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 s.40)

135 Morrissey

Boston, Massachusetts

Submitted to:

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

Submitted to:

MassDEP Northeast Regional Office
205B Lowell Street
Wilmington, Massachusetts 01887

Submitted by:

135 Morrissey Owner LLC.
c/o Nordblom Development Company, Inc.
71 Third Avenue
Burlington, MA 01803

Prepared by:

Epsilon Associates, Inc.
3 Mill & Main Place, Suite 250
Maynard, Massachusetts 01754

In Association with:
Copley Wolff Design Group
Howard Stein Hudson
Stantec Architecture and Engineering P.C.
Rubin and Rudman LLP

May 23, 2018

Epsilon ASSOCIATES INC.

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May 23, 2018

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

Subject: **Notice of Intent – 135 Morrissey, Boston, MA**

Dear Conservation Commission Members:

On behalf of 135 Morrissey Owner LLC, Epsilon Associates, Inc. (Epsilon) is pleased to submit the attached Notice of Intent (NOI) for the comprehensive revitalization and re-tenanting of the former Boston Globe Publishing Company building at 135 William T. Morrissey Boulevard in Boston (Dorchester), Massachusetts. This Project, hereafter referred to as the 135 Morrissey Project, entails a core and shell renovation within the massing of the existing building designed to attract creative office, technology, light manufacturing, warehouse, and life science tenants, with ancillary retail, as well as landscaping improvements of the surrounding property designed to improve site stormwater management and to enhance the visual character and pedestrian accessibility of the site.

Wetland resources areas on and proximate to the 135 Morrissey site consist solely of Land Subject to Coastal Storm Flowage. The Project has been designed to comply with the Wetlands Protection Act Regulations (310 CMR 10.00 *et seq.*), the Massachusetts Stormwater Standards as a redevelopment project, and the Boston Conservation Commission's policy on resiliency and sea level rise. Please refer to the attached NOI and supporting documents.

Please contact me directly at (978) 461-6248, or via email at amagee@epsilonassociates.com to schedule a site inspection or with questions regarding this correspondence. Thank you for your attention to this matter.

Sincerely,
EPSILON ASSOCIATES, INC.

Andrew D. Magee
Principal

cc: MassDEP – NERO
encl.

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ATTACHMENT G – PROJECT PLANS

WPA Form 3

Notice of Intent

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Provided by MassDEP:
MassDEP File Number
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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):

a. Street Address	b. City/Town	c. Zip Code
135 William T. Morrissey Boulevard	Boston	02125

Latitude and Longitude:

d. Latitude	e. Longitude
42d18'56.66" North	71d2'58.38" West

f. Assessors Map/Plat Number	g. Parcel /Lot Number
1302364050	

2. Applicant:

a. First Name	b. Last Name
Todd	Fremont-Smith

c. Organization: 135 Morrissey Owner LLC, c/o Nordblom Development Company, Inc.

d. Street Address: 71 Third Street

e. City/Town	f. State	g. Zip Code
Burlington	MA	01803

h. Phone Number	i. Fax Number	j. Email Address
781-272-4000	781-221-3314	tfremont-smith@nordblom.com

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

a. First Name	b. Last Name
135 Morrissey Owner LLC	

c. Organization: c/o Nordblom Development Company, Inc.

d. Street Address: 71 Third Street

e. City/Town	f. State	g. Zip Code
Burlington	MA	01803

h. Phone Number	i. Fax Number	j. Email address
781-272-4000	781-221-3314	tfremont-smith@nordblom.com

4. Representative (if any):

a. First Name	b. Last Name
Andrew	Magee

c. Company: Epsilon Associates, Inc.

d. Street Address: 3 Mill & Main Place, Suite 250

e. City/Town	f. State	g. Zip Code
Maynard	MA	01754

h. Phone Number	i. Fax Number	j. Email address
978-897-7100	978-897-0099	amagee@epsilonassociates.com

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

a. Total Fee Paid	b. State Fee Paid	c. City/Town Fee Paid
$2,012.50	$512.50	$1,500 (City fee schedule)

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A. General Information (continued)

6. General Project Description:

The project entails a core and shell renovation within the existing massing of the former Boston Globe Publishing Company building on Morrissey Boulevard. The project includes landscaping improvements to the surrounding property, including an increase in planted, pervious area.

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:

a. County	b. Certificate # (if registered land)
Suffolk	
c. Book	d. Page Number
58967	93

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.

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

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

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Bank	1. linear feet	2. linear feet
b. ☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

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

f. ☐ Riverfront Area

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

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☐ 200 ft. - All other projects

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

4. Proposed alteration of the Riverfront Area:

a. total square feet _____ b. square feet within 100 ft. _____ c. square feet between 100 ft. and 200 ft. _____

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☐ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☐ Yes ☐ No

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

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

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

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

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

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ 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

Resource Area	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	259,187 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

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C. Other Applicable Standards and Requirements

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

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

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

   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.

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

(c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm). 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
836 South Rodney French Blvd.
New Bedford, MA 02744
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.

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

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

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

b. ACEC

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

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

a. ☐ Yes ☒ No

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

a. ☐ Yes ☒ No

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

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

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

2. ☒ A portion of the site constitutes redevelopment

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

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

1. ☐ Single-family house

2. ☐ Emergency road repair

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

D. Additional Information

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

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

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

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

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

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D. Additional Information (cont'd)

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

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

See Attachment G, Project Plans
a. Plan Title

b. Prepared By

c. Signed and Stamped by

d. Final Revision Date

e. Scale

f. Additional Plan or Document Title

g. Date

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

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

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

8. ☒ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

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

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

36559	05-21-2018
2. Municipal Check Number	3. Check date
36560	05-21-2018
4. State Check Number	5. Check date
Epsilon Associates, Inc.	
6. Payor name on check: First Name	7. Payor name on check: Last Name

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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.

AGENT FOR

1. Signature of Applicant

5/1/18

2. Date

135 MONNSEY OWNER LLC

3. Signature of Property Owner (if different)

4. Date

5. Signature of Representative (if any)

5/23/18

6. Date

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

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

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

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

Attachment A

Project Narrative

ATTACHMENT A - PROJECT NARRATIVE

Nordblom Development Company, Inc., on behalf of 135 Morrissey Owner LLC (the Proponent), is proposing a comprehensive revitalization and re-tenanting of the former Boston Globe Publishing Company building at 135 Morrissey Boulevard, in Boston (Dorchester), Massachusetts. This Project, hereafter referred to as the 135 Morrissey Project, entails a core and shell renovation within the massing of the existing building designed to attract creative office, technology, light manufacturing, warehouse and life science tenants, with ancillary retail and restaurant facilities, as well as landscaping improvements designed to improve site stormwater management, to enhance the visual character of the site, and to facilitate pedestrian movement proximate to and within site boundaries.

Certain work associated with this Project will occur within a resource area subject to protection under the Massachusetts Wetlands Protection Act (WPA); specifically "Land Subject to Coastal Strom Flowage." This Notice of Intent (NOI) is being submitted to the City of Boston Conservation Commission under the WPA to demonstrate compliance with the performance standards of the WPA and its associated regulations at 310 CMR 10.00.

1.0 Existing Conditions

The Project site is located between Morrissey Boulevard to the east and the Southeast Expressway (Interstate I-93) to the west, and is bound to the north by an industrial lot and to the south by Patten's Cove park and the north side of the Savin Hill residential neighborhood. The location of the site is shown on Figure 1, *Project Locus – USGS Map*, and Figure 2, *Project Locus – Vertical Aerial Photograph* (see Attachment B, *Figures*). Figure 3, *Existing Conditions – Exterior*, shows the building as observed looking northwest from Morrissey Boulevard and as looking northeast from the Southeast Expressway. An existing conditions plan for the site is included in Attachment G, *Project Plans*.

The site is approximately 16.61 acres in area, with the existing former Boston Globe buildings occupying approximately 7.58 acres of this area. The lands surrounding the building consist almost entirely of impervious surfaces, including driveways, surface parking lots, and loading docks. There is currently open-air covered parking at the ground floor under the office space at the north end of the building, and open roof top parking on the second floor of the western side of the building, accessed by a ramp running parallel to the Southeast Expressway. These parking areas, combined with the large parking lot at the south end of the site, currently contain approximately 901 parking spaces. Meanwhile, a large covered loading dock serving 18 tractor-trailer trucks is located along the site driveway at the south edge of the site building, and an interior loading dock serving box trucks is located within the southeastern corner of the building (see Figure 3, "View Northwest from Morrissey Boulevard"). A (former) water storage tank and various support buildings are located at the south end of the building, facing the Southeast Expressway. The

tank served as back-up fire protection for the building and is located immediately adjacent to a large mechanical chiller unit. The other support buildings include a maintenance garage and fuel filling area previously used for the Boston Globe's fleet of delivery trucks.

The building as it currently exists is three floors in height, including a partial mezzanine level between the first and second floors, and has an uppermost roof elevation 57.5 feet above average grade. It has multiple areas with high floor to floor heights, which were previously used for the storage and manufacturing segments of the newspaper printing operations, while much of the other areas were designated for office and other uses.

While the site structures, the buildings to the north, and the position of the site adjacent to the Southeast Expressway lend an industrial/commercial atmosphere to the site, the surrounding lands also include parkland, a residential neighborhood, and an institutional campus (see Figure 2).

The southeast portion of the site abuts Patten's Cove park, an approximately 9.6-acre park bordering a tidal creek associated with Savin Hill Cove. The park is maintained by the Massachusetts Department of Conservation and Recreation (DCR), and includes open, mowed lawns and treed areas, with bluestone and paved pathways running through and along the borders of the Park and connecting directly to the Savin Hill neighborhood via Davitt Street. Meanwhile, the southwest corner of the site abuts the termini of three cul-de-sacs of the Savin Hill neighborhood, the middle of which, Wave Avenue, includes a gated emergency entrance to the Project site. The roads to the east and west, Sea View Terrace and Savin Hill Court, end at fences and vegetated rows.

Finally, the campus of Boston College High School is located directly opposite the site on Morrissey Boulevard. The high school building is set back from Morrissey Boulevard by 230 feet of lawn, and includes extensive playing fields on the south side, abutting the waters of Savin Hill Cove. These green spaces compliment those of the Patten's Cove park opposite Morrissey Boulevard and abutting the site, and together offer a green landscape balance to the more developed land of the site and its northern abutter.

2.0 Project Description

With the goal of revitalizing this now vacant building, the Proponent is proposing a comprehensive core and shell renovation of the Boston Globe building at 135 Morrissey Boulevard in the Dorchester neighborhood of Boston, and improvements to the exterior paved and landscaped portions of the site. The building improvements are designed to attract creative office, technology, light manufacturing, warehouse and life science tenants, with ancillary retail and restaurant uses. Landscaping improvements are being proposed to improve site stormwater management, to enhance the visual character of the site, and to facilitate pedestrian movement proximate to and within site boundaries. Site grading plans, site stormwater management detail plans, and landscaping plans are included in Attachment G, *Project Plans*.

2.1 Building Improvements

The 135 Morrissey Project is being designed so as to take advantage of, and to enhance, the physical and dimensional characteristics of the three floors and mezzanine space of the former Boston Globe building. The 135 Morrissey building renovation and redesign will cater to a mix of users with an occupancy assumed to be approximately 50 percent office (business) use and 50 percent light industrial (factory) or warehouse (storage) uses. These will be supported with a range of public assembly spaces, including a food hall and related seating areas, larger meeting rooms, and coffee vendors. In addition, the Proponent hopes to attract a brew pub or restaurant tenant and a fitness center, both of which would serve the building tenants and the neighborhood.

Renderings of the exterior building improvements are presented in Figure 4, *Morrissey Boulevard Perspective – View Northwest*, and Figure 5, *Southwest Entry Perspective – View Northeast*. At the heart of the renovated building, in place of the existing multi-level printing presses, will be a new entrance and multi-story atrium space, serving as a central gathering and circulation area. The atrium space is also intended to be the active hub of the building, containing a food hall and seating, and collaborative meeting and gathering spaces for the building's users. A rendering of the new atrium entry as seen from Morrissey Boulevard is presented in Figure 6, *Morrissey Boulevard Atrium Entrance*.

In addition to the new main entry on Morrissey Boulevard, there will be a new west entry to the main parking area, a new connection to the north courtyard, and smaller tenant access entries from additional parking lots on the ground floor and second floor roof. A perspective view of the new, western entrance is shown in Figure 5.

The physical characteristics of the 135 Morrissey building vary greatly from point to point due to the multiple and varied additions and changes that have been implemented over the past 70 years. There is a mix of brick, limestone, metal, and cement board exterior wall panels, and the curtainwall, storefront, or strip windows styles vary across each addition. The current design proposal intends to replace the older windows with new efficient ones, and to enlarge existing windows with a new curtainwall, with the goal of providing additional natural light into the tenant spaces, and to also unify the appearance of the existing building. Some areas of the building which currently have multiple wall finishes will be unified to limit the amount of apparent building style variations.

The current mechanical and communication systems of the 135 Morrissey building are varied and archaic, and are located on the multiple roof levels. The Project will include a comprehensive replacement of the entire mechanical systems with new, quieter, and more efficient equipment, and generally reduce the variability of the roof top equipment. The Proponent is evaluating the potential for roof-mounted solar (PV) systems, and the availability of grants and renewables funding. The feasibility of installing PV systems will depend on the incentives at the time of construction, as well as the amount of space

available on the rooftops once mechanical equipment is sized and located. Given the large expanses of open roof, consideration is also being given to the potential for urban farming on a portion of the roof.

As a result of the above improvements, the original building 741,250 gross square-footage (GSF) (680,400 gross FAR SF) will be increased to 750,000 GSF (695,000 gross FAR SF). However, the footprint and massing of the building will not be increased. Rather, the Project will enclose space on the ground floor at the southeast corner of the building previously used as both interior and exterior covered loading areas, all of which is located under the building's existing second floor overhang (see Figure 3 "View Northwest from Morrissey Boulevard"). This will result in increased usable floor space, but will not increase the footprint or massing of the building. Furthermore, the Project intends to remove both a mechanical and a garage outbuilding structures from the site, therefore actually reducing the overall building footprint on the site.

2.2 Landscape Improvements

The property stretches along Morrissey Boulevard on the east and the Southeast Expressway on the west, is bounded by Patten's Cove and the Savin Hill neighborhood on the south, and an existing industrial building directly to the north. As noted above, the 16.61-acre site is almost entirely covered with impervious areas comprised of the building footprint, site drives, parking areas, and loading docks.

Implementation of the proposed Project site landscape design will create a new main entry and drop off zone located at the new atrium on Morrissey Boulevard, with reconfigured parking along the main driveway. Most of the existing mature trees will be retained. Renderings of the existing and proposed site landscape are presented in Figure 7, *Existing and Proposed Site Landscape*. More detailed landscape plans, including layout and planting plans, are presented in Attachment G, *Project Plans*.

As shown in Figure 7, the middle of the site's three existing curb cuts will be eliminated, and the Project building will have a new west entry facing the Expressway. This will result in a reconfigured and reduced parking area to the south. The existing water tank will remain as an artifact of the former use, and as an art feature that also acts as an identifier for the building. The open space adjacent to this western building entry will be developed as a pedestrian zone, with an entry plaza, outdoor seating for the brewery/restaurant, a public lawn area for both passive and active recreational activities, and multiple seating areas around the terrace and water tank. Meanwhile, new improved and accessible site connections will be provided to the adjacent Patten's Cove park at the southern end of the property, and a new multi-use pathway will be created so as to connect to the Savin Hill neighborhood. A green buffer is being proposed for the site edge at Savin Hill, with extensive new trees and plantings throughout the parking area.

A landscaped courtyard and building entry located at the northern end of the building will serve as both an outdoor amenity for the tenants and a future connection to MBTA JFK/UMass Red Line/South Shore Commuter Rail Station to the north, while still providing loading access to the adjacent building space.

Pedestrian access to the site will be improved. The Project landscaping is being designed to re-integrate the site into the surrounding community. Pedestrian paths, lighting, benches, and trash receptacles will be installed throughout the site. An existing security fence along the southern site boundary will be removed to allow pedestrian access to the site from Patten's Cove park and the Savin Hill neighborhood, including a multi-use path adjacent to the site and integrated into the Morrissey Boulevard sidewalk system, thereby considerably improving neighborhood access to the combined MBTA JFK/UMass Red Line/South Shore Commuter Rail Station north of the site. Meanwhile, portions of the existing parking lot at the southerly edge of the site, adjacent to Savin Hill Court, Wave Avenue, and Sea View Terrace will be replaced by landscaped open space.

In addition to the above Project site improvement, the Proponent is in discussions with the DCR regarding the potential for an ongoing stewardship role for maintenance and oversight of the Patten's Cove park. This would include an initial cleanup of the park, and removal of the chain link fences that currently separates the park and Project property. The goal will be to make the park more accessible for the neighbors of Savin Hill and the community, as well as for the new building tenants.

3.0 Wetland Resources, Flood Zones, and Sea Level Rise

Work associated with the 135 Morrissey Project will occur within the LSCSF resource area, but does not occur within any other resource area, or within the buffer zone of any other resource area. Figure 8, *Environmental Constraints Map*, depicts the extent of LSCSF on the Project site. As shown on Figure 8, there are coastal wetlands associated with the flowed intertidal lands of Pattens Cove park, but these resource areas are located several hundred feet south of the site property and separated from the site by lawned parklands.

There are no WPA regulatory performance standards for the LSCSF overlay area. Typically, compliance with the state building code is deemed to provide "storm damage protection" and "flood control," two public interests of the WPA. The Boston Conservation Commission also requires applicants to submit the Boston Planning & Development Agency "*Climate Resiliency Report Summary*" with the NOI, and a copy of that document prepared for the Project is included as Attachment E, *Climate Resiliency Report Summary*, of this NOI. Compliance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Policies is also required in association with the WPA public interest in providing for the "prevention of pollution." Project compliance with these policies is reviewed in Section 4.2, below.

There are no Natural Heritage and Endangered Species Program (NHESP) Estimated and Priority Habitat of Rare and Endangered Species mapped near the Project site. Similarly, there is no eelgrass and no anadromous fish habitat associated with the site. The extent of LSCSF on the site and the proposed Project activities within LSCSF area are reviewed below. The Project's recognition of the potential for sea level rise is also reviewed below, as well as in the above-referenced *Climate Resiliency Report Summary.*

3.1 Extent of Land Subject to Coastal Storm Flowage (LSCSF)

LSCSF is defined 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 (310 CMR 10.04). The 100-year floodplain as mapped by the Federal Emergency Management Agency (FEMA) extends to elevation 11 feet North American Vertical Datum (NAVD), or 17.46 feet Boston City Base (BCB), within the Project site (FEMA Flood Insurance Rate Map 25025C0083J, Revised March 16, 2016). Figure 8 referenced above, and Figure 9, *Project Site – FEMA Flood Insurance Rate Map*, shows the extent and elevation of the flood zone on site as mapped by FEMA.

As shown, most of the building and a portion of the site parking lot are located within an area mapped as "100 Year Flood Zone." Project work within this resource area will include site grading and landscaping, repair of the site's existing stormwater management system, the addition of stormwater recharge system, building entranceway improvements, and building resiliency measures. As noted in Section 2.1, the Project will enclose space on the ground floor at the southeast corner of the building previously used as both interior and exterior covered loading areas, all of which is located under the building's existing second floor overhang. The floor of the enclosed portions of the former loading docks will be raised and leveled at an elevation of 18.5 feet BCB, or 1.0 feet above the currently estimated 100-year flood elevation. In addition and as discussed in Section 4.1, below, this area of the building will be flood-proofed to an elevation of 20.6 feet BCB.

3.2 Flood Zones and Sea Level Rise

On October 12, 2017, the BPDA Board approved the "*Climate Resiliency - Review Policy Update*" replacing the prior "*Climate Change Resiliency and Preparedness Checklist"* with the above-referenced *Climate Resiliency Report Summary*. The new policy reflects the findings and recommendations of the Boston Research Advisory Group and *Climate Ready Boston* report, and Mayor Martin J. Walsh's *Carbon Neutral 2050* goal. The update also introduced the BPDA online "*Sea Level Rise - Flood Hazard Area*" mapping tool for use in planning and designing for future sea level rise.

The FEMA Flood Insurance Rate Map (FIRM) for the area identifies the flood elevation (Zone AE) for the site as elevation 11 feet NAVD88, which converts to a Boston City Base (BCB) elevation of 17.46 feet. Meanwhile, the BPDA online *Sea Level Rise - Flood Hazard Area* mapping tool indicates a "Sea Level Rise – Base Flood Elevation" (SLR–BFE) for the

Project site of between 19.3 and 19.6 feet BCB, and assigns an elevation of 19.6 feet for use with the mapping tool. Per the *Climate Resiliency Report Summary,* project proponents "*should calculate the Sea Level Design Flood Elevation by adding 12 inches of freeboard*" to the highest site SLR-BFE, "*and 24 inches of freeboard for critical facilities and infrastructure and any ground floor residential units*." For the purpose of the BPDA mapping tool "*critical facilities and infrastructure"* are defined as *"hospitals, fire stations, police stations, critical record storage facilities and similar structures..."* and, as such, are not necessarily applicable to this site. The Guidance document does recommend locating "*critical building equipment and systems above potential flood elevations*," but does not quantify what that higher elevation should be.

Table 1 indicates the Zone AE elevation for the Project site in the first column, the BCB equivalent elevation in the second column, and the *Climate Resiliency Report Summary* recommended design flood elevations for the site in columns three and four.

Table 1 FEMA Elevations and BPDA Sea Level Rise Design Estimates (feet)

FEMA Zone AE Elevation 11 (NAVD88)	FEMA Zone AE Elevation 11 (Boston City Base - BCB)	BPDA Sea Level Rise - Base Flood Elevation (BCB)	BPDA Sea Level Rise - Design Flood Elevation (BCB) Buildings
11	17.46	19.6 (19.3 – 19.6)	20.6

4.0 Mitigation Measures and Compliance with the Wetland Protection Regulations

The 135 Morrissey Project is being designed and will be constructed in compliance with the WPA as regards work in LSCSF, as well as in consideration of future flood elevations and sea level rise.

4.1 Proposed Work within Land Subject to Coastal Storm Flowage

The 135 Morrissey Project is committed to the advancement of sustainable and environmentally conscious design and construction. To that end, the Project is being designed so as to meet the requirements of Article 37 of the Boston Zoning Code and to achieve certifiability under the United States Green Business Council (USGBC) Leadership in Green Energy and Environmental Design (LEED) v4 rating system. In addition, the Project is taking a multi-disciplinary and pro-active approach to designing the buildings and site infrastructure for flood resilience, and is embracing the recommendations outlined in the City of Boston *Climate Ready Boston* report.

To achieve the above recommendations, the Project is being designed with any new floor slabs either at or above the suggested Design Flood Elevation, or will be built with flood-proofed foundation walls to keep the water out to at least that elevation. With the exception of the portion of the former interior loading area to be enclosed, the existing floor elevations in the building are already at or above the Design Flood Elevation. The loading dock areas to be enclosed will be brought to elevation of 18.5 BCB, and will be flood-proofed to a minimum elevation of 20.6 BCB. Additionally, all new critical infrastructure for the renovated building (including water and fire service and pumps, electrical service and distribution, generator and generator fuel tanks, and other life safety equipment) are being located at levels above the Sea Level Rise - Design Flood Elevation of 20.6 feet BCB.

Similarly, the Project design incorporates measures to minimize the effects of extreme precipitation events and droughts. The Project's stormwater management system has been designed in compliance with the MassDEP Stormwater Management Policy guidelines to reduce the existing peak rates and volumes of stormwater runoff from the site, and to promote recharge to the greatest extent practicable. The Project will increase the pervious area on the site from the existing condition, thereby creating additional infiltration capacity on the site. At the same time, the Project will address potential drought impacts by reducing the amount of water used both within the buildings and across the site for irrigation. To minimize the Project's susceptibility to drought conditions, the landscape design incorporates native and adaptive plant materials, and a high efficiency irrigation system will be installed. Meanwhile, the Project will include low-flow fixtures and water conserving appliances to the extent feasible to minimize the amount of water used by the building's occupants.

The Project design incorporates a number of measures to minimize the impact of high temperature events, including the planting of additional shade trees and reduction of impervious surfaces, improvements to the building envelope, the installation of higher performance lighting and controls, including automatic LED lighting control, the incorporation of energy recovery ventilation, and the specifying of high albedo roof tops and green roofs to minimize the heat island effect.

4.2 Review of Stormwater Management Standards

The Project will comply with the Massachusetts Stormwater Management Standards to the maximum extent practicable consistent with its status as a Redevelopment Project as defined in Standard 7 of the standards. A completed stormwater management report for the site is presented as Attachment F, *Stormwater Report*, to this NOI, but filed separately as both hard and digital copies.

The proposed stormwater management system includes detention and infiltration systems that have been properly sized to manage site stormwater. The Project will allow for the restoration of the land surface, grading for proper stormwater management, and the introduction of areas of new vegetation and pervious landscaping. Site and stormwater

management improvements will improve the quality of runoff from the site and will provide a net benefit to the quality of the waters of Boston Harbor. The Project has been designed to fully comply with the Massachusetts Stormwater Management Standards, as follows:

Standard 1 - The Project site is fully developed with no evident stormwater Best Management Practices (BMPs) in place. The redevelopment of the site intends to treat all impervious pavement areas through a series of deep sump catch basins, water quality units and, where feasible, stormwater infiltration. Under the existing conditions the roof drainage is untreated and ties into storm drain pipes in the back of the building. In the proposed condition, all roof areas will be directed to an infiltration system.

Stormwater runoff from the entire site, with the exception of the front parking area, is tributary to the 60-inch storm drain that crosses the main parking area in the southerly part of the site. This storm drain outlets into Pattens Cove. No new connections to the 60-inch storm drain are proposed and there will be a reduction of flows into the storm drain due to the decrease of impervious areas on-site and the implementation of the proposed stormwater management system improvements.

The front parking area currently drains via overland flow into Morrissey Boulevard, primarily through breaks in the curbing along the parking area. It is proposed that stormwater runoff from this area be directed to deep sump catch basins, routed through a proprietary separator, and tied into the existing 36-inch storm drain in Morrissey Boulevard.

Standard 2 – Runoff from the Project site discharges to Land Subject to Coastal Storm Flowage; however, the Project is not seeking a waiver from the Standard 2 requirements. Peak discharge rates will be reduced as the result of a decrease in impervious area and the proposed stormwater management system. The 2-, 10- and 100-year storm events have been analyzed and the results are provided in Appendices C and D of the of the above-referenced Project site stormwater management report, with a summary provided in Table 1 of that report.

Standard 3 – The site consists primarily of impervious cover. Groundwater recharge will be improved by the introduction of landscaped areas and stormwater infiltration systems. The required recharge volume will be exceeded as averaged over the site even though the site has limitations, including soils comprising primarily of urban fill that exhibits characteristics of C and D soils, and shallow depth to groundwater in several locations. The proposed design provides an equivalent recharge depth of 0.78 inches times the impervious area of the site, greatly exceeding the required 0.25 inch target depth.

Stormwater runoff that is directed towards the proposed stormwater infiltration systems will receive pretreatment that removes at least 44% of the Total Suspended Solids (TSS).

Standard 4 – Runoff from impervious pavement areas will be collected by deep sump catch basins and directed to proprietary separators and then, in some cases, to stormwater infiltration systems. The stormwater management system will remove at least 80% of the TSS from these areas. A 1-inch water quality volume has been used to design the system.

Standard 5 – The site will have a high-intensity-use parking lot, which is considered a Land Use with Higher Potential Pollutant Loads (LUHPPL). Stormwater runoff from a majority of the parking areas will be directed to specific BMPs that are considered suitable for LUHPPL.

Runoff from some areas of the parking lots will be routed through deep sump catch basins and proprietary separators prior to connecting to the downstream storm drain system. This will result in an improvement over existing conditions, thereby meeting the pretreatment requirements of Standard 5 and the structural BMP requirements to the maximum extent practicable.

An operation and maintenance plan is provided in the attached stormwater management report. Implementation of the plan will contribute to the improved quality of the stormwater runoff leaving the site. A long-term pollution prevention plan will also be implemented, which will include source controls, good housekeeping practices, and emergency spill procedures.

Standard 6 – The Project site is not adjacent to a critical area; however, the stormwater runoff from the site is tributary to a portion of Boston Harbor (proper) that is identified as a Shellfish Suitability Area, although shellfish harvesting and cultivation is currently prohibited in this area. The stormwater management system is intended to meet the pretreatment standard, and meet the Structural BMP requirements to the maximum extent practicable. Due to the presence of this potentially critical area, the water quality volume for treatment is based on a 1-inch event, as opposed to a ½-inch event.

Standard 7 - The Project site is currently developed. The redevelopment will result in an improvement over existing conditions, most notably in water quality and future maintenance. Reasonable efforts have been made to meet all the stormwater standards to the maximum extent practicable.

Standard 8 – The Project will install erosion and sediment controls prior to any major earthwork activity. The Contractor will be required to prepare a Storm Water Pollution Prevention Plan in conjunction with the General Permit for Construction Activity under the US Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) program.

Standard 9 – Appendix F of the Project site stormwater management report details the operation and maintenance requirements of the stormwater management system.

Standard 10 – There are no known or proposed illicit connections associated with this Project. An illicit discharge compliance statement is provided in Appendix G of the Project site stormwater management report.

4.3 Construction Period Mitigation Measures

The following sections summarize the mitigation measures to be employed during construction.

4.3.1 Water Quality

To minimize potential short- and long-term impacts to water quality the following measures will be implemented:

- Install catch basin inlet protection in all on-site catch basins to prevent the transport of sediment to the harbor through the existing drainage system during construction.
- Install a sediment control barrier around the work area perimeter to trap sediment and prevent transport off-site, and to demarcate the work area.
- Post-construction, the site will have increased pervious cover and, hence, additional stormwater recharge.
- The drainage system has been designed with best management practices (BMPs) compliant with the MassDEP Stormwater Management Standards, as applicable. These improvements should result in an improvement in the quality of runoff from the site and a net benefit to the quality of the waters of Boston Harbor.

4.3.2 Dust and Vehicle Emissions

The construction contract will require contractors to use a number of measures to reduce dust, vehicle emissions and minimize impacts from construction vehicles and equipment, including:

- Use wetting agents where and when needed.
- Use of covered trucks to move aggregate material.
- Minimization of exposed storage of debris on-site.
- Monitoring of construction practices to minimize unnecessary transfers and mechanical disturbances of loose materials.
- Storage of aggregate materials away from the areas of greatest pedestrian activity, where and when possible.

- Establishment of a stabilized site entrance at the exit gate to prevent dirt from being tracked on the street.
- Cleaning of streets and sidewalks regularly to minimize dust accumulations.
- Use of appropriate mufflers on equipment, and properly maintain intake and exhaust mufflers.
- Use of muffling enclosures on continuously-operating equipment (e.g., air compressors and welding generators).
- Use of quieter construction operations, techniques, and equipment, where feasible.
- Scheduling of equipment operations to keep average noise levels low, synchronize noisiest operations with times of highest ambient noise levels, and maintain relatively uniform noise levels.
- Turning off of idling equipment.
- Use of shielding or distance to separate noisy equipment from sensitive receptors.

5.0 Summary and Conclusion

The 135 Morrissey Project entails the comprehensive revitalization and re-tenanting of the former Boston Globe building at 135 Morrissey Boulevard, in Boston (Dorchester), Massachusetts. The Project includes a core and shell renovation of the existing building designed to attract creative office, technology, light manufacturing, warehouse and life science tenants, with ancillary retail and restaurant facilities, as well as landscaping improvements designed to improve site stormwater management, to enhance the visual character of the site, and to facilitate pedestrian movement proximate to and within site boundaries.

A large portion of the site has been mapped by FEMA as lying within the 100-year floodplain. The 100-year floodplain is identified as the wetland resource LSCSF in the WPA and associated regulations. No other wetland resource areas or wetland buffer zones are located on or proximate to the site.

The Project building is being designed to meet the requirements of LEED certifiable, and as demonstrated above, complies with the applicable wetland resource area regulations. In addition, the Project building and site are being designed to address both currently designated floodplain issues and potential sea level rise.

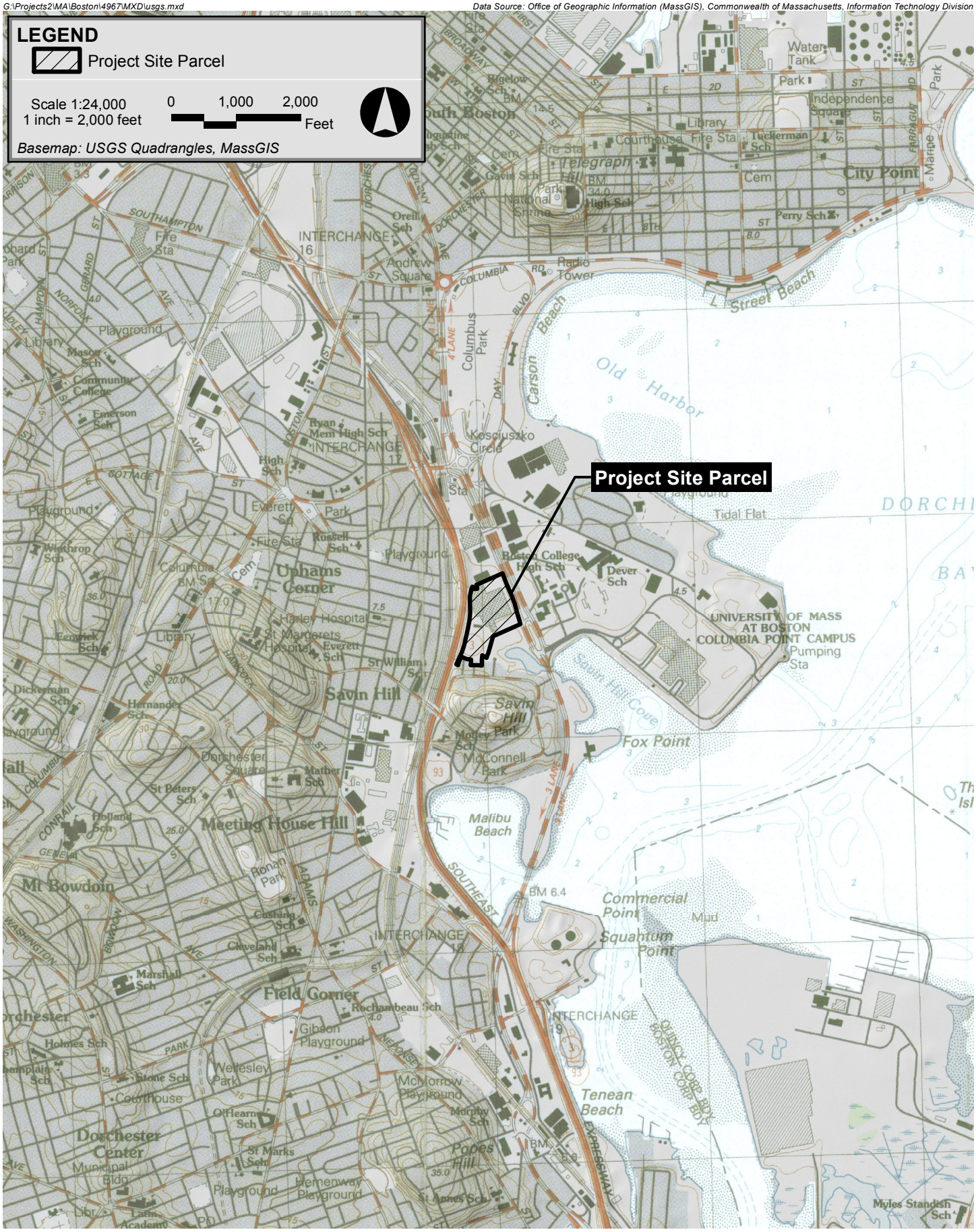
The ground floor of most of the site building exists at an elevation above the 20.6-foot (BCB) "Sea Level Rise – Design Flood Elevation" recommended per the October 12, 2017, BPDA Board-approved "*Climate Resiliency - Review Policy Update*" and associated

"*Climate Resiliency Report Summary.*" Meanwhile, all new critical infrastructure for the renovated building (including water and fire service and pumps, electrical service and distribution, generator and generator fuel tanks, and other life safety equipment) are being located at levels above the Design Flood Elevation of 20.6 feet. Meanwhile, the loading dock areas to be enclosed will be brought to elevation 18.5 BCB, and will be flood-proofed to a minimum elevation of 20.6 BCB.

Finally, the current site is essentially entirely paved. The re-development of the site will allow for the restoration of the land surface, grading for proper stormwater control, the introduction of areas of pervious cover and subsurface recharge infrastructure, and vegetated landscaping.

Attachment B

Figures



135 Morrissey Boston, Massachusetts

Epsilon ASSOCIATES INC.

Figure 1

Project Locus - USGS Map

Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division

135 Morrissey Boulevard, Boston, Massachusetts

Epsilon Associates Inc.

Figure 2

Project Locus - Vertical Aerial Photograph

View Northwest From Morrissey Boulevard

View Northeast From Southeast Expressway (I-93)

135 Morrissey Boston, Massachusetts

135 Morrissey **Boston, Massachusetts**

Stantec

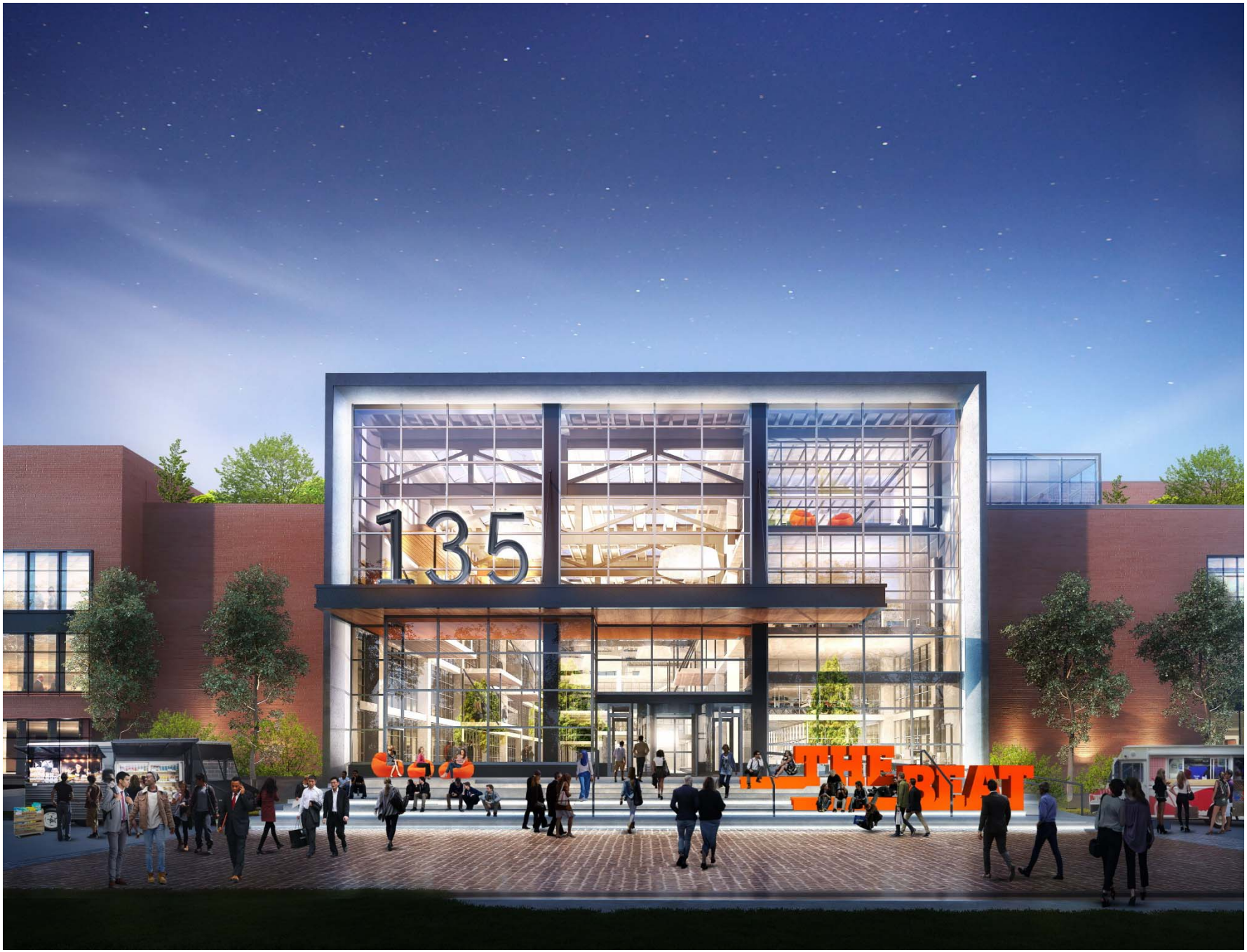
Figure 4

Morrissey Boulevard Perspective - View Northwest

135 Morrissey **Boston, Massachusetts**

Stantec

Figure 5
Southwest Entry Perspective – View Northeast



135 Morrissey **Boston, Massachusetts**

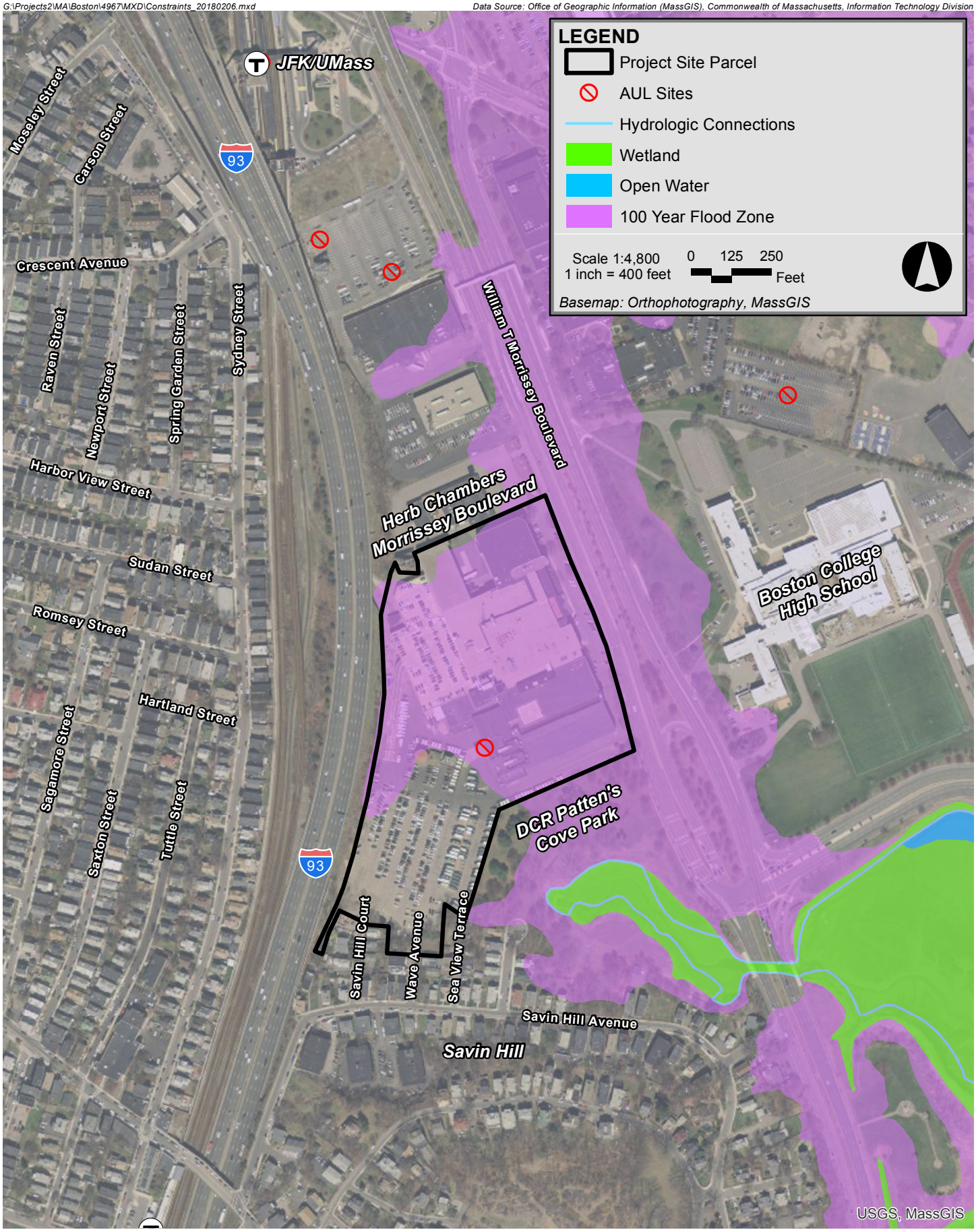
Stantec

Figure 6
Morrissey Boulevard Atrium Entrance

135 Morrissey Boston, Massachusetts

Stantec

Figure 7
Existing and Proposed Site Landscape

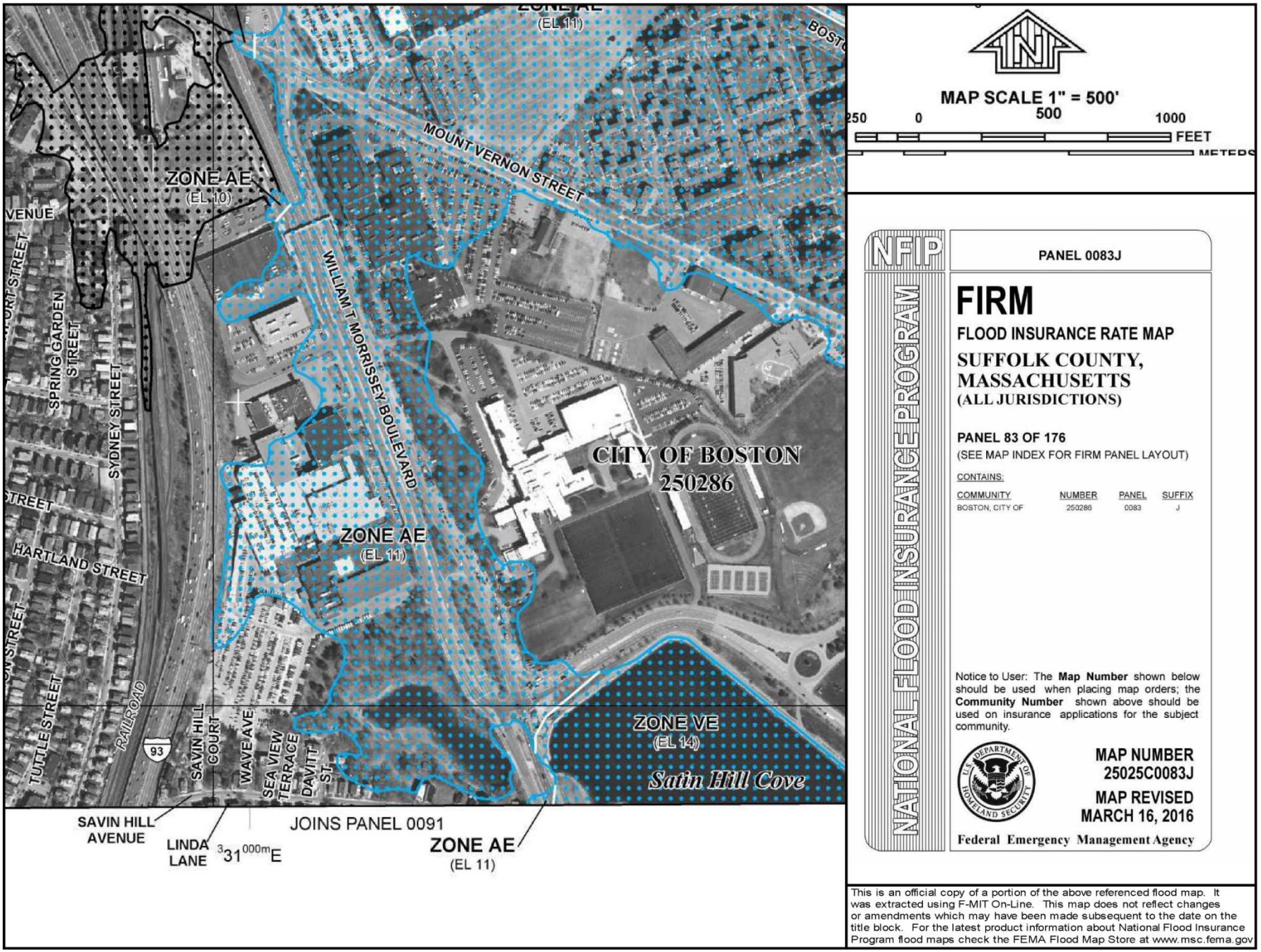


135 Morrissey Boulevard, Boston, Massachusetts

Epsilon Associates Inc.

Figure 8

Environmental Constraints Map



135 Morrissey Boston, Massachusetts

Epsilon ASSOCIATES INC.

Figure 9

Project Site – FEMA Flood Insurance Rate Map

Attachment C

Filing Fee Information

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:

135 William T. Morrissey Boulevard	Boston
a. Street Address	b. City/Town
	$512.50 - State fee
c. Check number	d. Fee amount

2. Applicant Mailing Address:

Todd	Fremont-Smith
a. First Name	b. Last Name

135 Morrissey Owner LLC, c/o Nordblom Development Company, Inc.
c. Organization

71 Third Avenue
d. Mailing Address

Burlington	MA	01803
e. City/Town	f. State	g. Zip Code

781-272-4000	781-221-3314	tfremont-smith@nordblom.com
h. Phone Number	i. Fax Number	j. Email Address

3. Property Owner (if different):

a. First Name	b. Last Name

c. Organization

d. Mailing Address

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

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

B. Fees

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

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

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

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

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

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

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

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
3.b.	1	$1,050	$1,050

Step 5/Total Project Fee:	$1,050 - State fee schedule only
Step 6/Fee Payments:	
Total Project Fee:	$1,050 - State fee schedule only
State share of filing Fee:	$512.50 b. 1/2 Total Fee **less $**12.50
City/Town share of filling Fee:	$1,500 - City Fee Schedule

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.)

Attachment D

Abutter Notification Information

Affidavit of Service
Under The Massachusetts Wetlands Protection Act

We ("Epsilon"), hereby certify under the pains and penalties of perjury that on **May 23, 2018** Epsilon Associates, Inc. gave notification to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the DEP Guide to Abutter Notification dated April 8, 1994 and 310 CMR 10.05(4)(a), in connection with the following matter:

> **A Notice of Intent** filed under the Massachusetts Wetland Protection Act by **135 Morrissey Owner LLC, c/o Nordblom Development Company, Inc.,** on **May 23, 2018** for property located at **135 William T. Morrissey Boulevard in Boston, MA.**

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

_____ May 23, 2018

Andrew D. Magee
Principal

Notification to Abutters

Under The Massachusetts Wetland Protection Act

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

a) The name of the applicant is: **135 Morrissey Owner LLC c/o Nordblom Development Company, Inc.**

b) The applicant has filed a **Notice of Intent ("NOI") application with the Boston Conservation Commission, seeking permission to alter an Area Subject to Protection under the Wetlands Protection Act (MGL c. 131 s. 40).**

c) The address of the lot where the activity is proposed is **135 William T. Morrissey Boulevard, Boston, Massachusetts**

d) The work proposed: **The Project entails the comprehensive revitalization and re-tenanting of the former Boston Globe building at 135 William T. Morrissey Boulevard, in Boston (Dorchester), Massachusetts, as well as landscaping improvements designed to introduce stormwater controls and to enhance the visual character of the site.**

e) Copies of the Notice of Intent may be examined at the **Boston Conservation Department Office at .Boston City Hall, One City Hall Square, Room 709, Boston.**

f) Or Applicant's representative's phone number: **(978) 897-7100 (Andrew Magee).**

g) The hearing date is scheduled for **June 6, 2018**. Additional information regarding the time and place of the public hearing may be obtained by calling the Boston Conservation Commission office at **(617) 635-3850**.

h) Person sending this notification (applicant, representative or other)

Name: **EPSILON ASSOCIATES, INC. (Attn. Andrew Magee)**
Address: **3 MILL & MAIN PLACE, SUITE 250**
Town: **MAYNARD** State: **MA** **Zip: 01754**
Telephone: **(978) 897-7100**

NOTES :

- Notice of the public hearing, including date, time and place will be published at least five (5) days in advance in a newspaper of general circulation.
- Notice of the public hearing, including date, time and place will be posted in the City Hall not less than forty-eight hours in advance.
- You may also contact the Northeast Regional Office of the Department of Environmental Protection at (978) 694-3200 for more information about this application.

