2.85 cfs @ 11.96 hrs, Volume= 11,309 cf
Primary = 2.85 cfs @ 11.96 hrs, Volume= 11,309 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 BLDG: Salt Sheds Runoff Area=7,680 sf 100.00% Impervious Runoff Depth=8.56"
Tc=6.0 min CN=98 Runoff=1.34 cfs 5,478 cf

Subcatchment C: Central Runoff Area=19,332 sf 44.64% Impervious Runoff Depth=4.55"
Tc=5.0 min CN=65 Runoff=2.11 cfs 7,331 cf

Subcatchment N: North Runoff Area=35,275 sf 58.58% Impervious Runoff Depth=6.26"
Tc=6.0 min CN=79 Runoff=5.13 cfs 18,392 cf

Subcatchment S: South Runoff Area=29,743 sf 5.14% Impervious Runoff Depth=5.16"
Tc=0.0 min CN=70 Runoff=4.25 cfs 12,787 cf

Subcatchment W: West Runoff Area=4,701 sf 79.79% Impervious Runoff Depth=7.11"
Tc=0.0 min CN=86 Runoff=0.89 cfs 2,785 cf

Reach 9R: (new Reach) Avg. Flow Depth=0.39' Max Vel=1.60 fps Inflow=2.11 cfs 7,331 cf
n=0.030 L=213.0' S=0.0057 '/' Capacity=13.34 cfs Outflow=1.94 cfs 7,331 cf

Pond 2P: Infiltration Basin Peak Elev=9.30' Storage=3,217 cf Inflow=5.13 cfs 18,392 cf
Discarded=0.09 cfs 6,442 cf Primary=3.39 cfs 11,922 cf Outflow=3.49 cfs 18,364 cf

Link 6L: swale Inflow=4.98 cfs 20,118 cf
Primary=4.98 cfs 20,118 cf

Total Runoff Area = 96,731 sf Runoff Volume = 46,774 cf Average Runoff Depth = 5.80"
56.32% Pervious = 54,475 sf 43.68% Impervious = 42,256 sf

Summary for Subcatchment BLDG: Salt Sheds

Runoff = 1.34 cfs @ 12.04 hrs, Volume= 5,478 cf, Depth= 8.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 100-yr Rainfall=8.80"

Area (sf)	CN	Description
7,680	98	Unconnected roofs, HSG D
7,680		100.00% Impervious Area
7,680		100.00% Unconnected

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

Summary for Subcatchment C: Central

Runoff = 2.11 cfs @ 12.03 hrs, Volume= 7,331 cf, Depth= 4.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 100-yr Rainfall=8.80"

Area (sf)	CN	Description
8,630	98	Paved parking, HSG D
10,702	39	>75% Grass cover, Good, HSG A
19,332	65	Weighted Average
10,702		55.36% Pervious Area
8,630		44.64% Impervious Area

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

Summary for Subcatchment N: North

Runoff = 5.13 cfs @ 12.04 hrs, Volume= 18,392 cf, Depth= 6.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 100-yr Rainfall=8.80"

Area (sf)	CN	Description
20,665	98	Paved parking, HSG D
10,310	39	>75% Grass cover, Good, HSG A
4,300	80	>75% Grass cover, Good, HSG D
35,275	79	Weighted Average
14,610		41.42% Pervious Area
20,665		58.58% Impervious Area

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

Summary for Subcatchment S: South

Runoff = 4.25 cfs @ 11.95 hrs, Volume= 12,787 cf, Depth= 5.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 100-yr Rainfall=8.80"

Area (sf)	CN	Description
1,530	98	Paved parking, HSG D
20,313	80	>75% Grass cover, Good, HSG D
7,900	39	>75% Grass cover, Good, HSG A
29,743	70	Weighted Average
28,213		94.86% Pervious Area
1,530		5.14% Impervious Area

Summary for Subcatchment W: West

Runoff = 0.89 cfs @ 11.95 hrs, Volume= 2,785 cf, Depth= 7.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
MA-Dorchester 24-hr S1 100-yr Rainfall=8.80"

Area (sf)	CN	Description
3,751	98	Paved parking, HSG D
950	39	>75% Grass cover, Good, HSG A
4,701	86	Weighted Average
950		20.21% Pervious Area
3,751		79.79% Impervious Area

Summary for Reach 9R: (new Reach)

Inflow Area = 19,332 sf, 44.64% Impervious, Inflow Depth = 4.55" for 100-yr event
Inflow = 2.11 cfs @ 12.03 hrs, Volume= 7,331 cf
Outflow = 1.94 cfs @ 12.10 hrs, Volume= 7,331 cf, Atten= 8%, Lag= 4.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.60 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.52 fps, Avg. Travel Time= 6.9 min

Peak Storage= 268 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 13.34 cfs

Custom cross-section, Length= 213.0' Slope= 0.0057 '/'
Constant n= 0.030 Short grass
Inlet Invert= 9.45', Outlet Invert= 8.23'

‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
0.00	11.50	0.00
3.00	10.50	1.00
5.00	10.50	1.00
8.00	11.50	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	2.0	0	0.00
1.00	5.0	8.3	1,065	13.34