LIST OF ABUTTERS NOTIFIED OF PUBLIC HEARING

Notice of Intent Application
135 William T. Morrissey Boulevard, Boston

PID	OWNER	ADDRESSEE	MLG_ADDRESS	MLG_CITYSTATE	ZIPCODE	LOC_ADDRESS	LOC_CITY	LOC_ZIPCODE
1302398016	ALLEN MEGHAN	C/O MEGHAN ALLEN	8 SEA VIEW TE #3	DORCHESTER MA	02125	8 SEA VIEW TE Apt 3	DORCHESTER	2125
1302398010	8 SEA VIEW TERRACE	C/O SEAVIEW LLC	51 THORNEY MEADOW WY	HANOVER MA	02339	8 SEA VIEW TE	DORCHESTER	2125
1302399004	DENOBLE MATTHEW	C/O MATTHEW DENOBLE	6 SEA VIEW TE #2	DORCHESTER MA	02125	6 SEA VIEW TE Apt 2	DORCHESTER	2125
1302411010	FLAHERTY MARY A		11 SAVIN HILL CT	DORCHESTER MA	02125	11 SAVIN HILL CT	DORCHESTER	2125
1302399002	FRADETTE MICHAEL P	C/O MICHAEL P FRADETTE	6 SEAVIEW TERRACE #1	DORCHESTR MA	02125	6 SEA VIEW TE Apt 1	DORCHESTER	2125
1302543001	COMMONWEALTH OF MASS		DILLINGHAM ST	DORCHESTER MA	02125	DILLINGHAM ST	DORCHESTER	2125
1302404000	ELLIOT DANIEL R		9 WAVE AV	DORCHESTER MA	02125	9 WAVE AV	DORCHESTER	2125
1302398014	FISKE FAMILY PROPERTIES LLC	C/O FISKE FAMILY PROPERTIES LLC	11 SENTINEL RD	HINGHAM MA	02043	8 SEA VIEW TE Apt 2	DORCHESTER	2125
1302398012	ZINE LINDA J	C/O LINDA J ZINE	8 SEA VIEW TE #1	DORCHESTER MA	02125	8 SEA VIEW TE Apt 1	DORCHESTER	2125
1302386000	SWEENEY JEREMIAH F		14 DAVITT ST	DORCHESTER MA	02125	14 DAVITT ST	DORCHESTER	2125
1302394000	BAKER VINCENT A	C/O VINCENT BAKER	10 DAVITT ST	DORCHESTER MA	02125	SEA VIEW TE	DORCHESTER	2125
1302395000	SWEENEY JEREMIAH F		14 DAVITT ST	DORCHESTER MA	02125	SEA VIEW TE	DORCHESTER	2125
1302401000	KELLEHER JOHN P TS		355 SAVIN HILL AVE	DORCHESTER MA	02125	355 SAVIN HILL AV	DORCHESTER	2125
1302409000	CABRAL CARLOS E		235 SAVIN HILL AV	DORCHESTER MA	02125	369 SAVIN HILL AV	DORCHESTER	2125
1302387000	BAKER VINCENT A	C/O VINCENT BAKER	10 DAVITT ST	DORCHESTER MA	02125	10 DAVITT ST	DORCHESTER	2125
1302364050	135 MORRISSEY OWNER LLC	C/O ALCION VENTRUE	ONE POST OFFICE SQ STE 3150	BOSTON MA	02109	135 WM T MORRISSEY BL	SOUTH BOSTON	2127
1302400000	GIBSON SUSAN		351 SAVIN HILL AV	DORCHESTER MA	02125	351 SAVIN HILL AV	DORCHESTER	2125
1302403000	DROMGOOLE THOMAS P	C/O THOMAS P DROMGOOLE	7 WAVE AV	DORCHESTER MA	02125	7 WAVE AV	DORCHESTER	2125
1302407000	SAVIN HILL AV CONDO TRUST		365 SAVIN HILL AV	DORCHESTER MA	02125	365 SAVIN HILL AV	DORCHESTER	2125
1302407002	HORAN JOSEPH	C/O JOSEPH HORAN	365 SAVIN HILL AV #1	DORCHESTER MA	02125	365 SAVIN HILL AV Apt 1	DORCHESTER	2125
1302407008	CECCHINI NICHOLAS B	C/O NICHOLAS B CECCHINI	365 SAVIN HILL AV #4	DORCHESTER MA	02125	365 SAVIN HILL AV Apt 4	DORCHESTER	2125
1302417000	MLECZKO TADEUSZ		12 SAVIN HILL CT	DORCHESTER MA	02125	SAVIN HILL CT	DORCHESTER	2125
1302410000	TANG WILLIAM H	C/O WILLIAM TANG	371 SAVIN HILL AV	DORCHESTER MA	02125	371 SAVIN HILL AV	DORCHESTER	2125
1302414000	COOK NANCY M		15 SAVIN HILL CT	DORCHESTER MA	02125	15 SAVIN HILL CT	DORCHESTER	2125
1302418010	MLECZKO TADEUSZ		12 SAVIN HILL CT	DORCHESTER MA	02125	12 SAVIN HILL CT	DORCHESTER	2125
1302419000	MOWBRAY ANDREW W	C/O ANDREW MOWBRAY	375 SAVIN HILL AVE	DORCHESTER MA	02125	375 SAVIN HILL AV	DORCHESTER	2125
1302364002	COMMWLTH OF MASS		MOUNT VERNON	DORCHESTER MA	02125	MT VERNON ST	DORCHESTER	2125
1302421000	DIP-ROSSI RITA		379 SAVIN HILL AV	DORCHESTER MA	02125	SAVIN HILL AV	DORCHESTER	2125
1302364045	POB CC 75 MORRISSEY LLC	C/O POB CC 75 MORRISSEY LLC	8 STONY BROOK PL	ARMONK NY	10504	75 WM T MORRISSEY BL	SOUTH BOSTON	2127
1302364060	COMMONWEALTH OF MASS		WM T MORRISSEY BLVD	DORCHESTER MA	02125	WM T MORRISSEY BL	SOUTH BOSTON	2127
1302364055	COMMWLTH OF MASS		WM T MORRISSEY BLVD	DORCHESTER MA	02125	WM T MORRISSEY BL	SOUTH BOSTON	2127
1302392000	DOWLING JOHN B TS	C/O JOHN B DOWLING TS	349 SAVIN HILL AVE	DORCHESTER MA	02125	349 SAVIN HILL AV	DORCHESTER	2125
1302399000	6 SEA VIEW TERRACE		6 SEA VIEW TE	DORCHESTER MA	02125	6 SEA VIEW TE	DORCHESTER	2125
1302402000	BAKER CASEY ELIZABETH	C/O CASEY ELIZABETH BAKER	361 SAVIN HILL AVE	DORCHESTER MA	02125	361 SAVIN HILL AV	DORCHESTER	2125
1302406000	JENKINS EDWARD ETAL	JENKINS EDWARD ETAL	67 MAYFLOWER RD	MARSHFIELD MA	02050	8 WAVE AV	DORCHESTER	2125
1302415000	LEYDON JAMES L JR	C/O JAMES L LEYDON JR	19 SAVIN HILL COURT	DORCHESTER MA	02125	19 SAVIN HILL CT	DORCHESTER	2125
1302407004	BROOKS JAMES J	C/O JAMES J BROOKS	365 SAVIN HILL AV #2	DORCHESTER MA	02125	365 SAVIN HILL AV Apt 2	DORCHESTER	2125
1302407006	ROSSEEL MORGAN	C/O MORGAN ROSSEEL	365 SAVIN HILL AVE #3	DORCHESTER MA	02125	365 SAVIN HILL AV Apt 3	DORCHESTER	2125
1302418050	MLECZKO TADEUSZ		10 SAVIN HILL CT	DORCHESTER MA	02125	10 SAVIN HILL CT	DORCHESTER	2125
1302425000	AMNAC PROPERTIES LLC	C/O AMNAC PROPERTIES LLC	71 GRAMPIAN WAY	DORCHESTER MA	02125	383 SAVIN HILL AV	DORCHESTER	2125
1302432001	COMMWLTH OF MASS		DILLINGHAM	DORCHESTER MA	02125	DILLINGHAM ST	DORCHESTER	2125
1302393000	BRUNETTI ROBERT G	C/O ROBERT G BRUNETTI	835 PUEBLO CT	NAPERVILLE IL	60565	5 SEA VIEW TE	DORCHESTER	2125
1302396000	CITY OF BOSTON		SEA VIEW TE	DORCHESTER MA	02125	SEA VIEW TE	DORCHESTER	2125
1302420000	ROSSI RITA DIP	C/O RITA M DIP- ROSSI	379 SAVIN HILL AV	DORCHESTER MA	02125	379 SAVIN HILL AV	DORCHESTER	2125
1302405000	REAL ESTATE BOSTON LLC	C/O REAL ESTATE BOSTON LLC	58 GAINSBOROUGH ST	BOSTON MA	02115	10 WAVE AV	DORCHESTER	2125
1302408000	SU XIN RONG	C/O XIN RONG SU	367 SAVIN HILL AV	DORCHESTER MA	02125	367 SAVIN HILL AV	DORCHESTER	2125
1302413000	COOK NANCY M		15 SAVIN HILL CT	DORCHESTER MA	02125	SAVIN HILL CT	DORCHESTER	2125
1303321002	AYAAD TAMIR (DBA MISTER T)	C/O TAMIR AYAAD (DBA MISTER T)	35 BROOKS AVE #12A	QUINCY MA	02169	875 COLUMBIA RD	DORCHESTER	2125
1303321001	MASS BAY TRANSP AUTH		875 COLUMBIA RD	DORCHESTER MA	02125	875 COLUMBIA RD	DORCHESTER	2125

Attachment E

Climate Resiliency Report Summary

Boston Planning & Development Agency
Climate Resiliency Report Summary

Submitted: 01/26/2018 15:02:23

A.1 - Project Information

Project Name:	135 Morrissey			
Project Address:	135 William T Morrissey Blvd Boston, MA 02125			
Filing Type:	Initial (PNF, EPNF, NPC or other substantial filing)			
Filing Contact:	Erik Rexford	Epsilon Associates	erexford@epsilonassociates.com	978-897-7100
Is MEPA approval required?	Yes	MEPA date:	02/15/2018	

A.2 - Project Team

Owner / Developer:	Nordblom Company
Architect:	Stantec
Engineer:	Howard Stein Hudson / Stantec / AHA Consulting Engineers, Inc.
Sustainability / LEED:	Stantec
Permitting:	Epsilon Associates, Inc.
Construction Management:	John Moriarty & Associates

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Mixed-use; light industrial, manufacturing, office
List the First Floor Uses:	Same as above
List any Critical Site Infrastructure and or Building Uses:	None

Site and Building:

Site Area (SF):	723697	Building Area (SF):	324866
Building Height (Ft):	57.5	Building Height (Stories):	4
Existing Site Elevation – Low (Ft BCB):	14.8	Existing Site Elevation – High (Ft BCB):	22.5
Proposed Site Elevation – Low (Ft BCB):	14.8	Proposed Site Elevation – High (Ft BCB):	22.5
Proposed First Floor Elevation (Ft BCB):	18.0	Below grade spaces/levels (#):	0

Article 37 Green Building:

LEED Version - Rating System:	V4	LEED Certification:	No
Proposed LEED rating:	Silver	Proposed LEED point score (Pts.):	56

Boston Planning & Development Agency
Climate Resiliency Report Summary

boston planning & development agency

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	Loads and energy performance are based on the anticipated areas and uses of the spaces, and CBECS annual average energy usage data per use type		
Annual Electric (kWh):	8311800	Peak Electric (kW):	6170.5
Annual Heating (MMbtu/hr):	23167.7	Peak Heating (MMbtu):	9.458
Annual Cooling (Tons/hr):	1754800	Peak Cooling (Tons):	2050
Energy Use - Below ASHRAE 90.1 - 2013 (%):	10	Have the local utilities reviewed the building energy performance?:	No
Energy Use - Below Mass. Code (%):	10	Energy Use Intensity (kBtu/SF):	72.322

Back-up / Emergency Power System

Electrical Generation Output (kW):	600	Number of Power Units:	1
System Type (kW):	600	Fuel Source:	Diesel

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

Electric (kW):	500	Heating (MMbtu/hr):	0
		Cooling (Tons/hr):	0

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): 6309.0

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

Energy performance is a focus of the project team for this renovation project; new HVAC systems and equipment are planned, new lighting will be installed in all areas, and new controls will be used for the systems. Energy modeling has been started and will be updated as the project design evolves and the project progresses.

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

The building exists; orientation and massing will be reused. Envelope improvements will be made to walls, windows, and roof, and new HVAC systems will be installed.

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

High-efficiency water chillers, condensing hot water boilers, variable flow pumping systems, exhaust air heat recovery, and LED lighting with controls systems will all be used.

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

On-site PV is being investigated. Depending on final economics and space available, it may be possible to install a PV array with a total capacity of 374 KW. This is estimated by PV Watts to produce 481,000 kW-hr per year, or approx.. 5.8% of the estimated annual electric usage.

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

Central cooling and heating plant will be used. Roof mounted PV is discussed above.

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

None anticipated at this time.

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):

Additional strategies to reduce GHG may include enhanced tenant metering, tenant operation guidelines, tenant fit-out requirements, addition energy conservation measures, expansion of on-site renewables and energy storage options, and deployment of new sustainability and adaptation strategies as they become feasible at the Project site. The Proponent will continue to evaluate energy conservation strategies during the design phase of the project.

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.): 0

Temperature Range - High (Deg.): 95

Annual Heating Degree Days:	5498.7	Annual Cooling Degree Days	889.2

What Extreme Heat Event characteristics will be / have been used for project planning

Days - Above 90° (#):	25	Days - Above 100° (#):	5
Number of Heatwaves / Year (#):	2	Average Duration of Heatwave (Days):	3

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

Reduction of impervious surface, additional shade trees and shrubs, high-albedo roofing materials, high reflectivity paving materials.

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:

Ongoing vulnerability assessment of risks to building/systems from extreme heat events. Feasibility of green roofs, walls, structures, and additional landscape elements are being evaluated. Use of high-efficiency HVAC systems that are appropriately sized for cooling load during design life of system.

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:

Operable windows, natural ventilation, external shading devices, feasibility of a “cool room” will be evaluated. On-site backup generation capacity in excess of critical systems demand and feasibility of on-site renewable generation and storage is being evaluated.

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)	6

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

Reduction of impervious surface, improvements to stormwater management system, installation of bioswales.

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):

Feasibility of additional stormwater retention, infiltration, and storage, including bioswales, green roofs, blue roofs, storage basins or tanks, and other infrastructure.

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)?			17.5
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)?	19.5		
What is the Sea Level Rise - Design Flood Elevation for the site (Ft BCB)?	20.5	First Floor Elevation (Ft BCB):	18.0
What are the Site Elevations at Building (Ft BCB)?	~16.5	What is the Accessible Route Elevation (Ft BCB)?	~17.0-20.0'

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.:

Backflow prevention at stormwater outfalls.

Describe how the proposed Building Design Flood Elevation will be achieved including dry / wet flood proofing, critical systems protection, utility service protection, temporary flood barriers, waste and drain water back flow prevention, etc.:

Critical systems, electric, cable, and other utility services located below design flood elevation, if any, may be dry flood proofed. To the extent feasible, critical systems will be located above SLR-BFE. Temporary flood barriers may be deployed at building openings to below-grade (non-habitable/equipment) spaces.

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:

Emergency power will be supplied on site to maintain life safety systems.

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

Flood damage-resistant structural and finish materials will be selected for appropriate locations.

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.:

Expansion of stormwater management systems, including additional storage or infiltration capacity is being evaluated. Hard/landscaped features that serve as flooding barriers, additional site fill, and deployable flood barriers.

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

Expansion of deployable protective barrier system, as necessary.

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

Attachment F

Stormwater Report

HOWARD STEIN HUDSON

Engineers + Planners

STORMWATER REPORT

135 Morrissey Boulevard

Boston (Dorchester), Massachusetts

Prepared for

135 Morrissey Owner LLC
c/o Nordblom Development Company, Inc.
71 Third Avenue
Burlington, MA 01803
(781) 272-4000

Prepared by

Howard Stein Hudson
11 Beacon Street, Suite 1010
Boston, MA 02108
617-482-7080

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATINI
CIVIL
No. 41033
REGISTERED PROFESSIONAL ENGINEER
5/22/18

May 2018

Table of Contents

Introduction

This Stormwater Management Report describes the existing drainage conditions and proposed stormwater best management practices (BMPs) designed to treat and control runoff as part of the redevelopment of 135 Morrissey Boulevard in the Dorchester neighborhood of Boston, Massachusetts.

The Site is approximately 16.6± acres and is almost completely covered by impervious surfaces. The building occupies over 7½ acres, and the paved parking, access, and loading over 8.3 acres. A majority of the Site's stormwater runoff ends up in a 60-inch pipe that traverses the site and outfalls into Patten's Cove located to the south of the Site. The front parking area drains into Morrissey Boulevard through the driveway openings, and gaps in the curbing along the parking area. The existing storm drain system provides almost no water quality treatment and stormwater infiltration is limited.

The Project will result in a decrease in impervious cover by over one acre. Stormwater BMPs will be constructed to improve the water quality of runoff from paved areas as well as the roof of the buildings. Stormwater BMPs include deep sump catch basins, subsurface infiltration systems, and stormwater treatment (water quality) units. These systems will capture and help reduce pollutant concentrations in the stormwater runoff prior to discharging to Patten's Cove and Boston Harbor.

Hydrology

Pre and post-development hydrology was analyzed with HydroCAD v 10.0, model using TR-20 methodology. The rainfall data was obtained from NOAA Atlas 14, Point Precipitation Frequency Estimates using 24-hour storms. The result of this analysis shows there will be a decrease in the peak discharge rates & volumes from the site in the post-development conditions for all the storm events analyzed (Refer to Table 1 in the Stormwater Management Standards section for pre- and post-development peak discharge rate comparisons).

PRE-CONSTRUCTION HYDROLOGY

The front parking area (easterly) has no drainage structures. Runoff drains towards Morrissey Boulevard either through the driveway openings or through gaps in the curbing along the easterly edge of the parking lot.

The building roof is collected by two drain lines under the building. These drain lines just about run the length of the building going front to back (east to west). Both drains tie into a drain line in the back of the building that runs approximately parallel with the I-93 right-of-way. This drain line

ultimately ties into a 60-inch storm drain that crosses under the main parking area to the south of the building and discharges into Patten's Cove

Surface runoff from the northerly loading area is captured by catch basins, which tie into the northerly drain line under the building mentioned above.

Surface runoff from the main parking area to the north of the building is picked up by catch basins, and eventually ends up in the 60-inch storm drain that outfalls into Patten's Cove.

POST-CONSTRUCTION HYDROLOGY

Flow to Storm Drain in Morrissey Boulevard

Stormwater runoff from the northerly portion of the front parking lot will be collected in deep sump catch basins, routed through a water quality unit for pretreatment before discharging to a subsurface infiltration system. The southerly portion of the front lot is too low to send to the infiltration system, but it is expected that over 80% of net annual total suspended solids (TSS) will be removed through the use of water quality units. This treated runoff, and overflows from the infiltration system during large storm events, will be directed to a new connection to the 36-inch storm drain in Morrissey Boulevard.

Flow to 60-Inch Storm Drain

It is proposed to collect all of the rooftop runoff and direct it to one of the several subsurface infiltration systems on-site. The infiltration systems all have overflows for large storm events. These overflows tie into the new closed drainage system on-site, which ultimately discharges to the 60-inch storm drain on-site. No new connections are proposed to the 60-inch pipe. The new storm drain system will tie into existing drain laterals off of the 60-inch pipe and located within the site.

Stormwater runoff from about 60% of the site to the south of the building, which includes most of the main parking area, will be collected in deep sump catch basins. The catch basins will be routed to water quality units providing over 80% removal of TSS prior to discharging to subsurface infiltration systems. The remaining portion of the site to the south of the building contains a portion of the parking area, the westerly loading dock, and the west entry courtyard area. This area gets routed to water quality units that will remove at least 80% of the TSS. Paved areas are captured be deep sump catch basins prior to the water quality units.

Runoff from the north entry courtyard is picked up by area drains and routed to an existing pipe that runs under the building. This pipe connects to the existing pipe network that is connected to the 60-inch storm drain.

Stormwater Management Standards

STANDARD 1: NO NEW UNTREATED DISCHARGES OR EROSION TO WETLANDS

The Project Site is fully developed with no evident stormwater Best Management Practices (BMPs). The Redevelopment intends to treat all impervious pavement areas through a series of deep sump catch basins, water quality units and, where feasible, stormwater infiltration. The roof drainage is untreated in existing conditions and ties into storm drain pipes in the back of the building. All roof areas are directed to an infiltration system in the proposed condition.

Stormwater runoff from the entire site, with the exception of the front parking area, is tributary to the 60-inch storm drain that crosses the main parking area in the southerly part of the site. This storm drain outlets into Patten's Cove. No new connections to the 60-inch storm drain are proposed and there will be a reduction of flows due to the decrease of impervious areas on-site and the proposed stormwater management system improvements.

The front parking area currently drains via overland flow into Morrissey Boulevard primarily through breaks in the curbing along the parking area. It is proposed to collect stormwater runoff from this area in deep sump catch basins and route through proprietary separators. Runoff from a portion of this parking area will also be directed to an infiltration system. The closed drainage system will tie into the 36-inch storm drain in Morrissey Boulevard.

STANDARD 2: POST-DEVELOPMENT PEAK DISCHARGE RATES NOT TO EXCEED PRE-DEVELOPMENT PEAK DISCHARGE RATES

The project site discharges to Land Subject to Coastal Storm Flowage; however, the project is not seeking a waiver from the Standard 2 requirements. Peak discharge rates will be reduced as the result of a decrease in impervious area and the proposed stormwater management system. The 2, 10 and 100-year storm events were analyzed. Calculations are provided in Appendix C and D with a summary provided in Table 1 below.

Table 1. Pre- Vs Post-Development Peak Discharge Rates

Design Point	Pre-Development Rate (cfs)	Post-Development Rates (cfs)
2-Year Storm Event		
DP1: 36-inch Storm Drain in Morrissey Blvd	4.05	2.66
DP2: 60-inch Storm Drain On-Site	49.35	41.71

10-Year Storm Event		
DP1: 36-inch Storm Drain in Morrissey Blvd	7.00	6.92
DP2: 60-inch Storm Drain On-Site	78.68	76.11
100-Year Storm Event		
DP1: 36-inch Storm Drain in Morrissey Blvd	11.59	10.41
DP2: 60-inch Storm Drain On-Site	124.78	119.77

STANDARD 3: MINIMIZE OR ELIMINATE LOSS OF ANNUAL RECHARGE TO GROUNDWATER

The existing site primarily consist of impervious cover and groundwater recharge will be improved by the introduction of several landscaped areas and stormwater infiltration systems. The required recharge volume will be exceeded as averaged over the Site even though the Site has limitations including soils comprising primarily of urban fill that exhibits characteristics of C and D soils, and shallow depth to groundwater in several locations. The proposed design provides an equivalent recharge depth of 0.78 inches times the impervious area of the site, greatly exceeding the 0.25 inch target depth required.

Stormwater runoff that is directed towards the proposed stormwater infiltration systems receive pretreatment that removes at least 44% of the Total Suspended Solids (TSS).

STANDARD 4: STORMWATER MANAGEMENT SYSTEM TO REMOVE 80% OF AVERAGE ANNUAL LOAD OF TOTAL SUSPENDED SOLIDS (TSS)

Impervious pavement areas are collected by deep sump catch basins and directed to proprietary separators, and then in some cases to stormwater infiltration systems. The stormwater management system removes at least 80% of the TSS from these areas. A 1-inch water quality volume is used to design the system.

STANDARD 5: LAND USES WITH HIGHER POTENTIAL POLLUTANT LOADS

The site will have a high-intensity-use parking lot, which is considered a Land Use with Higher Potential Pollutant Loads (LUHPPL). Stormwater runoff from a majority of the parking areas will be directed to specific BMPs that are considered suitable for LUHPPL.

Runoff from some areas of the parking will be routed through deep sump catch basins and proprietary separators prior to connecting to the downstream storm drain system. This will result in an improvement over existing conditions, meeting the pretreatment requirements of Standard 5, and meeting the structural BMP requirements to the maximum extent practicable.

An operation and maintenance plan that is provided in this report and will be followed by the owner will further improve the stormwater runoff leaving the site. A long-term pollution prevention plan will also be followed, which will include source controls, good housekeeping practices, and emergency spill procedures.

STANDARD 6: STORMWATER DISCHARGES TO CRITICAL AREAS

The Site is not adjacent to a critical area; however, the stormwater runoff from the site is tributary to a portion of Boston Harbor (Proper) that is a Shellfish Suitability Area although shellfish growing is currently prohibited. The stormwater management system is intended to meet the pretreatment standard, and meet the Structural BMP requirements to the maximum extent practicable. Due to the presence of this potentially critical area, the water quality volume is based on one-inch, as opposed to ½ inch.

STANDARD 7: REDEVELOPMENT PROJECTS

The Project site is currently developed. The redevelopment will result in an improvement over existing conditions most notably in water quality and future maintenance. Reasonable efforts have been made to meet all the stormwater standards to the maximum extent practicable.

STANDARD 8: CONTROL CONSTRUCTION-RELATED IMPACTS

The project will install erosion and sediment controls prior to any major earthwork activity. The Contractor will be required to prepare a Storm Water Pollution Prevention Plan in conjunction with the General Permit for Construction Activity under the EPA's National Pollutant Discharge Elimination System (NPDES) program.

STANDARD 9: LONG-TERM OPERATION AND MAINTENANCE PLAN

See Appendix F for the operation and maintenance requirements of the stormwater management system.

STANDARD 10: NO ILLICIT DISCHARGES

There are no known or proposed illicit connections associated with this project. Illicit discharge compliance statement is provided in Appendix G.

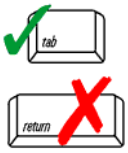
Appendix A:
Stormwater Checklist

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

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

---

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

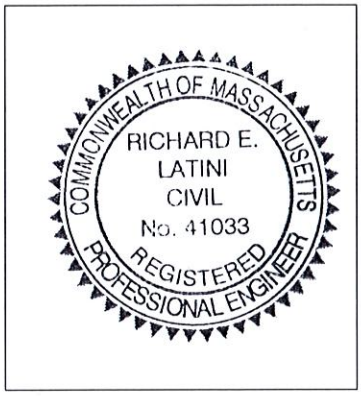
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



5/22/18

Signature and Date

Checklist

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

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☒ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☒ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

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

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☒ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☒ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☒ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

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

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☒* The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

* Infiltration is provided to the maximum extent practicable. There is not enough separation between the surface grade and seasonal high groundwater to provide infiltration at all locations

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☒ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

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

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☒ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

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

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

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

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

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☐ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☐ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

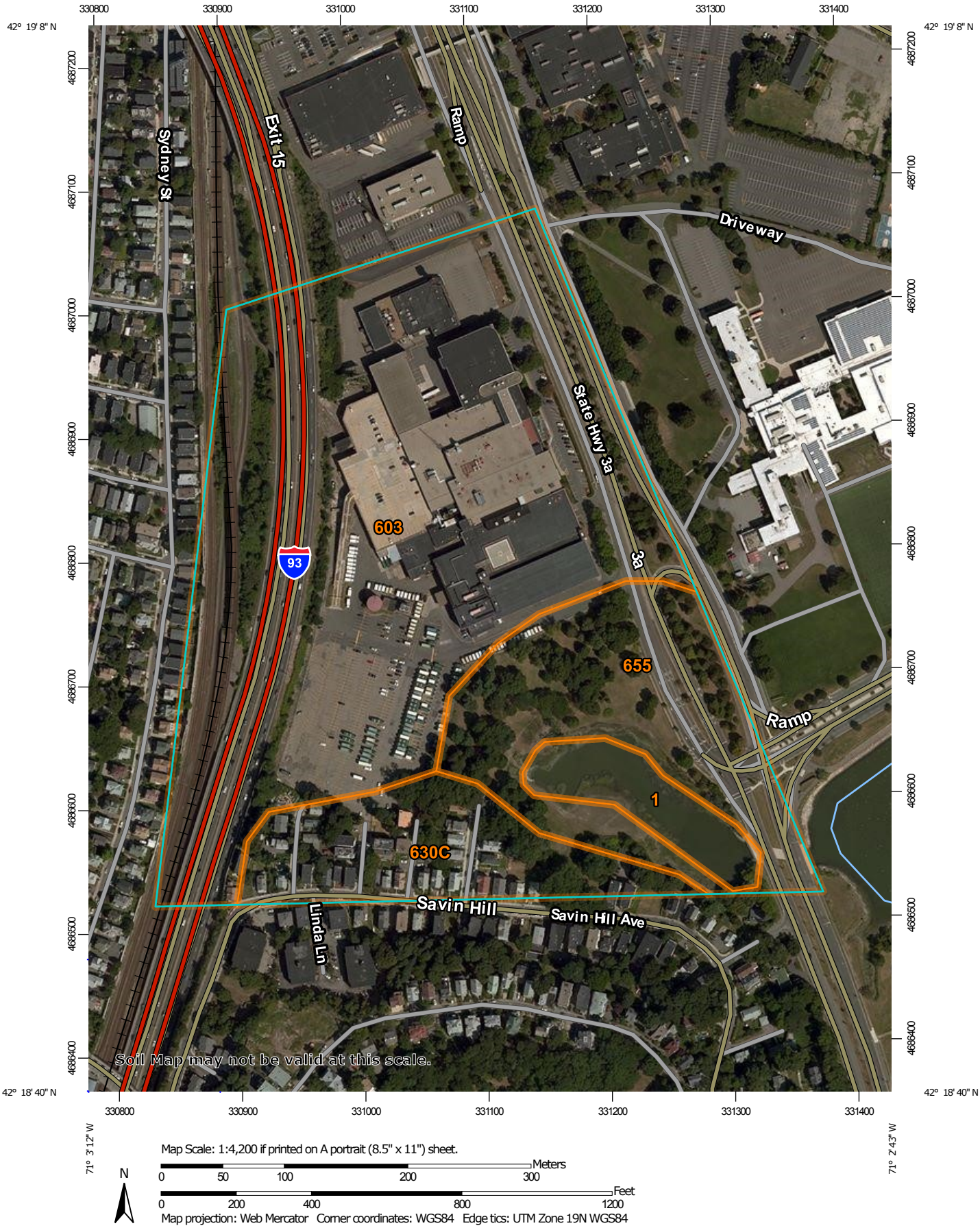
Standard 10: Prohibition of Illicit Discharges

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

☒ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Appendix B:
Soils Information


71° 3' 12" W
71° 2' 43" W
42° 19' 8" N
42° 18' 40" N
330800
330900
331000
331100
331200
331300
331400
4687200
4687100
4687000
4686900
4686800
4686700
4686600
4686500
4686400
Sydney St
Exit 15
Ramp
Driveway
State Hwy 3a
3a
603
655
1
630C
93
Ramp
Savin Hill
Savin Hill Ave
Linda Ln
Soil Map may not be valid at this scale.
Map Scale: 1:4,200 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 50 100 200 300
Feet
0 200 400 800 1200
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 13, Oct 6, 2017

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

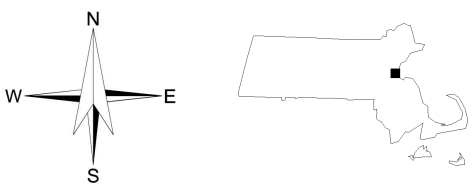
Date(s) aerial images were photographed: Aug 10, 2014—Aug 25, 2014

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1	Water	2.4	4.5%
603	Urban land, wet substratum, 0 to 3 percent slopes	33.7	65.0%
630C	Charlton-Hollis-Urban land complex, 3 to 15 percent slopes	6.0	11.6%
655	Udorthents, wet substratum	9.8	18.9%
Totals for Area of Interest		**51.9**	**100.0%**

SITE COORDINATES: 42°18'54"N,71°3'1"W



U.S.G.S. QUADRANGLE: BOSTON SOUTH, MA

HALEY & ALDRICH

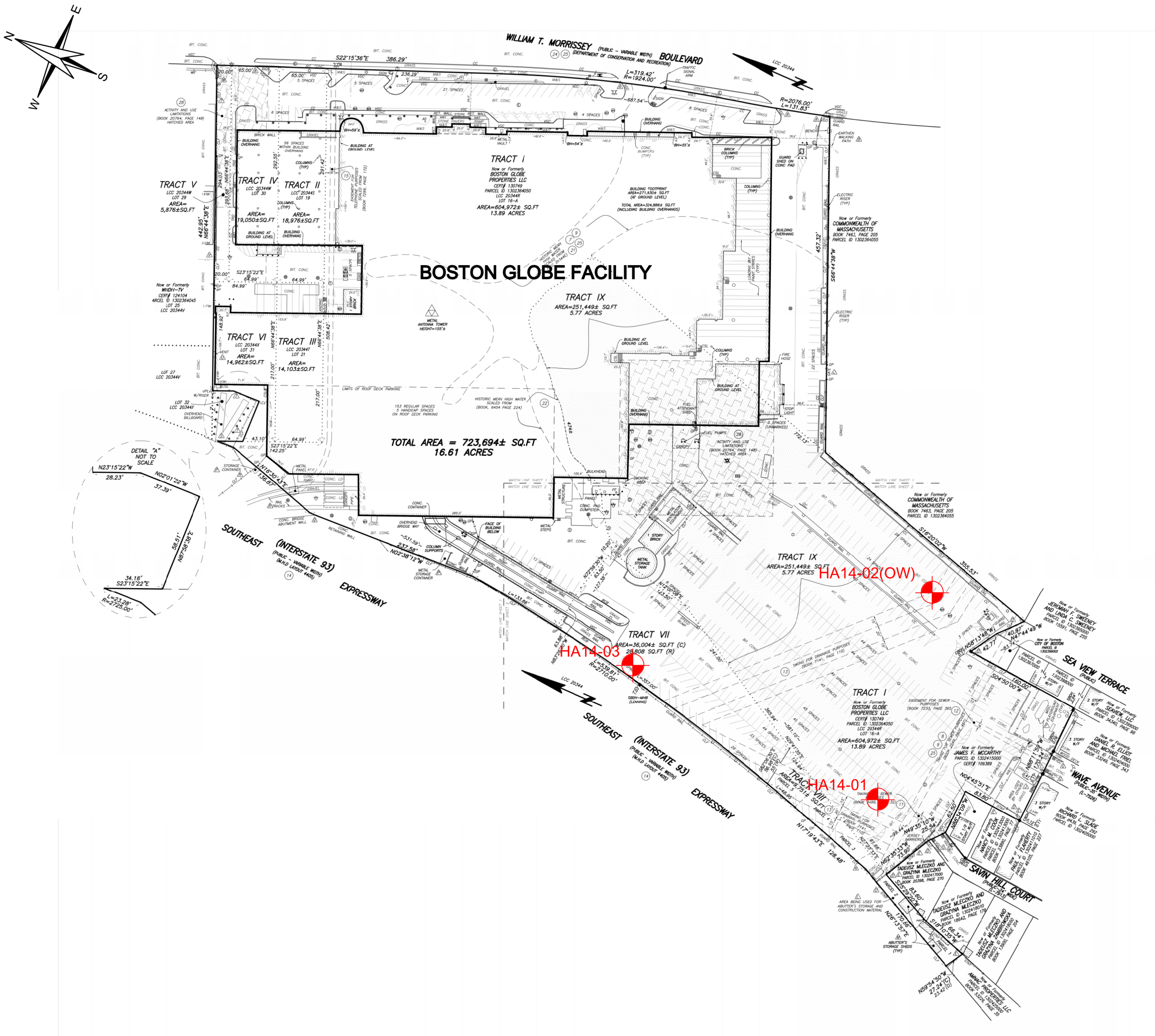
THE BOSTON GLOBE PROPERTY
135 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS

PROJECT LOCUS

SCALE: 1:24,000
DECEMBER 2014

FIGURE 1

41321-000 1.PDF



LEGEND:

HA14-01 — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS, LLC, AND MONITORED BY HALEY & ALDRICH, INC. DURING THE PERIOD OF 15 AND 19 DECEMBER 2014.

(OW) — INDICATES GROUNDWATER OBSERVATION WELL INSTALLED IN TEST BORING.

NOTE:

1. BASE PLAN TAKEN FROM DRAWING TITLED "ALTA/ACSM LAND TITLE SURVEY, 135 WILLIAM T. MORRISSEY BOULEVARD, BOSTON, MASS," PREPARED BY FELDMAN LAND SURVEYORS AND DATED 23 DECEMBER 2014.
2. ELEVATIONS ARE IN FEET AND REFER TO BOSTON CITY BASE (BCB) DATUM.

0 150 300
SCALE IN FEET

HALEY & ALDRICH

THE BOSTON GLOBE PROPERTY
135 MORRISSEY BOULEVARD
BOSTON, MASSACHUSETTS

SITE AND SUBSURFACE EXPLORATION LOCATION PLAN

SCALE: AS SHOWN
DECEMBER 2014

FIGURE 2

CIUFFETTI, MATTHEW Printed: December 30, 2014 layout: HA-FIG-B-L-H
Drawing: DRAWING1.DWG

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA14-01

Project	135 MORRISSEY BLVD, THE BOSTON GLOBE, BOSTON, MA
Client	WE 135 MORRISSEY BOULEVARD LLC
Contractor	NEW ENGLAND BORING CONTRACTORS, LLC

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	--	Rig Make & Model: Mobile B-53 Truck
Inside Diameter (in.)	4.0	1 3/8	--	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 19.0 ft
				Hoist/Hammer: Winch Safety Hammer
				PID Make & Model:

File No.	41321-000
Sheet No.	1 of 3
Start	15 December 2014
Finish	15 December 2014
Driller	K.Smith
H&A Rep.	D. Palleiko
Elevation	16.0 (est.)
Datum	Boston City Base
Location	See Plan

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0					15.7	-BITUMINOUS CONCRETE-										
	17 12 23	S1 10	0.5 2.0	SM	0.3	Dense gray silty SAND with gravel (SM), mps 1.0 in., no structure, no odor, moist, 30% ash, brick and glass in fragments, particles, and specks	5	15	5	20	35	20				
5	5 6 6 3	S2 5	4.0 6.0	SM		Medium dense gray silty SAND (SM), mps 0.5 in., no structure, no odor, moist, 80% ash, in fragments, particles, and specks		5		15	40	40				
						-FILL-										
					7.2											
	2 6 6 8	S3 14	9.0 11.0	OL/ OH	8.8	Note: Stratum change at 8.75 ft. Stiff gray ORGANIC SILT (OL/OH), mps 0.05 in., no structure, no odor, moist, root and plant fibers					10	90	S	L	L	
10						-ORGANIC DEPOSITS-										
	6 9 12 17	S4 17	14.0 16.0	OL/ OH	1.0	Stiff gray to red-brown ORGANIC SILT (OL/OH), mps 0.05 in., single layer of fine sand at 15.0 ft, 0.2 ft thick, no odor, wet					10	90	S	L	L	
15				CL	15.0	S4A: Very stiff olive-brown to olive-gray lean CLAY (CL), mps 0.10 in., no structure, no odor, moist, no pp data					5	95	N	M	M	
						-MARINE DEPOSITS-										
	11 10	S5 8	19.0 21.0	CL		Very stiff olive-brown to olive-gray lean CLAY (CL), mps 0.3 in., no structure, no odor, moist					5	95	N	M	M	
20																

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	62.1
Rock Cored (ft)	
Samples	13S

Boring No. HA14-01

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-09 REV HA-LIB09-BOS.GLB HA-TB+CORE+WELL-07-2 W FENCE.GDT G:\41321\000-WINSTANLEY DUE DILIGENCE\GINT\41321-000-TB.GPJ 30 Dec 14

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA14-01
File No. 41321-000
Sheet No. 2 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	11 11					PPA = 2.25 -3.25 tsf PPD = 1.75 -3.40 tsf										
25	6 6 9 16	S6 24	24.0 26.0	CL		Stiff gray lean CLAY (CL), mps 0.05 in., no structure, no odor, moist PPA = 2.25 - 2.5 tsf PPD = 2.0 - 2.5 tsf					5	95	N	M	M	
						-MARINE DEPOSITS-										
30	9 10 23 31	S7 24	29.0 31.0	ML		Medium dense gray SILT (ML), mps 0.05 in., no structure, no odor, wet						100	R	L	N	
35	2 6 13 9	S8 24	34.0 36.0	ML/ CL		Medium dense gray SILT (ML), mps 0.05 in., frequent interbeds of lean clay up to 8 in. thick, no odor, wet						100	R	L	L	
40	2 4 6 5	S9 24	39.0 41.0	CL		Stiff gray lean CLAY (CL), mps 0.05 in., frequent fine sand partings, no odor, moist PPA = 1.0 - 1.25 tsf PPD = 1.0 tsf						100	N	M	M	
45	3 6 22 14	S10 24	44.0 46.0	CL		Very stiff gray lean CLAY (CL), mps 0.05 in., frequent fine sand partings, no odor, moist PPA = 1.0 -1.25 tsf PPD = 1.0 tsf					5	95	N	M	M	
					-31.0 47.0	Note: Drill action indicates stratum change.										
	12	S11	49.0	SP-		Medium dense gray poorly graded SAND with silt (SP-SM), mps 0.05 in., no					90	10				

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. HA14-01

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA14-01
File No. 41321-000
Sheet No. 3 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
50	16 10 14	13	51.0	SM		structure, odor, wet										
						-MARINE DEPOSITS-										
						Note: Rig chatters indicate gravel and cobbles at 53.0 and 55.5 ft.										
55	15 15 15 60	S12 9	54.0 56.0	SP		Medium dense olive-gray fading to red-brown poorly graded SAND (SP), mps 0.05 in., no odor, moist					95	5				
				CL	-39.5 55.5	Change to hard lean CLAY at 55.5 ft, no odor, moist						100	N	M	M	
					-41.0 57.0	Note: Drill indicates stratum change.										
						Occasional cobbles										
60	26 48 100/1"	S13 6	59.0 61.0	SM		Very dense olive brown silty SAND with gravel (SM), mps 1.0 in., no structure, no odor, wet	5	15	15	25	20	20				
						-GLACIOFLUVIAL DEPOSITS-										
						Note:Advanced roller bit to 62.1 ft. Constant hard, smooth drilling.										
					-46.1 62.1	Note: Refusal on probable BEDROCK.										
						BOTTOM OF EXPLORATION 62.1 FT										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. HA14-01

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA14-02(OW)

Project	135 MORRISSEY BLVD, THE BOSTON GLOBE, BOSTON, MA
Client	WE 135 MORRISSEY BOULEVARD LLC
Contractor	NEW ENGLAND BORING CONTRACTORS, LLC

File No. 41321-000
Sheet No. 1 of 2
Start 19 December 2014
Finish 19 December 2014
Driller K. Smith
H&A Rep. D. Palleiko
Elevation 16.0 (est.)
Datum Boston City Base
Location See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	NW/HW	S	--	Rig Make & Model: Mobile B-53 Truck
Inside Diameter (in.)	3.0/4.0	1 3/8	--	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0						15.6	-BITUMINOUS CONCRETE-										
	8 4 3	S1 12	0.5 2.0	SM		0.4	Loose brown silty SAND with gravel (SM), mps 0.8 in., no structure, no odor, moist, 20 -25% ash, cinder, glass, coal in fragments, particles, and specks		15		10	40	35				
							-FILL-										
5	1 1 1 1	S2 9	5.0 7.0	SM			Very loose gray, black and red-brown mottled 100% ASH, cinders, slag in fragments, particles, and specks	5	15	10	15	20	35				
10	2 2 1 2	S3 10	10.0 12.0	OL/ OH		5.5 10.5	Note: Stratum change at 10.5 ft. 10.5-12.5: Soft dark brown fibrous ORGANIC SILT (OL/OH), mps 0.05 in., rootmat structure, moderate H2S odor, moist					5	95	S	L	L	
							-ORGANIC DEPOSITS-										
15	3 3 3 5	S4 16	15.0 17.0	OL/ OH			Medium stiff light gray ORGANIC SILT (OL/OH), mps 0.05 in., occasional brown fibrous peat up to 2 in. thick, no odor, moist					5	95	S	L	L	
						-3.0 19.0	Note: Drill action indicates stratum change at 19.0 ft										
20							-MARINE DEPOSITS-										

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/19/14	1400	0.25	17.0	42.0	11.8

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft) 42.0
Rock Cored (ft)
Samples 9S

Boring No. HA14-02(OW)

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Toughness**: L - Low M - Medium H - High **Plasticity**: N - Nonplastic L - Low M - Medium H - High **Dry Strength**: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-09 REV HA-LIB09-BOS.GLB HA-TB+CORE+WELL-07-2 W FENCE.GDT G:\41321\000-WINSTANLEY DUE DILIGENCE\GINT\41321-000-TB.GPJ 30 Dec 14

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TEST BORING REPORT

Boring No. HA14-02(OW)
File No. 41321-000
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	6 5 6 6	S5 21	20.0 22.0	CL			Stiff yellow-brown lean CLAY (CL), mps 0.5 in., occasional fine sand partings, no odor, moist PPA = 2.0 tsf PPD = 2.0 tsf						100	N	M	M	
							Note: Rig Chattering. Drill action indicates occasional gravel at 22.5 ft.										
25	2 2 5 4	S6 24	25.0 27.0	CL			Medium stiff olive-gray lean CLAY (CL), mps 0.05 in., no structure, no odor, moist PPA = 1.5 - 1.25 tsf PPD = 1.25 tsf						100	N	M	M	
							-MARINE DEPOSITS-										
30	6 5 6 6	S7 20	30.0 32.0	CL			Stiff gray lean CLAY (CL), mps 0.05 in., frequent interbeds of silt up to 1.0 in. thick, no odor, moist						100	N	M	M	
35	1 3 3 3	S8 24	35.0 37.0	CL			Medium stiff gray lean CLAY (CL), mps 0.05, no structure, no odor, moist PPA = 1.0 -1.25 tsf PPD = 1.0 tsf						100	N	M	M	
40	1 3 4 3	S9 24	40.0 42.0	CL			Medium stiff gray lean CLAY (CL), mps 0.05 in., no structure, no odor, moist PPA = 1.0 tsf PPD = 0.75 tsf						100	N	M	M	
						-26.0 42.0	BOTTOM OF EXPLORATION 42.0 FT										

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. HA14-02(OW)

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA14-03

Project	135 MORRISSEY BLVD, THE BOSTON GLOBE, BOSTON, MA
Client	WE 135 MORRISSEY BOULEVARD LLC
Contractor	NEW ENGLAND BORING CONTRACTORS, LLC

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	NX	Rig Make & Model: Mobile B-53 Truck
Inside Diameter (in.)	4.0	1 3/8	2.0	Bit Type: Roller Bit
Hammer Weight (lb)	300	140	-	Drill Mud: None
Hammer Fall (in.)	24	30	-	Casing: HW Drive to 15 ft
				Hoist/Hammer: Cat-Head Safety Hammer
				PID Make & Model:

File No.	41321-000
Sheet No.	1 of 6
Start	16 December 2014
Finish	19 December 2014
Driller	K. Smith
H&A Rep.	D. Palleiko
Elevation	16.0 (est.)
Datum	Boston City Base
Location	See Plan

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0					15.6	-BITUMINOUS CONCRETE-										
	17 7 7 8	S1 8	0.5 2.0	SM	0.4	Medium dense black and gray silty SAND with gravel (SM), mps 0.75 in., no structure, no odor, moist, 20% ash in particles and specks	5	10	5	15	30	35				
						-FILL-										
5	2 1 1 1	S2 5	5.0 7.0	ML		Very loose dark brown with gray brown specks sandy SILT with gravel (ML), mps 0.5 in., no structure, no odor, moist, 75-80% ash, coal in fragments, particles and specks		15		10	15	60				
						-ASH FILL-										
10	WOH 1 1 1	S3 18	10.0 12.0	OL/ OH	6.0 10.0	Note: Stratum change at 10.0 ft. Very soft brown to dark brown fibrous ORGANIC SOIL (OL/OH), mps 0.10 in., fibrous root mat structure, moderate to strong H2S odor, moist					5	95				
						-ORGANIC DEPOSITS-										
15	5 4 7 8	S4 11	15.0 17.0	OL/ OH		Stiff gray ORGANIC SILT (OL/OH), mps0.05 in., occasional plant fiber, no odor, moist					5	95	S/N	L	L/M	
					-2.0 18.0	-MARINE DEPOSITS-										
20																

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/17/14	0700	16	15	48.25	11.05
12/18/14	0700	16	15	107.6	11.34

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Split Spoon Sample

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	124.0
Rock Cored (ft)	5.0
Samples	22S

Boring No. HA14-03

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

†**Note: Maximum particle size is determined by direct observation within the limitations of sampler size.**

Note: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

H&A-TEST BORING-09 REV HA-LIB09-BOS.GLB HA-TB+CORE+WELL-07-2 W FENCE.GDT G:\41321\000-WINSTANLEY DUE DILIGENCE\GINT\41321-000-TB.GPJ 30 Dec 14

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA14-03
File No. 41321-000
Sheet No. 2 of 6

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
20	2 5 6 12	S5 17	20.0 22.0	CL		Stiff gray lean CLAY (CL). mps 0.05 in., no structure, no odor, moist						100	N	M	M	
25	4 5 6 8	S6 19	25.0 27.0	CL		Stiff gray lean CLAY (CL), mps 0.05 in., no structure, no odor, moist						100	N	M	M	
30	3 3 6 5	S7 21	30.0 32.0	CL		Stiff gray lean CLAY (CL), mps 0.05 in., frequent moderately angular fine sand partings up to 1/32 in. thick, no odor, moist PPA = 0.5 tsf PPD = 0.5 tsf						100	N	M	M	
35	2 1 2 4	S8 22	35.0 37.0	CL		Soft gray lean CLAY (CL), mps 0.05 in., frequent silt layers up to 2 in. thick, no odor, moist PPA = 1.0 - 1.5 tsf PPD = 1.0 - 1.25 tsf						100	N	M	M	
						-MARINE DEPOSITS-										
40	2 2 3 3	S9 22	40.0 42.0	CL		Medium stiff gray lean CLAY (CL), frequent interbeds of silt up to 2 in. thick, no odor, moist						100	N	M	M	
45	3 3 3 4	S10 14	45.0 47.0	ML		Loose gray SILT (ML), mps 0.05 in., frequent lean CLAY (CL) interbeds up to 2 in. thick, no odor, moist						100	R	L	N	

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. HA14-03

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA14-03
File No. 41321-000
Sheet No. 3 of 6

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
50	3 4 5 10	S11 24	50.0 52.0	CL		Stiff gray lean CLAY (CL), mps 0.05 in., frequent vertical silt partings, no odor, moist, no PP data						100	N	M	M	
55	4 4 5 5	S12 15	55.0 57.0	CL		Stiff gray lean CLAY (CL), mps 0.05 in., frequent fine sand/silt partings, no odor, moist PPA = 1.25 tsf PPD = 1.0 tsf						100	N	M	M	
60	3 5 5 7	S13 24	60.0 62.0	CL		Stiff gray lean CLAY (CL), mps 0.05 in., no structure, no odor, moist PPA = 1.25 tsf PPD = 1.0 tsf						100	N	M	M	
65	1 3 2 3	S14 24	65.0 67.0	CL		Medium stiff gray lean CLAY (CL), mps 0.05 in., frequent interbeds of silt up to 2 in. thick, no odor, wet						100	N	M	M	
70	WOR 6 6 6	S15 24	70.0 72.0	CL		Stiff gray lean CLAY (CL), mps 0.05 in., no structure, no odor, moist PPA = 0.75 tsf PPD = 0.75 tsf -MARINE DEPOSITS-						100	N	M	M	
75	2 3 4 7	S16 15	75.0 77.0	CL		Medium stiff gray lean CLAY (CL), mps 0.05 in., occasional fine sand partings, no odor, moist						100	N	M	M	

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. HA14-03

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA14-03
File No. 41321-000
Sheet No. 4 of 6

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
80	WOR WOH 3 5	S17 24	80.0 82.0	CL		Soft gray lean CLAY (CL), mps 0.05 in., no structure, no odor, moist PPA = 0.5 tsf						100	N	M	M	
85																
90	WOR/18" 5	S18 24	90.0 92.0	CL		Very soft gray lean CLAY (CL), mps 0.05 in., no structure, no odor, moist PPA = 0.05 tsf PPD = 0.5 tsf						100	N	M	M	
95																
100	1/12" 4 10	S19 24	100.0 102.0	CL		Soft gray lean CLAY (CL), mps 0.05 in., frequent fine sand partings, no odor, moist PPA = 0.5 tsf PPD = 0.5 tsf						100	N	M	M	
105																

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. HA14-03

HALEY & ALDRICH

TEST BORING REPORT

Boring No. HA14-03
File No. 41321-000
Sheet No. 5 of 6

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Density/consistency, color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
					-93.0 109.0	Note: Stratum change at 109.0 ft.										
110	28 57 85	S20 15	110.0 111.5	SW-SM		Very dense light brown well graded SAND with silt and gravel (SW-SM), mps 0.8 in., no structure, no odor, occasional iron stained band	5	10	15	20	40	10				
						-GLACIOFLUVIAL DEPOSITS-										
					-98.0 114.0	Note: Drill action indicates stratum change at 114.0 ft.										
115	51 46 48 66	S21 10	115.0 117.0	GM		Very dense light brown and gray mottled silty GRAVEL (GM), mps 1.2 in., weakly bonded, no odor, moist	55	20			10	15				
						-GLACIAL TILL-										
					-102.0 118.0	Note: Drill action indicates stratum change. Till gets harder.										
						-GLACIAL TILL-										
120	46 84 100/5"	S22 13	120.0 121.4	GM		Very dense light brown and gray mottled silty GRAVEL with sand (GM), mps 1.2 in., moderately bonded, no odor, moist Note: Drill action indicates top of bedrock at 122.0 ft.	40	30			15	15				
						TOP OF BEDROCK AT 122.0 FT SEE CORE BORING REPORT FOR ROCK DETAILS										
125																

NOTE: Soil identification based on visual-manual methods of the USCS as practiced by Haley & Aldrich, Inc.

Boring No. HA14-03

HALEY & ALDRICH

CORE BORING REPORT

Boring No. HA14-03
File No. 41321-000
Sheet No. 6 of 6

Depth (ft)	Drilling Rate (min./ft)	Run No.	Run Depth (ft)	Recovery/RQD in.	Recovery/RQD %	Weath-ering	Elev./ Depth (ft)	Visual Description and Remarks
								SEE TEST BORING REPORT FOR OVERBURDEN DETAILS
							-106.0	Note: Advanced to 124.0 ft. Consistently hard material
							122.0	
	4	C1	124.0	41	68	Slight		Medium hard, slightly weathered, lilac-purple aphanitic to fine grained ARGILLITE. Bedding extremely thin to very thin, low angle. Primary joints low angle, bed parallel, very close to extremely close, smooth, planar, fresh to discolored with iron stain, tight. Secondary joints high angle, close to moderately close, smooth, plan, fresh to discolored with iron stain, tight.
125	5		129.0	9	15			
	5							
	5							
								-CAMBRIDGE ARGILLITE-
							-113.0	
							129.0	BOTTOM OF EXPLORATION 129.0 FT
130								
135								
140								
145								
150								
155								

H+A_CORE+WELL07-1 HA-LIB09-BOS.GLB HA-TB+CORE+WELL-07-1.GDT G:\41321\000-WINSTANLEY DUE DILIGENCE\GINT\41321-000-TB.GPJ 30 Dec 14

HALEY& ALDRICH

GROUNDWATER OBSERVATION WELL INSTALLATION REPORT

Well No. HA14-02(OW)
Boring No. HA14-02(OW)

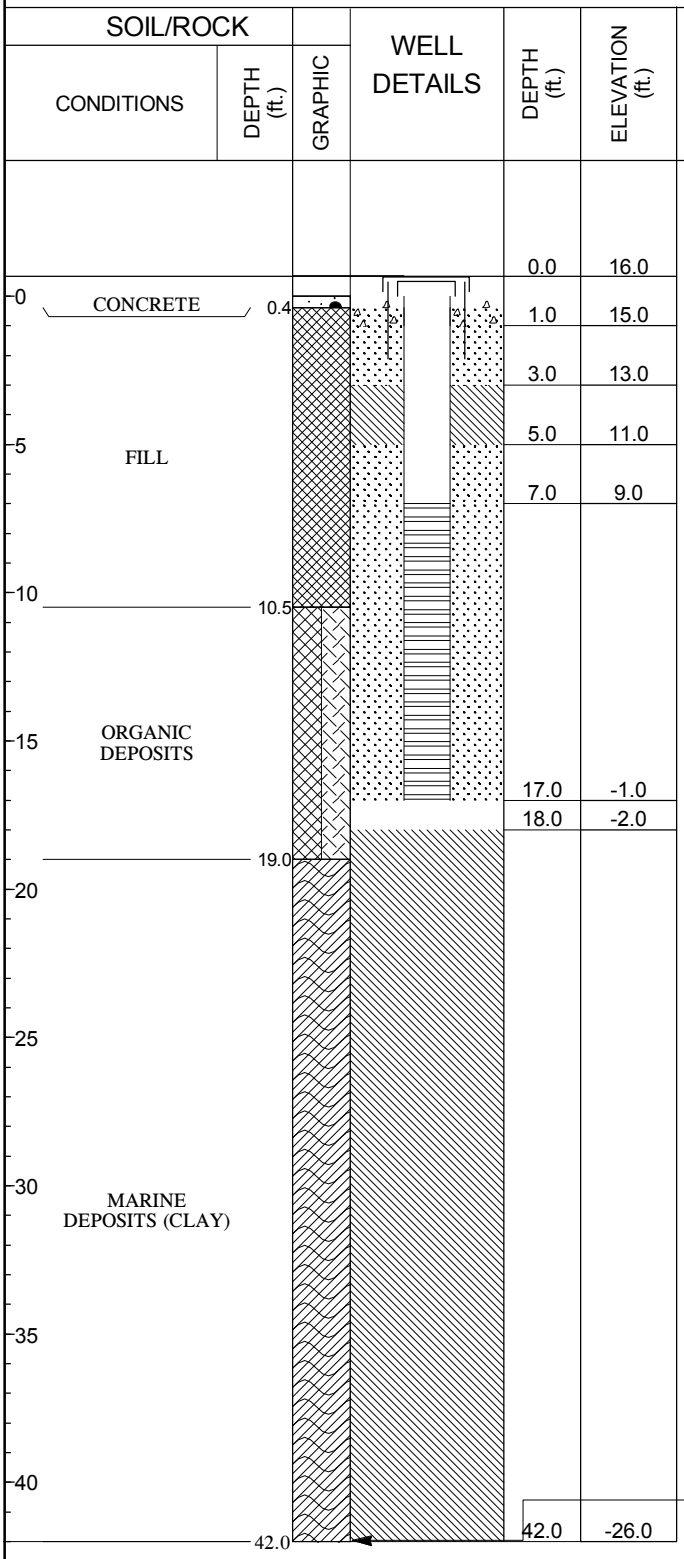
Project 135 MORRISSEY BLVD, THE BOSTON GLOBE
Location BOSTON, MA
Client WE 135 MORRISSEY BOULEVARD LLC
Contractor NEW ENGLAND BORING CONTRACTORS, LLC
Driller K. Smith

Initial Water Level (depth bgs) 11.8 ft

Well Diagram: Riser Pipe, Screen, Filter Sand, Cuttings, Grout, Concrete, Bentonite Seal

File No. 41321-000
Date Installed 19 Dec 2014
H&A Rep. D. Palleiko
Location See Plan

Ground El. 16.0 (est.)
Datum Boston City Base



WELL CONSTRUCTION DETAILS

Type of protective cover: Roadway Box Cover
Depth of Roadway Box below ground surface: 0.0 ft
Depth of top of riser below ground surface: 0.3 ft
Type of protective casing: Roadway Box
Length: 0.9 ft
Inside diameter: 5.0 in.
Depth of bottom of Roadway Box: 0.9 ft
Type of riser pipe: Schedule 40 PVC
Inside diameter of riser pipe: 2.0 in.
Depth of bottom of riser pipe: 7.0 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Concrete	0.0	0.5
Bentonite	3.0	2.0
Bentonite	18.0	23.0

Diameter of borehole: 4.5 in.
Depth to top of well screen: 7.0 ft
Type of screen: Machine slotted Sch 40 PVC
Screen gauge or size of openings: 0.010 in.
Diameter of screen: 2.0 in.
Type of Backfill around Screen: Filter Sand
Depth to bottom of well screen: 17.0 ft
Bottom of silt trap: -
Depth of bottom of borehole: 42.0 ft

COMMENTS:

HALEY & ALDRICH, INC.
465 Medford St.
Suite 2200
Boston, MA 02129
617.886.7400

Letter of Transmittal

Date	15 March 2018
File Number	130861-009
From	Lee S. Vanzler, P.E.; Michael J. Atwood, P.E.

To	Hacin + Associates 11 Beacon Street, Suite 1010 Boston, MA 02108
Attention	Richard Latini, P.E.
Copy to	Nordblom: Todd Fremont-Smith; Steve Logan John Moriarty & Associates: Will Marini; Joel Dyson; Eric Harstad; David Leathers Stantec: Thomas Urtz
Subject	135 Morrisey Boulevard – Test Pit Explorations and Hydraulic Conductivity

Attachments

Test Pit Exploration Location Plan
Logs of Test Pit Explorations
Test Pit Photographs
Soil Gradation Data

Transmitted via ☐ First class mail ☐ Overnight express ☐ Hand delivery ☒ Email

We have reviewed soil gradation laboratory testing from soil samples collected during the 7 March 2018 test pit exploration program at 135 Morrisey Boulevard. The soil samples were collected from each of the three (3) test pits conducted within the area of the proposed stormwater recharge systems; refer the attached sketch showing the designations and approximate locations of the test pits, as well as photographs of each pit.

The table below provides a general summary of our observations, as well as an estimate of hydraulic conductivity calculated from the soil gradation laboratory testing. Additional description of the conditions observed is included in the attached test pit logs.

Test Pit ID	Test Pit Depth (ft)	Depth to Groundwater (ft)	Groundwater Elevation (BCB)	Estimated Hydraulic Conductivity (cm/sec)
TP18-1	9.5	7.0	10.0	$1x10^{-2}$
TP18-2	9.5	8.0	7.5	$2x10^{-4}$
TP18-3	10.0	9.5	9.0	$3x10^{-6}$

HALEY & ALDRICH, INC.
465 Medford St.
Suite 2200
Boston, MA 02129
617.886.7400

Letter of Transmittal

As you are aware, there is inherent variability in subsurface conditions, particularly in the near surface urban fill soils – this is evident from the wide range of estimated hydraulic conductivity in each of the three pits. While the hydraulic conductivity estimates are representative of the soil sample collected, permeability characteristics could vary across the plan limits of the proposed recharge systems.

Please let us know if you have any questions or if you need further information to help advance your stormwater recharge system design.

WILLIAM T. MORRISSEY (PUBLIC – VARIABLE WIDTH) BOULEVARD
(DEPARTMENT OF CONSERVATION AND RECREATION)

ORIGINAL SIDELINE OF MORRISSEY BLVD.
R.R. SPIKE NOT FOUND

R.R. SPIKE NOT FOUND

LCC 20344

HISTORIC HIGHWATER (MASSGIS)

386.29' S22°15'36"E

236.29'

TBM–SH1

TBM–SH2

L=319.42'
R=1924.00'

~687.54'~

R=2076.00'
L=137.83'

TP18-1

TP18-2

TP18-3

TBM–DS4

TBM–DS2

TBM–DS3

SB/DH

SB/DH SET–08/22/08

ACTIVITY AND USE LIMITATIONS (BOOK 20764, PAGE 148) HATCHED AREA

ZONE AE (EL. 11)
ZONE X (UNSHADED)

TRACT I
Now or Formerly
BOSTON GLOBE PROPERTIES LLC
CERT# 130749
LCC 20344R
LOT 16–A
AREA=604,972± SQ.FT
13.89 ACRES

TRACT II
LCC 20344S
LOT 19
AREA= 18,976±SQ.FT

TRACT III
LCC 20344T
LOT 21
AREA= 14,103±SQ.FT

TRACT IV
LCC 20344W
LOT 30
AREA= 19,050±SQ.FT

TRACT V
LCC 20344W
LOT 29
AREA= 5,876±SQ.FT

TRACT VI
LCC 20344X
LOT 31
AREA= 14,962±SQ.FT

TRACT VII
AREA=36,004±SQ.FT(C)
28,808±SQ.FT(R)

TRACT IX
AREA=251,449± SQ.FT
5.77 ACRES

TOTAL AREA = 723,694± SQ.FT
16.61 ACRES
ASSESSOR'S PARCEL ID 1302364050
(TRACT I – IX)

Now or Formerly
HERB CHAMBERS MORRISSEY BLVD., LLC
CERT# 129487
PARCEL ID 1302364045
LOT 25
LCC 20344V

Now or Formerly
COMMONWEALTH OF MASSACHUSETTS
BOOK 7463, PAGE 205
PARCEL ID 1302364055

Now or Formerly
BOSTON GLOBE

LOT 27 LCC 20344V

LOT 32 LCC 20344X

442.95' N66°44'38"E

292.55'

234.03' N66°44'38"E

236.68' N66°44'38"E

457.32' S66°44'38"W

355.53' S16°20'02"W

148.92' N66°44'38"E

508.42' N66°44'38"E

217.00'

64.99' S23°15'22"E

84.99'

20.00'

65.00'

5 SPACES

6 SPACES

21 SPACES

4 SPACES

8 SPACES

153 REGULAR SPACES
5 HANDICAP SPACES
ON ROOF DECK PARKING

LIMITS OF ROOF DECK PARKING

HISTORIC MEAN HIGH WATER SCALED FROM (BOOK 6454, PAGE 224)

HISTORIC MEAN HIGH WATER SCALED FROM (LCC 20344E)

AREA UNDER CONSTRUCTION AT TIME OF SURVEY

BUILDING FOOTPRINT AREA=271,930± SQ.FT (AT GROUND LEVEL)

TOTAL AREA=324,886± SQ.FT (INCLUDING BUILDING OVERHANGS)

APPROXIMATE LOCATION OF TEST PIT EXPLORATION

DETAIL "A" NOT TO SCALE
N23°15'22"W 28.23'
N02°01'22"W 37.39'
58.51' N87°58'38"E
34.16' S23°15'22"E
L=23.28'
R=2725.00'
CH–B=N02°07'35"W
CH–L=23.28'

SOUTHEAST (INTERSTATE 93) EXPRESSWAY
(PUBLIC – VARIABLE WIDTH)
(M.H.D LAYOUT 4405)

NO ACCESS

N16°30'43"E 136.87'
ACCESS FOR RAILROAD PURPOSES

N02°38'12"W
NO ACCESS

~5.59'~ 237.58'

L=133.86'

N87°26'30"W 6.88'

L=539.61'
R=2710.00'
CH–B=N11°37'20"E
CH–L=538.91'
NO ACCESS

S72°13'

N72°56'30"W 61.50'

~127.38'~

N12°00'08"E 123.50'

S16°20'02"W

MATCH LINE SHEET 1
MATCH LINE SHEET 2
MATCH LINE SHEET 3

WF–A5
WF–A6
WF–A7
WF–A8
WF–A9
WF–A10
WF–A11
WF–A12
WF–A13

135 MORRISEY BOULEVARD
BOSTON, MASSACHUSETTS

TEST PIT EXPLORATION LOCATION PLAN

HALEY & ALDRICH, INC.
MARCH 2018

HALEY ALDRICH

TEST PIT LOG

Test Pit No. TP18-1

Project	135 WILLIAM T MORASSY BLVD	**File No.**	130861-009
Location	135 WILLIAM T MORASSY BLVD	**H&A Rep**	L. Navarret
Client	NORDBLOM	**Date**	7 Mar 2018
Contractor	J. DERENZO	**Weather**	30° cloudy/rain/snow
Equipment Used	CAT 430 F rubber tire backhoe		

Ground El.: 17.0 **El. Datum:** Boston City Base | **Location:** See Plan | **Groundwater depths/entry rates (in./min.):**

Depth (ft)	Sample ID	Stratum Change Elev./ Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (color, natural grain size and artificial component percentage estimates, maximum particle size, manual test properties, structure, odors, moisture, other descriptions and observations GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Tests Dilatancy	Toughness	Plasticity	Strength
0				-BITUMINOUS CONCRETE-										
		16.2 0.8	SP	Tan poorly graded SAND with gravel (SP), mps 1.5 in., no structure, no odor, dry, 1.5 dense grade (1.3 ft)	10	30	10	30	15	15				
		15.7 1.3	SM	Light brown silty SAND with gravel (SM), mps 3.0 ft, no structure, no odor, dry, pieces/fragments of brick, glass, asphalt, pieces of 4.0 in. clay throughout	10	15	10	10	40	15				
2														
4	TP18-1A 2.0 - 6.0			-URBAN FILL-										
6		11.0 6.0	SP	Brown poorly graded SAND with gravel (SP), mps 6.0 in., no odor, wet, pockets of approximately 2.0 to 3.0 in. organics	25	25	30	20	25	5				
8	TP18-1B 6.0 - 9.5			Note: Encountered water at 8.0 ft.										
		7.5		-FILL-										
		9.5		BOTTOM OF EXPLORATION 9.5 FT										

Obstructions:

Remarks:

Field Tests

Dilatancy R - Rapid S - Slow N - None
Toughness L - Low M - Medium H - High
Plasticity N - Nonplastic L - Low M - Medium H - High
Dry Strength N - None L - Low M - Medium H - High V - Very High

Standing Water in Completed Pit

at depth 8 / 7 ft
measured after 0 / 20 hours elapsed

Boulders

Diameter (in.)	Number	Approx. Vol. (cu.ft)
12 to 24	3	=
over 24	1	=

Test Pit Dimensions (ft)

Pit Length x Width (ft) 5 x 11
Pit Depth (ft) 9.5

NOTE: Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

HALEY ALDRICH

TEST PIT LOG

Test Pit No. TP18-2

Project	135 WILLIAM T MORASSY BLVD
Location	135 WILLIAM T MORASSY BLVD
Client	NORDBLOM
Contractor	J. DERENZO
Equipment Used	CAT 430 F rubber tire backhoe
File No.	130861-009
H&A Rep	L. Navarret
Date	7 Mar 2018
Weather	30° rain/snow

Ground El.: 15.5 ft
El. Datum: Boston City Base
Location: See Plan
Groundwater depths/entry rates (in./min.):

Depth (ft)	Sample ID	Stratum Change Elev./ Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (color, natural grain size and artificial component percentage estimates, maximum particle size, manual test properties, structure, odors, moisture, other descriptions and observations GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Tests: Dilatancy	Toughness	Plasticity	Strength
0				-BITUMINOUS CONCRETE-										
		15.0 / 0.5	SP	Yellow brown poorly graded SAND (SP), mps 0.5 in., no structure, no odor, dry Note: Sidewell wet (south).	10	10	5	50	20	5				
2				-FILL-										
		12.5 / 3.0	SP	Gray poorly graded SAND with gravel (SP), mps 1.0 in., no structure, no odor, dry, dense grade	10	15	10	10	40	15				
		12.0 / 3.5		-FILL-										
4	TP18-2 4.0 - 6.5		SM	Dark brown silty SAND with gravel (SM), mps 16.0 in., no structure, slight odor, dry, pieces of wood, brick, some cinders	10	10	10	10	25	35				
6				Note: Groundwater at 8.0 ft. Sample taken 3.5 to 6.0 ft.										
				-FILL-										
8				Note: Sidewalls on south had water poring out.										
		6.0 / 9.5		BOTTOM OF EXPLORATION 9.5 FT										

Obstructions:

Remarks:

Field Tests

Dilatancy R - Rapid S - Slow N - None
Toughness L - Low M - Medium H - High
Plasticity N - Nonplastic L - Low M - Medium H - High
Dry Strength N - None L - Low M - Medium H - High V - Very High

Standing Water in Completed Pit

at depth 8 ft
measured after NA hours elapsed

Boulders

Diameter (in.)	Number	Approx. Vol. (cu.ft)
12 to 24	2	=
over 24	-	=

Test Pit Dimensions (ft)

Pit Length x Width (ft) 4 x 8
Pit Depth (ft) 9.5

NOTE: Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

HA TESTPIT-07-1 HA-LIB09-BOS - COPY.GLB HA-TP07-1.GDT G:\130861_NORDBLOM\GINT\130861-009-TP.GPJ 15 Mar 18

HALEY ALDRICH

TEST PIT LOG

Test Pit No. TP18-3

Project	**135 WILLIAM T MORASSY BLVD**	**File No.**	130861-009
Location	135 WILLIAM T MORASSY BLVD	**H&A Rep**	L. Navarret
Client	NORDBLOM	**Date**	7 Mar 2018
Contractor	J. DERENZO	**Weather**	30° cloudy/rain/snow
Equipment Used	CAT 430 F rubber tire backhoe		

Ground El.: 18.5 ft
El. Datum: Boston City Base
Location: See Plan
Groundwater depths/entry rates (in./min.):

Depth (ft)	Sample ID	Stratum Change Elev./ Depth (ft)	USCS Symbol	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (color, natural grain size and artificial component percentage estimates, maximum particle size, manual test properties, structure, odors, moisture, other descriptions and observations GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Tests Dilatancy	Toughness	Plasticity	Strength
0		18.3		-BITUMINOUS CONCRETE-										
		0.3 / 17.9	SP	Tan poorly graded SAND with gravel (SP), mps 1.0 in., no structure, no odor, dry - dense grade	10	30	10	30	15	5				
		0.6	SP- SM	Brown poorly graded SAND with silt and gravel (SP-SM), mps 3.0 in., no structure, no odor, dry	10	15	10	15	40	10				
				-FILL-										
		16.9												
		1.6	SP- SM	Gray to brown poorly graded SAND with silt and gravel (SP-SM), mps 2.0 in., no structure, no odor, dry, pieces of clinkers, glass, brick, coal	10	15	10	15	40	10				
2														
4				Note: Ash percentage up to 30%.										
	TP18-3 0.0 - 10.0													
6				-FILL-										
8				Note: Groundwater at 9.5 ft.										
10		8.5												
		10.0		BOTTOM OF EXPLORATION 10.0 FT										

Obstructions:

Remarks:

Field Tests

Dilatancy R - Rapid S - Slow N - None
Toughness L - Low M - Medium H - High
Plasticity N - Nonplastic L - Low M - Medium H - High
Dry Strength N - None L - Low M - Medium H - High V - Very High

Standing Water in Completed Pit

at depth 9.5 ft
measured after 0 hours elapsed

Boulders

Diameter (in.)	Number	Approx. Vol. (cu.ft)
12 to 24	-	=
over 24	-	=

Test Pit Dimensions (ft)

Pit Length x Width (ft) 4 x 7
Pit Depth (ft) 10.0

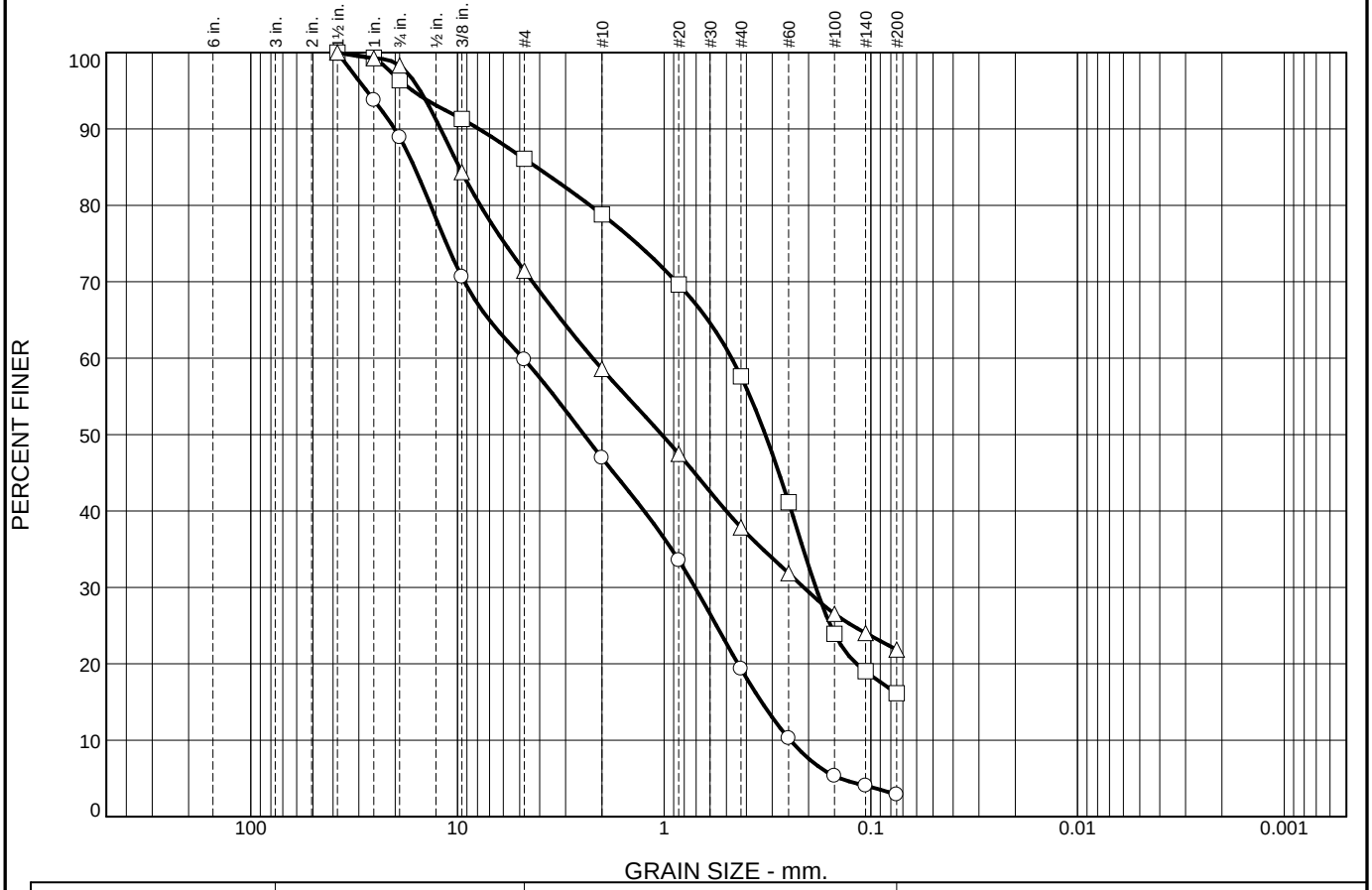
NOTE: Soil identification based on visual-manual methods of the USCS system as practiced by Haley & Aldrich, Inc.

TEST PIT PHOTOGRAPH: TP18-1

TEST PIT PHOTOGRAPH: TP18-2

TEST PIT PHOTOGRAPH: TP18-3

U.S. STANDARD SIEVE SIZE



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	11.1	29.1	12.8	27.7	16.4	2.9	
□	0.0	3.6	10.3	7.3	21.2	41.4	16.2	
△	0.0	1.7	26.9	12.8	20.7	16.0	21.9	

	Expl. No.	Sample No.	Depth (m.)	Atterberg Limits %			Water Content (%)	C_u	C_c	USCS
				w_L	w_P	I_P				
○	TP18-1A		3.0-6.0 ft.				9.7	19.64	0.43	SP
□	TP18-2		3.0-6.0 ft.				15.1			SM
△	TP18-3		4.0-7.0 ft.				35.5			SM

	Sample Description
○	Gray poorly graded sand with gravel
□	Dark brown silty sand
△	Brown silty sand with gravel

Remarks:
○Fill
□Fill
△Ash Fill

HALEY ALDRICH

Geotechnical Consulting Services, 135 Morrissey Boulevard
Boston, Massachusetts

GRAIN SIZE DISTRIBUTION

DATE: 3/12/2018

FILE NO: 130861.009

Appendix C:
Pre-Development Hydrology

NOAA Atlas 14, Volume 10, Version 2
Location name: Dorchester, Massachusetts, USA*
Latitude: 42.316°, Longitude: -71.0492°
Elevation: 10.89 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.300 (0.247-0.365)	0.372 (0.305-0.452)	0.488 (0.399-0.597)	0.585 (0.475-0.721)	0.719 (0.581-0.939)	0.821 (0.625-1.11)	0.924 (0.680-1.31)	1.07 (0.730-1.54)	1.26 (0.821-1.90)	1.41 (0.890-2.17)
10-min	0.425 (0.350-0.517)	0.526 (0.432-0.641)	0.692 (0.566-0.846)	0.829 (0.673-1.02)	1.02 (0.794-1.33)	1.16 (0.886-1.57)	1.31 (0.963-1.85)	1.52 (1.03-2.19)	1.79 (1.16-2.69)	1.99 (1.26-3.08)
15-min	0.500 (0.411-0.608)	0.619 (0.508-0.754)	0.814 (0.665-0.995)	0.975 (0.792-1.20)	1.20 (0.934-1.57)	1.37 (1.04-1.84)	1.54 (1.13-2.18)	1.78 (1.22-2.57)	2.10 (1.37-3.17)	2.34 (1.48-3.62)
30-min	0.680 (0.559-0.827)	0.843 (0.692-1.03)	1.11 (0.907-1.36)	1.33 (1.08-1.64)	1.64 (1.28-2.14)	1.87 (1.42-2.52)	2.10 (1.55-2.98)	2.44 (1.67-3.52)	2.88 (1.88-4.34)	3.22 (2.04-4.96)
60-min	0.860 (0.707-1.05)	1.07 (0.876-1.30)	1.41 (1.15-1.72)	1.69 (1.37-2.08)	2.07 (1.62-2.71)	2.37 (1.81-3.19)	2.67 (1.97-3.78)	3.09 (2.11-4.47)	3.66 (2.38-5.52)	4.09 (2.59-6.31)
2-hr	1.11 (0.914-1.33)	1.39 (1.15-1.68)	1.85 (1.52-2.24)	2.23 (1.82-2.73)	2.76 (2.17-3.59)	3.16 (2.43-4.24)	3.57 (2.65-5.03)	4.18 (2.86-5.98)	4.99 (3.26-7.45)	5.61 (3.56-8.56)
3-hr	1.29 (1.07-1.55)	1.62 (1.34-1.95)	2.15 (1.78-2.61)	2.60 (2.13-3.17)	3.22 (2.54-4.17)	3.70 (2.85-4.93)	4.17 (3.11-5.86)	4.90 (3.36-6.97)	5.86 (3.83-8.69)	6.59 (4.19-10.00)
6-hr	1.68 (1.40-2.01)	2.09 (1.75-2.51)	2.77 (2.30-3.33)	3.33 (2.75-4.03)	4.11 (3.26-5.28)	4.71 (3.64-6.22)	5.30 (3.97-7.37)	6.21 (4.28-8.74)	7.40 (4.86-10.9)	8.30 (5.30-12.5)
12-hr	2.18 (1.83-2.58)	2.68 (2.25-3.18)	3.50 (2.93-4.17)	4.18 (3.47-5.02)	5.12 (4.08-6.51)	5.84 (4.54-7.63)	6.56 (4.92-9.00)	7.62 (5.28-10.6)	9.02 (5.95-13.1)	10.1 (6.45-15.0)
24-hr	2.64 (2.23-3.11)	3.26 (2.76-3.85)	4.29 (3.61-5.08)	5.14 (4.29-6.13)	6.31 (5.06-7.97)	7.21 (5.64-9.37)	8.11 (6.13-11.1)	9.49 (6.59-13.1)	11.3 (7.47-16.2)	12.7 (8.13-18.6)
2-day	2.99 (2.55-3.50)	3.79 (3.22-4.44)	5.08 (4.31-5.98)	6.16 (5.18-7.29)	7.64 (6.18-9.62)	8.78 (6.93-11.4)	9.92 (7.59-13.5)	11.8 (8.23-16.2)	14.3 (9.48-20.3)	16.2 (10.4-23.5)
3-day	3.28 (2.81-3.83)	4.14 (3.54-4.83)	5.54 (4.71-6.49)	6.70 (5.66-7.90)	8.30 (6.74-10.4)	9.53 (7.55-12.3)	10.8 (8.26-14.6)	12.8 (8.97-17.5)	15.6 (10.3-22.0)	17.7 (11.4-25.5)
4-day	3.56 (3.06-4.14)	4.44 (3.81-5.17)	5.88 (5.02-6.87)	7.08 (5.99-8.32)	8.73 (7.10-10.9)	9.99 (7.94-12.9)	11.3 (8.67-15.3)	13.4 (9.39-18.2)	16.3 (10.8-22.9)	18.4 (11.9-26.4)
7-day	4.32 (3.73-4.99)	5.23 (4.51-6.05)	6.72 (5.76-7.81)	7.95 (6.77-9.30)	9.65 (7.90-12.0)	11.0 (8.75-14.0)	12.3 (9.47-16.4)	14.5 (10.2-19.5)	17.4 (11.6-24.3)	19.6 (12.7-27.9)
10-day	5.02 (4.35-5.78)	5.95 (5.14-6.86)	7.47 (6.43-8.65)	8.74 (7.46-10.2)	10.5 (8.59-12.9)	11.8 (9.44-14.9)	13.2 (10.1-17.4)	15.3 (10.8-20.5)	18.2 (12.2-25.2)	20.4 (13.2-28.8)
20-day	7.03 (6.13-8.04)	8.04 (7.00-9.21)	9.71 (8.41-11.2)	11.1 (9.53-12.8)	13.0 (10.7-15.7)	14.4 (11.5-17.9)	15.9 (12.2-20.5)	17.8 (12.7-23.5)	20.4 (13.7-27.9)	22.3 (14.5-31.2)
30-day	8.68 (7.60-9.89)	9.77 (8.54-11.1)	11.5 (10.0-13.2)	13.0 (11.2-15.0)	15.0 (12.4-18.0)	16.6 (13.2-20.3)	18.2 (13.8-23.0)	19.9 (14.2-26.0)	22.2 (15.0-30.1)	23.9 (15.6-33.2)
45-day	10.8 (9.46-12.2)	11.9 (10.5-13.5)	13.8 (12.1-15.7)	15.4 (13.3-17.6)	17.5 (14.5-20.8)	19.2 (15.3-23.3)	20.9 (15.8-26.0)	22.4 (16.0-29.1)	24.4 (16.6-32.9)	26.0 (17.0-35.8)
60-day	12.5 (11.0-14.2)	13.7 (12.1-15.5)	15.7 (13.7-17.8)	17.3 (15.1-19.8)	19.6 (16.2-23.1)	21.3 (17.0-25.7)	23.1 (17.5-28.6)	24.5 (17.6-31.6)	26.4 (17.9-35.3)	27.8 (18.2-38.1)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

WILLIAM T MORRISSEY BOULEVARD
(PUBLIC – VARIABLE)

SOUTHEAST EXPRESSWAY
(PRIVATE– VARIABLE)

E1=63,776 S.F.

E2 BLDG 1=328,992 S.F.

E3=247,510 S.F.

E4=83,416 S.F.

24" DRAINLINE

SOUTHEAST
EXPRESSWAY DMH
(DP#2)

COMMUNITY COMMERCIAL SUBDISTRICT

HISTORIC HIGHWATER (MASSGIS)

JURISDICTION (MASSGIS)

ZONE AE (EL. 11)

ZONE X (UNSHADED)

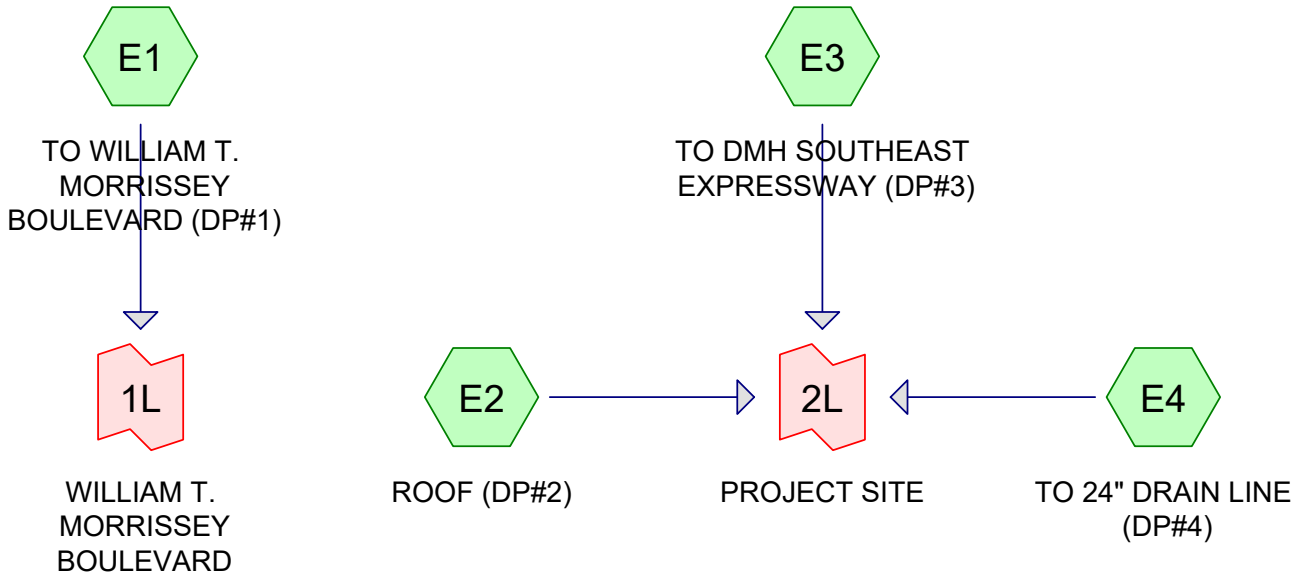
100 0 100 200

SCALE IN FEET

PRE–DEVELOPMENT DRAINAGE AREAS
135 MORRISSEY

HOWARD STEIN HUDSON
11 Beacon Street, Suite 1010
Boston, MA 02108
www.hshassoc.com

FIGURE
D.1



Subcat Reach Pond Link

Routing Diagram for Pre-135 Morrissey Blvd
Prepared by Howard Stein Hudson, Printed 5/17/2018

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.720	74	>75% Grass cover, Good, HSG C (E1, E3, E4)
8.341	98	Paved parking, HSG C (E1, E3, E4)
7.553	98	Roofs, HSG C (E2)
16.614	**97**	**TOTAL AREA**

Summary for Subcatchment E1: TO WILLIAM T. MORRISSEY BOULEVARD (DP#1)

Runoff = 4.05 cfs @ 12.07 hrs, Volume= 0.282 af, Depth> 2.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
1.053	98	Paved parking, HSG C
0.411	74	>75% Grass cover, Good, HSG C
1.464	91	Weighted Average
0.411		28.07% Pervious Area
1.053		71.93% Impervious Area

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

Summary for Subcatchment E2: ROOF (DP#2)

Runoff = 24.77 cfs @ 12.07 hrs, Volume= 1.904 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
7.553	98	Roofs, HSG C
7.553		100.00% Impervious Area

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

Summary for Subcatchment E3: TO DMH SOUTHEAST EXPRESSWAY (DP#3)

Runoff = 18.64 cfs @ 12.07 hrs, Volume= 1.432 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
5.594	98	Paved parking, HSG C
0.088	74	>75% Grass cover, Good, HSG C
5.682	98	Weighted Average
0.088		1.55% Pervious Area
5.594		98.45% Impervious Area

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

Summary for Subcatchment E4: TO 24" DRAIN LINE (DP#4)

Runoff = 5.94 cfs @ 12.07 hrs, Volume= 0.431 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
1.694	98	Paved parking, HSG C
0.221	74	>75% Grass cover, Good, HSG C
1.915	95	Weighted Average
0.221		11.54% Pervious Area
1.694		88.46% Impervious Area

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

Summary for Link 1L: WILLIAM T. MORRISSEY BOULEVARD

Inflow Area = 1.464 ac, 71.93% Impervious, Inflow Depth > 2.31" for 2-YR event
Inflow = 4.05 cfs @ 12.07 hrs, Volume= 0.282 af
Primary = 4.05 cfs @ 12.07 hrs, Volume= 0.282 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 2L: PROJECT SITE

Inflow Area = 15.150 ac, 97.96% Impervious, Inflow Depth > 2.98" for 2-YR event
Inflow = 49.35 cfs @ 12.07 hrs, Volume= 3.768 af
Primary = 49.35 cfs @ 12.07 hrs, Volume= 3.768 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Subcatchment E1: TO WILLIAM T. MORRISSEY BOULEVARD (DP#1)

Runoff = 7.00 cfs @ 12.07 hrs, Volume= 0.502 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
1.053	98	Paved parking, HSG C
0.411	74	>75% Grass cover, Good, HSG C
1.464	91	Weighted Average
0.411		28.07% Pervious Area
1.053		71.93% Impervious Area

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

Summary for Subcatchment E2: ROOF (DP#2)

Runoff = 39.36 cfs @ 12.07 hrs, Volume= 3.084 af, Depth> 4.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
7.553	98	Roofs, HSG C
7.553		100.00% Impervious Area

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

Summary for Subcatchment E3: TO DMH SOUTHEAST EXPRESSWAY (DP#3)

Runoff = 29.61 cfs @ 12.07 hrs, Volume= 2.320 af, Depth> 4.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
5.594	98	Paved parking, HSG C
0.088	74	>75% Grass cover, Good, HSG C
5.682	98	Weighted Average
0.088		1.55% Pervious Area
5.594		98.45% Impervious Area

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

Summary for Subcatchment E4: TO 24" DRAIN LINE (DP#4)

Runoff = 9.72 cfs @ 12.07 hrs, Volume= 0.727 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
1.694	98	Paved parking, HSG C
0.221	74	>75% Grass cover, Good, HSG C
1.915	95	Weighted Average
0.221		11.54% Pervious Area
1.694		88.46% Impervious Area

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

Summary for Link 1L: WILLIAM T. MORRISSEY BOULEVARD

Inflow Area = 1.464 ac, 71.93% Impervious, Inflow Depth > 4.12" for 10-YR event
Inflow = 7.00 cfs @ 12.07 hrs, Volume= 0.502 af
Primary = 7.00 cfs @ 12.07 hrs, Volume= 0.502 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 2L: PROJECT SITE

Inflow Area = 15.150 ac, 97.96% Impervious, Inflow Depth > 4.86" for 10-YR event
Inflow = 78.68 cfs @ 12.07 hrs, Volume= 6.131 af
Primary = 78.68 cfs @ 12.07 hrs, Volume= 6.131 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Subcatchment E1: TO WILLIAM T. MORRISSEY BOULEVARD (DP#1)

Runoff = 11.59 cfs @ 12.07 hrs, Volume= 0.857 af, Depth> 7.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
1.053	98	Paved parking, HSG C
0.411	74	>75% Grass cover, Good, HSG C
1.464	91	Weighted Average
0.411		28.07% Pervious Area
1.053		71.93% Impervious Area

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

Summary for Subcatchment E2: ROOF (DP#2)

Runoff = 62.30 cfs @ 12.07 hrs, Volume= 4.950 af, Depth> 7.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
7.553	98	Roofs, HSG C
7.553		100.00% Impervious Area

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

Summary for Subcatchment E3: TO DMH SOUTHEAST EXPRESSWAY (DP#3)

Runoff = 46.87 cfs @ 12.07 hrs, Volume= 3.724 af, Depth> 7.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
5.594	98	Paved parking, HSG C
0.088	74	>75% Grass cover, Good, HSG C
5.682	98	Weighted Average
0.088		1.55% Pervious Area
5.594		98.45% Impervious Area

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

Summary for Subcatchment E4: TO 24" DRAIN LINE (DP#4)

Runoff = 15.61 cfs @ 12.07 hrs, Volume= 1.198 af, Depth> 7.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
1.694	98	Paved parking, HSG C
0.221	74	>75% Grass cover, Good, HSG C
1.915	95	Weighted Average
0.221		11.54% Pervious Area
1.694		88.46% Impervious Area

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

Summary for Link 1L: WILLIAM T. MORRISSEY BOULEVARD

Inflow Area = 1.464 ac, 71.93% Impervious, Inflow Depth > 7.03" for 100-YR event
Inflow = 11.59 cfs @ 12.07 hrs, Volume= 0.857 af
Primary = 11.59 cfs @ 12.07 hrs, Volume= 0.857 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 2L: PROJECT SITE

Inflow Area = 15.150 ac, 97.96% Impervious, Inflow Depth > 7.82" for 100-YR event
Inflow = 124.78 cfs @ 12.07 hrs, Volume= 9.872 af
Primary = 124.78 cfs @ 12.07 hrs, Volume= 9.872 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Appendix D:
Post-Development Hydrology

DESIGN POINT #1
36" STORM DRAIN

WILLIAM T MORRISSEY BOULEVARD

P1A=0.57 Ac.

P1B=0.86 Ac.

P1C=0.90 Ac.

P2A=1.00 Ac.

P2B=2.54 Ac.

P2C=2.27 Ac.

P2D=1.44 Ac.

P3=0.42 Ac.

DESIGN POINT #2
60" STORM DRAIN

P3A=3.09 Ac.

P3B=1.76 Ac.

P4=1.75 Ac.

INF-3

INF-4

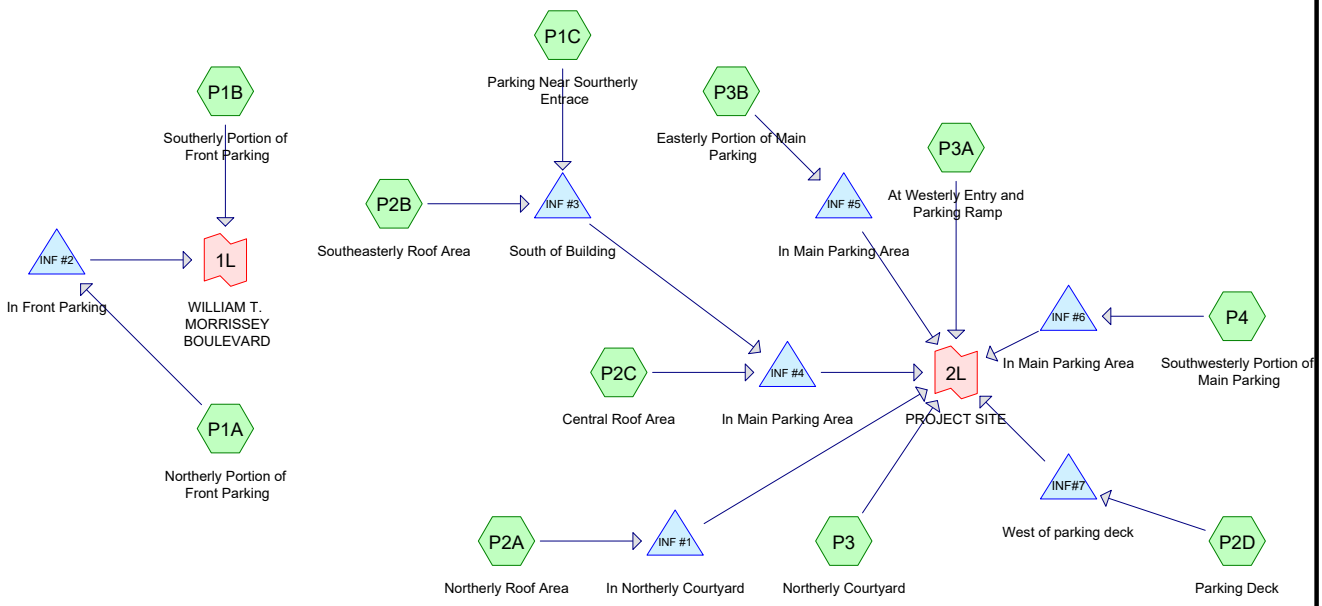
SOUTHEAST EXPRESSWAY

100 0 100 200
SCALE IN FEET

POST-DEVELOPMENT DRAINAGE AREAS
135 MORRISSEY

HOWARD STEIN HUDSON
11 Beacon Street, Suite 1010
Boston, MA 02108
www.hshassoc.com

FIGURE
D.2



Subcat Reach Pond Link

Routing Diagram for Post-135 Morrissey Blvd
Prepared by Howard Stein Hudson, Printed 5/17/2018

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.684	74	>75% Grass cover, Good, HSG C (P1A, P1B, P1C, P3A, P3B, P4)
0.033	96	Gravel surface, HSG C (P1B, P1C, P3A)
0.095	74	Landscaped Areas (P3)
7.217	98	Paved parking, HSG C (P1A, P1B, P1C, P3A, P3B, P4)
0.323	98	Pavement (P3)
2.266	98	Roof (P2C)
4.984	98	Roofs, HSG C (P2A, P2B, P2D)
16.602	**95**	**TOTAL AREA**

Summary for Subcatchment P1A: Northerly Portion of Front Parking

Runoff = 1.58 cfs @ 12.07 hrs, Volume= 0.110 af, Depth> 2.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
0.409	98	Paved parking, HSG C
0.162	74	>75% Grass cover, Good, HSG C
0.571	91	Weighted Average
0.162		28.37% Pervious Area
0.409		71.63% Impervious Area

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

Summary for Subcatchment P1B: Southerly Portion of Front Parking

Runoff = 2.61 cfs @ 12.07 hrs, Volume= 0.187 af, Depth> 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
0.728	98	Paved parking, HSG C
0.131	74	>75% Grass cover, Good, HSG C
0.003	96	Gravel surface, HSG C
0.862	94	Weighted Average
0.134		15.55% Pervious Area
0.728		84.45% Impervious Area

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

Summary for Subcatchment P1C: Parking Near Sourtherly Entrace

Runoff = 2.78 cfs @ 12.07 hrs, Volume= 0.202 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
0.775	98	Paved parking, HSG C
0.109	74	>75% Grass cover, Good, HSG C
0.012	96	Gravel surface, HSG C
0.896	95	Weighted Average
0.121		13.50% Pervious Area
0.775		86.50% Impervious Area

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

Summary for Subcatchment P2A: Northerly Roof Area

Runoff = 3.27 cfs @ 12.07 hrs, Volume= 0.251 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
0.997	98	Roofs, HSG C
0.997		100.00% Impervious Area

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

Summary for Subcatchment P2B: Southeasterly Roof Area

Runoff = 8.34 cfs @ 12.07 hrs, Volume= 0.641 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
2.543	98	Roofs, HSG C
2.543		100.00% Impervious Area

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

Summary for Subcatchment P2C: Central Roof Area

Runoff = 7.43 cfs @ 12.07 hrs, Volume= 0.571 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

	Area (ac)	CN	Description
*	2.266	98	Roof
	2.266		100.00% Impervious Area

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

Summary for Subcatchment P2D: Parking Deck

Runoff = 4.74 cfs @ 12.07 hrs, Volume= 0.364 af, Depth> 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
1.444	98	Roofs, HSG C
1.444		100.00% Impervious Area

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

Summary for Subcatchment P3: Northerly Courtyard

Runoff = 1.23 cfs @ 12.07 hrs, Volume= 0.087 af, Depth> 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

	Area (sf)	CN	Description
*	4,131	74	Landscaped Areas
*	14,060	98	Pavement
	18,191	93	Weighted Average
	4,131		22.71% Pervious Area
	14,060		77.29% Impervious Area

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

Summary for Subcatchment P3A: At Westerly Entry and Parking Ramp

Runoff = 9.08 cfs @ 12.07 hrs, Volume= 0.644 af, Depth> 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
2.458	98	Paved parking, HSG C
0.611	74	>75% Grass cover, Good, HSG C
0.018	96	Gravel surface, HSG C
3.087	93	Weighted Average
0.629		20.38% Pervious Area
2.458		79.62% Impervious Area

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

Summary for Subcatchment P3B: Easterly Portion of Main Parking

Runoff = 5.19 cfs @ 12.07 hrs, Volume= 0.368 af, Depth> 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
1.426	98	Paved parking, HSG C
0.338	74	>75% Grass cover, Good, HSG C
1.764	93	Weighted Average
0.338		19.16% Pervious Area
1.426		80.84% Impervious Area

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

Summary for Subcatchment P4: Southwesterly Portion of Main Parking

Runoff = 5.16 cfs @ 12.07 hrs, Volume= 0.366 af, Depth> 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-YR Rainfall=3.26"

Area (ac)	CN	Description
1.421	98	Paved parking, HSG C
0.333	74	>75% Grass cover, Good, HSG C
1.754	93	Weighted Average
0.333		18.99% Pervious Area
1.421		81.01% Impervious Area

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

Summary for Pond INF #1: In Northerly Courtyard

Inflow Area = 0.997 ac,100.00% Impervious, Inflow Depth > 3.03" for 2-YR event
Inflow = 3.27 cfs @ 12.07 hrs, Volume= 0.251 af
Outflow = 2.68 cfs @ 12.12 hrs, Volume= 0.168 af, Atten= 18%, Lag= 3.1 min
Discarded = 0.02 cfs @ 8.09 hrs, Volume= 0.032 af
Primary = 2.66 cfs @ 12.12 hrs, Volume= 0.135 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 14.37' @ 12.12 hrs Surf.Area= 0.068 ac Storage= 0.099 af

Plug-Flow detention time= 166.9 min calculated for 0.168 af (67% of inflow)
Center-of-Mass det. time= 68.5 min (823.2 - 754.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	12.00'	0.029 af	**39.50'W x 46.34'L x 3.50'H Field A** 0.147 af Overall - 0.051 af Embedded = 0.096 af x 30.0% Voids
#2A	12.50'	0.051 af	**ADS_StormTech SC-740 +Cap** x 48 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 8 Rows of 6 Chambers
#3B	12.00'	0.018 af	**44.25'W x 24.98'L x 3.50'H Field B** 0.089 af Overall - 0.028 af Embedded = 0.060 af x 30.0% Voids
#4B	12.50'	0.028 af	**ADS_StormTech SC-740 +Cap** x 27 Inside #3 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Rows of 3 Chambers
#5	12.45'	0.002 af	**5.00'D x 3.45'H DMH**
		0.128 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	12.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.45'	**12.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.45' / 12.40' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#3	Device 2	14.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 8.09 hrs HW=12.45' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=2.65 cfs @ 12.12 hrs HW=14.37' (Free Discharge)
└**2=Culvert** (Passes 2.65 cfs of 3.56 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 2.65 cfs @ 1.78 fps)

Stage-Area-Storage for Pond INF #1: In Northerly Courtyard

Elevation (feet)	Surface (acres)	Storage (acre-feet)
12.00	0.067	0.000
12.05	0.067	0.001
12.10	0.067	0.002
12.15	0.067	0.003
12.20	0.067	0.004
12.25	0.067	0.005
12.30	0.067	0.006
12.35	0.067	0.007
12.40	0.067	0.008
12.45	**0.068**	0.009
12.50	0.068	0.010
12.55	0.068	0.013
12.60	0.068	0.015
12.65	0.068	0.018
12.70	0.068	0.021
12.75	0.068	0.023
12.80	0.068	0.026
12.85	0.068	0.028
12.90	0.068	0.031
12.95	0.068	0.034
13.00	0.068	0.036
13.05	0.068	0.039
13.10	0.068	0.041
13.15	0.068	0.044
13.20	0.068	0.046
13.25	0.068	0.049
13.30	0.068	0.051
13.35	0.068	0.054
13.40	0.068	0.056
13.45	0.068	0.058
13.50	0.068	0.061
13.55	0.068	0.063
13.60	0.068	0.066
13.65	0.068	0.068
13.70	0.068	0.070
13.75	0.068	0.072
13.80	0.068	0.075
13.85	0.068	0.077
13.90	0.068	0.079
13.95	0.068	0.081
14.00	0.068	0.084
14.05	0.068	0.086
14.10	0.068	0.088
14.15	0.068	0.090
14.20	0.068	0.092
14.25	0.068	0.094
14.30	0.068	0.096
14.35	0.068	0.098
14.40	0.068	0.100
14.45	0.068	0.102
14.50	0.068	0.103
14.55	0.068	0.105
14.60	0.068	0.107
14.65	0.068	0.108
14.70	0.068	0.110
14.75	0.068	0.111
14.80	0.068	0.113
14.85	0.068	0.114
14.90	0.068	0.115
14.95	0.068	0.116
15.00	0.068	0.117
15.05	0.068	0.118
15.10	0.068	0.119
15.15	0.068	0.120
15.20	0.068	0.121
15.25	0.068	0.122
15.30	0.068	0.123
15.35	0.068	0.124
15.40	0.068	0.125
15.45	0.068	0.126
15.50	0.068	0.128
15.55	0.068	0.128
15.60	0.068	0.128
15.65	0.068	0.128
15.70	0.068	0.128
15.75	0.068	0.128
15.80	0.068	0.128
15.85	0.068	0.128
15.90	0.068	**0.128**

Summary for Pond INF #2: In Front Parking

Inflow Area = 0.571 ac, 71.63% Impervious, Inflow Depth > 2.31" for 2-YR event
Inflow = 1.58 cfs @ 12.07 hrs, Volume= 0.110 af
Outflow = 0.92 cfs @ 12.17 hrs, Volume= 0.073 af, Atten= 42%, Lag= 6.1 min
Discarded = 0.01 cfs @ 8.31 hrs, Volume= 0.018 af
Primary = 0.91 cfs @ 12.17 hrs, Volume= 0.055 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 12.49' @ 12.17 hrs Surf.Area= 0.048 ac Storage= 0.041 af

Plug-Flow detention time= 158.1 min calculated for 0.073 af (66% of inflow)
Center-of-Mass det. time= 61.1 min (861.5 - 800.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	10.87'	0.023 af	**24.83'W x 74.40'L x 2.33'H Field A** 0.099 af Overall - 0.024 af Embedded = 0.075 af x 30.0% Voids
#2A	11.37'	0.024 af	**ADS_StormTech SC-310 +Cap** x 70 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 7 Rows of 10 Chambers
#3B	10.87'	0.003 af	**8.17'W x 31.68'L x 2.33'H Field B** 0.014 af Overall - 0.003 af Embedded = 0.011 af x 30.0% Voids
#4B	11.37'	0.003 af	**ADS_StormTech SC-310 +Cap** x 8 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 2 Rows of 4 Chambers
		0.052 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	10.87'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	11.20'	**12.0" Round Culvert** L= 7.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.20' / 11.10' S= 0.0143 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#3	Device 2	12.30'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 8.31 hrs HW=10.89' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.90 cfs @ 12.17 hrs HW=12.49' (Free Discharge)
└**2=Culvert** (Passes 0.90 cfs of 2.65 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 0.90 cfs @ 1.21 fps)

Stage-Area-Storage for Pond INF #2: In Front Parking

Elevation (feet)	Surface (acres)	Storage (acre-feet)
10.87	**0.048**	0.000
10.92	0.048	0.001
10.97	0.048	0.001
11.02	0.048	0.002
11.07	0.048	0.003
11.12	0.048	0.004
11.17	0.048	0.004
11.22	0.048	0.005
11.27	0.048	0.006
11.32	0.048	0.007
11.37	0.048	0.007
11.42	0.048	0.009
11.47	0.048	0.011
11.52	0.048	0.013
11.57	0.048	0.014
11.62	0.048	0.016
11.67	0.048	0.018
11.72	0.048	0.020
11.77	0.048	0.021
11.82	0.048	0.023
11.87	0.048	0.025
11.92	0.048	0.026
11.97	0.048	0.028
12.02	0.048	0.029
12.07	0.048	0.031
12.12	0.048	0.032
12.17	0.048	0.034
12.22	0.048	0.035
12.27	0.048	0.036
12.32	0.048	0.038
12.37	0.048	0.039
12.42	0.048	0.040
12.47	0.048	0.041
12.52	0.048	0.042
12.57	0.048	0.043
12.62	0.048	0.044
12.67	0.048	0.045
12.72	0.048	0.045
12.77	0.048	0.046
12.82	0.048	0.047
12.87	0.048	0.047
12.92	0.048	0.048
12.97	0.048	0.049
13.02	0.048	0.050
13.07	0.048	0.050
13.12	0.048	0.051
13.17	0.048	**0.052**

Summary for Pond INF #3: South of Building

Inflow Area = 3.439 ac, 96.48% Impervious, Inflow Depth > 2.94" for 2-YR event
Inflow = 11.12 cfs @ 12.07 hrs, Volume= 0.843 af
Outflow = 11.52 cfs @ 12.07 hrs, Volume= 0.569 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.04 cfs @ 11.98 hrs, Volume= 0.071 af
Primary = 11.48 cfs @ 12.07 hrs, Volume= 0.498 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 14.09' @ 12.07 hrs Surf.Area= 0.151 ac Storage= 0.292 af

Plug-Flow detention time= 170.1 min calculated for 0.569 af (68% of inflow)
Center-of-Mass det. time= 73.5 min (834.0 - 760.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.00'	0.101 af	**25.25'W x 259.94'L x 3.50'H Field A** 0.527 af Overall - 0.190 af Embedded = 0.338 af x 30.0% Voids
#2A	9.50'	0.190 af	**ADS_StormTech SC-740 +Cap** x 180 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 36 Chambers
#3	12.20'	0.002 af	**5.00'D x 3.50'H DMH**
		0.293 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	9.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.00'	**24.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.00' / 11.95' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Discarded OutFlow Max=0.04 cfs @ 11.98 hrs HW=12.25' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=11.42 cfs @ 12.07 hrs HW=14.08' (Free Discharge)
↑**2=Culvert** (Barrel Controls 11.42 cfs @ 4.34 fps)