Summary for Pond 2P: Infiltration Basin

Inflow Area = 35,275 sf, 58.58% Impervious, Inflow Depth = 6.26" for 100-yr event
Inflow = 5.13 cfs @ 12.04 hrs, Volume= 18,392 cf
Outflow = 3.49 cfs @ 12.12 hrs, Volume= 18,364 cf, Atten= 32%, Lag= 4.9 min
Discarded = 0.09 cfs @ 12.05 hrs, Volume= 6,442 cf
Primary = 3.39 cfs @ 12.12 hrs, Volume= 11,922 cf

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 9.30' @ 12.12 hrs Surf.Area= 1,668 sf Storage= 3,217 cf

Plug-Flow detention time= 124.1 min calculated for 18,338 cf (100% of inflow)
Center-of-Mass det. time= 123.9 min (939.9 - 816.0)

Volume	Invert	Avail.Storage	Storage Description
#1	6.00'	4,378 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
6.00	227	0	0
7.00	637	432	432
8.00	1,125	881	1,313
9.00	1,668	1,397	2,710
10.00	1,668	1,668	4,378

Device	Routing	Invert	Outlet Devices
#1	Discarded	6.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Device 3	8.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	5.50'	**12.0" Round Culvert** L= 60.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 5.50' / 4.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.09 cfs @ 12.05 hrs HW=9.16' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=3.36 cfs @ 12.12 hrs HW=9.29' (Free Discharge)
└**3=Culvert** (Passes 3.36 cfs of 6.86 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 3.36 cfs @ 4.27 fps)

Summary for Link 6L: swale

Inflow Area = 49,075 sf, 20.70% Impervious, Inflow Depth = 4.92" for 100-yr event
Inflow = 4.98 cfs @ 11.96 hrs, Volume= 20,118 cf
Primary = 4.98 cfs @ 11.96 hrs, Volume= 20,118 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Grass Channel

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Grass Channel	**0.50**	**1.00**	**0.50**	**0.50**
	0.00	**0.50**	**0.00**	**0.50**
	0.00	**0.50**	**0.00**	**0.50**
	0.00	**0.50**	**0.00**	**0.50**
	0.00	**0.50**	**0.00**	**0.50**

Total TSS Removal = **50%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Dorchester Salt Sheds**
Prepared By: **Bree Sullivan, P.E.**
Date: **10/18/2018**

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Infiltration Basin

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Infiltration Basin	**0.80**	**1.00**	**0.80**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**
	0.00	**0.20**	**0.00**	**0.20**

Total TSS Removal = **80%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Dorchester Salt Sheds**
Prepared By: **Bree Sullivan, P.E.**
Date: **10/18/2018**

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed

1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Version 1, Automated: Mar. 4, 2008

Location: Infiltration Basin + Channel

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Grass Channel	**0.50**	**1.00**	**0.50**	**0.50**
Infiltration Basin	**0.80**	**0.50**	**0.40**	**0.10**
	0.00	**0.10**	**0.00**	**0.10**
	0.00	**0.10**	**0.00**	**0.10**
	0.00	**0.10**	**0.00**	**0.10**

Total TSS Removal = **90%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Dorchester Salt Sheds**
Prepared By: **Bree Sullivan, P.E.**
Date: **10/18/2018**

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

Groundwater Recharge

Impervious Area Increase = Proposed Impervious – Existing Impervious

Impervious Area Increase = 42,256 s.f. – 7,017 s.f. = 35,239 s.f.

Recharge Volume:

Rv = F x Impervious Area

A soils: No impervious surface within A soils.
D soils: Rv = 0.10 inch/12 inches/ft X 35,239 s.f. = 294 c.f.

Recharge Provided:

Infiltration Basin = 1,943 c.f. below the overflow weir

1,943 c.f. > 294 c.f. OK

Water Quality Efficiency

The Massachusetts DEP requires water quality calculations based on 1.0 inch of runoff for the total impervious areas where infiltration rates are greater than 2.1 in/hr. The following calculation identifies the water quality volume required:

Vwq = 0.083 ft. X 42,256 s.f. = 3,507 c.f.

The infiltration basin will infiltrate all runoff (4,085 c.f.) during the 2 year storm recurrence interval.

APPENDIX D

PHOTOS

List of Photographs

Photo No. 1 – Looking north at site

Photo No. 2 – Looking south at site

Photo No. 3 – Looking north along Freeport Street sidewalk (site is on the right)

Photo No. 4 – Looking south along Freeport Street sidewalk (site is on the left)

Photo No. 5 - Culvert Outfall (looking west)

Photo No. 6 – Culvert outfall (looking east) at Neponset River/Marina Bay

Photo No. 7 - Looking north from the southern end of site

Photo No. 8 – Looking south from site

Photo No. 1 – Looking north at site

Photo No. 2 – Looking south at site

Photo No. 3 – Looking north along Freeport Street sidewalk (site is on the right)

Photo No. 4 – Looking south along Freeport Street sidewalk (site is on the left)

Photo No. 5 - Culvert Outfall (looking west)

Photo No. 6 – Culvert outfall (looking east) at Neponset River/Marina Bay

Photo No. 7 - Looking north from the southern end of site

Photo No. 8 – Looking south from site