Stage-Area-Storage for Pond INF #3: South of Building

Elevation (feet)	Surface (acres)	Storage (acre-feet)
9.00	0.151	0.000
9.10	0.151	0.005
9.20	0.151	0.009
9.30	0.151	0.014
9.40	0.151	0.018
9.50	0.151	0.023
9.60	0.151	0.035
9.70	0.151	0.047
9.80	0.151	0.059
9.90	0.151	0.071
10.00	0.151	0.083
10.10	0.151	0.094
10.20	0.151	0.106
10.30	0.151	0.117
10.40	0.151	0.129
10.50	0.151	0.140
10.60	0.151	0.151
10.70	0.151	0.161
10.80	0.151	0.172
10.90	0.151	0.182
11.00	0.151	0.192
11.10	0.151	0.202
11.20	0.151	0.212
11.30	0.151	0.221
11.40	0.151	0.229
11.50	0.151	0.238
11.60	0.151	0.245
11.70	0.151	0.252
11.80	0.151	0.258
11.90	0.151	0.264
12.00	0.151	0.268
12.10	0.151	0.273
12.20	**0.151**	0.278
12.30	0.151	0.282
12.40	0.151	0.287
12.50	0.151	0.291
12.60	0.151	0.291
12.70	0.151	0.291
12.80	0.151	0.291
12.90	0.151	0.291
13.00	0.151	0.291
13.10	0.151	0.291
13.20	0.151	0.292
13.30	0.151	0.292
13.40	0.151	0.292
13.50	0.151	0.292
13.60	0.151	0.292
13.70	0.151	0.292
13.80	0.151	0.292
13.90	0.151	0.292
14.00	0.151	0.292
14.10	0.151	0.292
14.20	0.151	0.292
14.30	0.151	0.292
14.40	0.151	0.292
14.50	0.151	0.292
14.60	0.151	0.292
14.70	0.151	0.292
14.80	0.151	0.292
14.90	0.151	0.292
15.00	0.151	0.292
15.10	0.151	0.292
15.20	0.151	0.292
15.30	0.151	0.292
15.40	0.151	0.293
15.50	0.151	0.293
15.60	0.151	0.293
15.70	0.151	**0.293**

Summary for Pond INF #4: In Main Parking Area

Inflow Area = 5.705 ac, 97.88% Impervious, Inflow Depth > 2.25" for 2-YR event
Inflow = 18.91 cfs @ 12.07 hrs, Volume= 1.069 af
Outflow = 18.65 cfs @ 12.08 hrs, Volume= 0.868 af, Atten= 1%, Lag= 0.4 min
Discarded = 0.02 cfs @ 9.22 hrs, Volume= 0.032 af
Primary = 18.63 cfs @ 12.08 hrs, Volume= 0.835 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.25' @ 12.08 hrs Surf.Area= 0.066 ac Storage= 0.202 af

Plug-Flow detention time= 113.7 min calculated for 0.867 af (81% of inflow)
Center-of-Mass det. time= 42.3 min (835.6 - 793.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	10.25'	0.070 af	**37.08'W x 77.40'L x 5.50'H Field A** 0.362 af Overall - 0.130 af Embedded = 0.233 af x 30.0% Voids
#2A	11.00'	0.130 af	**ADS_StormTech MC-3500 d +Cap** x 50 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 5 Rows of 10 Chambers Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
#3	11.63'	0.003 af	**5.00'D x 6.97'H DMH**
		0.203 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	10.25'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	11.50'	**24.0" Round Culvert** L= 98.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.50' / 11.00' S= 0.0051 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#3	Device 2	16.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 9.22 hrs HW=11.63' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=18.50 cfs @ 12.08 hrs HW=17.25' (Free Discharge)
└**2=Culvert** (Passes 18.50 cfs of 26.02 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 18.50 cfs @ 3.71 fps)

Stage-Area-Storage for Pond INF #4: In Main Parking Area

Elevation (feet)	Surface (acres)	Storage (acre-feet)
10.25	0.066	0.000
10.35	0.066	0.002
10.45	0.066	0.004
10.55	0.066	0.006
10.65	0.066	0.008
10.75	0.066	0.010
10.85	0.066	0.012
10.95	0.066	0.014
11.05	0.066	0.018
11.15	0.066	0.023
11.25	0.066	0.028
11.35	0.066	0.034
11.45	0.066	0.039
11.55	**0.066**	0.044
11.65	**0.066**	0.050
11.75	0.066	0.055
11.85	0.066	0.060
11.95	0.066	0.066
12.05	0.066	0.071
12.15	0.066	0.076
12.25	0.066	0.081
12.35	0.066	0.086
12.45	0.066	0.091
12.55	0.066	0.096
12.65	0.066	0.101
12.75	0.066	0.106
12.85	0.066	0.111
12.95	0.066	0.116
13.05	0.066	0.120
13.15	0.066	0.125
13.25	0.066	0.129
13.35	0.066	0.134
13.45	0.066	0.138
13.55	0.066	0.142
13.65	0.066	0.147
13.75	0.066	0.151
13.85	0.066	0.155
13.95	0.066	0.158
14.05	0.066	0.162
14.15	0.066	0.166
14.25	0.066	0.169
14.35	0.066	0.172
14.45	0.066	0.174
14.55	0.066	0.177
14.65	0.066	0.179
14.75	0.066	0.181
14.85	0.066	0.183
14.95	0.066	0.185
15.05	0.066	0.187
15.15	0.066	0.189
15.25	0.066	0.191
15.35	0.066	0.193
15.45	0.066	0.195
15.55	0.066	0.197
15.65	0.066	0.199
15.75	0.066	0.201
15.85	0.066	0.201
15.95	0.066	0.201
16.05	0.066	0.201
16.15	0.066	0.201
16.25	0.066	0.202
16.35	0.066	0.202
16.45	0.066	0.202
16.55	0.066	0.202
16.65	0.066	0.202
16.75	0.066	0.202
16.85	0.066	0.202
16.95	0.066	0.202
17.05	0.066	0.202
17.15	0.066	0.202
17.25	0.066	0.202
17.35	0.066	0.202
17.45	0.066	0.202
17.55	0.066	0.202
17.65	0.066	0.202
17.75	0.066	0.202
17.85	0.066	0.202
17.95	0.066	0.202
18.05	0.066	0.202
18.15	0.066	0.202
18.25	0.066	0.202
18.35	0.066	0.202
18.45	0.066	0.203
18.55	0.066	**0.203**

Summary for Pond INF #5: In Main Parking Area

Inflow Area = 1.764 ac, 80.84% Impervious, Inflow Depth > 2.50" for 2-YR event
Inflow = 5.19 cfs @ 12.07 hrs, Volume= 0.368 af
Outflow = 5.39 cfs @ 12.09 hrs, Volume= 0.247 af, Atten= 0%, Lag= 1.2 min
Discarded = 0.02 cfs @ 7.44 hrs, Volume= 0.027 af
Primary = 5.37 cfs @ 12.09 hrs, Volume= 0.220 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 15.33' @ 12.09 hrs Surf.Area= 0.068 ac Storage= 0.131 af

Plug-Flow detention time= 158.8 min calculated for 0.247 af (67% of inflow)
Center-of-Mass det. time= 63.6 min (854.2 - 790.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.75'	0.046 af	**49.00'W x 60.58'L x 3.50'H Field A** 0.238 af Overall - 0.084 af Embedded = 0.154 af x 30.0% Voids
#2A	12.25'	0.084 af	**ADS_StormTech SC-740 +Cap** x 80 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 10 Rows of 8 Chambers
#3	18.55'	0.002 af	**4.00'D x 8.00'H DMH**
		0.133 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	11.75'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.20'	**18.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.20' / 11.20' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#3	Device 2	14.75'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 7.44 hrs HW=11.90' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=5.23 cfs @ 12.09 hrs HW=15.32' (Free Discharge)
└**2=Culvert** (Passes 5.23 cfs of 10.34 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 5.23 cfs @ 2.30 fps)

Stage-Area-Storage for Pond INF #5: In Main Parking Area

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
11.75	0.068	0.000	19.70	0.068	0.131
11.90	0.068	0.003	19.85	0.068	0.131
12.05	0.068	0.006	20.00	0.068	0.131
12.20	0.068	0.009	20.15	0.068	0.131
12.35	0.068	0.016	20.30	0.068	0.131
12.50	0.068	0.024	20.45	0.068	0.131
12.65	0.068	0.032	20.60	0.068	0.131
12.80	0.068	0.040	20.75	0.068	0.131
12.95	0.068	0.048	20.90	0.068	0.131
13.10	0.068	0.055	21.05	0.068	0.131
13.25	0.068	0.063	21.20	0.068	0.131
13.40	0.068	0.070	21.35	0.068	0.131
13.55	0.068	0.077	21.50	0.068	0.131
13.70	0.068	0.084	21.65	0.068	0.132
13.85	0.068	0.091	21.80	0.068	0.132
14.00	0.068	0.097	21.95	0.068	0.132
14.15	0.068	0.103	22.10	0.068	0.132
14.30	0.068	0.108	22.25	0.068	0.132
14.45	0.068	0.113	22.40	0.068	0.132
14.60	0.068	0.117	22.55	0.068	0.132
14.75	0.068	0.120	22.70	0.068	0.132
14.90	0.068	0.123	22.85	0.068	0.132
15.05	0.068	0.127	23.00	0.068	0.132
15.20	0.068	0.130	23.15	0.068	0.132
15.35	0.068	0.131	23.30	0.068	0.132
15.50	0.068	0.131	23.45	0.068	0.132
15.65	0.068	0.131	23.60	0.068	0.132
15.80	0.068	0.131	23.75	0.068	0.132
15.95	0.068	0.131	23.90	0.068	0.132
16.10	0.068	0.131	24.05	0.068	0.132
16.25	0.068	0.131	24.20	0.068	0.132
16.40	0.068	0.131	24.35	0.068	0.132
16.55	0.068	0.131	24.50	0.068	0.132
16.70	0.068	0.131	24.65	0.068	0.132
16.85	0.068	0.131	24.80	0.068	0.132
17.00	0.068	0.131	24.95	0.068	0.132
17.15	0.068	0.131	25.10	0.068	0.132
17.30	0.068	0.131	25.25	0.068	0.133
17.45	0.068	0.131	25.40	0.068	0.133
17.60	0.068	0.131	25.55	0.068	0.133
17.75	0.068	0.131	25.70	0.068	0.133
17.90	0.068	0.131	25.85	0.068	0.133
18.05	0.068	0.131	26.00	0.068	0.133
18.20	0.068	0.131	26.15	0.068	0.133
18.35	0.068	0.131	26.30	0.068	0.133
18.50	**0.068**	0.131	26.45	0.068	**0.133**
18.65	**0.068**	0.131			
18.80	0.068	0.131			
18.95	0.068	0.131			
19.10	0.068	0.131			
19.25	0.068	0.131			
19.40	0.068	0.131			
19.55	0.068	0.131			

Summary for Pond INF #6: In Main Parking Area

Inflow Area = 1.754 ac, 81.01% Impervious, Inflow Depth > 2.50" for 2-YR event
Inflow = 5.16 cfs @ 12.07 hrs, Volume= 0.366 af
Outflow = 3.92 cfs @ 12.14 hrs, Volume= 0.233 af, Atten= 24%, Lag= 3.8 min
Discarded = 0.02 cfs @ 12.05 hrs, Volume= 0.030 af
Primary = 3.90 cfs @ 12.14 hrs, Volume= 0.202 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 15.47' @ 12.14 hrs Surf.Area= 0.075 ac Storage= 0.143 af

Plug-Flow detention time= 168.3 min calculated for 0.233 af (64% of inflow)
Center-of-Mass det. time= 69.5 min (860.1 - 790.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	12.00'	0.051 af	**53.75'W x 60.58'L x 3.50'H Field A** 0.262 af Overall - 0.093 af Embedded = 0.169 af x 30.0% Voids
#2A	12.50'	0.093 af	**ADS_StormTech SC-740 +Cap** x 88 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 11 Rows of 8 Chambers
#3	14.55'	0.002 af	**5.00'D x 3.85'H Vertical Cone/Cylinder**
		0.145 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	12.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.50'	**18.0" Round Culvert** L= 11.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.50' / 12.35' S= 0.0136 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#3	Device 2	15.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 12.05 hrs HW=14.64' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=3.88 cfs @ 12.14 hrs HW=15.47' (Free Discharge)
↑**2=Culvert** (Passes 3.88 cfs of 10.02 cfs potential flow)
↑**3=Broad-Crested Rectangular Weir** (Weir Controls 3.88 cfs @ 2.05 fps)

Stage-Area-Storage for Pond INF #6: In Main Parking Area

Elevation (feet)	Surface (acres)	Storage (acre-feet)
12.00	0.075	0.000
12.10	0.075	0.002
12.20	0.075	0.004
12.30	0.075	0.007
12.40	0.075	0.009
12.50	0.075	0.011
12.60	0.075	0.017
12.70	0.075	0.023
12.80	0.075	0.029
12.90	0.075	0.035
13.00	0.075	0.041
13.10	0.075	0.047
13.20	0.075	0.052
13.30	0.075	0.058
13.40	0.075	0.063
13.50	0.075	0.069
13.60	0.075	0.074
13.70	0.075	0.079
13.80	0.075	0.085
13.90	0.075	0.090
14.00	0.075	0.095
14.10	0.075	0.099
14.20	0.075	0.104
14.30	0.075	0.109
14.40	0.075	0.113
14.50	**0.075**	0.117
14.60	**0.075**	0.121
14.70	0.075	0.124
14.80	0.075	0.127
14.90	0.075	0.130
15.00	0.075	0.132
15.10	0.075	0.135
15.20	0.075	0.137
15.30	0.075	0.139
15.40	0.075	0.142
15.50	0.075	0.144
15.60	0.075	0.144
15.70	0.075	0.144
15.80	0.075	0.144
15.90	0.075	0.144
16.00	0.075	0.144
16.10	0.075	0.144
16.20	0.075	0.144
16.30	0.075	0.144
16.40	0.075	0.144
16.50	0.075	0.144
16.60	0.075	0.144
16.70	0.075	0.144
16.80	0.075	0.144
16.90	0.075	0.145
17.00	0.075	0.145
17.10	0.075	0.145
17.20	0.075	0.145
17.30	0.075	0.145
17.40	0.075	0.145
17.50	0.075	0.145
17.60	0.075	0.145
17.70	0.075	0.145
17.80	0.075	0.145
17.90	0.075	0.145
18.00	0.075	0.145
18.10	0.075	0.145
18.20	0.075	0.145
18.30	0.075	0.145
18.40	0.075	**0.145**

Summary for Pond INF#7: West of parking deck

Inflow Area = 1.444 ac,100.00% Impervious, Inflow Depth > 3.03" for 2-YR event
Inflow = 4.74 cfs @ 12.07 hrs, Volume= 0.364 af
Outflow = 5.01 cfs @ 12.07 hrs, Volume= 0.247 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.02 cfs @ 2.80 hrs, Volume= 0.033 af
Primary = 4.99 cfs @ 12.07 hrs, Volume= 0.214 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 14.65' @ 12.07 hrs Surf.Area= 2,930 sf Storage= 5,521 cf

Plug-Flow detention time= 163.7 min calculated for 0.247 af (68% of inflow)
Center-of-Mass det. time= 67.4 min (822.1 - 754.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.10'	1,206 cf	**15.75'W x 110.42'L x 3.50'H Field A** 6,087 cf Overall - 2,067 cf Embedded = 4,019 cf x 30.0% Voids
#2A	11.60'	2,067 cf	**ADS_StormTech SC-740 +Cap** x 45 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 3 Rows of 15 Chambers
#3	11.00'	63 cf	**4.00'D x 5.00'H Vertical Cone/Cylinder**
#4B	11.10'	824 cf	**15.75'W x 74.82'L x 3.50'H Field B** 4,124 cf Overall - 1,378 cf Embedded = 2,746 cf x 30.0% Voids
#5B	11.60'	1,378 cf	**ADS_StormTech SC-740 +Cap** x 30 Inside #4 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 3 Rows of 10 Chambers
		5,538 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	10.80'	**18.0" Round Culvert** L= 166.0' Ke= 0.600 Inlet / Outlet Invert= 10.80' / 9.10' S= 0.0102 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf
#2	Device 1	14.10'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Discarded	11.00'	**0.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 2.80 hrs HW=11.10' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=4.98 cfs @ 12.07 hrs HW=14.65' (Free Discharge)
└**1=Culvert** (Passes 4.98 cfs of 14.05 cfs potential flow)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 4.98 cfs @ 2.26 fps)

Stage-Area-Storage for Pond INF#7: West of parking deck

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
11.00	13	0
11.05	13	1
11.10	**2,930**	1
11.15	2,930	46
11.20	2,930	90
11.25	2,930	134
11.30	2,930	179
11.35	2,930	223
11.40	2,930	268
11.45	2,930	312
11.50	2,930	356
11.55	2,930	401
11.60	2,930	445
11.65	2,930	559
11.70	2,930	673
11.75	2,930	786
11.80	2,930	900
11.85	2,930	1,013
11.90	2,930	1,125
11.95	2,930	1,237
12.00	2,930	1,349
12.05	2,930	1,460
12.10	2,930	1,570
12.15	2,930	1,680
12.20	2,930	1,789
12.25	2,930	1,898
12.30	2,930	2,006
12.35	2,930	2,113
12.40	2,930	2,220
12.45	2,930	2,326
12.50	2,930	2,432
12.55	2,930	2,536
12.60	2,930	2,640
12.65	2,930	2,743
12.70	2,930	2,845
12.75	2,930	2,946
12.80	2,930	3,047
12.85	2,930	3,146
12.90	2,930	3,244
12.95	2,930	3,341
13.00	2,930	3,438
13.05	2,930	3,533
13.10	2,930	3,626
13.15	2,930	3,719
13.20	2,930	3,811
13.25	2,930	3,900
13.30	2,930	3,989
13.35	2,930	4,075
13.40	2,930	4,160
13.45	2,930	4,243
13.50	2,930	4,325
13.55	2,930	4,404
13.60	2,930	4,482
13.65	2,930	4,557
13.70	2,930	4,629
13.75	2,930	4,699
13.80	2,930	4,764
13.85	2,930	4,825
13.90	2,930	4,882
13.95	2,930	4,934
14.00	2,930	4,983
14.05	2,930	5,031
14.10	2,930	5,076
14.15	2,930	5,121
14.20	2,930	5,165
14.25	2,930	5,210
14.30	2,930	5,254
14.35	2,930	5,298
14.40	2,930	5,343
14.45	2,930	5,387
14.50	2,930	5,432
14.55	2,930	5,476
14.60	2,930	5,520
14.65	2,930	5,521
14.70	2,930	5,522
14.75	2,930	5,522
14.80	2,930	5,523
14.85	2,930	5,524
14.90	2,930	5,524
14.95	2,930	5,525
15.00	2,930	5,525
15.05	2,930	5,526
15.10	2,930	5,527
15.15	2,930	5,527
15.20	2,930	5,528
15.25	2,930	5,529
15.30	2,930	5,529
15.35	2,930	5,530
15.40	2,930	5,530
15.45	2,930	5,531
15.50	2,930	5,532
15.55	2,930	5,532
15.60	2,930	5,533
15.65	2,930	5,534
15.70	2,930	5,534
15.75	2,930	5,535
15.80	2,930	5,535
15.85	2,930	5,536
15.90	2,930	5,537
15.95	2,930	5,537
16.00	2,930	**5,538**

Summary for Link 1L: WILLIAM T. MORRISSEY BOULEVARD

Inflow Area = 1.433 ac, 79.34% Impervious, Inflow Depth > 2.02" for 2-YR event
Inflow = 2.66 cfs @ 12.13 hrs, Volume= 0.241 af
Primary = 2.66 cfs @ 12.13 hrs, Volume= 0.241 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 2L: PROJECT SITE

Inflow Area = 15.169 ac, 90.01% Impervious, Inflow Depth > 1.85" for 2-YR event
Inflow = 41.71 cfs @ 12.09 hrs, Volume= 2.338 af
Primary = 41.71 cfs @ 12.09 hrs, Volume= 2.338 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Subcatchment P1A: Northerly Portion of Front Parking

Runoff = 2.73 cfs @ 12.07 hrs, Volume= 0.196 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
0.409	98	Paved parking, HSG C
0.162	74	>75% Grass cover, Good, HSG C
0.571	91	Weighted Average
0.162		28.37% Pervious Area
0.409		71.63% Impervious Area

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

Summary for Subcatchment P1B: Southerly Portion of Front Parking

Runoff = 4.32 cfs @ 12.07 hrs, Volume= 0.319 af, Depth> 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
0.728	98	Paved parking, HSG C
0.131	74	>75% Grass cover, Good, HSG C
0.003	96	Gravel surface, HSG C
0.862	94	Weighted Average
0.134		15.55% Pervious Area
0.728		84.45% Impervious Area

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

Summary for Subcatchment P1C: Parking Near Sourtherly Entrace

Runoff = 4.55 cfs @ 12.07 hrs, Volume= 0.340 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
0.775	98	Paved parking, HSG C
0.109	74	>75% Grass cover, Good, HSG C
0.012	96	Gravel surface, HSG C
0.896	95	Weighted Average
0.121		13.50% Pervious Area
0.775		86.50% Impervious Area

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

Summary for Subcatchment P2A: Northerly Roof Area

Runoff = 5.20 cfs @ 12.07 hrs, Volume= 0.407 af, Depth> 4.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
0.997	98	Roofs, HSG C
0.997		100.00% Impervious Area

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

Summary for Subcatchment P2B: Southeasterly Roof Area

Runoff = 13.25 cfs @ 12.07 hrs, Volume= 1.038 af, Depth> 4.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
2.543	98	Roofs, HSG C
2.543		100.00% Impervious Area

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

Summary for Subcatchment P2C: Central Roof Area

Runoff = 11.81 cfs @ 12.07 hrs, Volume= 0.925 af, Depth> 4.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

	Area (ac)	CN	Description
*	2.266	98	Roof
	2.266		100.00% Impervious Area

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

Summary for Subcatchment P2D: Parking Deck

Runoff = 7.52 cfs @ 12.07 hrs, Volume= 0.590 af, Depth> 4.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
1.444	98	Roofs, HSG C
1.444		100.00% Impervious Area

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

Summary for Subcatchment P3: Northerly Courtyard

Runoff = 2.06 cfs @ 12.07 hrs, Volume= 0.151 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

	Area (sf)	CN	Description
*	4,131	74	Landscaped Areas
*	14,060	98	Pavement
	18,191	93	Weighted Average
	4,131		22.71% Pervious Area
	14,060		77.29% Impervious Area

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

Summary for Subcatchment P3A: At Westerly Entry and Parking Ramp

Runoff = 15.25 cfs @ 12.07 hrs, Volume= 1.114 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
2.458	98	Paved parking, HSG C
0.611	74	>75% Grass cover, Good, HSG C
0.018	96	Gravel surface, HSG C
3.087	93	Weighted Average
0.629		20.38% Pervious Area
2.458		79.62% Impervious Area

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

Summary for Subcatchment P3B: Easterly Portion of Main Parking

Runoff = 8.72 cfs @ 12.07 hrs, Volume= 0.637 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
1.426	98	Paved parking, HSG C
0.338	74	>75% Grass cover, Good, HSG C
1.764	93	Weighted Average
0.338		19.16% Pervious Area
1.426		80.84% Impervious Area

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

Summary for Subcatchment P4: Southwesterly Portion of Main Parking

Runoff = 8.67 cfs @ 12.07 hrs, Volume= 0.633 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR Rainfall=5.14"

Area (ac)	CN	Description
1.421	98	Paved parking, HSG C
0.333	74	>75% Grass cover, Good, HSG C
1.754	93	Weighted Average
0.333		18.99% Pervious Area
1.421		81.01% Impervious Area

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

Summary for Pond INF #1: In Northerly Courtyard

Inflow Area = 0.997 ac,100.00% Impervious, Inflow Depth > 4.90" for 10-YR event
Inflow = 5.20 cfs @ 12.07 hrs, Volume= 0.407 af
Outflow = 3.95 cfs @ 12.13 hrs, Volume= 0.323 af, Atten= 24%, Lag= 3.7 min
Discarded = 0.02 cfs @ 5.80 hrs, Volume= 0.034 af
Primary = 3.93 cfs @ 12.13 hrs, Volume= 0.289 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 14.69' @ 12.13 hrs Surf.Area= 0.068 ac Storage= 0.110 af

Plug-Flow detention time= 138.2 min calculated for 0.323 af (79% of inflow)
Center-of-Mass det. time= 59.8 min (806.0 - 746.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	12.00'	0.029 af	**39.50'W x 46.34'L x 3.50'H Field A** 0.147 af Overall - 0.051 af Embedded = 0.096 af x 30.0% Voids
#2A	12.50'	0.051 af	**ADS_StormTech SC-740 +Cap** x 48 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 8 Rows of 6 Chambers
#3B	12.00'	0.018 af	**44.25'W x 24.98'L x 3.50'H Field B** 0.089 af Overall - 0.028 af Embedded = 0.060 af x 30.0% Voids
#4B	12.50'	0.028 af	**ADS_StormTech SC-740 +Cap** x 27 Inside #3 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Rows of 3 Chambers
#5	12.45'	0.002 af	**5.00'D x 3.45'H DMH**
		0.128 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	12.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.45'	**12.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.45' / 12.40' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#3	Device 2	14.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 5.80 hrs HW=12.45' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=3.93 cfs @ 12.13 hrs HW=14.69' (Free Discharge)
└**2=Culvert** (Inlet Controls 3.93 cfs @ 5.01 fps)
└**3=Broad-Crested Rectangular Weir** (Passes 3.93 cfs of 7.21 cfs potential flow)

Stage-Area-Storage for Pond INF #1: In Northerly Courtyard

Elevation (feet)	Surface (acres)	Storage (acre-feet)
12.00	0.067	0.000
12.05	0.067	0.001
12.10	0.067	0.002
12.15	0.067	0.003
12.20	0.067	0.004
12.25	0.067	0.005
12.30	0.067	0.006
12.35	0.067	0.007
12.40	0.067	0.008
12.45	**0.068**	0.009
12.50	0.068	0.010
12.55	0.068	0.013
12.60	0.068	0.015
12.65	0.068	0.018
12.70	0.068	0.021
12.75	0.068	0.023
12.80	0.068	0.026
12.85	0.068	0.028
12.90	0.068	0.031
12.95	0.068	0.034
13.00	0.068	0.036
13.05	0.068	0.039
13.10	0.068	0.041
13.15	0.068	0.044
13.20	0.068	0.046
13.25	0.068	0.049
13.30	0.068	0.051
13.35	0.068	0.054
13.40	0.068	0.056
13.45	0.068	0.058
13.50	0.068	0.061
13.55	0.068	0.063
13.60	0.068	0.066
13.65	0.068	0.068
13.70	0.068	0.070
13.75	0.068	0.072
13.80	0.068	0.075
13.85	0.068	0.077
13.90	0.068	0.079
13.95	0.068	0.081
14.00	0.068	0.084
14.05	0.068	0.086
14.10	0.068	0.088
14.15	0.068	0.090
14.20	0.068	0.092
14.25	0.068	0.094
14.30	0.068	0.096
14.35	0.068	0.098
14.40	0.068	0.100
14.45	0.068	0.102
14.50	0.068	0.103
14.55	0.068	0.105
14.60	0.068	0.107
14.65	0.068	0.108
14.70	0.068	0.110
14.75	0.068	0.111
14.80	0.068	0.113
14.85	0.068	0.114
14.90	0.068	0.115
14.95	0.068	0.116
15.00	0.068	0.117
15.05	0.068	0.118
15.10	0.068	0.119
15.15	0.068	0.120
15.20	0.068	0.121
15.25	0.068	0.122
15.30	0.068	0.123
15.35	0.068	0.124
15.40	0.068	0.125
15.45	0.068	0.126
15.50	0.068	0.128
15.55	0.068	0.128
15.60	0.068	0.128
15.65	0.068	0.128
15.70	0.068	0.128
15.75	0.068	0.128
15.80	0.068	0.128
15.85	0.068	0.128
15.90	0.068	**0.128**

Summary for Pond INF #2: In Front Parking

Inflow Area = 0.571 ac, 71.63% Impervious, Inflow Depth > 4.12" for 10-YR event
Inflow = 2.73 cfs @ 12.07 hrs, Volume= 0.196 af
Outflow = 2.66 cfs @ 12.09 hrs, Volume= 0.158 af, Atten= 2%, Lag= 1.0 min
Discarded = 0.01 cfs @ 6.37 hrs, Volume= 0.020 af
Primary = 2.65 cfs @ 12.09 hrs, Volume= 0.138 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 12.67' @ 12.09 hrs Surf.Area= 0.048 ac Storage= 0.045 af

Plug-Flow detention time= 112.9 min calculated for 0.158 af (81% of inflow)
Center-of-Mass det. time= 40.0 min (824.5 - 784.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	10.87'	0.023 af	**24.83'W x 74.40'L x 2.33'H Field A** 0.099 af Overall - 0.024 af Embedded = 0.075 af x 30.0% Voids
#2A	11.37'	0.024 af	**ADS_StormTech SC-310 +Cap** x 70 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 7 Rows of 10 Chambers
#3B	10.87'	0.003 af	**8.17'W x 31.68'L x 2.33'H Field B** 0.014 af Overall - 0.003 af Embedded = 0.011 af x 30.0% Voids
#4B	11.37'	0.003 af	**ADS_StormTech SC-310 +Cap** x 8 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 2 Rows of 4 Chambers
		0.052 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	10.87'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	11.20'	**12.0" Round Culvert** L= 7.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.20' / 11.10' S= 0.0143 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#3	Device 2	12.30'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 6.37 hrs HW=10.89' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.65 cfs @ 12.09 hrs HW=12.67' (Free Discharge)
└**2=Culvert** (Passes 2.65 cfs of 2.94 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 2.65 cfs @ 1.77 fps)

Stage-Area-Storage for Pond INF #2: In Front Parking

Elevation (feet)	Surface (acres)	Storage (acre-feet)
10.87	**0.048**	0.000
10.92	0.048	0.001
10.97	0.048	0.001
11.02	0.048	0.002
11.07	0.048	0.003
11.12	0.048	0.004
11.17	0.048	0.004
11.22	0.048	0.005
11.27	0.048	0.006
11.32	0.048	0.007
11.37	0.048	0.007
11.42	0.048	0.009
11.47	0.048	0.011
11.52	0.048	0.013
11.57	0.048	0.014
11.62	0.048	0.016
11.67	0.048	0.018
11.72	0.048	0.020
11.77	0.048	0.021
11.82	0.048	0.023
11.87	0.048	0.025
11.92	0.048	0.026
11.97	0.048	0.028
12.02	0.048	0.029
12.07	0.048	0.031
12.12	0.048	0.032
12.17	0.048	0.034
12.22	0.048	0.035
12.27	0.048	0.036
12.32	0.048	0.038
12.37	0.048	0.039
12.42	0.048	0.040
12.47	0.048	0.041
12.52	0.048	0.042
12.57	0.048	0.043
12.62	0.048	0.044
12.67	0.048	0.045
12.72	0.048	0.045
12.77	0.048	0.046
12.82	0.048	0.047
12.87	0.048	0.047
12.92	0.048	0.048
12.97	0.048	0.049
13.02	0.048	0.050
13.07	0.048	0.050
13.12	0.048	0.051
13.17	0.048	**0.052**

Summary for Pond INF #3: South of Building

Inflow Area = 3.439 ac, 96.48% Impervious, Inflow Depth > 4.81" for 10-YR event
Inflow = 17.80 cfs @ 12.07 hrs, Volume= 1.378 af
Outflow = 17.79 cfs @ 12.07 hrs, Volume= 1.103 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.04 cfs @ 11.28 hrs, Volume= 0.075 af
Primary = 17.75 cfs @ 12.07 hrs, Volume= 1.027 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 15.21' @ 12.07 hrs Surf.Area= 0.151 ac Storage= 0.292 af

Plug-Flow detention time= 136.8 min calculated for 1.103 af (80% of inflow)
Center-of-Mass det. time= 60.2 min (811.3 - 751.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.00'	0.101 af	**25.25'W x 259.94'L x 3.50'H Field A** 0.527 af Overall - 0.190 af Embedded = 0.338 af x 30.0% Voids
#2A	9.50'	0.190 af	**ADS_StormTech SC-740 +Cap** x 180 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 36 Chambers
#3	12.20'	0.002 af	**5.00'D x 3.50'H DMH**
		0.293 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	9.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.00'	**24.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.00' / 11.95' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Discarded OutFlow Max=0.04 cfs @ 11.28 hrs HW=12.22' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=17.73 cfs @ 12.07 hrs HW=15.20' (Free Discharge)
↑**2=Culvert** (Inlet Controls 17.73 cfs @ 5.64 fps)

Stage-Area-Storage for Pond INF #3: South of Building

Elevation (feet)	Surface (acres)	Storage (acre-feet)
9.00	0.151	0.000
9.10	0.151	0.005
9.20	0.151	0.009
9.30	0.151	0.014
9.40	0.151	0.018
9.50	0.151	0.023
9.60	0.151	0.035
9.70	0.151	0.047
9.80	0.151	0.059
9.90	0.151	0.071
10.00	0.151	0.083
10.10	0.151	0.094
10.20	0.151	0.106
10.30	0.151	0.117
10.40	0.151	0.129
10.50	0.151	0.140
10.60	0.151	0.151
10.70	0.151	0.161
10.80	0.151	0.172
10.90	0.151	0.182
11.00	0.151	0.192
11.10	0.151	0.202
11.20	0.151	0.212
11.30	0.151	0.221
11.40	0.151	0.229
11.50	0.151	0.238
11.60	0.151	0.245
11.70	0.151	0.252
11.80	0.151	0.258
11.90	0.151	0.264
12.00	0.151	0.268
12.10	0.151	0.273
12.20	**0.151**	0.278
12.30	0.151	0.282
12.40	0.151	0.287
12.50	0.151	0.291
12.60	0.151	0.291
12.70	0.151	0.291
12.80	0.151	0.291
12.90	0.151	0.291
13.00	0.151	0.291
13.10	0.151	0.291
13.20	0.151	0.292
13.30	0.151	0.292
13.40	0.151	0.292
13.50	0.151	0.292
13.60	0.151	0.292
13.70	0.151	0.292
13.80	0.151	0.292
13.90	0.151	0.292
14.00	0.151	0.292
14.10	0.151	0.292
14.20	0.151	0.292
14.30	0.151	0.292
14.40	0.151	0.292
14.50	0.151	0.292
14.60	0.151	0.292
14.70	0.151	0.292
14.80	0.151	0.292
14.90	0.151	0.292
15.00	0.151	0.292
15.10	0.151	0.292
15.20	0.151	0.292
15.30	0.151	0.292
15.40	0.151	0.293
15.50	0.151	0.293
15.60	0.151	0.293
15.70	0.151	**0.293**

Summary for Pond INF #4: In Main Parking Area

Inflow Area = 5.705 ac, 97.88% Impervious, Inflow Depth > 4.11" for 10-YR event
Inflow = 29.56 cfs @ 12.07 hrs, Volume= 1.952 af
Outflow = 29.54 cfs @ 12.07 hrs, Volume= 1.751 af, Atten= 0%, Lag= 0.1 min
Discarded = 0.02 cfs @ 7.24 hrs, Volume= 0.033 af
Primary = 29.52 cfs @ 12.07 hrs, Volume= 1.718 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 18.61' @ 12.07 hrs Surf.Area= 0.066 ac Storage= 0.203 af

Plug-Flow detention time= 78.6 min calculated for 1.750 af (90% of inflow)
Center-of-Mass det. time= 30.5 min (812.3 - 781.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	10.25'	0.070 af	**37.08'W x 77.40'L x 5.50'H Field A** 0.362 af Overall - 0.130 af Embedded = 0.233 af x 30.0% Voids
#2A	11.00'	0.130 af	**ADS_StormTech MC-3500 d +Cap** x 50 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 5 Rows of 10 Chambers Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
#3	11.63'	0.003 af	**5.00'D x 6.97'H DMH**
		0.203 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	10.25'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	11.50'	**24.0" Round Culvert** L= 98.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.50' / 11.00' S= 0.0051 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#3	Device 2	16.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 7.24 hrs HW=11.63' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=29.47 cfs @ 12.07 hrs HW=18.59' (Free Discharge)
└**2=Culvert** (Inlet Controls 29.47 cfs @ 9.38 fps)
└**3=Broad-Crested Rectangular Weir** (Passes 29.47 cfs of 55.29 cfs potential flow)

Stage-Area-Storage for Pond INF #4: In Main Parking Area

Elevation (feet)	Surface (acres)	Storage (acre-feet)
10.25	0.066	0.000
10.35	0.066	0.002
10.45	0.066	0.004
10.55	0.066	0.006
10.65	0.066	0.008
10.75	0.066	0.010
10.85	0.066	0.012
10.95	0.066	0.014
11.05	0.066	0.018
11.15	0.066	0.023
11.25	0.066	0.028
11.35	0.066	0.034
11.45	0.066	0.039
11.55	**0.066**	0.044
11.65	**0.066**	0.050
11.75	0.066	0.055
11.85	0.066	0.060
11.95	0.066	0.066
12.05	0.066	0.071
12.15	0.066	0.076
12.25	0.066	0.081
12.35	0.066	0.086
12.45	0.066	0.091
12.55	0.066	0.096
12.65	0.066	0.101
12.75	0.066	0.106
12.85	0.066	0.111
12.95	0.066	0.116
13.05	0.066	0.120
13.15	0.066	0.125
13.25	0.066	0.129
13.35	0.066	0.134
13.45	0.066	0.138
13.55	0.066	0.142
13.65	0.066	0.147
13.75	0.066	0.151
13.85	0.066	0.155
13.95	0.066	0.158
14.05	0.066	0.162
14.15	0.066	0.166
14.25	0.066	0.169
14.35	0.066	0.172
14.45	0.066	0.174
14.55	0.066	0.177
14.65	0.066	0.179
14.75	0.066	0.181
14.85	0.066	0.183
14.95	0.066	0.185
15.05	0.066	0.187
15.15	0.066	0.189
15.25	0.066	0.191
15.35	0.066	0.193
15.45	0.066	0.195
15.55	0.066	0.197
15.65	0.066	0.199
15.75	0.066	0.201
15.85	0.066	0.201
15.95	0.066	0.201
16.05	0.066	0.201
16.15	0.066	0.201
16.25	0.066	0.202
16.35	0.066	0.202
16.45	0.066	0.202
16.55	0.066	0.202
16.65	0.066	0.202
16.75	0.066	0.202
16.85	0.066	0.202
16.95	0.066	0.202
17.05	0.066	0.202
17.15	0.066	0.202
17.25	0.066	0.202
17.35	0.066	0.202
17.45	0.066	0.202
17.55	0.066	0.202
17.65	0.066	0.202
17.75	0.066	0.202
17.85	0.066	0.202
17.95	0.066	0.202
18.05	0.066	0.202
18.15	0.066	0.202
18.25	0.066	0.202
18.35	0.066	0.202
18.45	0.066	0.203
18.55	0.066	**0.203**

Summary for Pond INF #5: In Main Parking Area

Inflow Area = 1.764 ac, 80.84% Impervious, Inflow Depth > 4.33" for 10-YR event
Inflow = 8.72 cfs @ 12.07 hrs, Volume= 0.637 af
Outflow = 9.14 cfs @ 12.07 hrs, Volume= 0.516 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.02 cfs @ 5.40 hrs, Volume= 0.030 af
Primary = 9.12 cfs @ 12.07 hrs, Volume= 0.486 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 15.54' @ 12.07 hrs Surf.Area= 0.068 ac Storage= 0.131 af

Plug-Flow detention time= 118.7 min calculated for 0.516 af (81% of inflow)
Center-of-Mass det. time= 46.0 min (822.1 - 776.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.75'	0.046 af	**49.00'W x 60.58'L x 3.50'H Field A** 0.238 af Overall - 0.084 af Embedded = 0.154 af x 30.0% Voids
#2A	12.25'	0.084 af	**ADS_StormTech SC-740 +Cap** x 80 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 10 Rows of 8 Chambers
#3	18.55'	0.002 af	**4.00'D x 8.00'H DMH**
		0.133 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	11.75'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.20'	**18.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.20' / 11.20' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#3	Device 2	14.75'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 5.40 hrs HW=11.90' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=9.14 cfs @ 12.07 hrs HW=15.54' (Free Discharge)
↑**2=Culvert** (Passes 9.14 cfs of 10.80 cfs potential flow)
↑**3=Broad-Crested Rectangular Weir** (Weir Controls 9.14 cfs @ 2.91 fps)

Stage-Area-Storage for Pond INF #5: In Main Parking Area

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
11.75	0.068	0.000	19.70	0.068	0.131
11.90	0.068	0.003	19.85	0.068	0.131
12.05	0.068	0.006	20.00	0.068	0.131
12.20	0.068	0.009	20.15	0.068	0.131
12.35	0.068	0.016	20.30	0.068	0.131
12.50	0.068	0.024	20.45	0.068	0.131
12.65	0.068	0.032	20.60	0.068	0.131
12.80	0.068	0.040	20.75	0.068	0.131
12.95	0.068	0.048	20.90	0.068	0.131
13.10	0.068	0.055	21.05	0.068	0.131
13.25	0.068	0.063	21.20	0.068	0.131
13.40	0.068	0.070	21.35	0.068	0.131
13.55	0.068	0.077	21.50	0.068	0.131
13.70	0.068	0.084	21.65	0.068	0.132
13.85	0.068	0.091	21.80	0.068	0.132
14.00	0.068	0.097	21.95	0.068	0.132
14.15	0.068	0.103	22.10	0.068	0.132
14.30	0.068	0.108	22.25	0.068	0.132
14.45	0.068	0.113	22.40	0.068	0.132
14.60	0.068	0.117	22.55	0.068	0.132
14.75	0.068	0.120	22.70	0.068	0.132
14.90	0.068	0.123	22.85	0.068	0.132
15.05	0.068	0.127	23.00	0.068	0.132
15.20	0.068	0.130	23.15	0.068	0.132
15.35	0.068	0.131	23.30	0.068	0.132
15.50	0.068	0.131	23.45	0.068	0.132
15.65	0.068	0.131	23.60	0.068	0.132
15.80	0.068	0.131	23.75	0.068	0.132
15.95	0.068	0.131	23.90	0.068	0.132
16.10	0.068	0.131	24.05	0.068	0.132
16.25	0.068	0.131	24.20	0.068	0.132
16.40	0.068	0.131	24.35	0.068	0.132
16.55	0.068	0.131	24.50	0.068	0.132
16.70	0.068	0.131	24.65	0.068	0.132
16.85	0.068	0.131	24.80	0.068	0.132
17.00	0.068	0.131	24.95	0.068	0.132
17.15	0.068	0.131	25.10	0.068	0.132
17.30	0.068	0.131	25.25	0.068	0.133
17.45	0.068	0.131	25.40	0.068	0.133
17.60	0.068	0.131	25.55	0.068	0.133
17.75	0.068	0.131	25.70	0.068	0.133
17.90	0.068	0.131	25.85	0.068	0.133
18.05	0.068	0.131	26.00	0.068	0.133
18.20	0.068	0.131	26.15	0.068	0.133
18.35	0.068	0.131	26.30	0.068	0.133
18.50	**0.068**	0.131	26.45	0.068	**0.133**
18.65	**0.068**	0.131			
18.80	0.068	0.131			
18.95	0.068	0.131			
19.10	0.068	0.131			
19.25	0.068	0.131			
19.40	0.068	0.131			
19.55	0.068	0.131			

Summary for Pond INF #6: In Main Parking Area

Inflow Area = 1.754 ac, 81.01% Impervious, Inflow Depth > 4.33" for 10-YR event
Inflow = 8.67 cfs @ 12.07 hrs, Volume= 0.633 af
Outflow = 8.83 cfs @ 12.07 hrs, Volume= 0.500 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.59 hrs, Volume= 0.034 af
Primary = 8.81 cfs @ 12.07 hrs, Volume= 0.467 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 15.77' @ 12.07 hrs Surf.Area= 0.075 ac Storage= 0.144 af

Plug-Flow detention time= 125.2 min calculated for 0.500 af (79% of inflow)
Center-of-Mass det. time= 48.4 min (824.4 - 776.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	12.00'	0.051 af	**53.75'W x 60.58'L x 3.50'H Field A** 0.262 af Overall - 0.093 af Embedded = 0.169 af x 30.0% Voids
#2A	12.50'	0.093 af	**ADS_StormTech SC-740 +Cap** x 88 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 11 Rows of 8 Chambers
#3	14.55'	0.002 af	**5.00'D x 3.85'H Vertical Cone/Cylinder**
		0.145 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	12.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.50'	**18.0" Round Culvert** L= 11.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.50' / 12.35' S= 0.0136 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#3	Device 2	15.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 11.59 hrs HW=14.56' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=8.79 cfs @ 12.07 hrs HW=15.77' (Free Discharge)
└**2=Culvert** (Passes 8.79 cfs of 10.66 cfs potential flow)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 8.79 cfs @ 2.86 fps)

Stage-Area-Storage for Pond INF #6: In Main Parking Area

Elevation (feet)	Surface (acres)	Storage (acre-feet)
12.00	0.075	0.000
12.10	0.075	0.002
12.20	0.075	0.004
12.30	0.075	0.007
12.40	0.075	0.009
12.50	0.075	0.011
12.60	0.075	0.017
12.70	0.075	0.023
12.80	0.075	0.029
12.90	0.075	0.035
13.00	0.075	0.041
13.10	0.075	0.047
13.20	0.075	0.052
13.30	0.075	0.058
13.40	0.075	0.063
13.50	0.075	0.069
13.60	0.075	0.074
13.70	0.075	0.079
13.80	0.075	0.085
13.90	0.075	0.090
14.00	0.075	0.095
14.10	0.075	0.099
14.20	0.075	0.104
14.30	0.075	0.109
14.40	0.075	0.113
14.50	**0.075**	0.117
14.60	**0.075**	0.121
14.70	0.075	0.124
14.80	0.075	0.127
14.90	0.075	0.130
15.00	0.075	0.132
15.10	0.075	0.135
15.20	0.075	0.137
15.30	0.075	0.139
15.40	0.075	0.142
15.50	0.075	0.144
15.60	0.075	0.144
15.70	0.075	0.144
15.80	0.075	0.144
15.90	0.075	0.144
16.00	0.075	0.144
16.10	0.075	0.144
16.20	0.075	0.144
16.30	0.075	0.144
16.40	0.075	0.144
16.50	0.075	0.144
16.60	0.075	0.144
16.70	0.075	0.144
16.80	0.075	0.144
16.90	0.075	0.145
17.00	0.075	0.145
17.10	0.075	0.145
17.20	0.075	0.145
17.30	0.075	0.145
17.40	0.075	0.145
17.50	0.075	0.145
17.60	0.075	0.145
17.70	0.075	0.145
17.80	0.075	0.145
17.90	0.075	0.145
18.00	0.075	0.145
18.10	0.075	0.145
18.20	0.075	0.145
18.30	0.075	0.145
18.40	0.075	**0.145**

Summary for Pond INF#7: West of parking deck

Inflow Area = 1.444 ac,100.00% Impervious, Inflow Depth > 4.90" for 10-YR event
Inflow = 7.52 cfs @ 12.07 hrs, Volume= 0.590 af
Outflow = 7.60 cfs @ 12.07 hrs, Volume= 0.473 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.02 cfs @ 1.48 hrs, Volume= 0.035 af
Primary = 7.58 cfs @ 12.07 hrs, Volume= 0.438 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 14.81' @ 12.07 hrs Surf.Area= 2,930 sf Storage= 5,523 cf

Plug-Flow detention time= 135.0 min calculated for 0.473 af (80% of inflow)
Center-of-Mass det. time= 58.4 min (804.6 - 746.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.10'	1,206 cf	**15.75'W x 110.42'L x 3.50'H Field A** 6,087 cf Overall - 2,067 cf Embedded = 4,019 cf x 30.0% Voids
#2A	11.60'	2,067 cf	**ADS_StormTech SC-740 +Cap** x 45 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 3 Rows of 15 Chambers
#3	11.00'	63 cf	**4.00'D x 5.00'H Vertical Cone/Cylinder**
#4B	11.10'	824 cf	**15.75'W x 74.82'L x 3.50'H Field B** 4,124 cf Overall - 1,378 cf Embedded = 2,746 cf x 30.0% Voids
#5B	11.60'	1,378 cf	**ADS_StormTech SC-740 +Cap** x 30 Inside #4 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 3 Rows of 10 Chambers
		5,538 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	10.80'	**18.0" Round Culvert** L= 166.0' Ke= 0.600 Inlet / Outlet Invert= 10.80' / 9.10' S= 0.0102 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf
#2	Device 1	14.10'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Discarded	11.00'	**0.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 1.48 hrs HW=11.10' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=7.58 cfs @ 12.07 hrs HW=14.81' (Free Discharge)
└**1=Culvert** (Passes 7.58 cfs of 14.39 cfs potential flow)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 7.58 cfs @ 2.68 fps)

Stage-Area-Storage for Pond INF#7: West of parking deck

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
11.00	13	0
11.05	13	1
11.10	**2,930**	1
11.15	2,930	46
11.20	2,930	90
11.25	2,930	134
11.30	2,930	179
11.35	2,930	223
11.40	2,930	268
11.45	2,930	312
11.50	2,930	356
11.55	2,930	401
11.60	2,930	445
11.65	2,930	559
11.70	2,930	673
11.75	2,930	786
11.80	2,930	900
11.85	2,930	1,013
11.90	2,930	1,125
11.95	2,930	1,237
12.00	2,930	1,349
12.05	2,930	1,460
12.10	2,930	1,570
12.15	2,930	1,680
12.20	2,930	1,789
12.25	2,930	1,898
12.30	2,930	2,006
12.35	2,930	2,113
12.40	2,930	2,220
12.45	2,930	2,326
12.50	2,930	2,432
12.55	2,930	2,536
12.60	2,930	2,640
12.65	2,930	2,743
12.70	2,930	2,845
12.75	2,930	2,946
12.80	2,930	3,047
12.85	2,930	3,146
12.90	2,930	3,244
12.95	2,930	3,341
13.00	2,930	3,438
13.05	2,930	3,533
13.10	2,930	3,626
13.15	2,930	3,719
13.20	2,930	3,811
13.25	2,930	3,900
13.30	2,930	3,989
13.35	2,930	4,075
13.40	2,930	4,160
13.45	2,930	4,243
13.50	2,930	4,325
13.55	2,930	4,404
13.60	2,930	4,482
13.65	2,930	4,557
13.70	2,930	4,629
13.75	2,930	4,699
13.80	2,930	4,764
13.85	2,930	4,825
13.90	2,930	4,882
13.95	2,930	4,934
14.00	2,930	4,983
14.05	2,930	5,031
14.10	2,930	5,076
14.15	2,930	5,121
14.20	2,930	5,165
14.25	2,930	5,210
14.30	2,930	5,254
14.35	2,930	5,298
14.40	2,930	5,343
14.45	2,930	5,387
14.50	2,930	5,432
14.55	2,930	5,476
14.60	2,930	5,520
14.65	2,930	5,521
14.70	2,930	5,522
14.75	2,930	5,522
14.80	2,930	5,523
14.85	2,930	5,524
14.90	2,930	5,524
14.95	2,930	5,525
15.00	2,930	5,525
15.05	2,930	5,526
15.10	2,930	5,527
15.15	2,930	5,527
15.20	2,930	5,528
15.25	2,930	5,529
15.30	2,930	5,529
15.35	2,930	5,530
15.40	2,930	5,530
15.45	2,930	5,531
15.50	2,930	5,532
15.55	2,930	5,532
15.60	2,930	5,533
15.65	2,930	5,534
15.70	2,930	5,534
15.75	2,930	5,535
15.80	2,930	5,535
15.85	2,930	5,536
15.90	2,930	5,537
15.95	2,930	5,537
16.00	2,930	**5,538**

Summary for Link 1L: WILLIAM T. MORRISSEY BOULEVARD

Inflow Area = 1.433 ac, 79.34% Impervious, Inflow Depth > 3.83" for 10-YR event
Inflow = 6.92 cfs @ 12.08 hrs, Volume= 0.457 af
Primary = 6.92 cfs @ 12.08 hrs, Volume= 0.457 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 2L: PROJECT SITE

Inflow Area = 15.169 ac, 90.01% Impervious, Inflow Depth > 3.69" for 10-YR event
Inflow = 76.11 cfs @ 12.07 hrs, Volume= 4.663 af
Primary = 76.11 cfs @ 12.07 hrs, Volume= 4.663 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Subcatchment P1A: Northerly Portion of Front Parking

Runoff = 4.52 cfs @ 12.07 hrs, Volume= 0.334 af, Depth> 7.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
0.409	98	Paved parking, HSG C
0.162	74	>75% Grass cover, Good, HSG C
0.571	91	Weighted Average
0.162		28.37% Pervious Area
0.409		71.63% Impervious Area

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

Summary for Subcatchment P1B: Southerly Portion of Front Parking

Runoff = 6.99 cfs @ 12.07 hrs, Volume= 0.531 af, Depth> 7.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
0.728	98	Paved parking, HSG C
0.131	74	>75% Grass cover, Good, HSG C
0.003	96	Gravel surface, HSG C
0.862	94	Weighted Average
0.134		15.55% Pervious Area
0.728		84.45% Impervious Area

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

Summary for Subcatchment P1C: Parking Near Sourtherly Entrace

Runoff = 7.30 cfs @ 12.07 hrs, Volume= 0.560 af, Depth> 7.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
0.775	98	Paved parking, HSG C
0.109	74	>75% Grass cover, Good, HSG C
0.012	96	Gravel surface, HSG C
0.896	95	Weighted Average
0.121		13.50% Pervious Area
0.775		86.50% Impervious Area

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

Summary for Subcatchment P2A: Northerly Roof Area

Runoff = 8.22 cfs @ 12.07 hrs, Volume= 0.653 af, Depth> 7.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
0.997	98	Roofs, HSG C
0.997		100.00% Impervious Area

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

Summary for Subcatchment P2B: Southeasterly Roof Area

Runoff = 20.98 cfs @ 12.07 hrs, Volume= 1.667 af, Depth> 7.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
2.543	98	Roofs, HSG C
2.543		100.00% Impervious Area

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

Summary for Subcatchment P2C: Central Roof Area

Runoff = 18.69 cfs @ 12.07 hrs, Volume= 1.485 af, Depth> 7.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

	Area (ac)	CN	Description
*	2.266	98	Roof
	2.266		100.00% Impervious Area

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

Summary for Subcatchment P2D: Parking Deck

Runoff = 11.91 cfs @ 12.07 hrs, Volume= 0.946 af, Depth> 7.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
1.444	98	Roofs, HSG C
1.444		100.00% Impervious Area

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

Summary for Subcatchment P3: Northerly Courtyard

Runoff = 3.36 cfs @ 12.07 hrs, Volume= 0.253 af, Depth> 7.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

	Area (sf)	CN	Description
*	4,131	74	Landscaped Areas
*	14,060	98	Pavement
	18,191	93	Weighted Average
	4,131		22.71% Pervious Area
	14,060		77.29% Impervious Area

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

Summary for Subcatchment P3A: At Westerly Entry and Parking Ramp

Runoff = 24.85 cfs @ 12.07 hrs, Volume= 1.869 af, Depth> 7.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
2.458	98	Paved parking, HSG C
0.611	74	>75% Grass cover, Good, HSG C
0.018	96	Gravel surface, HSG C
3.087	93	Weighted Average
0.629		20.38% Pervious Area
2.458		79.62% Impervious Area

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

Summary for Subcatchment P3B: Easterly Portion of Main Parking

Runoff = 14.20 cfs @ 12.07 hrs, Volume= 1.068 af, Depth> 7.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
1.426	98	Paved parking, HSG C
0.338	74	>75% Grass cover, Good, HSG C
1.764	93	Weighted Average
0.338		19.16% Pervious Area
1.426		80.84% Impervious Area

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

Summary for Subcatchment P4: Southwesterly Portion of Main Parking

Runoff = 14.12 cfs @ 12.07 hrs, Volume= 1.062 af, Depth> 7.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR Rainfall=8.11"

Area (ac)	CN	Description
1.421	98	Paved parking, HSG C
0.333	74	>75% Grass cover, Good, HSG C
1.754	93	Weighted Average
0.333		18.99% Pervious Area
1.421		81.01% Impervious Area

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

Summary for Pond INF #1: In Northerly Courtyard

Inflow Area = 0.997 ac,100.00% Impervious, Inflow Depth > 7.87" for 100-YR event
Inflow = 8.22 cfs @ 12.07 hrs, Volume= 0.653 af
Outflow = 8.79 cfs @ 12.10 hrs, Volume= 0.569 af, Atten= 0%, Lag= 1.8 min
Discarded = 0.02 cfs @ 3.73 hrs, Volume= 0.035 af
Primary = 8.77 cfs @ 12.10 hrs, Volume= 0.534 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 21.57' @ 12.10 hrs Surf.Area= 0.068 ac Storage= 0.128 af

Plug-Flow detention time= 112.0 min calculated for 0.569 af (87% of inflow)
Center-of-Mass det. time= 52.3 min (791.9 - 739.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	12.00'	0.029 af	**39.50'W x 46.34'L x 3.50'H Field A** 0.147 af Overall - 0.051 af Embedded = 0.096 af x 30.0% Voids
#2A	12.50'	0.051 af	**ADS_StormTech SC-740 +Cap** x 48 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 8 Rows of 6 Chambers
#3B	12.00'	0.018 af	**44.25'W x 24.98'L x 3.50'H Field B** 0.089 af Overall - 0.028 af Embedded = 0.060 af x 30.0% Voids
#4B	12.50'	0.028 af	**ADS_StormTech SC-740 +Cap** x 27 Inside #3 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Rows of 3 Chambers
#5	12.45'	0.002 af	**5.00'D x 3.45'H DMH**
		0.128 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	12.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.45'	**12.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.45' / 12.40' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#3	Device 2	14.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 3.73 hrs HW=12.45' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=8.63 cfs @ 12.10 hrs HW=21.30' (Free Discharge)
└**2=Culvert** (Inlet Controls 8.63 cfs @ 10.98 fps)
└**3=Broad-Crested Rectangular Weir** (Passes 8.63 cfs of 261.82 cfs potential flow)

Stage-Area-Storage for Pond INF #1: In Northerly Courtyard

Elevation (feet)	Surface (acres)	Storage (acre-feet)
12.00	0.067	0.000
12.10	0.067	0.002
12.20	0.067	0.004
12.30	0.067	0.006
12.40	**0.067**	0.008
12.50	**0.068**	0.010
12.60	0.068	0.015
12.70	0.068	0.021
12.80	0.068	0.026
12.90	0.068	0.031
13.00	0.068	0.036
13.10	0.068	0.041
13.20	0.068	0.046
13.30	0.068	0.051
13.40	0.068	0.056
13.50	0.068	0.061
13.60	0.068	0.066
13.70	0.068	0.070
13.80	0.068	0.075
13.90	0.068	0.079
14.00	0.068	0.084
14.10	0.068	0.088
14.20	0.068	0.092
14.30	0.068	0.096
14.40	0.068	0.100
14.50	0.068	0.103
14.60	0.068	0.107
14.70	0.068	0.110
14.80	0.068	0.113
14.90	0.068	0.115
15.00	0.068	0.117
15.10	0.068	0.119
15.20	0.068	0.121
15.30	0.068	0.123
15.40	0.068	0.125
15.50	0.068	0.128
15.60	0.068	0.128
15.70	0.068	0.128
15.80	0.068	0.128
15.90	0.068	**0.128**
16.00	0.068	0.128
16.10	0.068	0.128
16.20	0.068	0.128
16.30	0.068	0.128
16.40	0.068	0.128
16.50	0.068	0.128
16.60	0.068	0.128
16.70	0.068	0.128
16.80	0.068	0.128
16.90	0.068	0.128
17.00	0.068	0.128
17.10	0.068	0.128
17.20	0.068	0.128
17.30	0.068	0.128
17.40	0.068	0.128
17.50	0.068	0.128
17.60	0.068	0.128
17.70	0.068	0.128
17.80	0.068	0.128
17.90	0.068	0.128
18.00	0.068	0.128
18.10	0.068	0.128
18.20	0.068	0.128
18.30	0.068	0.128
18.40	0.068	0.128
18.50	0.068	0.128
18.60	0.068	0.128
18.70	0.068	0.128
18.80	0.068	0.128
18.90	0.068	0.128
19.00	0.068	0.128
19.10	0.068	0.128
19.20	0.068	0.128
19.30	0.068	0.128
19.40	0.068	0.128
19.50	0.068	0.128
19.60	0.068	0.128
19.70	0.068	0.128
19.80	0.068	0.128
19.90	0.068	0.128
20.00	0.068	0.128
20.10	0.068	0.128
20.20	0.068	0.128
20.30	0.068	0.128
20.40	0.068	0.128
20.50	0.068	0.128
20.60	0.068	0.128
20.70	0.068	0.128
20.80	0.068	0.128
20.90	0.068	0.128
21.00	0.068	0.128
21.10	0.068	0.128
21.20	0.068	0.128
21.30	0.068	0.128
21.40	0.068	0.128
21.50	0.068	0.128

Summary for Pond INF #2: In Front Parking

Inflow Area = 0.571 ac, 71.63% Impervious, Inflow Depth > 7.03" for 100-YR event
Inflow = 4.52 cfs @ 12.07 hrs, Volume= 0.334 af
Outflow = 3.66 cfs @ 12.12 hrs, Volume= 0.297 af, Atten= 19%, Lag= 3.2 min
Discarded = 0.01 cfs @ 4.21 hrs, Volume= 0.022 af
Primary = 3.65 cfs @ 12.12 hrs, Volume= 0.274 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 13.19' @ 12.12 hrs Surf.Area= 0.048 ac Storage= 0.052 af

Plug-Flow detention time= 86.2 min calculated for 0.297 af (89% of inflow)
Center-of-Mass det. time= 33.5 min (804.3 - 770.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	10.87'	0.023 af	**24.83'W x 74.40'L x 2.33'H Field A** 0.099 af Overall - 0.024 af Embedded = 0.075 af x 30.0% Voids
#2A	11.37'	0.024 af	**ADS_StormTech SC-310 +Cap** x 70 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 7 Rows of 10 Chambers
#3B	10.87'	0.003 af	**8.17'W x 31.68'L x 2.33'H Field B** 0.014 af Overall - 0.003 af Embedded = 0.011 af x 30.0% Voids
#4B	11.37'	0.003 af	**ADS_StormTech SC-310 +Cap** x 8 Inside #3 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 2 Rows of 4 Chambers
		0.052 af	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	10.87'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	11.20'	**12.0" Round Culvert** L= 7.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.20' / 11.10' S= 0.0143 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf
#3	Device 2	12.30'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 4.21 hrs HW=10.89' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=3.65 cfs @ 12.12 hrs HW=13.19' (Free Discharge)
└**2=Culvert** (Inlet Controls 3.65 cfs @ 4.64 fps)
└**3=Broad-Crested Rectangular Weir** (Passes 3.65 cfs of 11.13 cfs potential flow)

Stage-Area-Storage for Pond INF #2: In Front Parking

Elevation (feet)	Surface (acres)	Storage (acre-feet)
10.87	**0.048**	0.000
10.92	0.048	0.001
10.97	0.048	0.001
11.02	0.048	0.002
11.07	0.048	0.003
11.12	0.048	0.004
11.17	0.048	0.004
11.22	0.048	0.005
11.27	0.048	0.006
11.32	0.048	0.007
11.37	0.048	0.007
11.42	0.048	0.009
11.47	0.048	0.011
11.52	0.048	0.013
11.57	0.048	0.014
11.62	0.048	0.016
11.67	0.048	0.018
11.72	0.048	0.020
11.77	0.048	0.021
11.82	0.048	0.023
11.87	0.048	0.025
11.92	0.048	0.026
11.97	0.048	0.028
12.02	0.048	0.029
12.07	0.048	0.031
12.12	0.048	0.032
12.17	0.048	0.034
12.22	0.048	0.035
12.27	0.048	0.036
12.32	0.048	0.038
12.37	0.048	0.039
12.42	0.048	0.040
12.47	0.048	0.041
12.52	0.048	0.042
12.57	0.048	0.043
12.62	0.048	0.044
12.67	0.048	0.045
12.72	0.048	0.045
12.77	0.048	0.046
12.82	0.048	0.047
12.87	0.048	0.047
12.92	0.048	0.048
12.97	0.048	0.049
13.02	0.048	0.050
13.07	0.048	0.050
13.12	0.048	0.051
13.17	0.048	**0.052**

Summary for Pond INF #3: South of Building

Inflow Area = 3.439 ac, 96.48% Impervious, Inflow Depth > 7.77" for 100-YR event
Inflow = 28.28 cfs @ 12.07 hrs, Volume= 2.227 af
Outflow = 28.28 cfs @ 12.07 hrs, Volume= 1.949 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.04 cfs @ 9.61 hrs, Volume= 0.078 af
Primary = 28.24 cfs @ 12.07 hrs, Volume= 1.871 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 18.59' @ 12.07 hrs Surf.Area= 0.151 ac Storage= 0.293 af

Plug-Flow detention time= 107.9 min calculated for 1.949 af (87% of inflow)
Center-of-Mass det. time= 49.8 min (793.4 - 743.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.00'	0.101 af	**25.25'W x 259.94'L x 3.50'H Field A** 0.527 af Overall - 0.190 af Embedded = 0.338 af x 30.0% Voids
#2A	9.50'	0.190 af	**ADS_StormTech SC-740 +Cap** x 180 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 5 Rows of 36 Chambers
#3	12.20'	0.002 af	**5.00'D x 3.50'H DMH**
		0.293 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	9.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.00'	**24.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.00' / 11.95' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf

Discarded OutFlow Max=0.04 cfs @ 9.61 hrs HW=12.21' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=28.24 cfs @ 12.07 hrs HW=18.59' (Free Discharge)
↑**2=Culvert** (Inlet Controls 28.24 cfs @ 8.99 fps)

Stage-Area-Storage for Pond INF #3: South of Building

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
9.00	0.151	0.000	14.30	0.151	0.292
9.10	0.151	0.005	14.40	0.151	0.292
9.20	0.151	0.009	14.50	0.151	0.292
9.30	0.151	0.014	14.60	0.151	0.292
9.40	0.151	0.018	14.70	0.151	0.292
9.50	0.151	0.023	14.80	0.151	0.292
9.60	0.151	0.035	14.90	0.151	0.292
9.70	0.151	0.047	15.00	0.151	0.292
9.80	0.151	0.059	15.10	0.151	0.292
9.90	0.151	0.071	15.20	0.151	0.292
10.00	0.151	0.083	15.30	0.151	0.292
10.10	0.151	0.094	15.40	0.151	0.293
10.20	0.151	0.106	15.50	0.151	0.293
10.30	0.151	0.117	15.60	0.151	0.293
10.40	0.151	0.129	15.70	0.151	**0.293**
10.50	0.151	0.140	15.80	0.151	0.293
10.60	0.151	0.151	15.90	0.151	0.293
10.70	0.151	0.161	16.00	0.151	0.293
10.80	0.151	0.172	16.10	0.151	0.293
10.90	0.151	0.182	16.20	0.151	0.293
11.00	0.151	0.192	16.30	0.151	0.293
11.10	0.151	0.202	16.40	0.151	0.293
11.20	0.151	0.212	16.50	0.151	0.293
11.30	0.151	0.221	16.60	0.151	0.293
11.40	0.151	0.229	16.70	0.151	0.293
11.50	0.151	0.238	16.80	0.151	0.293
11.60	0.151	0.245	16.90	0.151	0.293
11.70	0.151	0.252	17.00	0.151	0.293
11.80	0.151	0.258	17.10	0.151	0.293
11.90	0.151	0.264	17.20	0.151	0.293
12.00	0.151	0.268	17.30	0.151	0.293
12.10	0.151	0.273	17.40	0.151	0.293
12.20	**0.151**	0.278	17.50	0.151	0.293
12.30	0.151	0.282	17.60	0.151	0.293
12.40	0.151	0.287	17.70	0.151	0.293
12.50	0.151	0.291	17.80	0.151	0.293
12.60	0.151	0.291	17.90	0.151	0.293
12.70	0.151	0.291	18.00	0.151	0.293
12.80	0.151	0.291	18.10	0.151	0.293
12.90	0.151	0.291	18.20	0.151	0.293
13.00	0.151	0.291	18.30	0.151	0.293
13.10	0.151	0.291	18.40	0.151	0.293
13.20	0.151	0.292	18.50	0.151	0.293
13.30	0.151	0.292	18.60	0.151	0.293
13.40	0.151	0.292			
13.50	0.151	0.292			
13.60	0.151	0.292			
13.70	0.151	0.292			
13.80	0.151	0.292			
13.90	0.151	0.292			
14.00	0.151	0.292			
14.10	0.151	0.292			
14.20	0.151	0.292			

Summary for Pond INF #4: In Main Parking Area

Inflow Area = 5.705 ac, 97.88% Impervious, Inflow Depth > 7.06" for 100-YR event
Inflow = 46.93 cfs @ 12.07 hrs, Volume= 3.356 af
Outflow = 46.94 cfs @ 12.07 hrs, Volume= 3.155 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.02 cfs @ 5.15 hrs, Volume= 0.034 af
Primary = 46.92 cfs @ 12.07 hrs, Volume= 3.121 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 27.94' @ 12.07 hrs Surf.Area= 0.066 ac Storage= 0.203 af

Plug-Flow detention time= 55.7 min calculated for 3.153 af (94% of inflow)
Center-of-Mass det. time= 23.2 min (793.7 - 770.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	10.25'	0.070 af	**37.08'W x 77.40'L x 5.50'H Field A** 0.362 af Overall - 0.130 af Embedded = 0.233 af x 30.0% Voids
#2A	11.00'	0.130 af	**ADS_StormTech MC-3500 d +Cap** x 50 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 5 Rows of 10 Chambers Cap Storage= +14.9 cf x 2 x 5 rows = 149.0 cf
#3	11.63'	0.003 af	**5.00'D x 6.97'H DMH**
		0.203 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	10.25'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	11.50'	**24.0" Round Culvert** L= 98.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 11.50' / 11.00' S= 0.0051 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#3	Device 2	16.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 5.15 hrs HW=11.63' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=46.92 cfs @ 12.07 hrs HW=27.94' (Free Discharge)
↑—**2=Culvert** (Inlet Controls 46.92 cfs @ 14.93 fps)
↑—**3=Broad-Crested Rectangular Weir** (Passes 46.92 cfs of 547.58 cfs potential flow)

Stage-Area-Storage for Pond INF #4: In Main Parking Area

Elevation (feet)	Surface (acres)	Storage (acre-feet)
10.25	0.066	0.000
10.45	0.066	0.004
10.65	0.066	0.008
10.85	0.066	0.012
11.05	0.066	0.018
11.25	0.066	0.028
11.45	0.066	0.039
11.65	**0.066**	0.050
11.85	0.066	0.060
12.05	0.066	0.071
12.25	0.066	0.081
12.45	0.066	0.091
12.65	0.066	0.101
12.85	0.066	0.111
13.05	0.066	0.120
13.25	0.066	0.129
13.45	0.066	0.138
13.65	0.066	0.147
13.85	0.066	0.155
14.05	0.066	0.162
14.25	0.066	0.169
14.45	0.066	0.174
14.65	0.066	0.179
14.85	0.066	0.183
15.05	0.066	0.187
15.25	0.066	0.191
15.45	0.066	0.195
15.65	0.066	0.199
15.85	0.066	0.201
16.05	0.066	0.201
16.25	0.066	0.202
16.45	0.066	0.202
16.65	0.066	0.202
16.85	0.066	0.202
17.05	0.066	0.202
17.25	0.066	0.202
17.45	0.066	0.202
17.65	0.066	0.202
17.85	0.066	0.202
18.05	0.066	0.202
18.25	0.066	0.202
18.45	0.066	**0.203**
18.65	0.066	**0.203**
18.85	0.066	0.203
19.05	0.066	0.203
19.25	0.066	0.203
19.45	0.066	0.203
19.65	0.066	0.203
19.85	0.066	0.203
20.05	0.066	0.203
20.25	0.066	0.203
20.45	0.066	0.203
20.65	0.066	0.203
20.85	0.066	0.203
21.05	0.066	0.203
21.25	0.066	0.203
21.45	0.066	0.203
21.65	0.066	0.203
21.85	0.066	0.203
22.05	0.066	0.203
22.25	0.066	0.203
22.45	0.066	0.203
22.65	0.066	0.203
22.85	0.066	0.203
23.05	0.066	0.203
23.25	0.066	0.203
23.45	0.066	0.203
23.65	0.066	0.203
23.85	0.066	0.203
24.05	0.066	0.203
24.25	0.066	0.203
24.45	0.066	0.203
24.65	0.066	0.203
24.85	0.066	0.203
25.05	0.066	0.203
25.25	0.066	0.203
25.45	0.066	0.203
25.65	0.066	0.203
25.85	0.066	0.203
26.05	0.066	0.203
26.25	0.066	0.203
26.45	0.066	0.203
26.65	0.066	0.203
26.85	0.066	0.203
27.05	0.066	0.203
27.25	0.066	0.203
27.45	0.066	0.203
27.65	0.066	0.203
27.85	0.066	0.203

Summary for Pond INF #5: In Main Parking Area

Inflow Area = 1.764 ac, 80.84% Impervious, Inflow Depth > 7.27" for 100-YR event
Inflow = 14.20 cfs @ 12.07 hrs, Volume= 1.068 af
Outflow = 14.16 cfs @ 12.07 hrs, Volume= 0.947 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.02 cfs @ 3.68 hrs, Volume= 0.032 af
Primary = 14.14 cfs @ 12.07 hrs, Volume= 0.915 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.38' @ 12.07 hrs Surf.Area= 0.068 ac Storage= 0.131 af

Plug-Flow detention time= 91.2 min calculated for 0.947 af (89% of inflow)
Center-of-Mass det. time= 37.8 min (801.5 - 763.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.75'	0.046 af	**49.00'W x 60.58'L x 3.50'H Field A** 0.238 af Overall - 0.084 af Embedded = 0.154 af x 30.0% Voids
#2A	12.25'	0.084 af	**ADS_StormTech SC-740 +Cap** x 80 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 10 Rows of 8 Chambers
#3	18.55'	0.002 af	**4.00'D x 8.00'H DMH**
		0.133 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	11.75'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.20'	**18.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.20' / 11.20' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#3	Device 2	14.75'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 3.68 hrs HW=11.90' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=14.13 cfs @ 12.07 hrs HW=17.38' (Free Discharge)
└**2=Culvert** (Inlet Controls 14.13 cfs @ 8.00 fps)
└**3=Broad-Crested Rectangular Weir** (Passes 14.13 cfs of 56.53 cfs potential flow)

Stage-Area-Storage for Pond INF #5: In Main Parking Area

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
11.75	0.068	0.000	19.70	0.068	0.131
11.90	0.068	0.003	19.85	0.068	0.131
12.05	0.068	0.006	20.00	0.068	0.131
12.20	0.068	0.009	20.15	0.068	0.131
12.35	0.068	0.016	20.30	0.068	0.131
12.50	0.068	0.024	20.45	0.068	0.131
12.65	0.068	0.032	20.60	0.068	0.131
12.80	0.068	0.040	20.75	0.068	0.131
12.95	0.068	0.048	20.90	0.068	0.131
13.10	0.068	0.055	21.05	0.068	0.131
13.25	0.068	0.063	21.20	0.068	0.131
13.40	0.068	0.070	21.35	0.068	0.131
13.55	0.068	0.077	21.50	0.068	0.131
13.70	0.068	0.084	21.65	0.068	0.132
13.85	0.068	0.091	21.80	0.068	0.132
14.00	0.068	0.097	21.95	0.068	0.132
14.15	0.068	0.103	22.10	0.068	0.132
14.30	0.068	0.108	22.25	0.068	0.132
14.45	0.068	0.113	22.40	0.068	0.132
14.60	0.068	0.117	22.55	0.068	0.132
14.75	0.068	0.120	22.70	0.068	0.132
14.90	0.068	0.123	22.85	0.068	0.132
15.05	0.068	0.127	23.00	0.068	0.132
15.20	0.068	0.130	23.15	0.068	0.132
15.35	0.068	0.131	23.30	0.068	0.132
15.50	0.068	0.131	23.45	0.068	0.132
15.65	0.068	0.131	23.60	0.068	0.132
15.80	0.068	0.131	23.75	0.068	0.132
15.95	0.068	0.131	23.90	0.068	0.132
16.10	0.068	0.131	24.05	0.068	0.132
16.25	0.068	0.131	24.20	0.068	0.132
16.40	0.068	0.131	24.35	0.068	0.132
16.55	0.068	0.131	24.50	0.068	0.132
16.70	0.068	0.131	24.65	0.068	0.132
16.85	0.068	0.131	24.80	0.068	0.132
17.00	0.068	0.131	24.95	0.068	0.132
17.15	0.068	0.131	25.10	0.068	0.132
17.30	0.068	0.131	25.25	0.068	0.133
17.45	0.068	0.131	25.40	0.068	0.133
17.60	0.068	0.131	25.55	0.068	0.133
17.75	0.068	0.131	25.70	0.068	0.133
17.90	0.068	0.131	25.85	0.068	0.133
18.05	0.068	0.131	26.00	0.068	0.133
18.20	0.068	0.131	26.15	0.068	0.133
18.35	0.068	0.131	26.30	0.068	0.133
18.50	**0.068**	0.131	26.45	0.068	**0.133**
18.65	**0.068**	0.131			
18.80	0.068	0.131			
18.95	0.068	0.131			
19.10	0.068	0.131			
19.25	0.068	0.131			
19.40	0.068	0.131			
19.55	0.068	0.131			

Summary for Pond INF #6: In Main Parking Area

Inflow Area = 1.754 ac, 81.01% Impervious, Inflow Depth > 7.27" for 100-YR event
Inflow = 14.12 cfs @ 12.07 hrs, Volume= 1.062 af
Outflow = 14.10 cfs @ 12.07 hrs, Volume= 0.929 af, Atten= 0%, Lag= 0.2 min
Discarded = 0.02 cfs @ 10.09 hrs, Volume= 0.036 af
Primary = 14.08 cfs @ 12.07 hrs, Volume= 0.893 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 17.64' @ 12.07 hrs Surf.Area= 0.075 ac Storage= 0.145 af

Plug-Flow detention time= 97.2 min calculated for 0.929 af (87% of inflow)
Center-of-Mass det. time= 40.1 min (803.7 - 763.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	12.00'	0.051 af	**53.75'W x 60.58'L x 3.50'H Field A** 0.262 af Overall - 0.093 af Embedded = 0.169 af x 30.0% Voids
#2A	12.50'	0.093 af	**ADS_StormTech SC-740 +Cap** x 88 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 11 Rows of 8 Chambers
#3	14.55'	0.002 af	**5.00'D x 3.85'H Vertical Cone/Cylinder**
		0.145 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	12.00'	**0.270 in/hr Exfiltration over Surface area**
#2	Primary	12.50'	**18.0" Round Culvert** L= 11.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 12.50' / 12.35' S= 0.0136 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#3	Device 2	15.00'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 10.09 hrs HW=14.56' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=14.05 cfs @ 12.07 hrs HW=17.63' (Free Discharge)
↑**2=Culvert** (Inlet Controls 14.05 cfs @ 7.95 fps)
↑**3=Broad-Crested Rectangular Weir** (Passes 14.05 cfs of 56.53 cfs potential flow)

Stage-Area-Storage for Pond INF #6: In Main Parking Area

Elevation (feet)	Surface (acres)	Storage (acre-feet)
12.00	0.075	0.000
12.10	0.075	0.002
12.20	0.075	0.004
12.30	0.075	0.007
12.40	0.075	0.009
12.50	0.075	0.011
12.60	0.075	0.017
12.70	0.075	0.023
12.80	0.075	0.029
12.90	0.075	0.035
13.00	0.075	0.041
13.10	0.075	0.047
13.20	0.075	0.052
13.30	0.075	0.058
13.40	0.075	0.063
13.50	0.075	0.069
13.60	0.075	0.074
13.70	0.075	0.079
13.80	0.075	0.085
13.90	0.075	0.090
14.00	0.075	0.095
14.10	0.075	0.099
14.20	0.075	0.104
14.30	0.075	0.109
14.40	0.075	0.113
14.50	**0.075**	0.117
14.60	**0.075**	0.121
14.70	0.075	0.124
14.80	0.075	0.127
14.90	0.075	0.130
15.00	0.075	0.132
15.10	0.075	0.135
15.20	0.075	0.137
15.30	0.075	0.139
15.40	0.075	0.142
15.50	0.075	0.144
15.60	0.075	0.144
15.70	0.075	0.144
15.80	0.075	0.144
15.90	0.075	0.144
16.00	0.075	0.144
16.10	0.075	0.144
16.20	0.075	0.144
16.30	0.075	0.144
16.40	0.075	0.144
16.50	0.075	0.144
16.60	0.075	0.144
16.70	0.075	0.144
16.80	0.075	0.144
16.90	0.075	0.145
17.00	0.075	0.145
17.10	0.075	0.145
17.20	0.075	0.145
17.30	0.075	0.145
17.40	0.075	0.145
17.50	0.075	0.145
17.60	0.075	0.145
17.70	0.075	0.145
17.80	0.075	0.145
17.90	0.075	0.145
18.00	0.075	0.145
18.10	0.075	0.145
18.20	0.075	0.145
18.30	0.075	0.145
18.40	0.075	**0.145**

Summary for Pond INF#7: West of parking deck

Inflow Area = 1.444 ac,100.00% Impervious, Inflow Depth > 7.87" for 100-YR event
Inflow = 11.91 cfs @ 12.07 hrs, Volume= 0.946 af
Outflow = 11.89 cfs @ 12.07 hrs, Volume= 0.829 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.02 cfs @ 0.82 hrs, Volume= 0.035 af
Primary = 11.87 cfs @ 12.07 hrs, Volume= 0.794 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Peak Elev= 15.03' @ 12.07 hrs Surf.Area= 2,930 sf Storage= 5,526 cf

Plug-Flow detention time= 107.1 min calculated for 0.829 af (88% of inflow)
Center-of-Mass det. time= 49.1 min (788.8 - 739.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	11.10'	1,206 cf	**15.75'W x 110.42'L x 3.50'H Field A** 6,087 cf Overall - 2,067 cf Embedded = 4,019 cf x 30.0% Voids
#2A	11.60'	2,067 cf	**ADS_StormTech SC-740 +Cap** x 45 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 3 Rows of 15 Chambers
#3	11.00'	63 cf	**4.00'D x 5.00'H Vertical Cone/Cylinder**
#4B	11.10'	824 cf	**15.75'W x 74.82'L x 3.50'H Field B** 4,124 cf Overall - 1,378 cf Embedded = 2,746 cf x 30.0% Voids
#5B	11.60'	1,378 cf	**ADS_StormTech SC-740 +Cap** x 30 Inside #4 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 3 Rows of 10 Chambers
		5,538 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	10.80'	**18.0" Round Culvert** L= 166.0' Ke= 0.600 Inlet / Outlet Invert= 10.80' / 9.10' S= 0.0102 '/' Cc= 0.900 n= 0.011, Flow Area= 1.77 sf
#2	Device 1	14.10'	**4.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Discarded	11.00'	**0.270 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.02 cfs @ 0.82 hrs HW=11.10' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=11.87 cfs @ 12.07 hrs HW=15.03' (Free Discharge)
└**1=Culvert** (Passes 11.87 cfs of 14.88 cfs potential flow)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 11.87 cfs @ 3.19 fps)

Stage-Area-Storage for Pond INF#7: West of parking deck

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
11.00	13	0
11.05	13	1
11.10	**2,930**	1
11.15	2,930	46
11.20	2,930	90
11.25	2,930	134
11.30	2,930	179
11.35	2,930	223
11.40	2,930	268
11.45	2,930	312
11.50	2,930	356
11.55	2,930	401
11.60	2,930	445
11.65	2,930	559
11.70	2,930	673
11.75	2,930	786
11.80	2,930	900
11.85	2,930	1,013
11.90	2,930	1,125
11.95	2,930	1,237
12.00	2,930	1,349
12.05	2,930	1,460
12.10	2,930	1,570
12.15	2,930	1,680
12.20	2,930	1,789
12.25	2,930	1,898
12.30	2,930	2,006
12.35	2,930	2,113
12.40	2,930	2,220
12.45	2,930	2,326
12.50	2,930	2,432
12.55	2,930	2,536
12.60	2,930	2,640
12.65	2,930	2,743
12.70	2,930	2,845
12.75	2,930	2,946
12.80	2,930	3,047
12.85	2,930	3,146
12.90	2,930	3,244
12.95	2,930	3,341
13.00	2,930	3,438
13.05	2,930	3,533
13.10	2,930	3,626
13.15	2,930	3,719
13.20	2,930	3,811
13.25	2,930	3,900
13.30	2,930	3,989
13.35	2,930	4,075
13.40	2,930	4,160
13.45	2,930	4,243
13.50	2,930	4,325
13.55	2,930	4,404
13.60	2,930	4,482
13.65	2,930	4,557
13.70	2,930	4,629
13.75	2,930	4,699
13.80	2,930	4,764
13.85	2,930	4,825
13.90	2,930	4,882
13.95	2,930	4,934
14.00	2,930	4,983
14.05	2,930	5,031
14.10	2,930	5,076
14.15	2,930	5,121
14.20	2,930	5,165
14.25	2,930	5,210
14.30	2,930	5,254
14.35	2,930	5,298
14.40	2,930	5,343
14.45	2,930	5,387
14.50	2,930	5,432
14.55	2,930	5,476
14.60	2,930	5,520
14.65	2,930	5,521
14.70	2,930	5,522
14.75	2,930	5,522
14.80	2,930	5,523
14.85	2,930	5,524
14.90	2,930	5,524
14.95	2,930	5,525
15.00	2,930	5,525
15.05	2,930	5,526
15.10	2,930	5,527
15.15	2,930	5,527
15.20	2,930	5,528
15.25	2,930	5,529
15.30	2,930	5,529
15.35	2,930	5,530
15.40	2,930	5,530
15.45	2,930	5,531
15.50	2,930	5,532
15.55	2,930	5,532
15.60	2,930	5,533
15.65	2,930	5,534
15.70	2,930	5,534
15.75	2,930	5,535
15.80	2,930	5,535
15.85	2,930	5,536
15.90	2,930	5,537
15.95	2,930	5,537
16.00	2,930	**5,538**

Summary for Link 1L: WILLIAM T. MORRISSEY BOULEVARD

Inflow Area = 1.433 ac, 79.34% Impervious, Inflow Depth > 6.74" for 100-YR event
Inflow = 10.41 cfs @ 12.08 hrs, Volume= 0.805 af
Primary = 10.41 cfs @ 12.08 hrs, Volume= 0.805 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Summary for Link 2L: PROJECT SITE

Inflow Area = 15.169 ac, 90.01% Impervious, Inflow Depth > 6.63" for 100-YR event
Inflow = 119.77 cfs @ 12.07 hrs, Volume= 8.379 af
Primary = 119.77 cfs @ 12.07 hrs, Volume= 8.379 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Appendix E:
Recharge and Water Quality Compliance Documentation

Table 1 Required Recharge Volume
135 William T Morressey Boulevard
As shown in Vol 3. Chapter 1 Page 15 of the Massachusetts Stormwater Handbook
Required Recharge Volume determined by the following equation:

$R_v = F \times A_{imp}$ where:

R_v	Required Recharge Volume
F	Target Depth Factor
A_{imp}	Impervious Area

Given:
NRCS Hydrologic Soil Type - C
Target Depth Factor = 0.25 inch

Subcatchment	A_{imp} $ft.^2$	A_{imp} acre	F inch	R_v acre-ft	R_v $ft.^3$
P1A	17,824	0.41	0.25	0.0085	371
P1B	31,709	0.73	0.25	0.0152	661
P1C	33,760	0.78	0.25	0.0161	703
P2A	43,433	1.00	0.25	0.0208	905
P2B	110,757	2.54	0.25	0.0530	2,307
P2C	98,711	2.27	0.25	0.0472	2,056
P2D	62,911	1.44	0.25	0.0301	1,311
P3	14,060	0.32	0.25	0.0067	293
P3A	107,070	2.46	0.25	0.0512	2,231
P3B	62,131	1.43	0.25	0.0297	1,294
P4	61,916	1.42	0.25	0.0296	1,290
				TOTAL	13,423

Table 2 Simple Dynamic Method for Recharge
135 William T Morressey Boulevard
As shown in Vol 3. Chapter 1 Page 19 of the Massachusetts Stormwater Handbook
Using the following equations

$A = R_v / (D+KT)$

$V = A \times D$

where

R_v	Required Recharge Volume
A	Minimum Req'd surface area of the bottom of the infiltration structure
V	Storage Volume
D	depth of the infiltration facility
K	Rawls rate for saturated hydraulic conductivity
T	allowable drawdown

Use

k=	0.27 in/hr	C -Soils
T	2 hours	

Subcatchment	R_v ft.^{3}	nD ft	A ft.^{2}	$V_{Required}$ ft.^{3}	Receiving Recharge Facility	$V_{provided}$ ft.^{3}	$V_{provided} > V_{req}$ Yes/No
P1A	371.33	1.48	243.50	360.38	INF #2	1,612	Yes
P1B	660.60	0.00	0.00	660.60	NONE	0	No
P1C and P2B	3,010.77	2.65	1,117.17	2,960.50	INF #3	11,674	Yes
P2A	904.85	2.65	335.75	889.75	INF #1	3,659	Yes
P2C	2,056.48	4.05	502.19	2,033.88	INF #4	8,755	Yes
P2D	1,310.65	2.65	486.32	1,288.76	INF #7	5,076	Yes
P3	292.92	0.00	0.00	292.92	NONE	0	No
P3A	2,230.63	0.00	0.00	2,230.63	NONE	0	No
P3B	1,294.40	2.65	480.30	1,272.78	INF #5	5,227	Yes
P4	1,289.92	2.65	478.63	1,268.38	INF #6	5,750	Yes
			TOTALS	13,258.57		41,753	Yes

Table 3 Drawdown
135 William T Morressey Boulevard

Using the following equations
$Time_{drawdown} = R_v/(K^*$ Bottom Area)
As shown in Vol 3. Chapter 1 Page 25 of the Massachusetts Stormwater Handbook

$Time_{drawdown}$	Drawdown time for Infiltration BMP, must be < 72 hours
R_v	Storage Volume
Bottom area	Bottom Area of Recharge Structure
K	Rawls rate for saturated hydraulic conductivity
k=	0.27 in/hr C -Soils

Subcatchment	R_v $ft.^3$	Bottom Area $ft.^2$	$Time_{drawdown}$ hours	$Time_{drawdown}$ < 72 hours Yes/No
INF #2	371.33	2106	7.84	Yes
INF #3	3,010.77	6563	20.39	Yes
INF #1	904.85	2936	13.70	Yes
INF #4	2,056.48	2870	31.85	Yes
INF #7	1,310.65	2918	19.96	Yes
INF #5	1,294.40	2968	19.38	Yes
INF #6	1,289.92	3256	17.61	Yes

HSH Project No.: 16127
Project: 135 Morrissey Boulevard, Boston, MA
Date: May 17, 2018

TSS REMOVAL CALCULATION

Location: Subcatchment P1A

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Deep Sump and Hooded Catchbasin	0.25	1.00	0.25	0.75
Proprietary Treatment Unit	0.85	0.75	0.64	0.11
Infiltration Basin	0.80	0.11	0.09	0.02

Total TSS Removal 98%

HSH Project No.: 16127
Project: 135 Morrissey Boulevard, Boston, MA
Date: May 17, 2018

TSS REMOVAL CALCULATION

Location: Subcatchment P1B

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Deep Sump and Hooded Catchbasin	0.25	1.00	0.25	0.75
Proprietary Treatment Unit	0.86	0.75	0.65	0.11

Total TSS Removal 90%

HSH Project No.: 16127
Project: 135 Morrissey Boulevard, Boston, MA
Date: May 17, 2018

TSS REMOVAL CALCULATION

Location: Subcatchment P1C and P2B

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Deep Sump and Hooded Catchbasin	0.25	1.00	0.25	0.75
Proprietary Treatment Unit	0.81	0.75	0.61	0.14
Infiltration Basin	0.80	0.14	0.11	0.03

Total TSS Removal 97%

HSH Project No.: 16127
Project: 135 Morrissey Boulevard, Boston, MA
Date: May 17, 2018

TSS REMOVAL CALCULATION

Location: Subcatchment P2A (Roof Area)

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Infiltration Basin	0.80	1.00	0.80	0.20

Total TSS Removal 80%

HSH Project No.: 16127
Project: 135 Morrissey Boulevard, Boston, MA
Date: May 17, 2018

TSS REMOVAL CALCULATION

Location: Subcatchment P2B (Roof Area)

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Infiltration Basin	0.80	1.00	0.80	0.20

Total TSS Removal 80%

HSH Project No.: 16127
Project: 135 Morrissey Boulevard, Boston, MA
Date: May 17, 2018

TSS REMOVAL CALCULATION

Location: Subcatchment P2C (Roof Area)

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Infiltration Basin	0.80	1.00	0.80	0.20

Total TSS Removal 80%

HSH Project No.: 16127
Project: 135 Morrissey Boulevard, Boston, MA
Date: May 17, 2018

TSS REMOVAL CALCULATION

Location: Subcatchment P2D

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Proprietary Treatment Unit	0.25	1.00	0.25	0.75
Infiltration Basin	0.80	0.75	0.60	0.15

Total TSS Removal 85%

HSH Project No.: 16127
Project: 135 Morrissey Boulevard, Boston, MA
Date: May 17, 2018

TSS REMOVAL CALCULATION

Location: Subcatchment P3A

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Deep Sump and Hooded Catchbasin	0.25	1.00	0.25	0.75
Proprietary Treatment Unit	0.81	0.75	0.61	0.14

Total TSS Removal 86%

HSH Project No.: 16127
Project: 135 Morrissey Boulevard, Boston, MA
Date: May 17, 2018

TSS REMOVAL CALCULATION

Location: Subcatchment P3B

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Deep Sump and Hooded Catchbasin	0.25	1.00	0.25	0.75
Proprietary Treatment Unit	0.83	0.75	0.62	0.13
Infiltration Basin	0.80	0.13	0.10	0.03

Total TSS Removal 97%

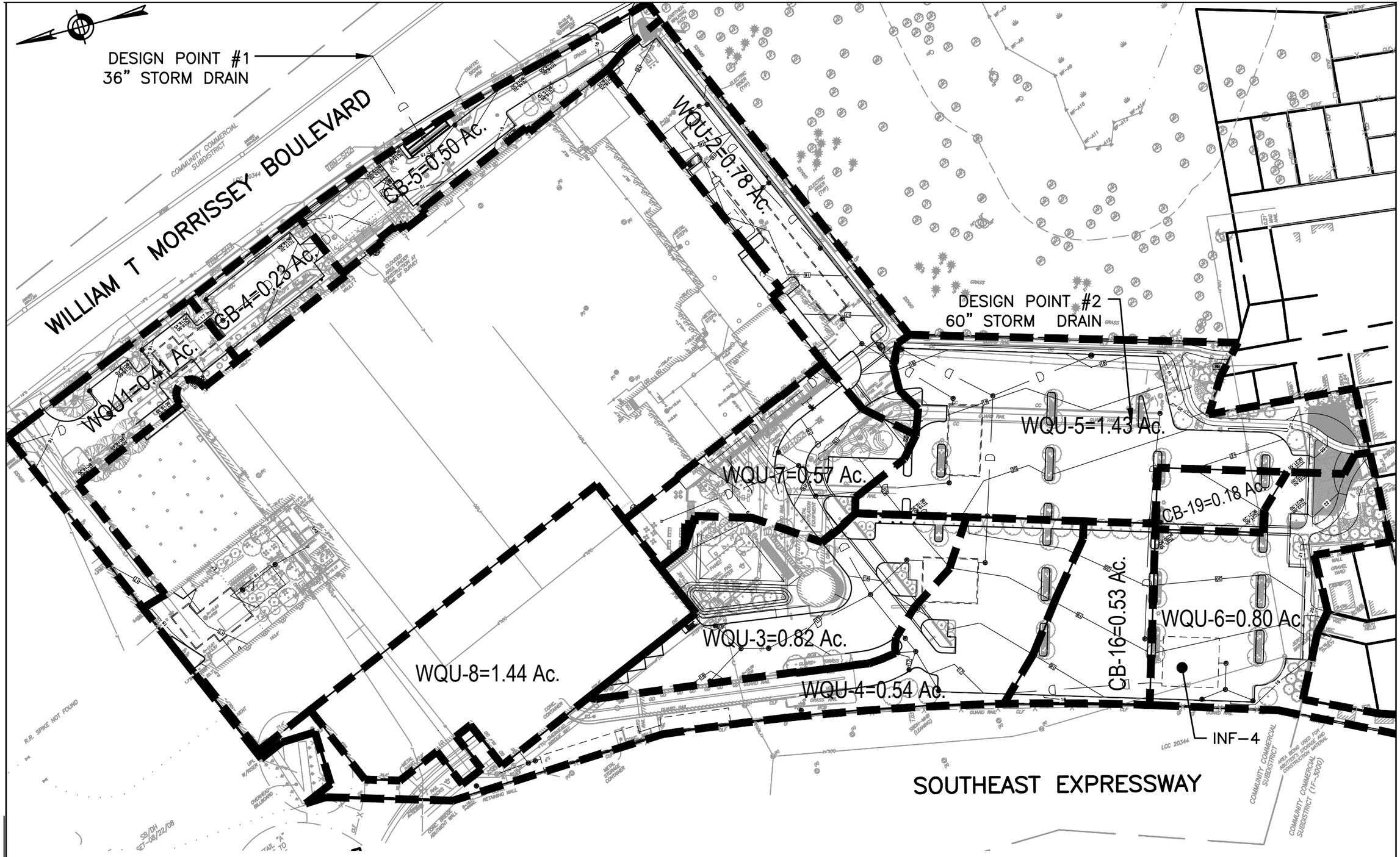
HSH Project No.: 16127
Project: 135 Morrissey Boulevard, Boston, MA
Date: May 17, 2018

TSS REMOVAL CALCULATION

Location: Subcatchment P4

BMP	TSS Removal Rate	Starting TSS Load	Amount Removed	Remaining Load
Deep Sump and Hooded Catchbasin	0.25	1.00	0.25	0.75
Proprietary Treatment Unit	0.81	0.75	0.61	0.14
Infiltration Basin	0.80	0.14	0.11	0.03

Total TSS Removal 97%



WATER QUALITY UNITS IMPERVIOUS AREAS
135 MORRISSEY BOULEVARD

HOWARD STEIN HUDSON
11 Beacon Street, Suite 1010
Boston, MA 02108
www.hshassoc.com

FIGURE
W.1

Project: Boston Globe
Location: Boston, MA
Prepared For: Howard Stein Hudson

Purpose: To calculate the water quality flow rate (WQF) over a given site area. In this situation the WQF is derived from the first 1" of runoff from the contributing impervious surface.

Reference: Massachusetts Dept. of Environmental Protection Wetlands Program / United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Procedure: Determine unit peak discharge using Figure 1 or 2. Figure 2 is in tabular form so is preferred. Using the tc, read the unit peak discharge (qu) from Figure 1 or Table in Figure 2. qu is expressed in the following units: cfs/mi^2/watershed inches (csm/in).

Compute Q Rate using the following equation:

$$Q = (qu)\ (A)\ (WQV)$$

where:

Q = flow rate associated with first 1" of runoff
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area (in square miles)
WQV = water quality volume in watershed inches (1" in this case)

Structure Name	Impv. (acres)	A (miles^2)	t_c (min)	t_c (hr)	WQV (in)	qu (csm/in.)	Q (cfs)
CB-4	0.23	0.0003594	6.0	0.100	1.00	774.00	0.28
CB-5	0.50	0.0007813	6.0	0.100	1.00	774.00	0.60
CB-16	0.53	0.0008281	6.0	0.100	1.00	774.00	0.64
CB-19	0.18	0.0002813	6.0	0.100	1.00	774.00	0.22

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

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

BOSTON GLOBE
BOSTON, MA

Area	0.23 ac	Unit Site Designation	CB-4
Weighted C	0.9	Rainfall Station #	69
t_c	6 min		
CDS Model	2015-4	CDS Treatment Capacity	**1.4 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.00	0.00	9.9
0.04	9.6%	19.8%	0.01	0.01	9.3
0.06	9.4%	29.3%	0.01	0.01	9.1
0.08	7.7%	37.0%	0.02	0.02	7.5
0.10	8.6%	45.6%	0.02	0.02	8.2
0.12	6.3%	51.9%	0.02	0.02	6.0
0.14	4.7%	56.5%	0.03	0.03	4.5
0.16	4.6%	61.2%	0.03	0.03	4.4
0.18	3.5%	64.7%	0.04	0.04	3.4
0.20	4.3%	69.1%	0.04	0.04	4.1
0.25	8.0%	77.1%	0.05	0.05	7.6
0.30	5.6%	82.7%	0.06	0.06	5.3
0.35	4.4%	87.0%	0.07	0.07	4.1
0.40	2.5%	89.5%	0.08	0.08	2.4
0.45	2.5%	92.1%	0.09	0.09	2.3
0.50	1.4%	93.5%	0.10	0.10	1.3
0.75	5.0%	98.5%	0.16	0.16	4.5
1.00	1.0%	99.5%	0.21	0.21	0.9
1.50	0.0%	99.5%	0.31	0.31	0.0
2.00	0.0%	99.5%	0.41	0.41	0.0
3.00	0.5%	100.0%	0.62	0.62	0.3
					95.1
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**88.7%**

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

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

BOSTON GLOBE
BOSTON, MA

Area	**0.50 ac**	Unit Site Designation	**CB-5**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**2015-4**	CDS Treatment Capacity	**1.4 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	9.8
0.04	9.6%	19.8%	0.02	0.02	9.3
0.06	9.4%	29.3%	0.03	0.03	9.1
0.08	7.7%	37.0%	0.04	0.04	7.4
0.10	8.6%	45.6%	0.05	0.05	8.1
0.12	6.3%	51.9%	0.05	0.05	6.0
0.14	4.7%	56.5%	0.06	0.06	4.4
0.16	4.6%	61.2%	0.07	0.07	4.3
0.18	3.5%	64.7%	0.08	0.08	3.3
0.20	4.3%	69.1%	0.09	0.09	4.0
0.25	8.0%	77.1%	0.11	0.11	7.3
0.30	5.6%	82.7%	0.14	0.14	5.1
0.35	4.4%	87.0%	0.16	0.16	3.9
0.40	2.5%	89.5%	0.18	0.18	2.2
0.45	2.5%	92.1%	0.20	0.20	2.2
0.50	1.4%	93.5%	0.23	0.23	1.2
0.75	5.0%	98.5%	0.34	0.34	4.1
1.00	1.0%	99.5%	0.45	0.45	0.8
1.50	0.0%	99.5%	0.68	0.68	0.0
2.00	0.0%	99.5%	0.90	0.90	0.0
3.00	0.5%	100.0%	1.35	1.35	0.2
					92.7
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**86.3%**

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

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

BOSTON GLOBE
BOSTON, MA

Area	**0.53 ac**	Unit Site Designation	**CB-16**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**2015-4**	CDS Treatment Capacity	**1.4 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	9.8
0.04	9.6%	19.8%	0.02	0.02	9.3
0.06	9.4%	29.3%	0.03	0.03	9.1
0.08	7.7%	37.0%	0.04	0.04	7.4
0.10	8.6%	45.6%	0.05	0.05	8.1
0.12	6.3%	51.9%	0.06	0.06	5.9
0.14	4.7%	56.5%	0.07	0.07	4.4
0.16	4.6%	61.2%	0.08	0.08	4.3
0.18	3.5%	64.7%	0.09	0.09	3.3
0.20	4.3%	69.1%	0.10	0.10	4.0
0.25	8.0%	77.1%	0.12	0.12	7.3
0.30	5.6%	82.7%	0.14	0.14	5.0
0.35	4.4%	87.0%	0.17	0.17	3.9
0.40	2.5%	89.5%	0.19	0.19	2.2
0.45	2.5%	92.1%	0.21	0.21	2.2
0.50	1.4%	93.5%	0.24	0.24	1.2
0.75	5.0%	98.5%	0.36	0.36	4.0
1.00	1.0%	99.5%	0.48	0.48	0.8
1.50	0.0%	99.5%	0.72	0.72	0.0
2.00	0.0%	99.5%	0.95	0.95	0.0
3.00	0.5%	100.0%	1.43	1.40	0.1
					92.4
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**86.0%**

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

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

BOSTON GLOBE
BOSTON, MA

Area	**0.18 ac**	Unit Site Designation	**CB-19**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**2015-4**	CDS Treatment Capacity	**1.4 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.00	0.00	9.9
0.04	9.6%	19.8%	0.01	0.01	9.4
0.06	9.4%	29.3%	0.01	0.01	9.1
0.08	7.7%	37.0%	0.01	0.01	7.5
0.10	8.6%	45.6%	0.02	0.02	8.3
0.12	6.3%	51.9%	0.02	0.02	6.1
0.14	4.7%	56.5%	0.02	0.02	4.5
0.16	4.6%	61.2%	0.03	0.03	4.5
0.18	3.5%	64.7%	0.03	0.03	3.4
0.20	4.3%	69.1%	0.03	0.03	4.2
0.25	8.0%	77.1%	0.04	0.04	7.6
0.30	5.6%	82.7%	0.05	0.05	5.3
0.35	4.4%	87.0%	0.06	0.06	4.1
0.40	2.5%	89.5%	0.06	0.06	2.4
0.45	2.5%	92.1%	0.07	0.07	2.4
0.50	1.4%	93.5%	0.08	0.08	1.3
0.75	5.0%	98.5%	0.12	0.12	4.6
1.00	1.0%	99.5%	0.16	0.16	0.9
1.50	0.0%	99.5%	0.24	0.24	0.0
2.00	0.0%	99.5%	0.32	0.32	0.0
3.00	0.5%	100.0%	0.49	0.49	0.4
					95.6
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**89.1%**

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

Project: Boston Globe
Location: Boston, MA
Prepared For: Howard Stein Hudson

Purpose: To calculate the water quality flow rate (WQF) over a given site area. In this situation the WQF is derived from the first 1" of runoff from the contributing impervious surface.

Reference: Massachusetts Dept. of Environmental Protection Wetlands Program / United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual

Procedure: Determine unit peak discharge using Figure 1 or 2. Figure 2 is in tabular form so is preferred. Using the tc, read the unit peak discharge (qu) from Figure 1 or Table in Figure 2. qu is expressed in the following units: cfs/mi^2/watershed inches (csm/in).

Compute Q Rate using the following equation:

$$Q = (qu)\ (A)\ (WQV)$$

where:

Q = flow rate associated with first 1" of runoff
qu = the unit peak discharge, in csm/in.
A = impervious surface drainage area (in square miles)
WQV = water quality volume in watershed inches (1" in this case)

Structure Name	Impv. (acres)	A (miles^2)	t_c (min)	t_c (hr)	WQV (in)	qu (csm/in.)	Q (cfs)
WQU-1	0.41	0.0006391	6.0	0.100	1.00	774.00	0.49
WQU-2	0.78	0.0012188	6.0	0.100	1.00	774.00	0.94
WQU-3	0.82	0.0012813	6.0	0.100	1.00	774.00	0.99
WQU-4	0.54	0.0008438	6.0	0.100	1.00	774.00	0.65
WQU-5	1.43	0.0022344	6.0	0.100	1.00	774.00	1.73
WQU-6	0.80	0.0012500	6.0	0.100	1.00	774.00	0.97
WQU-7	0.57	0.0008906	6.0	0.100	1.00	774.00	0.69
WQU-8	1.44	0.0022500	6.0	0.100	1.00	774.00	1.74

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

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

BOSTON GLOBE
BOSTON, MA

Area	**0.41 ac**	Unit Site Designation	**WQU-1**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	9.8
0.04	9.6%	19.8%	0.01	0.01	9.3
0.06	9.4%	29.3%	0.02	0.02	9.0
0.08	7.7%	37.0%	0.03	0.03	7.4
0.10	8.6%	45.6%	0.04	0.04	8.1
0.12	6.3%	51.9%	0.04	0.04	5.9
0.14	4.7%	56.5%	0.05	0.05	4.4
0.16	4.6%	61.2%	0.06	0.06	4.3
0.18	3.5%	64.7%	0.07	0.07	3.3
0.20	4.3%	69.1%	0.07	0.07	4.0
0.25	8.0%	77.1%	0.09	0.09	7.3
0.30	5.6%	82.7%	0.11	0.11	5.0
0.35	4.4%	87.0%	0.13	0.13	3.9
0.40	2.5%	89.5%	0.15	0.15	2.2
0.45	2.5%	92.1%	0.17	0.17	2.2
0.50	1.4%	93.5%	0.18	0.18	1.2
0.75	5.0%	98.5%	0.28	0.28	4.0
1.00	1.0%	99.5%	0.37	0.37	0.7
1.50	0.0%	99.5%	0.55	0.55	0.0
2.00	0.0%	99.5%	0.74	0.74	0.0
3.00	0.5%	100.0%	1.10	1.00	0.1
					92.1
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.5%
				Predicted Net Annual Load Removal Efficiency =	**85.6%**

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

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

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

BOSTON GLOBE
BOSTON, MA

Area	**0.78 ac**	Unit Site Designation	**WQU-2**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	9.8
0.04	9.6%	19.8%	0.03	0.03	9.2
0.06	9.4%	29.3%	0.04	0.04	8.9
0.08	7.7%	37.0%	0.06	0.06	7.2
0.10	8.6%	45.6%	0.07	0.07	7.9
0.12	6.3%	51.9%	0.08	0.08	5.8
0.14	4.7%	56.5%	0.10	0.10	4.2
0.16	4.6%	61.2%	0.11	0.11	4.2
0.18	3.5%	64.7%	0.13	0.13	3.1
0.20	4.3%	69.1%	0.14	0.14	3.8
0.25	8.0%	77.1%	0.18	0.18	6.8
0.30	5.6%	82.7%	0.21	0.21	4.6
0.35	4.4%	87.0%	0.25	0.25	3.5
0.40	2.5%	89.5%	0.28	0.28	2.0
0.45	2.5%	92.1%	0.32	0.32	1.9
0.50	1.4%	93.5%	0.35	0.35	1.0
0.75	5.0%	98.5%	0.53	0.53	3.1
1.00	1.0%	99.5%	0.70	0.70	0.5
1.50	0.0%	99.5%	1.05	1.00	0.0
2.00	0.0%	99.5%	1.40	1.00	0.0
3.00	0.5%	100.0%	2.11	1.00	0.1
					87.7
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.3%
				Predicted Net Annual Load Removal Efficiency =	**81.2%**

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

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

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

BOSTON GLOBE
BOSTON, MA

Area	**0.82 ac**	Unit Site Designation	**WQU-3**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	9.8
0.04	9.6%	19.8%	0.03	0.03	9.2
0.06	9.4%	29.3%	0.04	0.04	8.9
0.08	7.7%	37.0%	0.06	0.06	7.2
0.10	8.6%	45.6%	0.07	0.07	7.9
0.12	6.3%	51.9%	0.09	0.09	5.7
0.14	4.7%	56.5%	0.10	0.10	4.2
0.16	4.6%	61.2%	0.12	0.12	4.1
0.18	3.5%	64.7%	0.13	0.13	3.1
0.20	4.3%	69.1%	0.15	0.15	3.8
0.25	8.0%	77.1%	0.18	0.18	6.8
0.30	5.6%	82.7%	0.22	0.22	4.6
0.35	4.4%	87.0%	0.26	0.26	3.5
0.40	2.5%	89.5%	0.30	0.30	2.0
0.45	2.5%	92.1%	0.33	0.33	1.9
0.50	1.4%	93.5%	0.37	0.37	1.0
0.75	5.0%	98.5%	0.55	0.55	3.0
1.00	1.0%	99.5%	0.74	0.74	0.5
1.50	0.0%	99.5%	1.11	1.00	0.0
2.00	0.0%	99.5%	1.48	1.00	0.0
3.00	0.5%	100.0%	2.21	1.00	0.1
					87.2
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.3%
				Predicted Net Annual Load Removal Efficiency =	**80.7%**

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

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

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

BOSTON GLOBE
BOSTON, MA

Area	**0.54 ac**	Unit Site Designation	**WQU-4**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	9.8
0.04	9.6%	19.8%	0.02	0.02	9.3
0.06	9.4%	29.3%	0.03	0.03	9.0
0.08	7.7%	37.0%	0.04	0.04	7.3
0.10	8.6%	45.6%	0.05	0.05	8.1
0.12	6.3%	51.9%	0.06	0.06	5.9
0.14	4.7%	56.5%	0.07	0.07	4.3
0.16	4.6%	61.2%	0.08	0.08	4.3
0.18	3.5%	64.7%	0.09	0.09	3.2
0.20	4.3%	69.1%	0.10	0.10	3.9
0.25	8.0%	77.1%	0.12	0.12	7.1
0.30	5.6%	82.7%	0.15	0.15	4.9
0.35	4.4%	87.0%	0.17	0.17	3.7
0.40	2.5%	89.5%	0.19	0.19	2.1
0.45	2.5%	92.1%	0.22	0.22	2.1
0.50	1.4%	93.5%	0.24	0.24	1.1
0.75	5.0%	98.5%	0.36	0.36	3.7
1.00	1.0%	99.5%	0.49	0.49	0.7
1.50	0.0%	99.5%	0.73	0.73	0.0
2.00	0.0%	99.5%	0.97	0.97	0.0
3.00	0.5%	100.0%	1.46	1.00	0.1
					90.5
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.4%
				Predicted Net Annual Load Removal Efficiency =	**84.1%**

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

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

BOSTON GLOBE
BOSTON, MA

Area	1.43 ac	Unit Site Designation	WQU-5
Weighted C	0.9	Rainfall Station #	69
t_c	6 min		
CDS Model	2020-5	CDS Treatment Capacity	**2.2 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.03	0.03	9.8
0.04	9.6%	19.8%	0.05	0.05	9.2
0.06	9.4%	29.3%	0.08	0.08	9.0
0.08	7.7%	37.0%	0.10	0.10	7.3
0.10	8.6%	45.6%	0.13	0.13	8.0
0.12	6.3%	51.9%	0.15	0.15	5.8
0.14	4.7%	56.5%	0.18	0.18	4.3
0.16	4.6%	61.2%	0.21	0.21	4.2
0.18	3.5%	64.7%	0.23	0.23	3.2
0.20	4.3%	69.1%	0.26	0.26	3.9
0.25	8.0%	77.1%	0.32	0.32	7.0
0.30	5.6%	82.7%	0.39	0.39	4.8
0.35	4.4%	87.0%	0.45	0.45	3.6
0.40	2.5%	89.5%	0.51	0.51	2.1
0.45	2.5%	92.1%	0.58	0.58	2.0
0.50	1.4%	93.5%	0.64	0.64	1.1
0.75	5.0%	98.5%	0.97	0.97	3.4
1.00	1.0%	99.5%	1.29	1.29	0.6
1.50	0.0%	99.5%	1.93	1.93	0.0
2.00	0.0%	99.5%	2.57	2.20	0.0
3.00	0.5%	100.0%	3.86	2.20	0.1
					89.2
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.3%
				Predicted Net Annual Load Removal Efficiency =	**82.7%**

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

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

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

BOSTON GLOBE
BOSTON, MA

Area	**0.80 ac**	Unit Site Designation	**WQU-6**
Weighted C	**0.9**	Rainfall Station #	**69**
t_c	**6 min**		
CDS Model	**1515-3**	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	9.8
0.04	9.6%	19.8%	0.03	0.03	9.2
0.06	9.4%	29.3%	0.04	0.04	8.9
0.08	7.7%	37.0%	0.06	0.06	7.2
0.10	8.6%	45.6%	0.07	0.07	7.9
0.12	6.3%	51.9%	0.09	0.09	5.8
0.14	4.7%	56.5%	0.10	0.10	4.2
0.16	4.6%	61.2%	0.12	0.12	4.1
0.18	3.5%	64.7%	0.13	0.13	3.1
0.20	4.3%	69.1%	0.14	0.14	3.8
0.25	8.0%	77.1%	0.18	0.18	6.8
0.30	5.6%	82.7%	0.22	0.22	4.6
0.35	4.4%	87.0%	0.25	0.25	3.5
0.40	2.5%	89.5%	0.29	0.29	2.0
0.45	2.5%	92.1%	0.32	0.32	1.9
0.50	1.4%	93.5%	0.36	0.36	1.0
0.75	5.0%	98.5%	0.54	0.54	3.0
1.00	1.0%	99.5%	0.72	0.72	0.5
1.50	0.0%	99.5%	1.08	1.00	0.0
2.00	0.0%	99.5%	1.44	1.00	0.0
3.00	0.5%	100.0%	2.16	1.00	0.1
					87.4
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.3%
				Predicted Net Annual Load Removal Efficiency =	**81.0%**

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

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

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

BOSTON GLOBE
BOSTON, MA

Area	0.57 ac	Unit Site Designation	WQU-7
Weighted C	0.9	Rainfall Station #	69
t_c	6 min		
CDS Model	1515-3	CDS Treatment Capacity	**1.0 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.01	0.01	9.8
0.04	9.6%	19.8%	0.02	0.02	9.2
0.06	9.4%	29.3%	0.03	0.03	9.0
0.08	7.7%	37.0%	0.04	0.04	7.3
0.10	8.6%	45.6%	0.05	0.05	8.0
0.12	6.3%	51.9%	0.06	0.06	5.9
0.14	4.7%	56.5%	0.07	0.07	4.3
0.16	4.6%	61.2%	0.08	0.08	4.3
0.18	3.5%	64.7%	0.09	0.09	3.2
0.20	4.3%	69.1%	0.10	0.10	3.9
0.25	8.0%	77.1%	0.13	0.13	7.1
0.30	5.6%	82.7%	0.15	0.15	4.8
0.35	4.4%	87.0%	0.18	0.18	3.7
0.40	2.5%	89.5%	0.21	0.21	2.1
0.45	2.5%	92.1%	0.23	0.23	2.1
0.50	1.4%	93.5%	0.26	0.26	1.1
0.75	5.0%	98.5%	0.38	0.38	3.6
1.00	1.0%	99.5%	0.51	0.51	0.6
1.50	0.0%	99.5%	0.77	0.77	0.0
2.00	0.0%	99.5%	1.03	1.00	0.0
3.00	0.5%	100.0%	1.54	1.00	0.1
					90.2
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.4%
				Predicted Net Annual Load Removal Efficiency =	**83.7%**

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

CONTECH ENGINEERED SOLUTIONS

CDS TECHNOLOGIES

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

BOSTON GLOBE
BOSTON, MA

Area	1.44 ac	Unit Site Designation	WQU-8
Weighted C	0.9	Rainfall Station #	69
t_c	6 min		
CDS Model	2020-5	CDS Treatment Capacity	**2.2 cfs**

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Treated Flowrate (cfs)	Incremental Removal (%)
0.02	10.2%	10.2%	0.03	0.03	9.8
0.04	9.6%	19.8%	0.05	0.05	9.2
0.06	9.4%	29.3%	0.08	0.08	9.0
0.08	7.7%	37.0%	0.10	0.10	7.3
0.10	8.6%	45.6%	0.13	0.13	8.0
0.12	6.3%	51.9%	0.16	0.16	5.8
0.14	4.7%	56.5%	0.18	0.18	4.3
0.16	4.6%	61.2%	0.21	0.21	4.2
0.18	3.5%	64.7%	0.23	0.23	3.2
0.20	4.3%	69.1%	0.26	0.26	3.9
0.25	8.0%	77.1%	0.32	0.32	7.0
0.30	5.6%	82.7%	0.39	0.39	4.8
0.35	4.4%	87.0%	0.45	0.45	3.6
0.40	2.5%	89.5%	0.52	0.52	2.1
0.45	2.5%	92.1%	0.58	0.58	2.0
0.50	1.4%	93.5%	0.65	0.65	1.1
0.75	5.0%	98.5%	0.97	0.97	3.4
1.00	1.0%	99.5%	1.30	1.30	0.6
1.50	0.0%	99.5%	1.94	1.94	0.0
2.00	0.0%	99.5%	2.59	2.20	0.0
3.00	0.5%	100.0%	3.89	2.20	0.1
					89.1
				Removal Efficiency Adjustment[2] =	6.5%
				Predicted % Annual Rainfall Treated =	93.3%
				Predicted Net Annual Load Removal Efficiency =	**82.7%**

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

Appendix F:
Operation and Maintenance Plan

135 Morrissey Boulevard
Stormwater Management System

Operation and Maintenance Plan (O&M)
and
Long Term Pollution Prevention Plan (LTPPP)

May 2018

This Stormwater Management System Operation and Maintenance Plan provides for the inspection and maintenance of structural Best Management Practices (BMPs) and for measures to prevent pollution associated with the 135 William T Morrissey Boulevard Project in Boston, MA.

This document has been prepared in accordance with the requirements of the Stormwater Regulations included in the Massachusetts Wetlands Protection Act Regulations (310 CMR 10).

Stormwater Management System Owner:

135 Morrissey Owner LLC
c/o Nordblom Company
Attn.: Todd Fremont-Smith
71 Third Avenue
Burlington, MA 01803
Tel.: (781) 272-4000

The stormwater management system will be maintained properly to assure its continued performance, as follows.

1. Catch basins and area drains
   a. Inspect quarterly (January, April, July, October)
   b. Clean 4 times per year or when deposits reach ½ the depth of the sump

2. Subsurface Infiltration Systems
   a. Inspect every 6 months and after every major storm event, remove debris
   b. Remove any debris that may clog system.
   c. Remove sediment if depth reaches 3 inches.

3. Water Quality Units
   Follow manufacturer's recommendations, general requirements include:
   a. Inspect twice a year (spring and fall) minimum and after major storm events
   b. System should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when appreciable level of hydrocarbons and trash has accumulated.

c. Cleaning should be done during dry weather. Use of a vacuum truck is most effective to clean the sump. Absorbent pads are recommended to remove oil or other hydrocarbon layer. Trash and debris can be netted out. The screen should be cleaned of trash and debris.

4. Semi-annually (generally May and November)
   a. Street sweeping

Practices for Long Term Pollution Prevention

Litter Pick-up
The Owner will conduct litter pick-up from the stormwater management facilities in conjunction with routine maintenance activities.

Routine Inspection and Maintenance of Stormwater BMPs
The Owner will conduct inspection and maintenance of the stormwater management practices in accordance with the guidelines discussed above.

Maintenance of Landscaped Areas
The Owner shall minimize use of fertilizers, herbicides, and pesticides for the maintenance of facilities covered by this plan.

Snow and Ice Management
Snow shall not be plowed to the back of the site where it could melt and flow untreated into Pattens Cove.

Prohibition of Illicit Discharges
The DEP Stormwater Management Standards prohibit illicit discharges to the storm water management system. Illicit discharges are discharges that do not entirely consist of stormwater, except for certain specified non-stormwater discharges.

Discharges from the following activities are not considered illicit discharges:

firefighting	foundation drains
water line flushing	footing drains
landscape irrigation	individual resident car washing
uncontaminated groundwater	flows from riparian habitats and wetlands
potable water sources	dechlorinated water from swimming pools
water used to clean residential buildings without detergents	water used for street washing
	air conditioning condensation

There are no known or proposed illicit connections associated with this project.

WILLIAM T MORRISSEY BOULEVARD

SOUTHEAST EXPRESSWAY

COMMUNITY COMMERCIAL SUBDISTRICT

COMMUNITY COMMERCIAL SUBDISTRICT (11-3000)

LCC 20344

R.R. SPIKE NOT FOUND

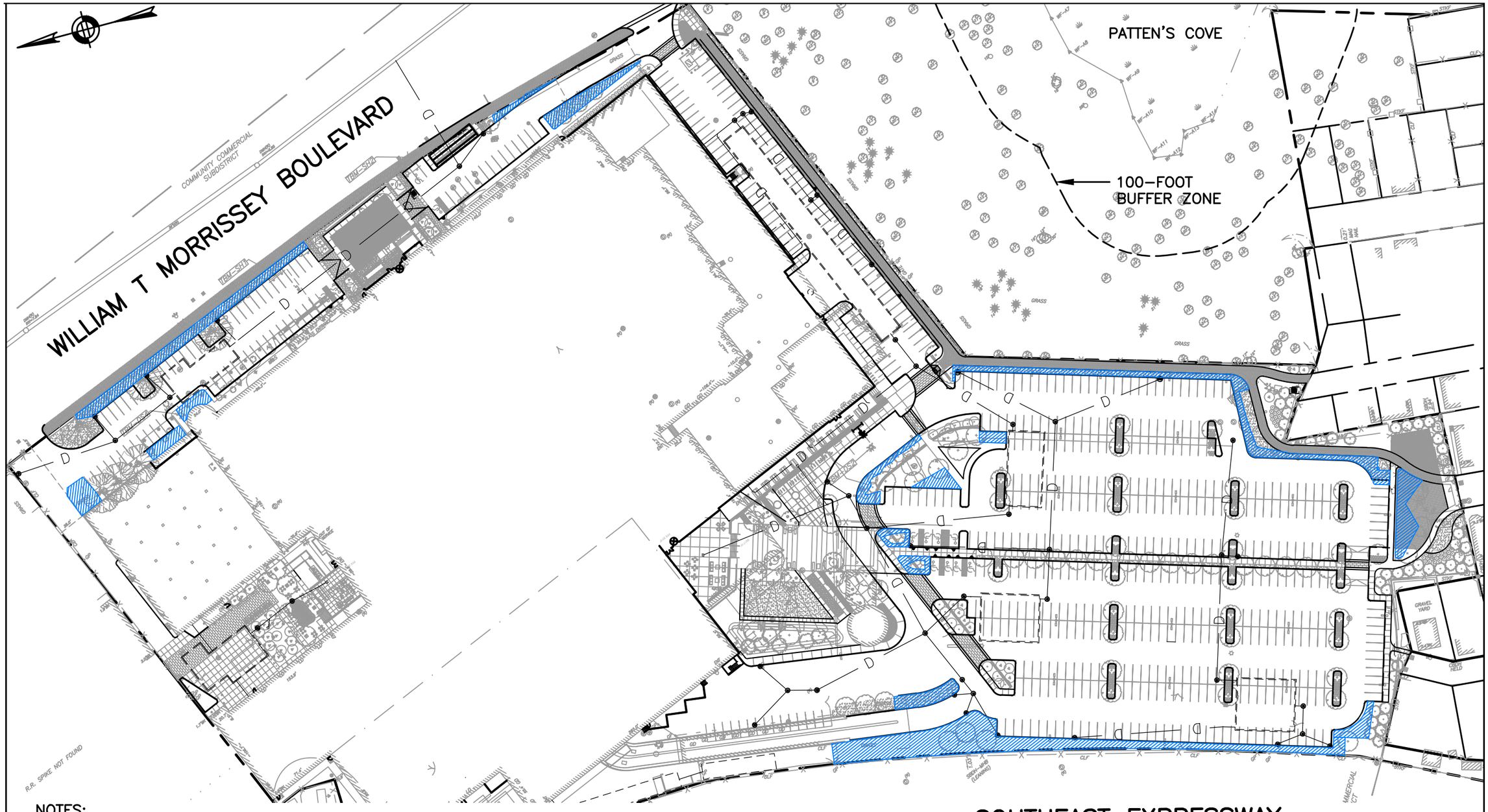
100 0 100 200

SCALE IN FEET

SNOW STORAGE
135 MORRISSEY BOULEVARD

HOWARD STEIN HUDSON
11 Beacon Street, Suite 1010
Boston, MA 02108
www.hshassoc.com

FIGURE
S.1



NOTES:

1. KEEP STORM DRAIN INLETS CLEAR.
2. SNOW DISPOSAL SITES MUST BE AT UPLAND LOCATIONS THAT DRAIN TO THE STORMWATER MANAGEMENT SYSTEM OR HAVE A 50–FOOT VEGETATIVE BUFFER STRIP
3. DEBRIS SHOULD BE CLEARED AND PROPERLY DISPOSED OF AT THE END OF THE SNOW SEASON AND NO LATER THAN MAY 15.

SNOW STORAGE AREA

100 0 100 200

SCALE IN FEET

SNOW STORAGE
135 MORRISSEY BOULEVARD

HOWARD STEIN HUDSON
11 Beacon Street, Suite 1010
Boston, MA 02108
www.hshassoc.com

FIGURE S.1

Appendix G:
Illicit Discharge Compliance Statement

Illicit Discharge Compliance Statement

To the best of my knowledge, belief and information the stormwater management system servicing 135 William T Morrissey Boulevard, Boston, Massachusetts will not receive illicit discharges, including wastewater discharges or stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, or hazardous substances.

The stormwater management and conveyance systems are shown on the plans entitled "Grading & Utilities Plan" prepared by Howard Stein Hudson and included with the Notice of Intent submittal.

Applicant: **135 Morrissey Owner LLC**
c/o Nordblom Development Company, Inc.

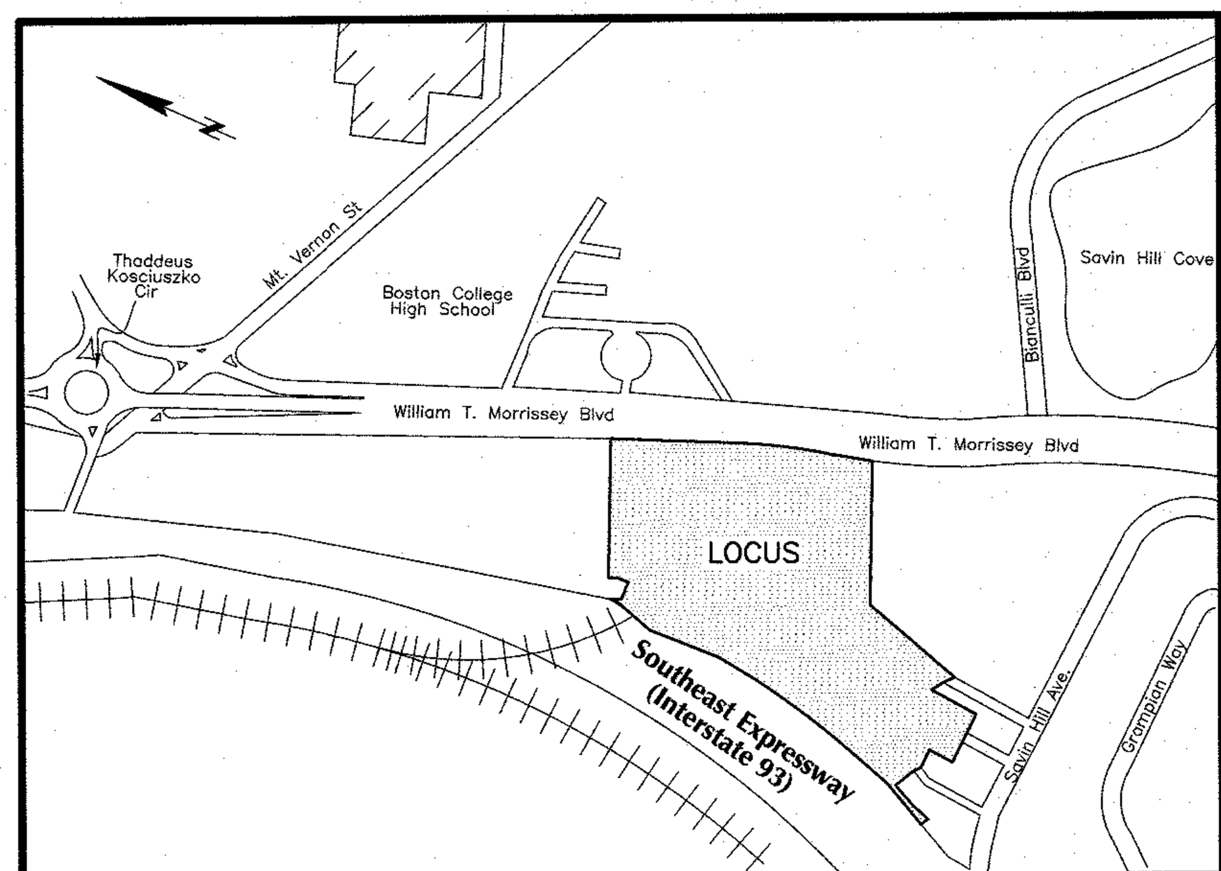
Signature: _____
Todd Fremont-Smith
Authorized Representative

Address: 71 Third Avenue
Burlington, MA 01803

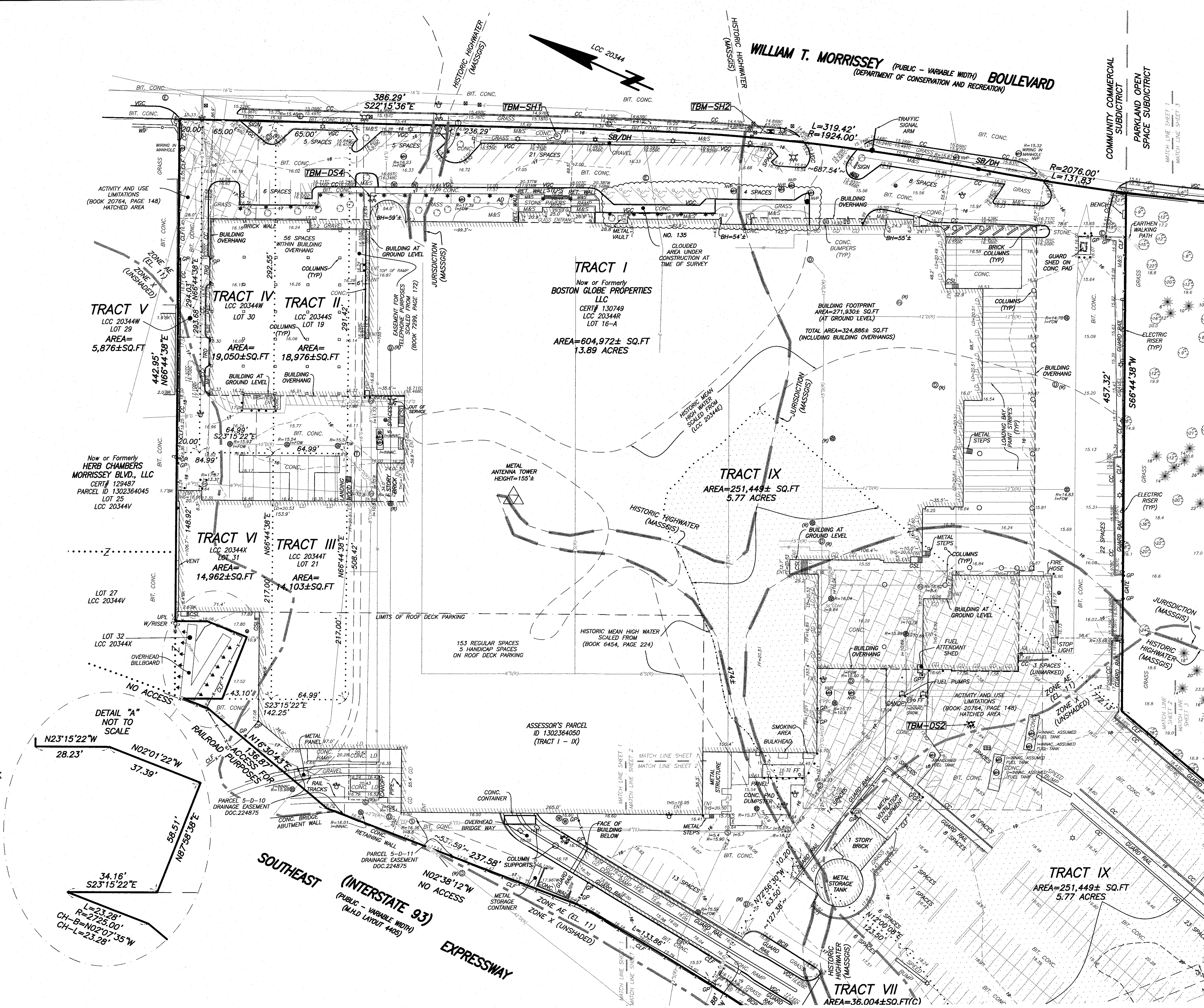
Tel.: (781) 272-4000

Attachment G

Project Plans



VICINITY MAP NOT TO SCALE



GENERAL NOTES:

1) BY GRAPHIC PLOTTING ONLY, THE PARCEL SHOWN HEREON LIES WITHIN A ZONE "AE" (BASE FLOOD ELEVATION 11), AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT, AND A ZONE "X" (UNSHADED), AN AREA OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD, AS SHOWN ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY (F.E.M.A) FLOOD INSURANCE RATE MAP (F.I.R.M.) FOR SUFFOLK COUNTY, MASSACHUSETTS, MAP NUMBER 25025C0083J, CITY OF BOSTON COMMUNITY NUMBER 250286, PANEL NUMBER 0083J, HAVING AN EFFECTIVE DATE OF MARCH 16, 2016.

2) BUILDING HEIGHTS SHOWN HEREON WERE CALCULATED FROM THE AVERAGE GRADE PLANE TO THE TOP OF ROOF. BY CITY OF BOSTON ZONING CODE, THE DEFINITION OF BUILDING HEIGHT IS TO THE TOP OF THE HIGHEST ROOF BEAM; THIS WAS INACCESSIBLE AT TIME OF SURVEY. THEREFORE THE BUILDING HEIGHT BY DEFINITION WOULD BE LESS THAN THE HEIGHT SHOWN HEREON.

3) BENCH MARKS USED:

BM-C: NORTH CORNER OF 3.5 FOOT HIGH CONCRETE WALL AS SHOWN ON EXISTING CONDITIONS PLAN BY FLS #13360.
ELEVATION=20.48

BM-D: RIGHT OUTER CORNER LOWER STONE STEP (R.O.C.L.S.S.) AT THE ENTRANCE TO THE JFK LIBRARY AND MUSEUM AS SHOWN HEREON ON EXISTING CONDITIONS PLAN BY FLS #13360.

ELEVATION=18.87

TEMPORARY BENCH MARKS USED:

TBM-B: CHISEL SQUARE ON SOUTH SIDE OF LIGHT POLE BASE AS SHOWN ON EXISTING CONDITIONS PLAN BY FLS #15296.
ELEVATION=20.15

TBM-C: FLANGE BOLT NEXT TO THE "O" IN "OPEN" ON A HYDRANT AS SHOWN ON EXISTING CONDITIONS PLAN BY FLS #15296.
ELEVATION=22.22

TEMPORARY BENCH MARKS SET: TBM-DS2: WESTERLY HYDRANT BONNET BOLT SOUTH OF THE BUILDING AT THE FUELING STATION AREA. (SHOWN ON PLAN)
ELEVATION = 19.28

TBM-DS3: LEFT FRONT EASTERLY HYDRANT BONNET BOLT UNDER "Y" IN KENNEDY IN THE FAR SOUTHERLY CORNER OF THE PARKING LOT. (SHOWN ON PLAN)
ELEVATION = 19.64

TBM-DS4: WESTERLY HYDRANT BONNET BOLT AT THE NORTHEASTERLY END OF BUILDING. (SHOWN ON PLAN)
ELEVATION = 18.10

TBM-SH1: CHISELED SQUARE ON OUTER EDGE OF FLAG POLE BASE APPROXIMATELY 2' FROM FLAG POLE IN FRONT OF BUILDING. (SHOWN ON PLAN)
ELEVATION = 17.13

TBM-SH2: MARK ON BACK RIGHT CORNER OF OF CONCRETE BASE OF TRAFFIC SIGNAL BOX BY ENTRANCE TO 135 MORRISSEY BOULEVARD. (SHOWN ON PLAN)
ELEVATION = 16.71

4) ELEVATIONS REFER TO BOSTON CITY BASE, PER ABOVE REFERENCED PLAN.

5) SITE WAS UNDER HEAVY SNOW CONDITIONS DURING TIME OF SURVEY.

COMMONWEALTH OF MASSACHUSETTS
DAMIEN J. RAFFLE
No.49629
REGISTERED PROFESSIONAL LAND SURVEYOR
4/11/2018

EXISTING CONDITIONS PLAN
135 WILLIAM T. MORRISSEY BOULEVARD
BOSTON, MASS.

FELDMAN LAND SURVEYORS
152 HAMPDEN STREET
BOSTON, MASS. 02119
PHONE: (617)357-9740
www.feldmansurveyors.com

JANUARY 8, 2018

FELDMAN
LAND SURVEYORS

40 0 20 40 80 160

SCALE: 1"=40'

RESEARCH JBD	FIELD CHIEF JF	PROJ MGR DJR	APPROVED	SHEET NO. 1 OF 3
CALC JBD	CADD JBD/DCH	FIELD CHECKED AC	CRD FILE 15775	JOB NO. 15775B

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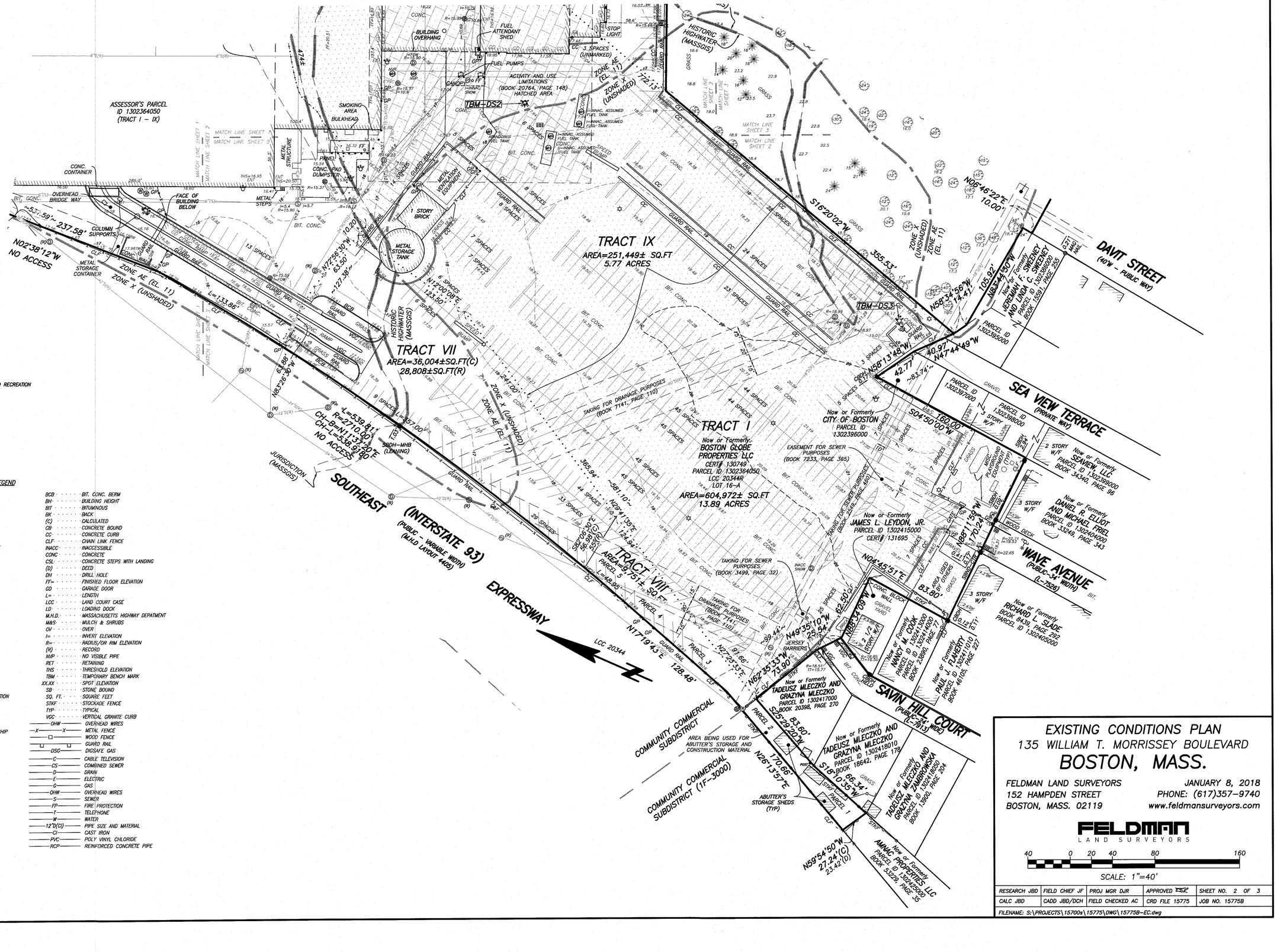
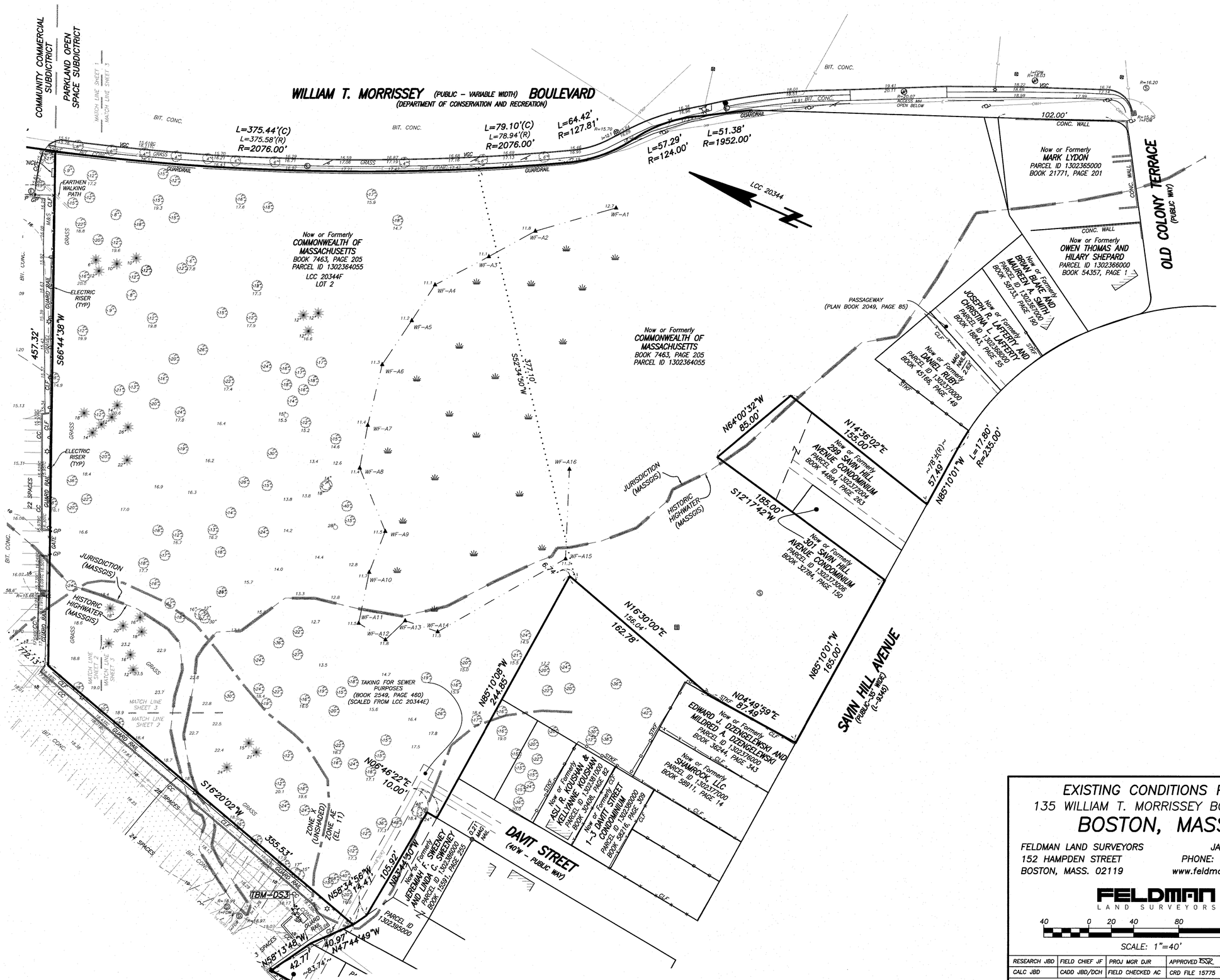

TRACT IX
AREA=251,449± SQ.FT
5.77 ACRES
TRACT VII
AREA=36,004±SQ.FT(C)
28,808±SQ.FT(R)
TRACT I
Now or Formerly
BOSTON GLOBE
PROPERTIES LLC
CERT# 130749
PARCEL ID 1302364050
LCC 20344R
LOT 16-A
AREA=604,972± SQ.FT
13.89 ACRES
TRACT VIII
AREA=9,751± SQ.FT
ASSESSOR'S PARCEL
ID 1302364050
(TRACT I - IX)
SOUTHEAST EXPRESSWAY
(INTERSTATE 93)
(PUBLIC - VARIABLE WIDTH)
(M.H.D. LAYOUT 1405)
DAVIT STREET
(40'W - PUBLIC WAY)
SEA VIEW TERRACE
(PRIVATE WAY)
WAVE AVENUE
(PUBLIC-3'' WIDTH)
(L-7526)
SAVIN HILL COURT
(PUBLIC-24' WIDE)
(L-7813)
HISTORIC HIGHWATER (MASSGIS)
COMMUNITY COMMERCIAL SUBDISTRICT
COMMUNITY COMMERCIAL SUBDISTRICT (1F-3000)
JURISDICTION (MASSGIS)
LCC 20344
TBM-DS2
TBM-DS3
ZONE AE (EL. 11)
ZONE X (UNSHADED)
Now or Formerly
CITY OF BOSTON
PARCEL ID
1302396000
Now or Formerly
JAMES L. LEYDON, JR.
PARCEL ID 1302415000
CERT# 131695
Now or Formerly
TADEUSZ MLECZKO AND
GRAZYNA MLECZKO
PARCEL ID 1302417000
BOOK 20398, PAGE 270
Now or Formerly
TADEUSZ MLECZKO AND
GRAZYNA MLECZKO
PARCEL ID 1302418010
BOOK 18642, PAGE 178
Now or Formerly
TADEUSZ MLECZKO AND
GRAZYNA ZAMBRONOWSKA
PARCEL ID 1302418030
BOOK 13801, PAGE 204
Now or Formerly
AMNIC PROPERTIES LLC
PARCEL ID 1302425000
BOOK 33229, PAGE 35
Now or Formerly
SEAVIEW, LLC
PARCEL ID 1302398000
BOOK 34340, PAGE 98
Now or Formerly
DANIEL R. ELLIOT
AND MICHAEL TRIEL
PARCEL ID 1302404000
BOOK 30249, PAGE 343
Now or Formerly
RICHARD L. SLADE
BOOK 8439, PAGE 282
PARCEL ID 1302405000
Now or Formerly
JERUMAH C. SWEENEY
AND LINDA C. SWEENEY
PARCEL ID 1302396000
BOOK 15591, PAGE 295
Now or Formerly
NANCY M. COOK
PARCEL ID 1302414000
BOOK 23860, PAGE 77
Now or Formerly
PAUL J. FLAHERTY
PARCEL ID 1302411010
BOOK 46105, PAGE 227
PARCEL ID
1302397000
PARCEL ID
1302398000
PARCEL ID
1302396000
PLAN REFERENCES
COUNTY REGISTRY OF DEEDS
PLAN BOOK 1865, PAGE 605
PLAN BOOK 2385, PAGE 96
PLAN BOOK 2398, PAGE 11
PLAN BOOK 7039, PAGE 179
PLAN BOOK 10145, PAGE 1
PLAN BOOK 14932, PAGE 49
MASSACHUSETTS LAND COURT
LCC 20344
LCC 21884
CITY OF BOSTON ENGINEERING DEPARTMENT
PLAN NO. L-7526
PLAN NO. L-8033
PLAN NO. L-7913
FIELD BOOK B-836, PAGE 143-144
FIELD BOOK B-836, PAGE 146
FIELD BOOK B-1254, PAGE 29
MASSACHUSETTS HIGHWAY DEPARTMENT
PLAN NO. 4405
MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION
PLAN NO. 38010-VT
LEGEND
SEWER MANHOLE
DRAIN MANHOLE
ELECTRIC MANHOLE
WATER MANHOLE
TELEPHONE MANHOLE
CABLE TV MANHOLE
MANHOLE
BOSTON WATER VALVE
WATER SHUT OFF/WATER GATE
GAS SHUT OFF/GAS GATE
HYDRANT
CATCH BASIN
ROUND CATCH BASIN
D-FRAME CATCH BASIN
GUY WIRE
TRAFFIC CONTROL BOX
TRAFFIC SIGNAL
GUY POLE
UTILITY POLE
LIGHT POLE
WALK LIGHT
ELECTRIC HANDHOLE
BOLLARD
SIGN
AREA DRAIN
FUEL FILL
FLAG POLE
FIRE ALARM
BOUND FOUND
OBSERVATION WELL
STAND PIPE/SIAMESE CONNECTION
FLOOD LIGHT
UTILITY POLE W/ LIGHT
GATE POST
IRRIGATION CONTROL VALVE
INDICATES COMMON OWNERSHIP
EXCEPTION NUMBER LISTED IN TITLE COMMITMENT
ENCROACHMENT
HANDICAP RAMP
TRACT IX
AUL AREA
BIT. CONC. BERM
BUILDING HEIGHT
BITUMINOUS
BACK
CALCULATED
CONCRETE BOUND
CONCRETE CURB
CHAIN LINK FENCE
INACCESSIBLE
CONCRETE
CONCRETE STEPS WITH LANDING
DEED
DRILL HOLE
FINISHED FLOOR ELEVATION
GARAGE DOOR
LENGTH
LAND COURT CASE
LOADING DOCK
MASSACHUSETTS HIGHWAY DEPATMENT
MULCH & SHRUBS
OVER
INVERT ELEVATION
RADIUS/OR RIM ELEVATION
RECORD
NO VISIBLE PIPE
RETAINING
THRESHOLD ELEVATION
TEMPORARY BENCH MARK
SPOT ELEVATION
STONE BOUND
SQUARE FEET
STOCKADE FENCE
TYPICAL
VERTICAL GRANITE CURB
OVERHEAD WIRES
METAL FENCE
WOOD FENCE
GUARD RAIL
DIGSAFE GAS
CABLE TELEVISION
COMBINED SEWER
DRAIN
ELECTRIC
GAS
OVERHEAD WIRES
SEWER
FIRE PROTECTION
TELEPHONE
WATER
PIPE SIZE AND MATERIAL
CAST IRON
POLY VINYL CHLORIDE
REINFORCED CONCRETE PIPE
EXISTING CONDITIONS PLAN
135 WILLIAM T. MORRISSEY BOULEVARD
BOSTON, MASS.
FELDMAN LAND SURVEYORS
152 HAMPDEN STREET
BOSTON, MASS. 02119
JANUARY 8, 2018
PHONE: (617)357-9740
www.feldmansurveyors.com
FELDMAN
LAND SURVEYORS
40 0 20 40 80 160
SCALE: 1"=40'
RESEARCH JBD | FIELD CHIEF JF | PROJ MGR DJR | APPROVED DJR | SHEET NO. 2 OF 3
CALC JBD | CADD JBD/DCH | FIELD CHECKED AC | CRD FILE 15775 | JOB NO. 15775B
FILENAME: S:\PROJECTS\15700s\15775\DWG\15775B-EC.dwg



EXISTING CONDITIONS PLAN
135 WILLIAM T. MORRISSEY BOULEVARD
BOSTON, MASS.

FELDMAN LAND SURVEYORS
152 HAMPDEN STREET
BOSTON, MASS. 02119

JANUARY 8, 2018
PHONE: (617)357-9740
www.feldmansurveyors.com

FELDMAN LAND SURVEYORS

40 0 20 40 80 160

SCALE: 1"=40'

RESEARCH JBD	FIELD CHIEF JF	PROJ MGR DJR	APPROVED DJR	SHEET NO. 3 OF 3
CALC JBD	CADD JBD/DCH	FIELD CHECKED AC	CRD FILE 15775	JOB NO. 15775B

FILENAME: S:\PROJECTS\15700s\15775\DWG\15775B-EC.dwg

NOTES:

1. EROSION AND SEDIMENT CONTROL MEASURES MUST BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND MAINTAINED AND UPGRADED AS NECESSARY DURING CONSTRUCTION BY THE CONTRACTOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT AND INSTALL ADDITIONAL CONTROL MEASURES AS NEEDED DURING CONSTRUCTION.
2. STABILIZATION OF ALL RE-GRADED AND SOIL STOCKPILE AREAS MUST BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
3. SEDIMENT REMOVED FROM EROSION AND SEDIMENT CONTROL DEVICES MUST BE PROPERLY REMOVED AND DISPOSED. ALL DAMAGED CONTROLS MUST BE REMOVED AND REPLACED.
4. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING THE EROSION AND SEDIMENT CONTROL PLAN. THIS INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, AND NOTIFYING THE PROPER CITY AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING WIND EROSION AND DUST THROUGHOUT THE LIFE OF HIS CONTRACT. DUST CONTROL MAY INCLUDE, BUT IS NOT LIMITED TO, SPRINKLING OF WATER ON EXPOSED SOILS AND STREET SWEEPING ADJACENT ROADWAYS.
6. IF FINAL GRADING IS TO BE DELAYED FOR MORE THAN 21 DAYS AFTER LAND DISTURBANCE ACTIVITIES CEASE, TEMPORARY VEGETATION OR MULCH SHALL BE USED TO STABILIZED SOILS WITHIN 14 DAYS OF THE LAST DISTURBANCE.
7. IF A DISTURBED AREA WILL BE EXPOSED FOR GREATER THAN ONE YEAR, PERMANENT GRASSES OR OTHER APPROVED COVER MUST BE INSTALLED.
8. THE CONTRACTOR MUST KEEP ON-SITE AT ALL TIMES ADDITIONAL FILTER BERMS AND/OR SILT FENCE FOR THE INSTALLATION AT THE DIRECTION OF THE ENGINEER OR CONSERVATION COMMISSION TO MITIGATE ANY EMERGENCY CONDITION.
9. THE EROSION AND SEDIMENT CONTROLS AS SHOWN MAY NOT BE PRACTICAL DURING ALL STAGES OF CONSTRUCTION. EARTHWORK ACTIVITY ON-SITE MUST BE DONE IN A MANNER SUCH THAT RUNOFF IS DIRECTED TO A SEDIMENT CONTROL DEVICE OR INFILTRATED TO THE GROUND.
10. DEMOLITION AND CONSTRUCTION DEBRIS MUST BE PROPERLY CONTAINED AND DISPOSED OF.
11. DISPOSAL OF ALL DEMOLISHED MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE HAULED OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.

LEGEND

ABAN	ABANDON
R&D	REMOVE & DISPOSE
R&S	REMOVE & STACK
R&R	REMOVE & REPLACE
ADJ	ADJUST
EXIST	EXISTING
CC	CONCRETE CURB
VGC	VERTICAL GRANITE CURB
CLF	CHAIN LINKED FENCE
C	CUT & CAP UTILITY LINE
SF	SILT FENCE
	TEMPORARY CONSTRUCTION FENCE
	CATCH BASIN FILTER
	TEMP CONSTRUCTION ENTRANCE
// // //	ABANDON
	PROPERTY LINE
	R&D TREE & STUMP

SEA VIEW TERRACE
SOUTHEAST EXPRESSWAY (INTERSTATE 93)
PATTEN'S COVE
WILLIAM T. MORRISSEY BOULEVARD
CB FILTER (TYP.)
SILT FENCE (TYP)
RECLAIM ASPHALT PAVEMENT (TYP)
FLOODPLAIN BOUNDARY
PROVIDE CB FILTER UNTIL REMOVAL (TYP OF ALL DRAIN INLETS)
HISTORIC HIGH WATER
100 FT BUFFER ZONE
BORDERING VEGETATED WETLANDS
R&D GUARD SHED, CONC PADS, AND BOLLARDS
TEMPORARY CONSTRUCTION ENTRANCE
R&D METAL STRUCTURE
R&D FUEL PUMPS
RET HYDRANT (PRIVATE)
R&D HYDRANT (PRIVATE)
HYDRANT (PUBLIC)
R&D STAIRS, STONE PAVERS, RAMP, GLASS ENTRANCE
R&D CONC SIDEWALK
R&D BIT CONC
R&D CONC
R&D STANDPIPE
RET WALL
R&D GUARD RAIL
R&D SPEED BUMP
R&D CLF
R&D GATE
R&D CC
ABAN CB
ABAN/CB
R&R HYD
CUT & CAP (TYP)
SCALE IN FEET 40 0 40 80

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Notes

NOTICE OF INTENT
Not for construction

Issued/Revision	By	Appd	YYYY.MM.DD
NOTICE OF INTENT			2018.05.21
DESIGN DEVELOPMENT			2018.05.04
PROGRESS			2018.04.25

File Name: 20 & 27	Author	Designer	Checker
	AS	JC	RS

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATINI
CIVIL
No. 41033
REGISTERED PROFESSIONAL ENGINEER
5/21/18

Client/Project Logo

Nordblom

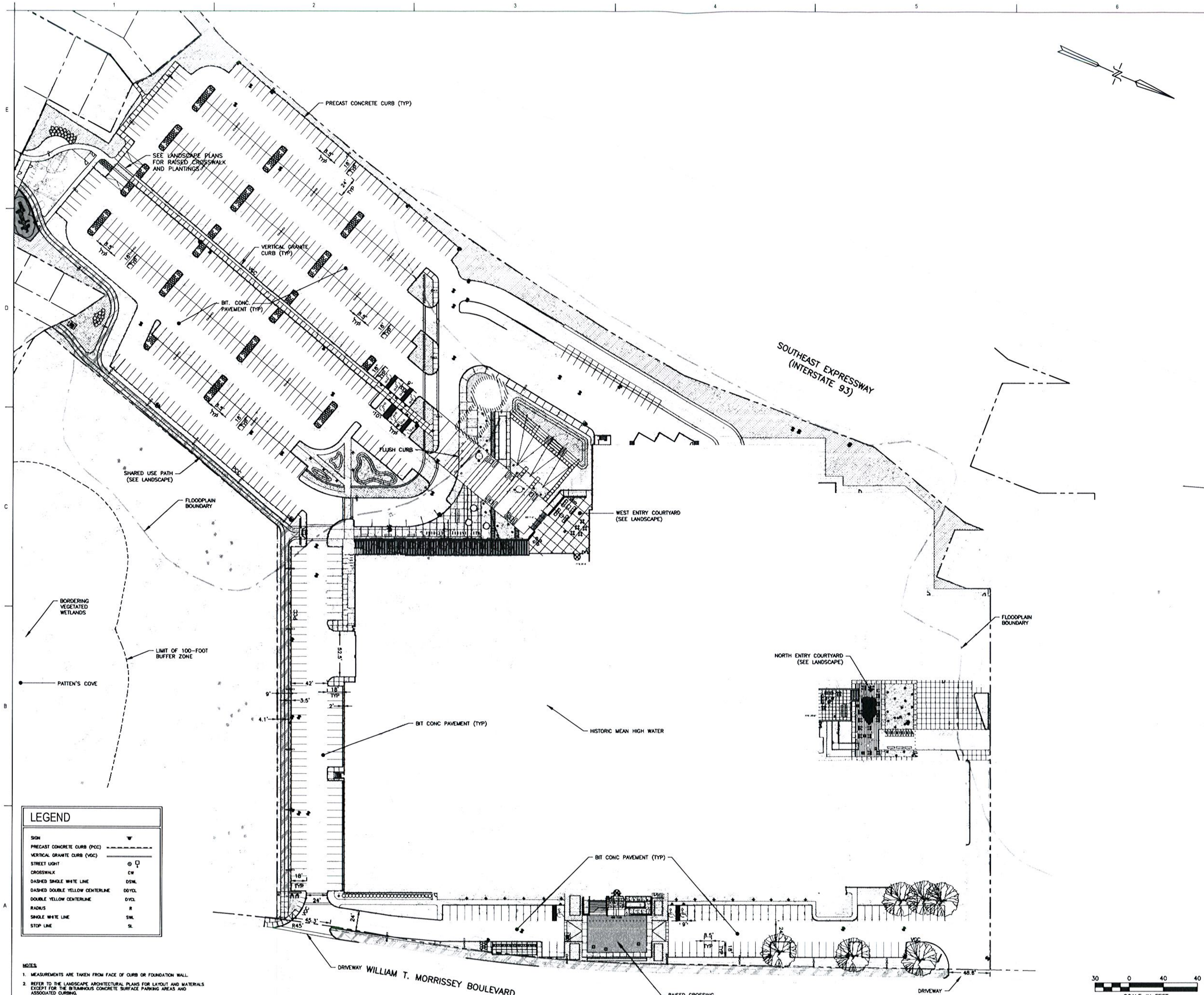
Client/Project
NORDBLOM

THE BEAT

135 WILLIAM T MORRISSEY BLVD, BOSTON, MA 02125

Title
SITE PREPARATION PLAN

Project No.	Scale
21842012	As Noted
Revision	Drawing No.
	C-100



LEGEND

SIGN	
PRECAST CONCRETE CURB (PCC)	
VERTICAL GRANITE CURB (VGC)	
STREET LIGHT	
CROSSWALK	CW
DASHED SINGLE WHITE LINE	DSWL
DASHED DOUBLE YELLOW CENTERLINE	DDYCL
DOUBLE YELLOW CENTERLINE	DYCL
RADIUS	R
SINGLE WHITE LINE	SWL
STOP LINE	SL

NOTES:

1. MEASUREMENTS ARE TAKEN FROM FACE OF CURB OR FOUNDATION WALL.
2. REFER TO THE LANDSCAPE ARCHITECTURAL PLANS FOR LAYOUT AND MATERIALS EXCEPT FOR THE BITUMINOUS CONCRETE SURFACE PARKING AREAS AND ASSOCIATED CURBING.

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Notes

NOTICE OF INTENT
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NOTICE OF INTENT			2018.05.2
DESIGN DEVELOPMENT			2018.05.04
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File Name: 20 6 27	Author	Designer	Checker	
	AL	JC	RL	YYYY.MM.DD

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATINI
CIVIL
No. 41033
REGISTERED PROFESSIONAL ENGINEER
5/21/18

Client/Project Logo

Nordblom

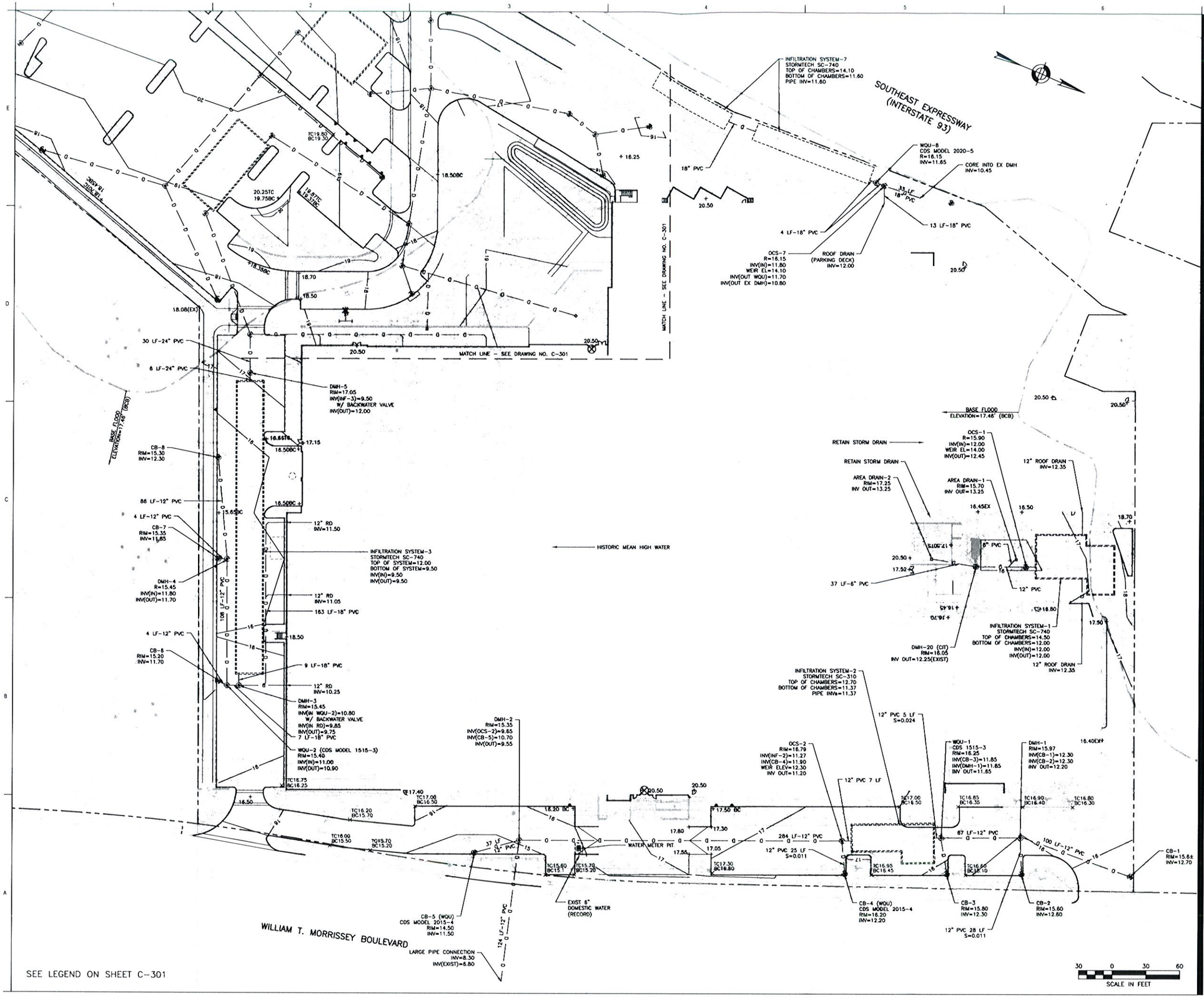
Client/Project
NORDBLOM

THE BEAT

135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

Title
LAYOUT & MATERIALS PLAN

Project No.	Scale
218421012	As Noted
Revision	Drawing No.
	C-200



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Notes

NOTICE OF INTENT
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NOTICE OF INTENT			2018.05.21
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File name: 20_1_27	Author: AL	Designer: JC	Checker: PL

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATHAM
CIVIL
No. 41033
REGISTERED PROFESSIONAL ENGINEER
5/21/18

Client/Project Logo

Nordblom

Client/Project
NORDBLOM

THE BEAT

135 WILLIAM T MORRISSEY BLVD, BOSTON, MA 02125

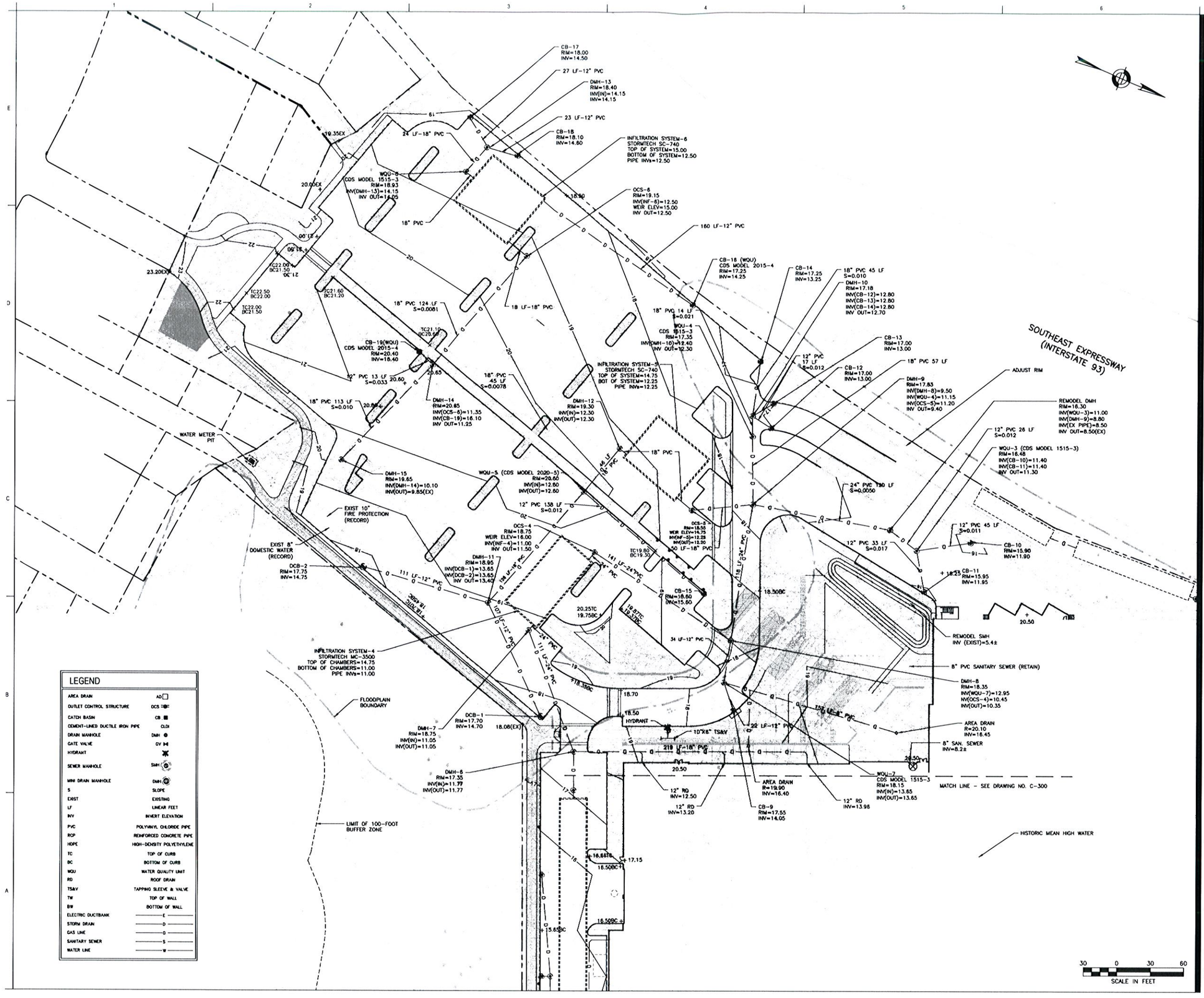
Title
GRADING & UTILITIES PLAN

Project No.
21421012

Scale
As Noted

Revision

Drawing No.
C-300



LEGEND

AREA DRAIN	AD
OUTLET CONTROL STRUCTURE	OCS
CATCH BASIN	CB
CEMENT-LINED DUCTILE IRON PIPE	CLDI
DRAIN MANHOLE	DMH
GATE VALVE	GV
HYDRANT	
SEWER MANHOLE	SMH
MINI DRAIN MANHOLE	DMH
S	SLOPE
EXIST	EXISTING
LF	LINEAR FEET
INV	INVERT ELEVATION
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
HDPE	HIGH-DENSITY POLYETHYLENE
TC	TOP OF CURB
BC	BOTTOM OF CURB
WQU	WATER QUALITY UNIT
RD	ROOF DRAIN
TSAV	TAPPING SLEEVE & VALVE
TW	TOP OF WALL
BW	BOTTOM OF WALL
ELECTRIC DUCTBANK	E
STORM DRAIN	D
GAS LINE	G
SANITARY SEWER	S
WATER LINE	W

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PROGRESS SET			2018.04.25
***** WAIVER *****			

File Name: 2C x 2F	Author	Designer	Checker
	AS	JC	PL

Permit/Seal

RICHARD E. LATINI CIVIL No. 41003 REGISTERED PROFESSIONAL ENGINEER
5/21/18

Client/Project Logo

Nordblom

Client/Project
NORDBLOM

THE BEAT

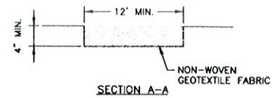
135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

Title
GRADING & UTILITIES PLAN

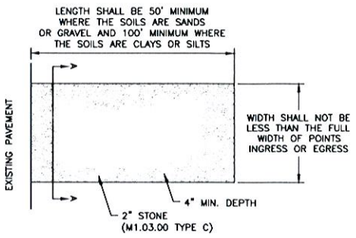
Project No.	Scale
218421012	As Noted
Revision	Drawing No.
	C-301

EROSION & SEDIMENT CONTROL NOTES:

1. EROSION AND SEDIMENT CONTROL MEASURES MUST BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND MAINTAINED AND UPGRADED AS NECESSARY DURING CONSTRUCTION BY THE CONTRACTOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT AND INSTALL ADDITIONAL CONTROL MEASURES AS NEEDED DURING CONSTRUCTION.
2. ALL CATCH BASINS RECEIVING DRAINAGE FROM THE PROJECT SITE MUST BE PROVIDED WITH A CATCH BASIN FILTER.
3. STABILIZATION OF ALL RE-GRADED AND SOIL STOCKPILE AREAS MUST BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
4. SEDIMENT REMOVED FROM EROSION AND SEDIMENT CONTROL DEVICES MUST BE PROPERLY REMOVED AND DISPOSED. ALL DAMAGED CONTROLS MUST BE REMOVED AND REPLACED.
5. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING THE EROSION AND SEDIMENT CONTROL PLAN. THIS INCLUDES THE INSTALLATION AND MAINTENANCE OF CONTROL MEASURES, INFORMING ALL PARTIES ENGAGED ON THE CONSTRUCTION SITE OF THE REQUIREMENTS AND OBJECTIVES OF THE PLAN, AND NOTIFYING THE PROPER CITY AGENCY OF ANY TRANSFER OF THIS RESPONSIBILITY.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING WIND EROSION AND DUST THROUGHOUT THE LIFE OF HIS CONTRACT. DUST CONTROL MAY INCLUDE, BUT IS NOT LIMITED TO, SPRINKLING OF WATER ON EXPOSED SOILS AND STREET SWEEPING ADJACENT ROADWAYS.
7. IF FINAL GRADING IS TO BE DELAYED FOR MORE THAN 21 DAYS AFTER LAND DISTURBANCE ACTIVITIES CEASE, TEMPORARY VEGETATION OR MULCH SHALL BE USED TO STABILIZED SOILS WITHIN 14 DAYS OF THE LAST DISTURBANCE.
8. IF A DISTURBED AREA WILL BE EXPOSED FOR GREATER THAN ONE YEAR, PERMANENT GRASSES OR OTHER APPROVED COVER MUST BE INSTALLED.
9. THE CONTRACTOR MUST KEEP ON-SITE AT ALL TIMES ADDITIONAL FILTER BERMS AND/OR SILT FENCE FOR THE INSTALLATION AT THE DIRECTION OF THE ENGINEER OR CONSERVATION COMMISSION TO MITIGATE ANY EMERGENCY CONDITION.
10. THE CONSTRUCTION FENCING AND EROSION AND SEDIMENT CONTROLS AS SHOWN MAY NOT BE PRACTICAL DURING ALL STAGES OF CONSTRUCTION. EARTHWORK ACTIVITY ON-SITE MUST BE DONE IN A MANNER SUCH THAT RUNOFF IS DIRECTED TO A SEDIMENT CONTROL DEVICE OR INFILTRATED TO THE GROUND.
11. DEMOLITION AND CONSTRUCTION DEBRIS MUST BE PROPERLY CONTAINED AND DISPOSED OF.
12. DISPOSAL OF ALL DEMOLISHED MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE HAULED OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.
13. CONSTRUCTION VEHICLES MUST ACCESS THE SITE FROM MORRISSEY BOULEVARD DURING CONSTRUCTION.



SECTION A-A

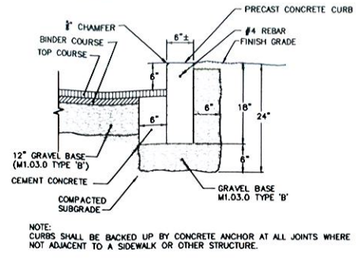


PLAN

NOTES:

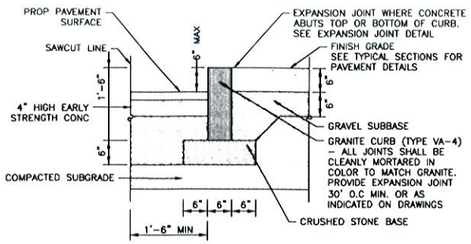
1. INSTALLATION: THE AREA OF THE ENTRANCE SHOULD BE CLEARED OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL. THE GRAVEL SHALL BE PLACED TO THE SPECIFIED DIMENSIONS NOTED ABOVE.
2. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENTS ONTO PUBLIC RIGHT-OF-WAYS. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE, OR ADDITIONAL LENGTH, AS CONDITIONS DEMAND, AND REPAIR, AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAYS MUST BE REMOVED IMMEDIATELY.
3. LOCATION: SEE C1.0 FOR LOCATION OF CONSTRUCTION ENTRANCES.

ROCK CONSTRUCTION ENTRANCE
NOT TO SCALE



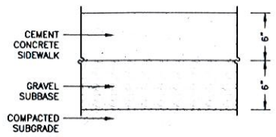
NOTE:
CURBS SHALL BE BACKED UP BY CONCRETE ANCHOR AT ALL JOINTS WHERE NOT ADJACENT TO A SIDEWALK OR OTHER STRUCTURE.

PRECAST CONCRETE CURB
NOT TO SCALE



NOTE: USE 2" BIT. CONC. TOP COURSE ABOVE HIGH EARLY STRENGTH CONCRETE FOR RESETTING CURBS

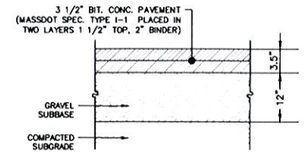
VERTICAL GRANITE CURB
NOT TO SCALE



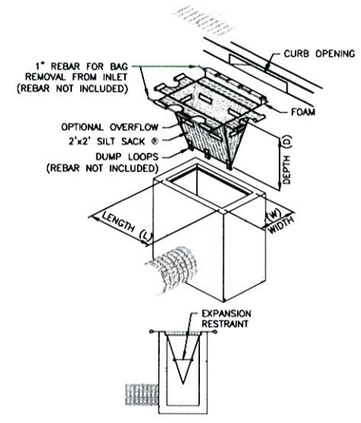
NOTES:

1. CONCRETE SIDEWALK DETAIL AND NOTES APPLY TO SIDEWALK WITHIN THE RIGHT-OF-WAY.
2. CONCRETE SHALL BE 4,000 PSI.
3. SIDEWALKS ARE TO BE RAKED FINISH WITH 3/8 INCH TROWEL JOINTS.

CEM CONC SIDEWALK SECTION DETAIL
NOT TO SCALE

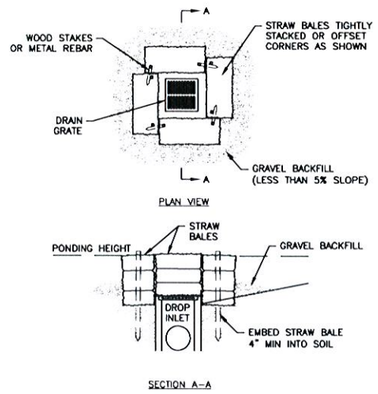


BITUMINOUS CONCRETE PAVEMENT
NOT TO SCALE



SIDE VIEW INSTALLED

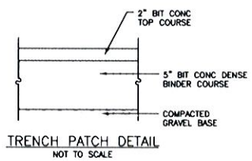
CATCH BASIN FILTER



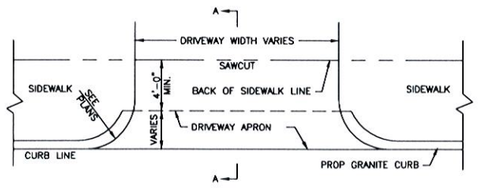
SECTION A-A

STRAW BALE & GRAVEL INLET SEDIMENT BARRIER

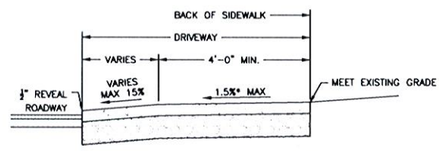
TEMPORARY INLET PROTECTION
NOT TO SCALE



TRENCH PATCH DETAIL
NOT TO SCALE



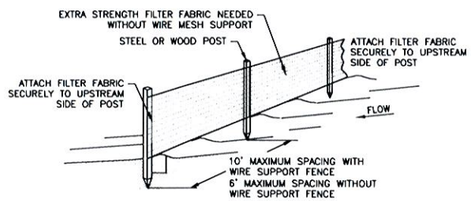
PLAN

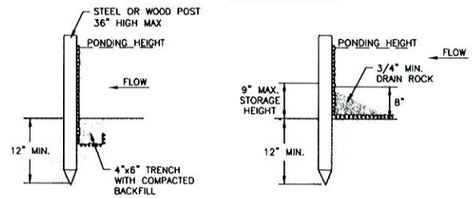


SECTION A-A

NOTE:
* CONSTRUCTION TOLERANCE ±0.5%

DRIVEWAY CONSTRUCTION DETAIL
NOT TO SCALE





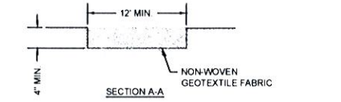
TRENCH DETAIL

INSTALLATION WITHOUT TRENCHING

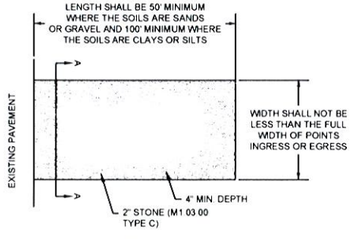
NOTES:

1. EROSION CONTROL BARRIER (HAY BALES, SILT FENCE OR EROSION STOCK) SHALL BE PLACED AROUND ALL MATERIAL STOCKPILE AREAS AND MAINTAINED AT STAGING AREAS TO ASSURE NO SILTATION ONTO PUBLIC OR PRIVATE WAYS OR PROPERTY.

EROSION CONTROL BARRIER
NOT TO SCALE



SECTION A-A



PLAN

NOTES:

1. INSTALLATION: THE AREA OF THE ENTRANCE SHOULD BE CLEARED OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL. THE GRAVEL SHALL BE PLACED TO THE SPECIFIED DIMENSIONS NOTED ABOVE.
2. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENTS ONTO PUBLIC RIGHT-OF-WAYS. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE, OR ADDITIONAL LENGTH, AS CONDITIONS DEMAND, AND REPAIR, AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAYS MUST BE REMOVED IMMEDIATELY.
3. LOCATION: SEE C1.0 FOR LOCATION OF CONSTRUCTION ENTRANCES.

ROCK CONSTRUCTION ENTRANCE
NOT TO SCALE

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Notes

NOTICE OF INTENT
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DESIGN DEVELOPMENT			2018.09.04
PROGRESS SET			2018.09.25
File Name: 20_6_27	Author: AS	Designed: JC	Checked: AS

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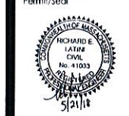


Client/Project Logo

Nordblom

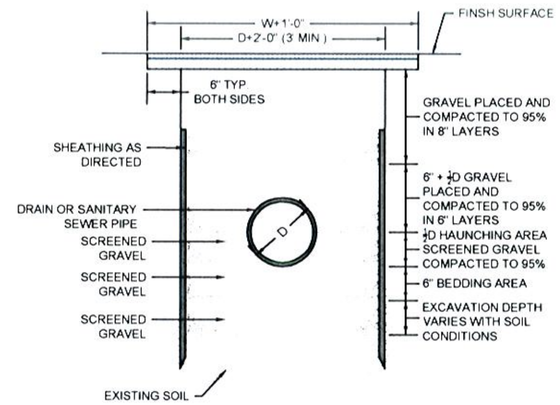
Client/Project
NORDBLOM

THE BEAT

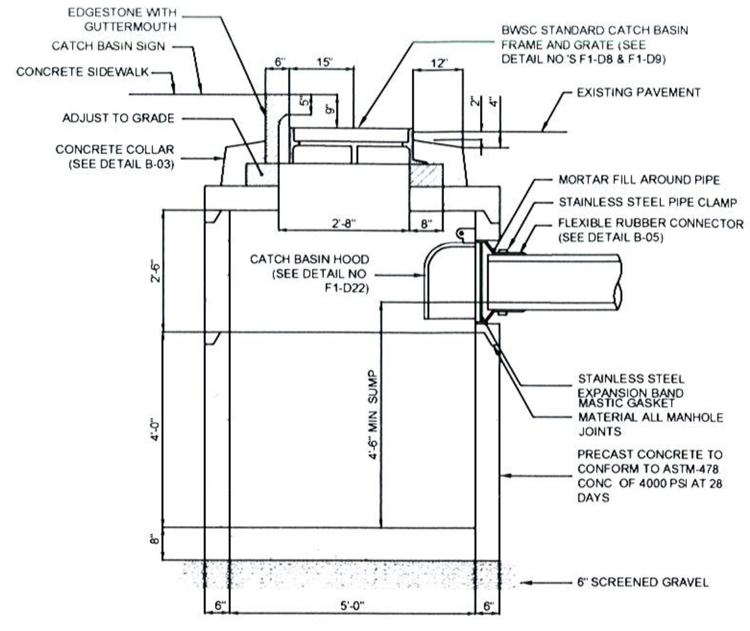
135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

Title
SITE DETAILS

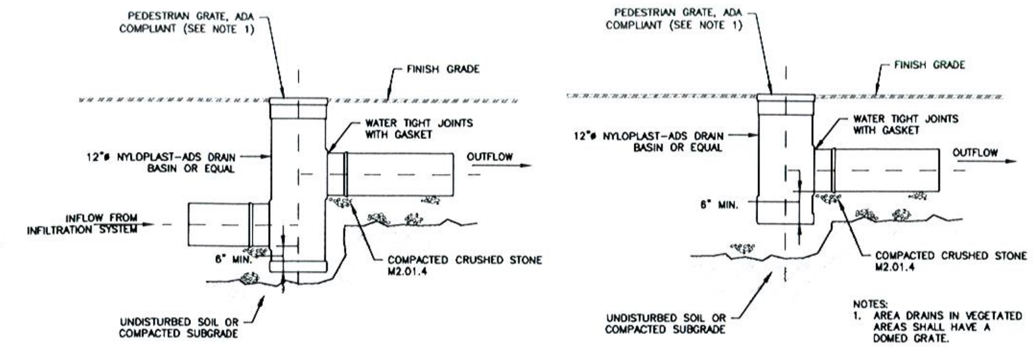
Project No.	Scale
218421012	As Noted
Revision	Drawing No.
	C-400



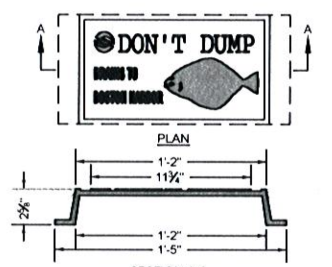
TRENCH DETAIL - DRAIN & SANITARY SEWER (B-08)
NOT TO SCALE



SHALLOW CATCH BASIN (B-01d)
NOT TO SCALE

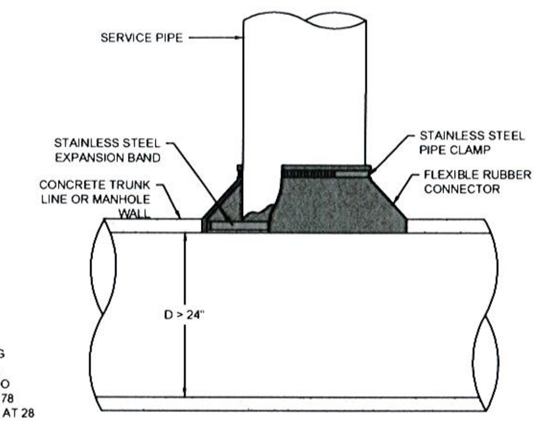


AREA DRAIN
NOT TO SCALE



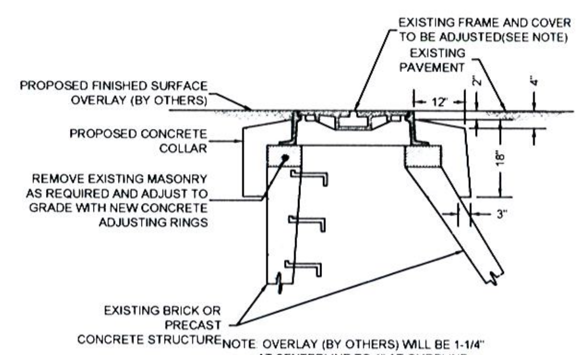
NOTE:
CATCH BASIN SIGNS TO BE PROVIDED BY THE BOSTON WATER AND SEWER COMMISSION (BWSC)

8" X 14" CATCH BASIN SIGN (F1-D23)
NOT TO SCALE



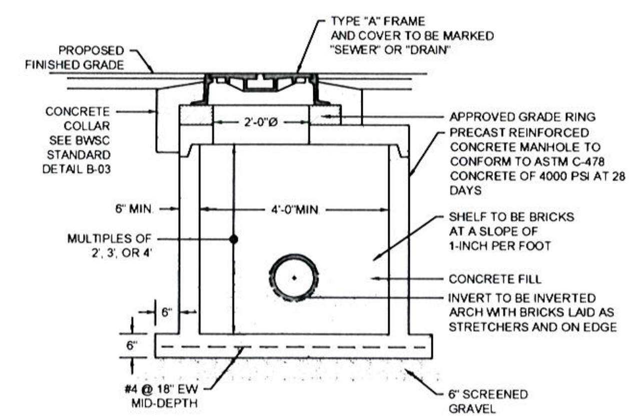
NOTES:
1. OPENING IN CONCRETE WALL SHALL BE CORED USING HIGH SPEED DIAMOND DRILL
2. ALL METAL FIXTURES SHALL BE OF STAINLESS STEEL
3. SERVICE LINE SHALL BE FLUSH WITH THE INSIDE OF THE CONCRETE PIPE OR WALL
4. IF TRUNK LINE DIAMETER IS LESS THAN 24" THEN A SADDLE TYPE CONNECTION WILL BE USED

TYPICAL FIELD CONNECTION TO LARGE CONCRETE PIPE OR CONCRETE MANHOLE (B-05)
NOT TO SCALE

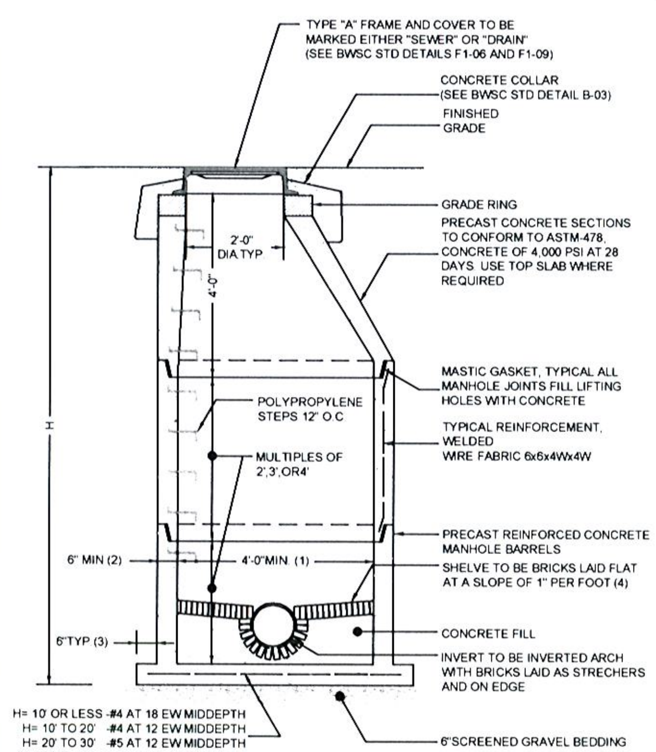


NOTE: OVERLAY (BY OTHERS) WILL BE 1-1/4" AT CENTERLINE TO 1" AT CURBLINE

CONCRETE MANHOLE ADJUSTMENT TO GRADE (B-03)
NOT TO SCALE



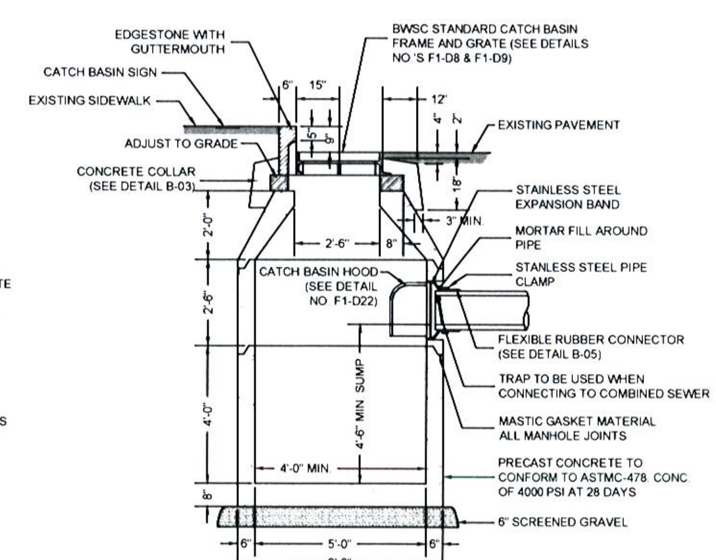
SHALLOW MANHOLE (B-06)
NOT TO SCALE



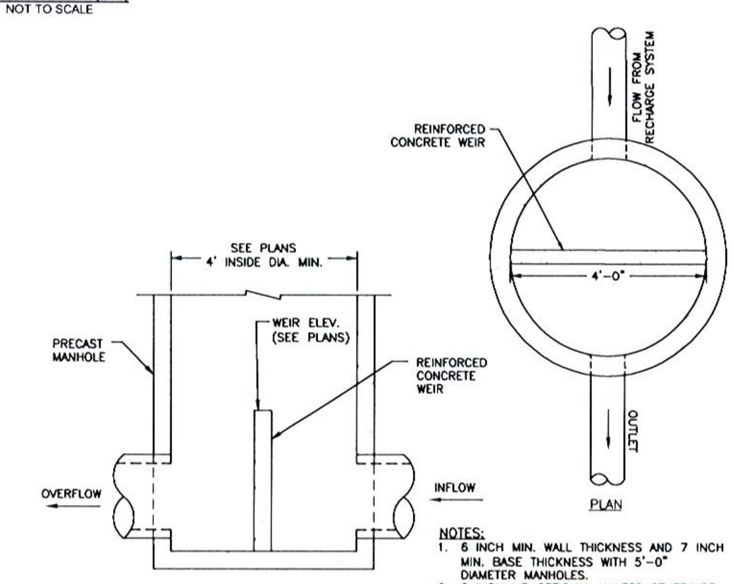
H= 10' OR LESS -#4 AT 18 EW MIDDEPTH
H= 10' TO 20' -#4 AT 12 EW MIDDEPTH
H= 20' TO 30' -#5 AT 12 EW MIDDEPTH
IN ADDITION TO WELDED WIRE FABRIC

NOTES:
1. 5'-0" DIAMETER FOR ALL MANHOLE DEPTHS GREATER THAN 20 FEET OR WHEN ORDERED BY THE ENGINEER
2. 6 INCH MIN. WALL THICKNESS AND 7 INCH MIN. BASE THICKNESS WITH 5'-0" DIAMETER MANHOLES
3. 6 INCH LIP OPTIONAL UNLESS OTHERWISE NOTED CONCRETE INVERT AND SHELF MAY BE SUBSTITUTED IN STORM DRAIN MANHOLES AS DIRECTED BY THE ENGINEER

PRECAST CONCRETE MANHOLE (B-02a)
NOT TO SCALE



STANDARD CATCH BASIN NO 5 (B-01b)
NOT TO SCALE



OUTLET CONTROL STRUCTURE
NOT TO SCALE

NOTES:
1. 6 INCH MIN. WALL THICKNESS AND 7 INCH MIN. BASE THICKNESS WITH 5'-0" DIAMETER MANHOLES.
2. 6 INCH LIP OPTIONAL UNLESS OTHERWISE NOTED. CONCRETE INVERT AND SHELF MAY BE SUBSTITUTED IN STORM DRAIN MANHOLES AS DIRECTED BY THE ENGINEER.
3. CONTRACTOR TO SUBMIT METHOD OF BRACING WEIR.

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THE BEAT

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Title
SITE DETAILS

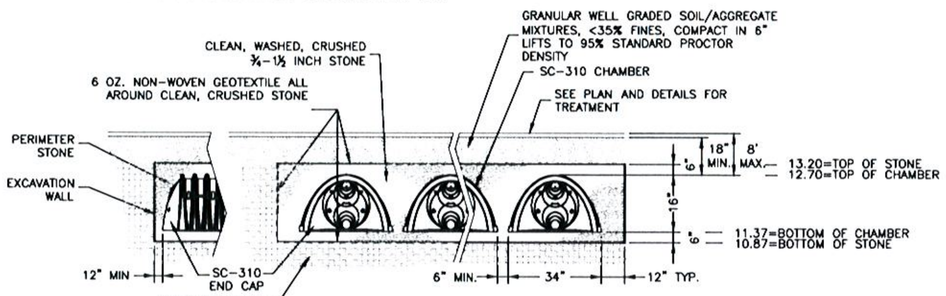
Project No. 218421012
Scale As Noted
Revision
Drawing No.
C-401

PROPOSED LAYOUT

(78) STORMTECH SC-310 CHAMBERS
(18) STORMTECH SC-310 END CAPS
INSTALLED WITH 6" COVER STONE, 6" BASE STONE, 30% STONE VOID

NOTES

- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.



SECTION VIEW

STORMWATER CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-310 OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE OR POLYETHYLENE RESINS.
   CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
3. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
4. CHAMBERS SHALL MEET ASTM F2922 (POLYETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
5. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 OR ASTM F2922 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310 SYSTEM

1. STORMTECH SC-310 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF CATCH BASIN FILTER INSERT DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

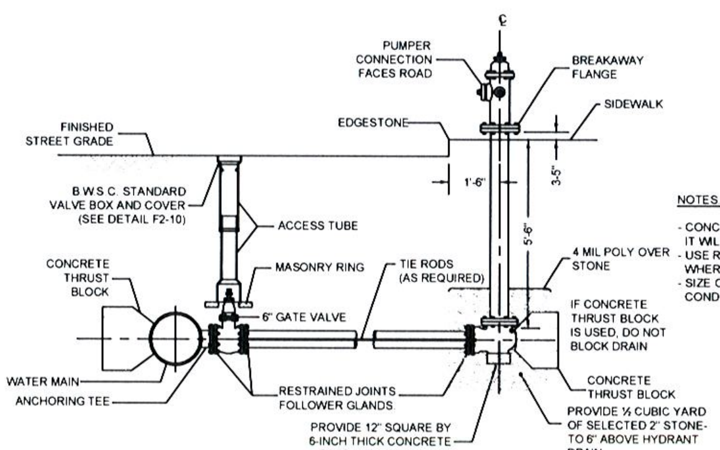
NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

INFILTRATION SYSTEM-2
STORMTECH SC-310
NOT TO SCALE



NOTES
- CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BEAR ON UNDISTURBED EARTH
- USE RESTRAINED JOINT FOLLOWER GLANDS, OR TIE RODS WHERE CONCRETE THRUST BLOCK IS UNACCEPTABLE
- SIZE OF BLOCK OR FITTING TO BE DESIGNED FOR SPECIFIC CONDITIONS, OR ANY NECESSARY BENDS

TYPICAL FIRE HYDRANT CONNECTION FOR HIGH OR LOW SERVICE LINE (A-07a)
NOT TO SCALE

PROPOSED SYSTEM No.1

(75) STORMTECH ADS STORMTECH SC-740 CHAMBERS
(34) STORMTECH SC-740 END CAPS
INSTALLED WITH 6" COVER STONE, 6" BASE STONE, 30% STONE VOID

PROPOSED SYSTEM No.3

(180) STORMTECH ADS STORMTECH SC-740 CHAMBERS
(10) STORMTECH SC-740 END CAPS
INSTALLED WITH 6" COVER STONE, 6" BASE STONE, 30% STONE VOID

PROPOSED SYSTEM No.5

(80) STORMTECH ADS STORMTECH SC-740 CHAMBERS
(20) STORMTECH SC-740 END CAPS
INSTALLED WITH 6" COVER STONE, 6" BASE STONE, 30% STONE VOID

PROPOSED SYSTEM No.6

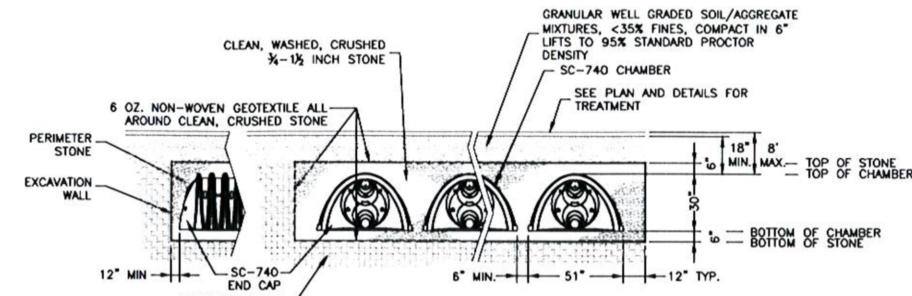
(88) STORMTECH ADS STORMTECH SC-740 CHAMBERS
(22) STORMTECH SC-740 END CAPS
INSTALLED WITH 6" COVER STONE, 6" BASE STONE, 30% STONE VOID

PROPOSED SYSTEM No.7

(75) STORMTECH ADS STORMTECH SC-740 CHAMBERS
(12) STORMTECH SC-740 END CAPS
INSTALLED WITH 6" COVER STONE, 6" BASE STONE, 30% STONE VOID

NOTES

- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.



SECTION VIEW

STORMWATER CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740 OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE OR POLYETHYLENE RESINS.
   CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
3. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
4. CHAMBERS SHALL MEET ASTM F2922 (POLYETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
5. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 OR ASTM F2922 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-740 SYSTEM

1. STORMTECH SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF CATCH BASIN FILTER INSERT DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

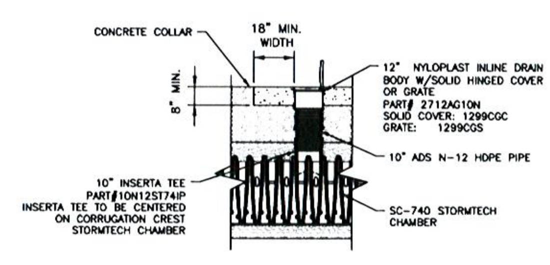
NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

INFILTRATION SYSTEMS-1, 3, 5, 6, AND 7
STORMTECH SC-740
NOT TO SCALE



SC-740 INSPECTION PORT DETAIL
NOT TO SCALE

Stantec

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PROGRESS SET			2018.04.25

File Name: 2016.27	Author	Designer	Checker	YYYY.MM.DD
	AL	JC	RL	

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
RICHARD E. LATINI
CIVIL
No. 41033
REGISTERED PROFESSIONAL ENGINEER
5/21/18

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NORDBLOM

THE BEAT

135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

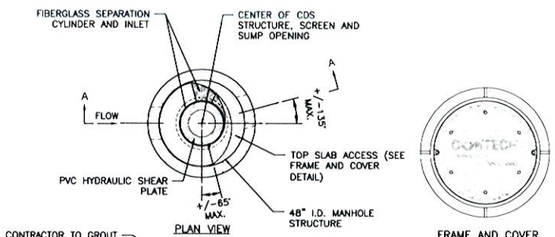
Title
SITE DETAILS

Project No.
218421012

Scale
As Noted

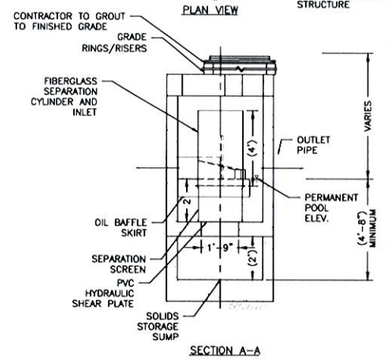
Revision

Drawing No.
C-402



PLAN VIEW

FRAME AND COVER

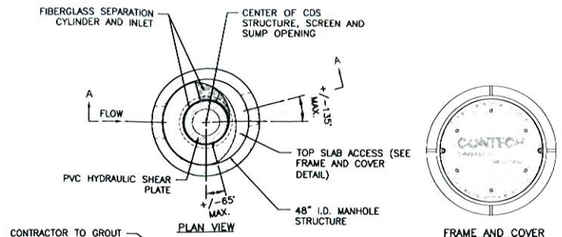


SECTION A–A

GENERAL NOTES
1. CDS2015-4-C RATED TREATMENT CAPACITY IS 1.4 CFS, OR PER LOCAL REGULATIONS.
2. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
3. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
4. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH CONSTRICTION PRODUCTS REPRESENTATIVE. www.contechstormwater.com
5. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
6. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET AASHTO M306 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION.
7. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

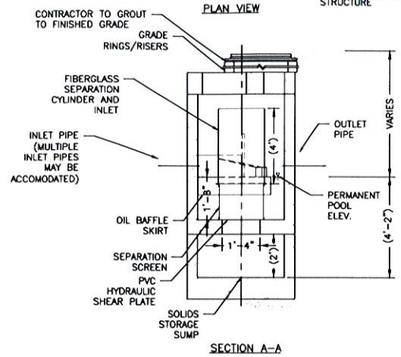
INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

WATER QUALITY UNIT – CDS2015-4-C
NOT TO SCALE



PLAN VIEW

FRAME AND COVER

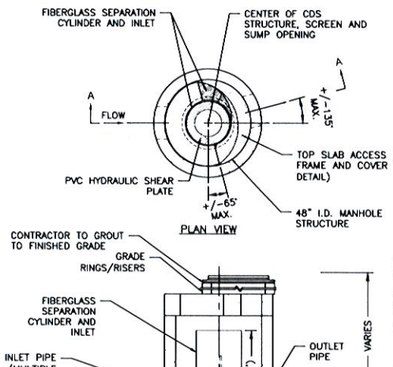


SECTION A–A

GENERAL NOTES
1. CDS2015-3-C RATED TREATMENT CAPACITY IS 1.0 CFS, OR PER LOCAL REGULATIONS.
2. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
3. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
4. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH CONSTRICTION PRODUCTS REPRESENTATIVE. www.contechstormwater.com
5. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
6. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET AASHTO M306 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION.
7. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

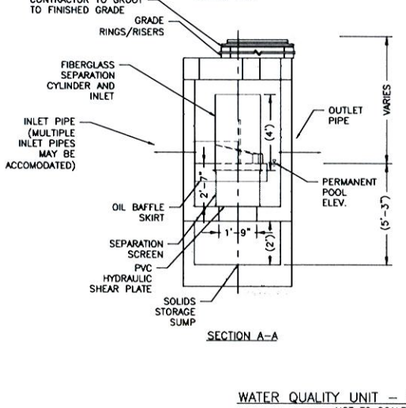
INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

WATER QUALITY UNIT – CDS1515-3-C
NOT TO SCALE



PLAN VIEW

FRAME AND COVER



SECTION A–A

GENERAL NOTES
1. CDS2020-5-C RATED TREATMENT CAPACITY IS 2.2 CFS, OR PER LOCAL REGULATIONS.
2. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
3. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
4. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH CONSTRICTION PRODUCTS REPRESENTATIVE. www.contechstormwater.com
5. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
6. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET AASHTO M306 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION.
7. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

WATER QUALITY UNIT – CDS2020-5-C
NOT TO SCALE

PROPOSED LAYOUT

(216) STORMTECH MC-4500 CHAMBERS
(24) STORMTECH MC-4500 END CAPS
INSTALLED WITH 12" COVER STONE, 20" BASE STONE, 35% STONE VOID

PROPOSED ELEVATIONS

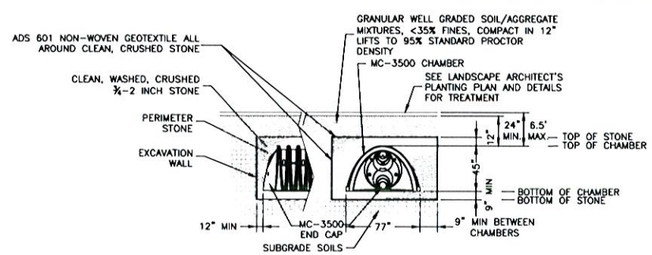
MAXIMUM ALLOWABLE GRADE:
MINIMUM ALLOWABLE GRADE:
TOP OF STONE:
TOP OF CHAMBER:
BOTTOM OF CHAMBER:
BOTTOM OF STONE:

NOTES

- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.

PROPOSED LAYOUT

(50) STORMTECH MC-4500 CHAMBERS
(10) STORMTECH MC-4500 END CAPS
INSTALLED WITH 12" COVER STONE, 20" BASE STONE, 35% STONE VOID



INFILTRATION SYSTEM-4
STORM TECH MODEL MC-3500
NOT TO SCALE

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HOWARD STEIN HUDSON
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Notes

NOTICE OF INTENT
not for construction

NOTICE OF INTENT				2018.02.27
DESIGN DEVELOPMENT				2018.05.04
PROGRESS SET				2018.04.25
Issued/Revision		By	Appd	YYYY.MM.DD
File name: 2C 6 27	Author: AJ	Designer: JC	Checker: KR	YYYY.MM.DD

Permit/Seal

COMMONWEALTH OF MASSACHUSETTS
RICHARD B. LATHE
CIVIL
No. 41033
5/21/18

Client/Project Logo

Nordblom

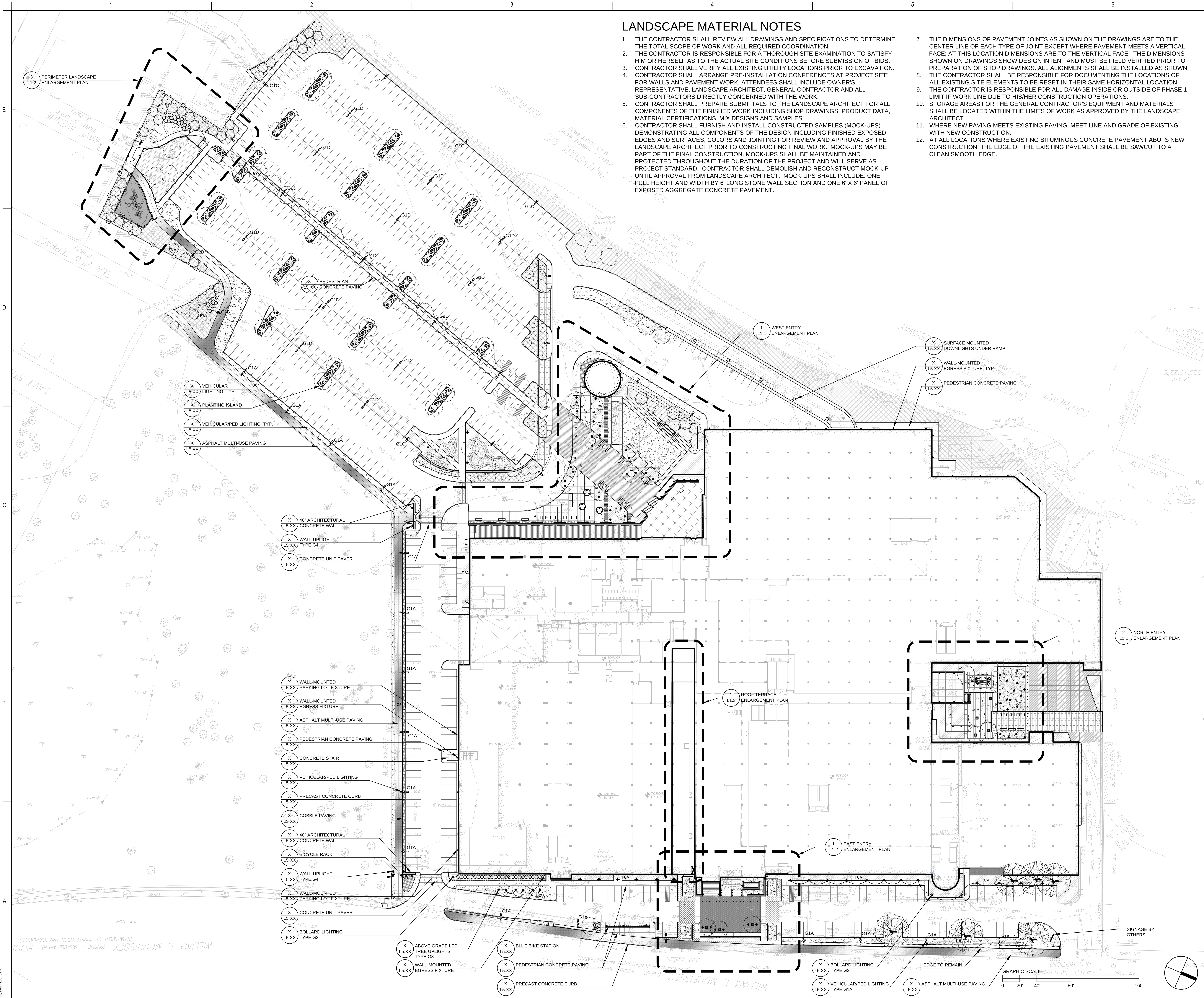
Client/Project
NORDBLOM

THE BEAT

135 WILLIAM T MORRISSEY BLVD, BOSTON, MA 02125

Title
SITE DETAILS

Project No.	Scale
218421012	As Noted
Revision	Drawing No.
	C-403



LANDSCAPE MATERIAL NOTES

1. THE CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS TO DETERMINE THE TOTAL SCOPE OF WORK AND ALL REQUIRED COORDINATION.
2. THE CONTRACTOR IS RESPONSIBLE FOR A THOROUGH SITE EXAMINATION TO SATISFY HIM OR HERSELF AS TO THE ACTUAL SITE CONDITIONS BEFORE SUBMISSION OF BIDS.
3. CONTRACTOR SHALL VERIFY ALL EXISTING UTILITY LOCATIONS PRIOR TO EXCAVATION.
4. CONTRACTOR SHALL ARRANGE PRE-INSTALLATION CONFERENCES AT PROJECT SITE FOR WALLS AND PAVEMENT WORK. ATTENDEES SHALL INCLUDE OWNER'S REPRESENTATIVE, LANDSCAPE ARCHITECT, GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS DIRECTLY CONCERNED WITH THE WORK.
5. CONTRACTOR SHALL PREPARE SUBMITTALS TO THE LANDSCAPE ARCHITECT FOR ALL COMPONENTS OF THE FINISHED WORK INCLUDING SHOP DRAWINGS, PRODUCT DATA, MATERIAL CERTIFICATIONS, MIX DESIGNS AND SAMPLES.
6. CONTRACTOR SHALL FURNISH AND INSTALL CONSTRUCTED SAMPLES (MOCK-UPS) DEMONSTRATING ALL COMPONENTS OF THE DESIGN INCLUDING FINISHED EXPOSED EDGES AND SURFACES, COLORS AND JOINTING FOR REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTING FINAL WORK. MOCK-UPS MAY BE PART OF THE FINAL CONSTRUCTION. MOCK-UPS SHALL BE MAINTAINED AND PROTECTED THROUGHOUT THE DURATION OF THE PROJECT AND WILL SERVE AS PROJECT STANDARD. CONTRACTOR SHALL DEMOLISH AND RECONSTRUCT MOCK-UP UNTIL APPROVAL FROM LANDSCAPE ARCHITECT. MOCK-UPS SHALL INCLUDE: ONE FULL HEIGHT AND WIDTH BY 6' LONG STONE WALL SECTION AND ONE 6' X 6' PANEL OF EXPOSED AGGREGATE CONCRETE PAVEMENT.
7. THE DIMENSIONS OF PAVEMENT JOINTS AS SHOWN ON THE DRAWINGS ARE TO THE CENTER LINE OF EACH TYPE OF JOINT EXCEPT WHERE PAVEMENT MEETS A VERTICAL FACE; AT THIS LOCATION DIMENSIONS ARE TO THE VERTICAL FACE. THE DIMENSIONS SHOWN ON DRAWINGS SHOW DESIGN INTENT AND MUST BE FIELD VERIFIED PRIOR TO PREPARATION OF SHOP DRAWINGS. ALL ALIGNMENTS SHALL BE INSTALLED AS SHOWN.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DOCUMENTING THE LOCATIONS OF ALL EXISTING SITE ELEMENTS TO BE RESET IN THEIR SAME HORIZONTAL LOCATION.
9. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE INSIDE OR OUTSIDE OF PHASE 1 LIMIT IF WORK LINE DUE TO HIS/HER CONSTRUCTION OPERATIONS.
10. STORAGE AREAS FOR THE GENERAL CONTRACTOR'S EQUIPMENT AND MATERIALS SHALL BE LOCATED WITHIN THE LIMITS OF WORK AS APPROVED BY THE LANDSCAPE ARCHITECT.
11. WHERE NEW PAVING MEETS EXISTING PAVING, MEET LINE AND GRADE OF EXISTING WITH NEW CONSTRUCTION.
12. AT ALL LOCATIONS WHERE EXISTING BITUMINOUS CONCRETE PAVEMENT ABUTS NEW CONSTRUCTION, THE EDGE OF THE EXISTING PAVEMENT SHALL BE SAWCUT TO A CLEAN SMOOTH EDGE.

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Consultant

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Landscape Architects & Planners
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Notes

DESIGN DEVELOPMENT			2018.05.04
SCHEMATIC DESIGN			2018.03.09
Issued/Revision	By	Appd	YYYY.MM.DD

File Name: N/A	AA/AS	JC/AA	JC	2018.05.04
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

Client/Project Logo

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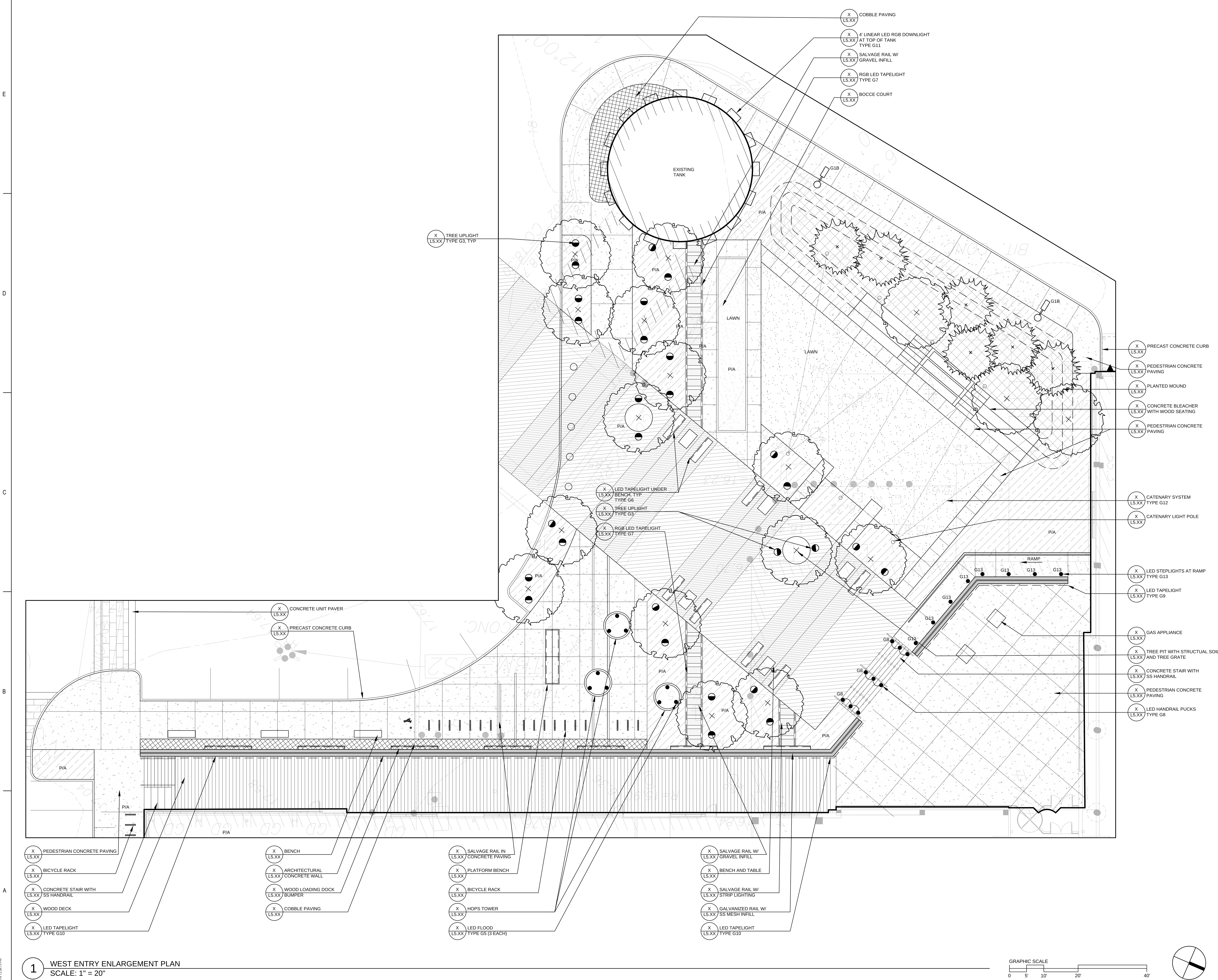
THE BEAT

135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

Title
LANDSCAPE MATERIALS PLAN

Project No. 218421012
Scale 1" = 40' - 0"
Revision
Drawing No.
L1.0



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Notes

DESIGN DEVELOPMENT			2018.05.04
Issued/Revision	By	Appd	YYYY.MM.DD
File Name: N/A	AA/AS	JC/AA	JC	2018.05.04
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

Client/Project Logo

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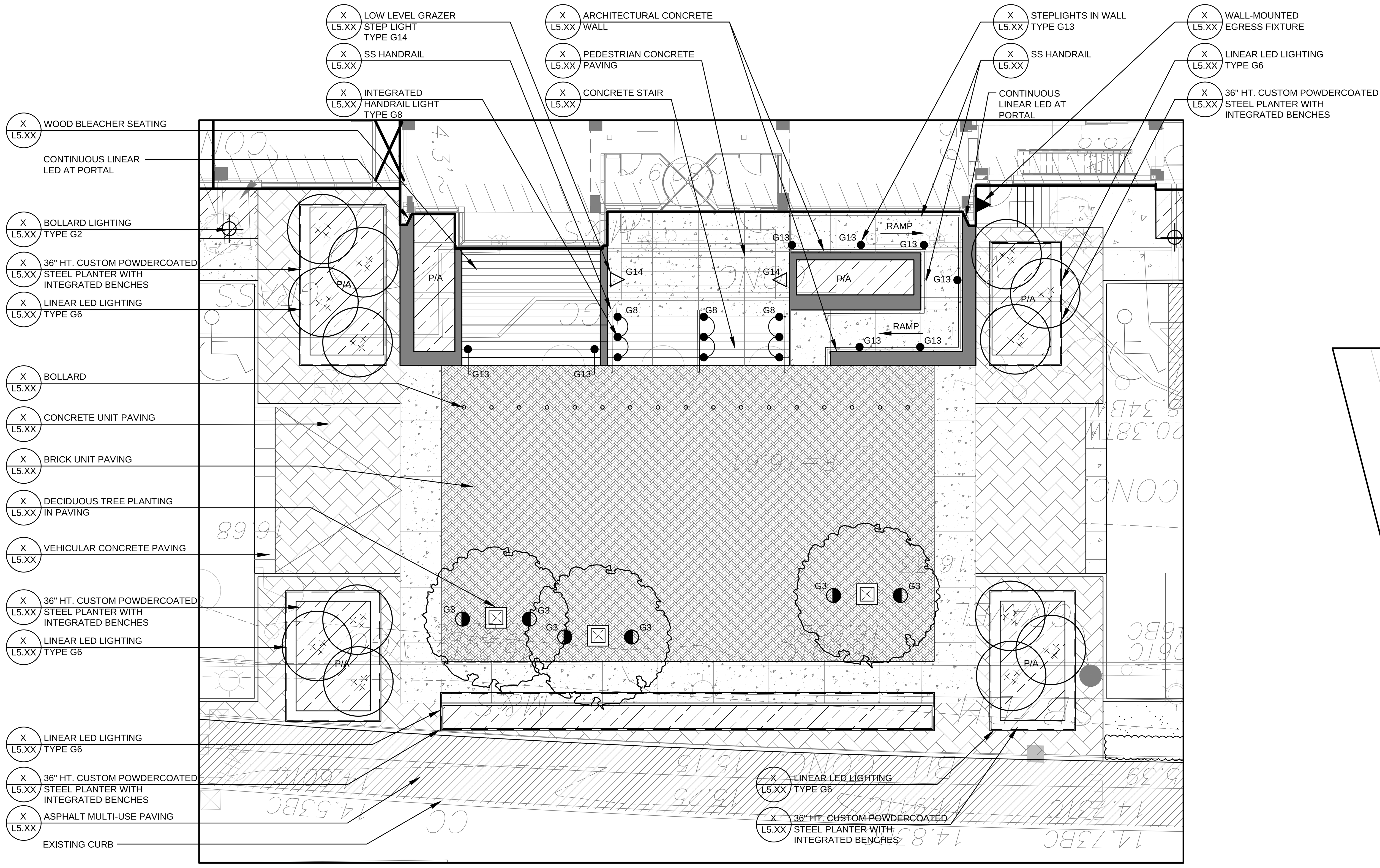
THE BEAT

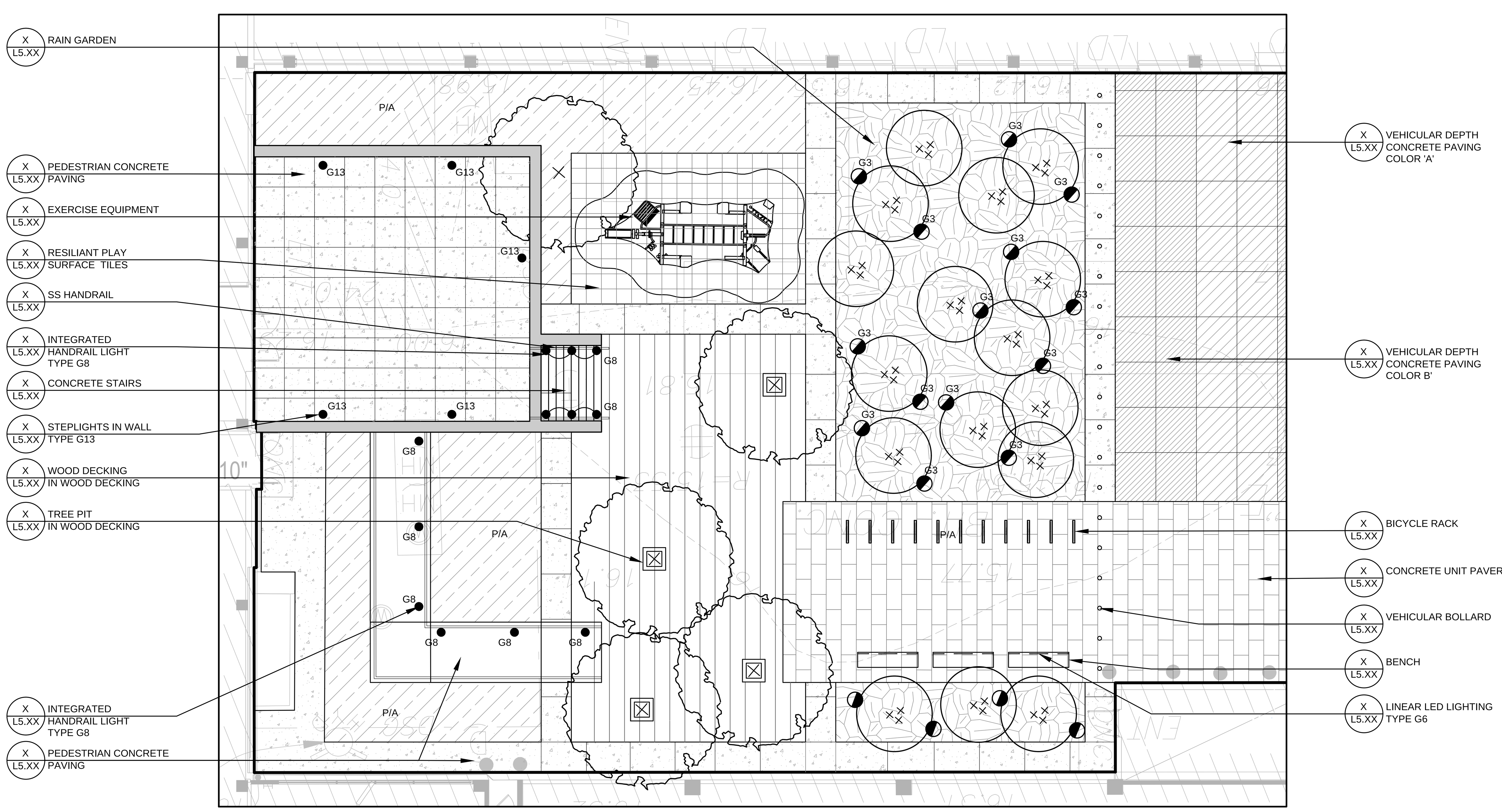
135 WILLIAM T MORRISSEY BLVD, BOSTON, MA 02125

Title
LANDSCAPE PLAN ENLARGEMENTS

Project No. 218421012
Scale 1" = 10' - 0"
Revision
Drawing No.
L1.1



1 EAST ENTRY ENLARGEMENT PLAN
SCALE: 1" = 10"



2 NORTH ENTRY ENLARGEMENT PLAN
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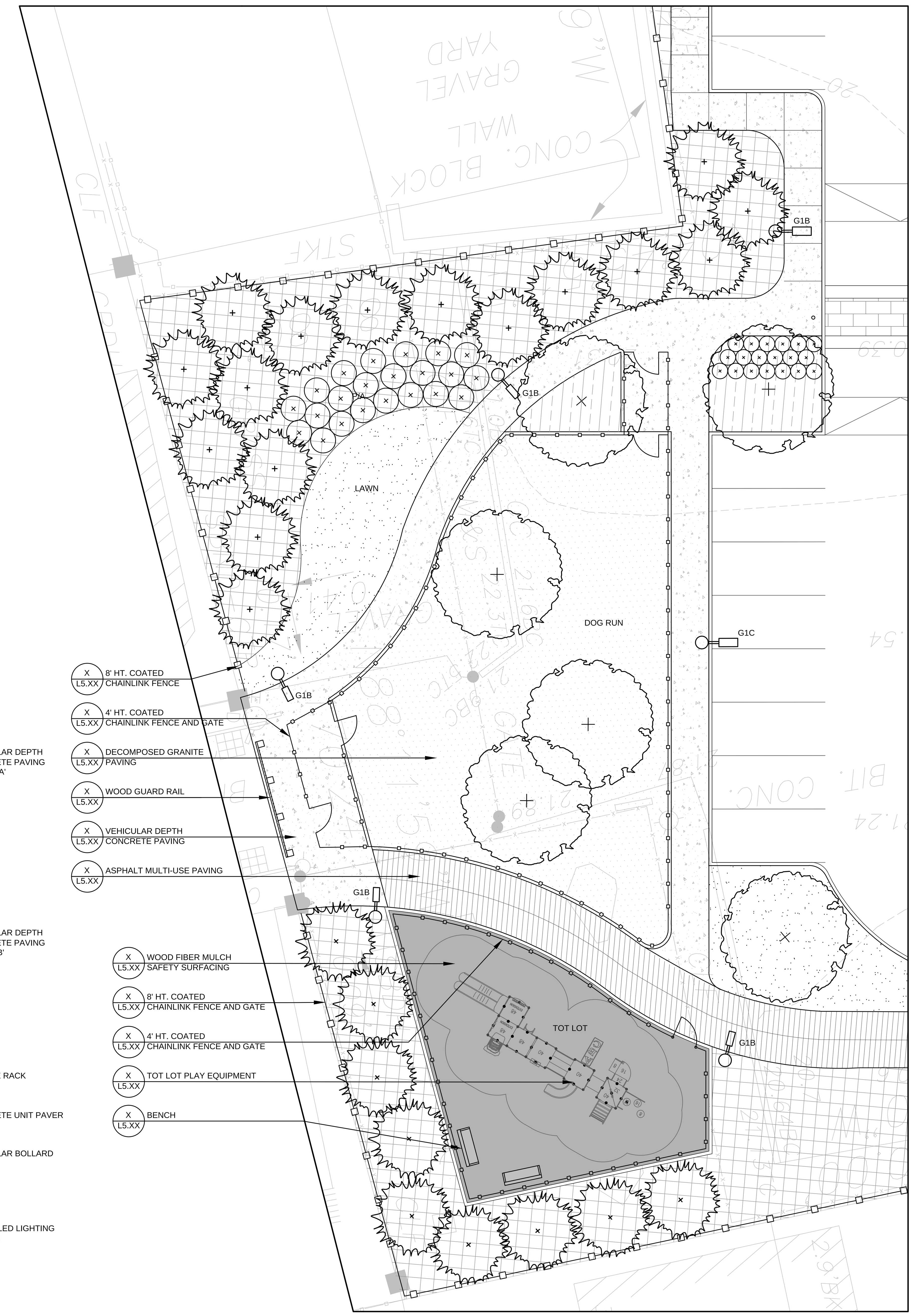

3 PERIMETER LANDSCAPE ENLARGEMENT PLAN
SCALE: 1" = 10"

GRAPHIC SCALE
0 5' 10' 20' 40'

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Issued/Revision	By	Appd	YYYY.MM.DD
DESIGN DEVELOPMENT			2018.05.04

File Name: N/A	AA/AS	JC/AA	JC	2018.05.04
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

Client/Project Logo

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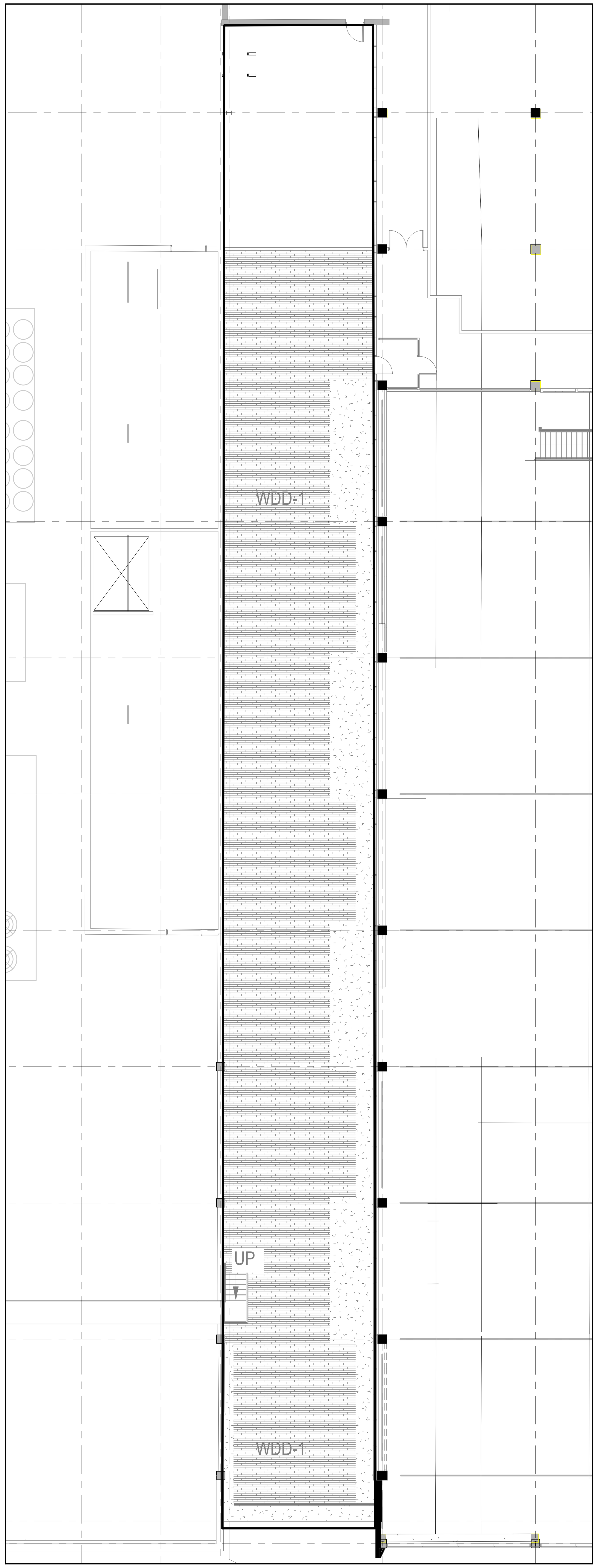
THE BEAT

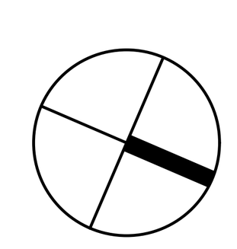
135 WILLIAM T MORRISSEY BLVD, BOSTON, MA 02125

Title
LANDSCAPE PLAN ENLARGEMENTS

Project No. 218421012
Scale 1" = 10' - 0"
Revision
Drawing No.
L1.2



1 ROOF TERRACE PLAN
SCALE: 1" = 10"



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Issued/Revision	By	Appd	YYYY.MM.DD
DESIGN DEVELOPMENT			2018.05.04

File Name: N/A	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
	AA/AS	JC/AA	JC	2018.05.04

Permit/Seal

Client/Project Logo

Nordblom

Client/Project
NORDBLOM

THE BEAT

135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

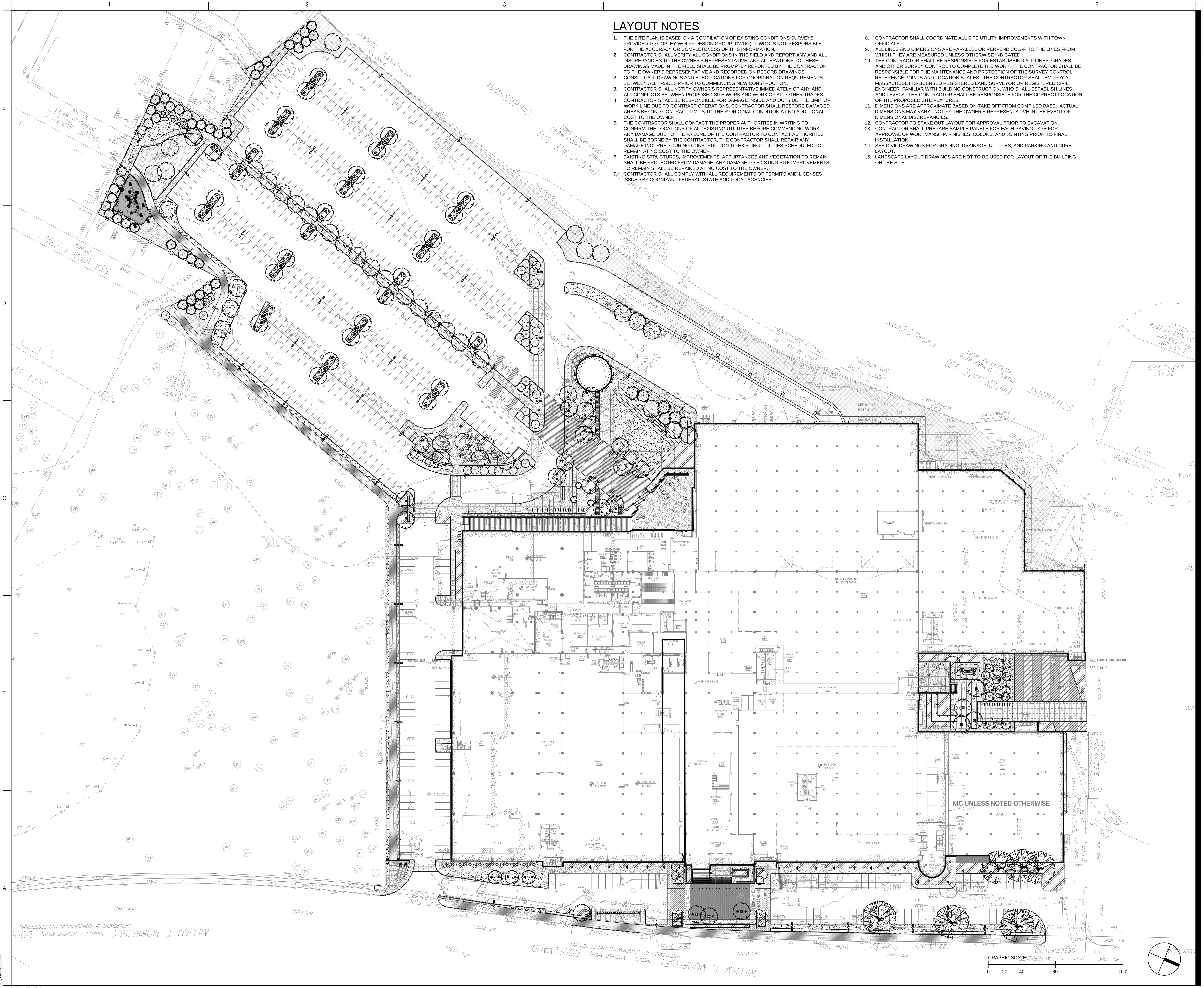
Title
LANDSCAPE PLAN ENLARGEMENTS

Project No.
218421012

Scale
1" = 10' - 0"

Revision

Drawing No.
L1.3



LAYOUT NOTES

1. THE SITE PLAN IS BASED ON A COMPILATION OF EXISTING CONDITIONS SURVEYS PROVIDED TO COPLEY-WOLFF DESIGN GROUP (CWDG). CWDG IS NOT RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THIS INFORMATION.
2. CONTRACTOR SHALL VERIFY ALL CONDITIONS IN THE FIELD AND REPORT ANY AND ALL DISCREPANCIES TO THE OWNER'S REPRESENTATIVE. ANY ALTERATIONS TO THESE DRAWINGS MADE IN THE FIELD SHALL BE PROMPTLY REPORTED BY THE CONTRACTOR TO THE OWNER'S REPRESENTATIVE AND RECORDED ON RECORD DRAWINGS.
2. CONSULT ALL DRAWINGS AND SPECIFICATIONS FOR COORDINATION REQUIREMENTS BETWEEN ALL TRADES PRIOR TO COMMENCING NEW CONSTRUCTION.
3. CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE IMMEDIATELY OF ANY AND ALL CONFLICTS BETWEEN PROPOSED SITE WORK AND WORK OF ALL OTHER TRADES.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE INSIDE AND OUTSIDE THE LIMIT OF WORK LINE DUE TO CONTRACT OPERATIONS. CONTRACTOR SHALL RESTORE DAMAGED AREAS BEYOND CONTRACT LIMITS TO THEIR ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
5. THE CONTRACTOR SHALL CONTACT THE PROPER AUTHORITIES IN WRITING TO CONFIRM THE LOCATIONS OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO THE FAILURE OF THE CONTRACTOR TO CONTACT AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR. THE CONTRACTOR SHALL REPAIR ANY DAMAGE INCURRED DURING CONSTRUCTION TO EXISTING UTILITIES SCHEDULED TO REMAIN AT NO COST TO THE OWNER.
6. EXISTING STRUCTURES, IMPROVEMENTS, APPURTANCES AND VEGETATION TO REMAIN SHALL BE PROTECTED FROM DAMAGE. ANY DAMAGE TO EXISTING SITE IMPROVEMENTS TO REMAIN SHALL BE REPAIRED AT NO COST TO THE OWNER.
7. CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF PERMITS AND LICENSES ISSUED BY COGNIZANT FEDERAL, STATE AND LOCAL AGENCIES.
8. CONTRACTOR SHALL COORDINATE ALL SITE UTILITY IMPROVEMENTS WITH TOWN OFFICIALS.
9. ALL LINES AND DIMENSIONS ARE PARALLEL OR PERPENDICULAR TO THE LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE INDICATED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING ALL LINES, GRADES, AND OTHER SURVEY CONTROL TO COMPLETE THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND PROTECTION OF THE SURVEY CONTROL REFERENCE POINTS AND LOCATION STAKES. THE CONTRACTOR SHALL EMPLOY A MASSACHUSETTS-LICENSED REGISTERED LAND SURVEYOR OR REGISTERED CIVIL ENGINEER, FAMILIAR WITH BUILDING CONSTRUCTION, WHO SHALL ESTABLISH LINES AND LEVELS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CORRECT LOCATION OF THE PROPOSED SITE FEATURES.
11. DIMENSIONS ARE APPROXIMATE BASED ON TAKE OFF FROM COMPILED BASE. ACTUAL DIMENSIONS MAY VARY. NOTIFY THE OWNER'S REPRESENTATIVE IN THE EVENT OF DIMENSIONAL DISCREPANCIES.
12. CONTRACTOR TO STAKE OUT LAYOUT FOR APPROVAL PRIOR TO EXCAVATION.
13. CONTRACTOR SHALL PREPARE SAMPLE PANELS FOR EACH PAVING TYPE FOR APPROVAL OF WORKMANSHIP, FINISHES, COLORS, AND JOINTING PRIOR TO FINAL INSTALLATION.
14. SEE CIVIL DRAWINGS FOR GRADING, DRAINAGE, UTILITIES, AND PARKING AND CURB LAYOUT.
15. LANDSCAPE LAYOUT DRAWINGS ARE NOT TO BE USED FOR LAYOUT OF THE BUILDING ON THE SITE.

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Notes

	By	Appd	YYYY.MM.DD
DESIGN DEVELOPMENT			2018.05.04

Issued/Revision

File Name: N/A	AA/AS	JC/AA	JC	2018.05.04
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

MASSACHUSETTS JOHN HENRY COPLEY, JR. No. 726 REGISTERED LANDSCAPE ARCHITECT

Client/Project Logo

Nordblom

Client/Project
NORDBLOM

THE BEAT

135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

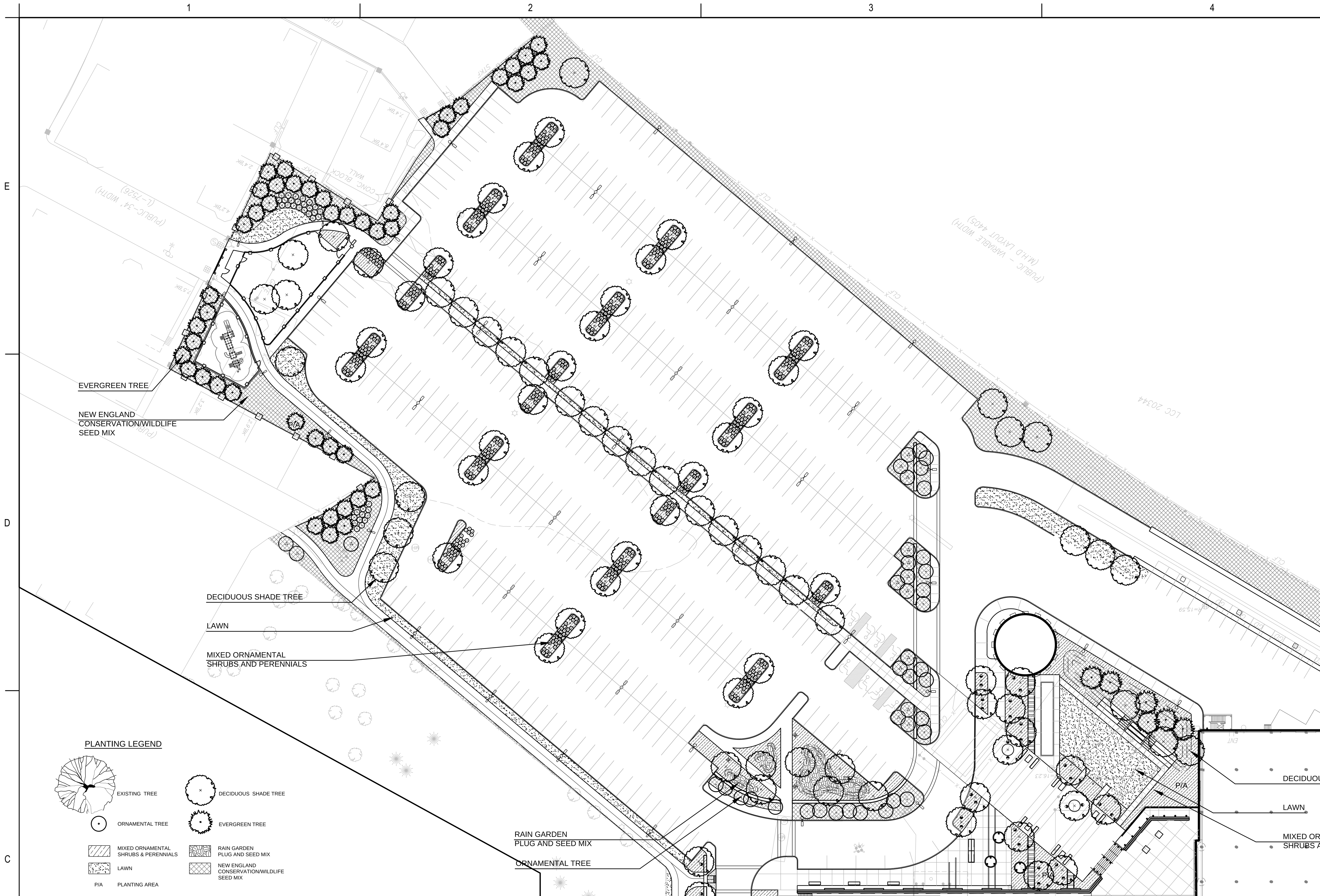
Title
LANDSCAPE LAYOUT PLAN

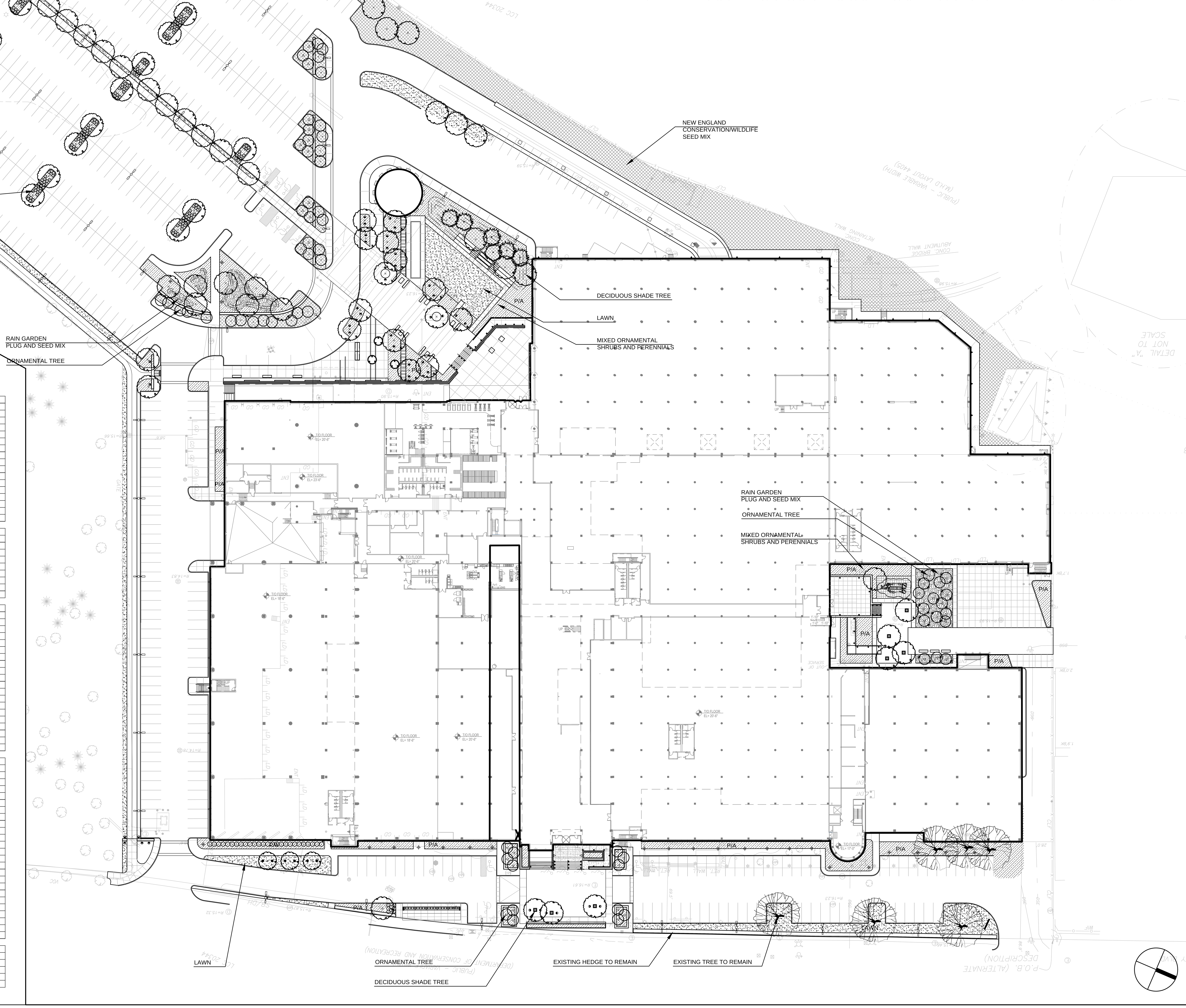
Project No. 218421012

Scale 1" = 40' - 0"

Revision

Drawing No. **L2.0**





PLANTING NOTES

1. THE CONTRACTOR SHALL SUPPLY ALL NEW PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING SHOWN ON THE DRAWINGS. IF DISCREPANCIES EXIST BETWEEN THE NUMBER OF PLANTS DRAWN ON THE PLANTING PLAN AND THE NUMBER OF PLANTS IN THE PLANT SCHEDULE, THE PLANTING PLAN SHALL GOVERN.
2. ALL NEW PLANT MATERIAL SHALL CONFORM TO THE MINIMUM GUIDELINES ESTABLISHED FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC. IN ADDITION, ALL NEW PLANT MATERIAL FOR THE PROJECT SHALL BE OF SPECIMEN QUALITY.
3. ALL NEW PLANTS TO BE BALLED AND BURLAPPED OR CONTAINER-GROWN, UNLESS OTHERWISE NOTED ON THE PLANT LIST.
4. ANY PROPOSED SUBSTITUTIONS OF PLANT SPECIES SHALL BE MADE WITH PLANTS OF EQUIVALENT OVERALL FORM, HEIGHT, BRANCHING HABIT, FLOWER, LEAF, COLOR, FRUIT AND CULTURE, AND ONLY AFTER WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT.
5. ALL NEW TREES SHALL BE TAGGED AND APPROVED BY THE LANDSCAPE ARCHITECT AT THEIR PLACE OF GROWTH PRIOR TO DIGGING OR DELIVERY TO THE SITE. ACCEPTABLE NURSERIES SHALL INCLUDE HALKA NURSERIES: MILLSTONE TOWNSHIP NJ 08535, (732) 462-8450; ELHANNON NURSERIES: PETERSBURGH, NY 12138, (518) 686-5553; OR WM. F. HAMMELL NURSERIES: HONEY BROOK, PA 19344, (610) 942-8733.
6. FOR SHRUBS AND SMALLER MATERIALS, REPRESENTATIVE TAGGING BY THE LANDSCAPE ARCHITECT WILL BE ACCEPTABLE.
7. CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITY LINES PRIOR TO PLANTING AND SHALL REPORT ANY CONFLICTS TO THE LANDSCAPE ARCHITECT.
8. STAKE LOCATION OF ALL PROPOSED PLANTING FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO THE COMMENCEMENT OF PLANTING.
9. NEW PLANTS SHALL BEAR THE SAME RELATIONSHIP TO GRADE AS IT BORE TO PREVIOUS GRADE. TREES SHALL BE SET 3" HIGHER THAN PREVIOUS GRADE. NO TREES SHALL BE PLANTED BEFORE ACCEPTANCE OF ROUGH GRADING.
10. ALL PLANT BEDS TO RECEIVE TWO INCHES (2") OF BARK MULCH AS PER SPECIFICATIONS.
11. ALL EXISTING TREES TO REMAIN SHALL BE PROPERLY PROTECTED DURING CONSTRUCTION. PROTECTION TECHNIQUES SHALL BE REVIEWED AND APPROVED BY THE LANDSCAPE ARCHITECT.
12. PRUNE TREES IN ACCORDANCE WITH THE SPECIFICATIONS.
13. CONTRACTOR SHALL PROVIDE FULL DEPTHS OF LOAM AS NOTED ON DETAILS AND AS SPECIFIED, FOR ALL PLANTING.
14. CONTRACTOR SHALL PROVIDE ALL LABOR AND WATER REQUIRED TO ESTABLISH PLANTS. DURING THE MAINTENANCE PERIOD THE CONTRACTOR SHALL WATER AS REQUIRED TO INSURE THAT SOIL MOISTURE IS MAINTAINED TO A DEPTH OF SIX INCHES OR GREATER AT ALL TIMES.
15. WATERING SHALL BE DONE IN A MANNER THAT WILL PROVIDE UNIFORM COVERAGE, PREVENT EROSION DUE TO APPLICATION OF EXCESSIVE QUANTITIES OVER SMALL AREAS, AND PREVENT DAMAGE TO THE FINISHED SURFACE BY THE WATERING EQUIPMENT. THE CONTRACTOR SHALL FURNISH SUFFICIENT WATERING EQUIPMENT TO MAINTAIN REQUIRED WATER LEVELS IN THE SOIL.
16. ALL PLANT MATERIAL SHALL BE MAINTAINED BY CONTRACTOR UNTIL FINAL ACCEPTANCE AND GUARANTEED FOR 1 CALENDAR YEAR.
17. ALL LAWN AREAS DISTURBED BY CONSTRUCTION OPERATIONS INSIDE AND OUTSIDE THE LIMIT OF WORK SHALL BE LOAMED AND SEEDED AS SPECIFIED.

PLANTING SCHEDULE

Sym.	Qty.	Botanical Name	Common Name	Size	Comments
Deciduous Trees					
AR		Acer rubrum 'Red Sunset'	Red Sunset Red Maple	4"-4.5" cal.	B&B, Matched
GT		Gleditsia triacanthos var. inermis 'Halka'	Halka Thornless Honeylocust	4"-4.5" cal.	B&B, Matched
GD		Gymnocladus dioicus 'Espresso'	Kentucky Coffeetree	3"-3.5" cal.	B&B, Matched
LS		Liquidambar styracifliua 'Ward'	Ward Seedless Sweetgum	3"-3.5" cal.	B&B, Matched
LT		Liriodendron tulipifera	Tuliptree	3"-3.5" cal.	B&B, Matched
NS		Nyssa sylvatica	Black Tupelo	3"-3.5" cal.	B&B, Matched
QB		Quercus bicolor	Swamp White Oak	4"-4.5" cal.	B&B, Matched
QC		Quercus coccinea	Scarlet Oak	4"-4.5" cal.	B&B, Matched
QP		Quercus palustris	Pin Oak	4"-4.5" cal.	B&B, Matched
TA		Tilia americana 'Redmond'	Redmond American Linden	4"-4.5" cal.	B&B, Matched
UA		Ulmus americana 'Accolade'	Morton Accolade American Elm	4"-4.5" cal.	B&B, Matched
Evergreen Trees					
IO		Ilex opaca 'Jersey Princess'	Jersey Princess American Holly	8'-10' ht.	B&B, Full to base
JV		Juniperus virginiana 'Emerald Sentinel'	Eastern Redcedar	8'-10' ht.	B&B, Full to base
PS		Pinus strobus 'Fastigiata'	Fastigate White Pine	8'-10' ht.	B&B
TO		Thuja occidentalis 'Nigra'	Dark American Arborvitae	8'-10' ht.	B&B, Full to base
Ornamental Trees					
AC		Amelanchier canadensis	Shadblow Serviceberry	8'-10' ht	Multi-Stem
BN1		Betula nigra 'Heritage'	Heritage River Birch	10'-12' ht.	Single-stem; Spring Dig Only
BN2		Betula nigra 'Heritage'	Heritage River Birch	10'-12' ht.	Multi-stem; Spring Dig Only
BP1		Betula populifolia 'Whitespire'	Gray White Birch	10'-12' ht.	Single-stem; Spring Dig Only
BP2		Betula populifolia 'Whitespire'	Gray White Birch	10'-12' ht.	Multi-stem; Spring Dig Only
CC		Crataegus crus-galli inermis 'Crusader'	Thornless Cockspur Hawthorn	8'-10' ht	B&B, Matched
HI		Hamamelis x intermedia 'Arnold's Promise'	Arnold's Promise Witch-hazel	8'-10' ht	Multi-Stem
MV		Magnolia virginiana	Sweetbay Magnolia	10'-12' ht.	B&B, Matched
RC		Rhus copallinum	Winged Sumac	8'-10' ht	Multi-Stem
RT		Rhus typhina	Staghorn Sumac	8'-10' ht	Multi-Stem
Shrubs / Groundcover					
AU		Arctostaphylos uva-ursi	Bearberry	#2 cont.	18" O.C.
AMV		Aronia melanocarpa 'Viking'	Viking Black Chokeberry	24"-36" ht.	30" O.C.
AMM		Aronia melanocarpa 'Morton'	Iroquois Beauty Dwarf Chokeberry	24"-36" ht.	30" O.C.
CA		Clethra alnifolia 'Sixteen Candles'	Sixteen Candles Summersweet	18"-24" ht.	24" O.C.
CSK		Cornus sericea 'Cardinal'	Red Twig Dogwood	30"-36" ht.	36" O.C.
CSF		Cornus sericea 'Flaviramea'	Yellow Twig Dogwood	30"-36" ht.	36" O.C.
HA		Hydrangea arborescens 'Annabelle'	Annabelle Smooth Hydrangea	24"-36" ht.	30" O.C.
HP		Hydrangea paniculata 'Limelight'	Limelight Hydrangea	30"-36" ht.	36" O.C.
HQ		Hydrangea quercifolia 'Alice'	Alice Oakleaf Hydrangea	30"-36" ht.	36" O.C.
IG		Ilex glabra 'Shamrock'	Shamrock Inkberry	24"-36" ht.	30" O.C.
IVJ		Ilex verticillata 'Jim Dandy'	Winterberry (male)	30"-36" ht.	36" O.C.
IVH		Ilex verticillata 'Hoogendorn'	Winterberry (male)	30"-36" ht.	36" O.C.
IVR		Ilex verticillata 'Red Sprite'	Winterberry (female)	30"-36" ht.	36" O.C.
JH		Juniperus horizontalis 'Bar Harbor'	Creeping Juniper	12"-15" spd.	18" O.C.
MP		Myrica pensylvanica	Northern Bayberry	30"-36" ht.	36" O.C.
RAG		Rhus aromatica 'Gro-Low'	Gro-Low Fragrant Sumac	18"-24" ht.	36" O.C.
VA		Vaccinium angustifolium	Lowbush Blueberry	12"-15" spd.	18" O.C.
VA		Vaccinium angustifolium 'Ruby Carpet'	Ruby Carpet Lowbush Blueberry	12"-15" spd.	18" O.C.
VD		Viburnum dentatum 'Chicago Lustre'	Chicago Lustre Arrowwood Viburnum	3'-4' ht.	48" O.C.
VT		Viburnum trilobum	American Cranberrybush Viburnum	3'-4' ht.	48" O.C.
Sym.	**Qty.**	**Botanical Name**	**Common Name**	**Size**	**Comments**
Perennials / Grasses / Vines					
AR		Actaea racemosa 'James Compton'	James Compton Snakeroot	#2 cont.	18" O.C.
AP		Adiantum pedatum	Northern Maidenhair	#2 cont.	12" O.C.
AAC		Ageratina altissima 'Chocolate'	Chocolate White Snakeroot	#2 cont.	24" O.C.
CB		Carex bromoides	Brome-like Sedge	#2 cont.	18" O.C.
CP		Comptonia peregrina	Sweetfern	#2 cont.	24" O.C.
CR		Coreopsis rosea	Pink Tickseed	#1 cont.	18" O.C.
DM		Dyropteris marginalis	Marginal Wood Fern	#1 cont.	18" O.C.
EP		Echinacea purpurea	Eastern Purple Coneflower	#1 cont.	18" O.C.
ES		Echinacea 'Sunset'	Big Sky Coneflower	#1 cont.	18" O.C.
HGS		Heuchera 'Green Spice'	Green Spice Coralbells	#2 cont.	18" O.C.
HSS		Heuchera 'Silver Scrolls'	Silver Scrolls Coralbells	#2 cont.	18" O.C.
HVA		Heuchera villosa 'Autumn Bride'	Autumn Bride Hairy Alum Root	#2 cont.	18" O.C.
LS		Liatris spicata	Marsh Blazing Star	#2 cont.	15" O.C.
MD		Monarda didyma 'Jacob Cline'	Oswego Tea	#2 cont.	18" O.C.
OS		Onoclea sensibilis	Sensitive Fern	#2 cont.	18" O.C.
OC		Osmunda cinnamomea	Cinnamon Fern	#2 cont.	18" O.C.
PVS		Panicum virgatum 'Shenandoah'	Switchgrass	#2 cont.	24" O.C.
RFG		Rudbeckia fulgida 'Goldsturm'	Black-eyed Susan	#2 cont.	18" O.C.
RP		Ratibida pinnata	Gray Headed Coneflower	#2 cont.	18" O.C.
SH		Sporobolus heterolepsis	Prairie Dropseed	#2 cont.	24" O.C.
SYB		Symphyotrichum laeve 'Blue Bird'	Smooth Aster	#2 cont.	12" O.C.
SYB		Symphyotrichum novae-angliae 'Alma Potschke'	Alma Potschke New England Aster	#2 cont.	18" O.C.
SYB		Symphyotrichum novae-angliae 'Purple Dome'	Purple Dome New England Aster	#2 cont.	18" O.C.
SYB		Symphyotrichum novai-belgii 'Wood's Pink'	New York Aster	#2 cont.	12" O.C.
SYB		Symphyotrichum oblongifolium 'Raydon's Favorite'	Aromatic Aster	#2 cont.	12" O.C.
Sym.	**Qty.**	**Botanical Name**	**Common Name**	**Size**	**Comments**
Raingarden Planting					
AM		Achillea millefolium	Common Yarrow	#2 cont.	18" O.C.
AG		Andropogon gerardii	Big Bluestem	#2 cont.	24" O.C.
CP		Comptonia peregrina	Sweetfern	#2 cont.	24" O.C.
DC		Deschampsia cespitosa	Tufted Hair Grass	#2 cont.	24" O.C.
IV		Iris versicolor	Blue Flag Iris	#2 cont.	12" O.C.
PVP		Panicum virgatum 'Prairie Fire'	Prairie Fire Switch Grass	#2 cont.	18" O.C.

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ORIGINAL SHEET - ARCH E1

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Notes

Issued/Revision	By	Appd	YYYY.MM.DD
DESIGN DEVELOPMENT			2018.05.04

File Name: N/A	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
	AA/AS	JC/AA	JC	2018.05.04

Permit/Seal

MASSACHUSETTS · JOHN HENRY COPLEY, JR. · No. 726 · REGISTERED LANDSCAPE ARCHITECT

Client/Project Logo

Nordblom

Client/Project
NORDBLOM

THE BEAT

135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

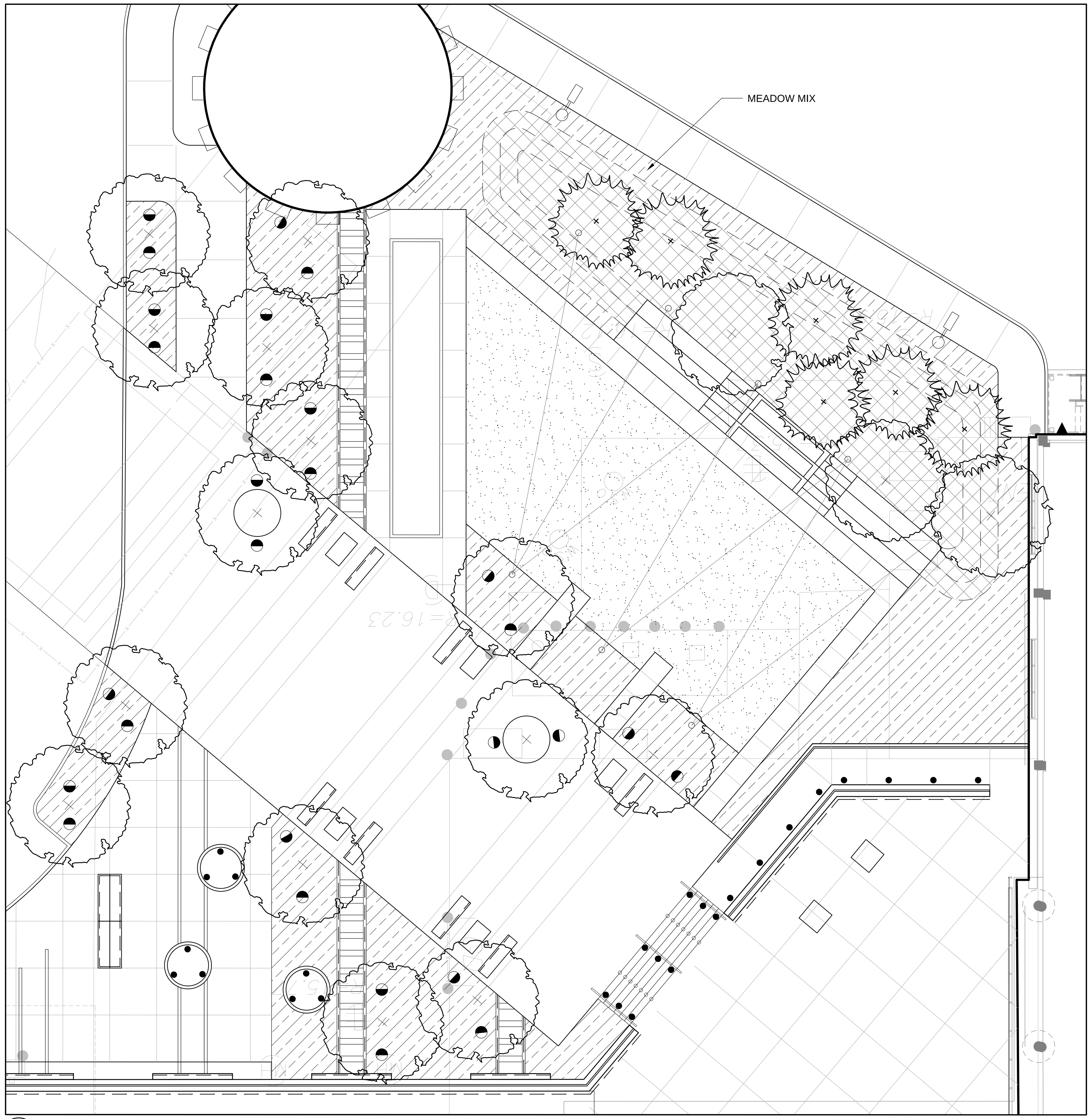
Title
PLANTING PLAN

Project No. 218421012

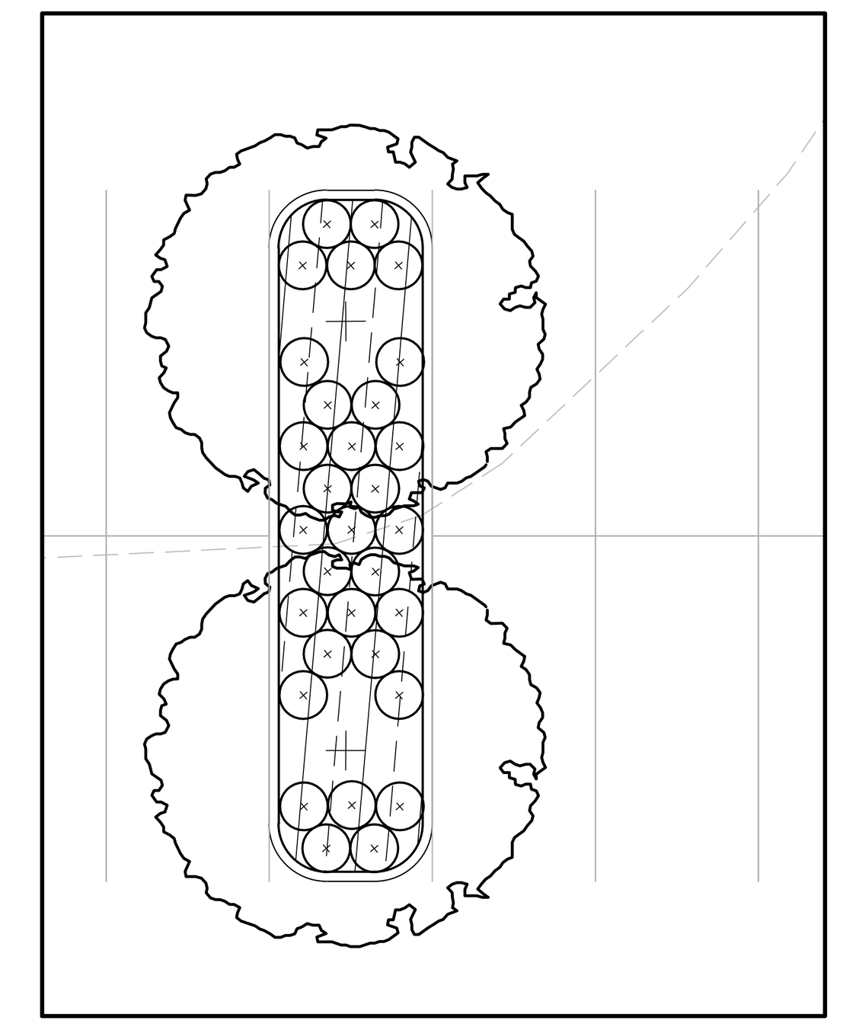
Scale 1" = 40' - 0"

Revision

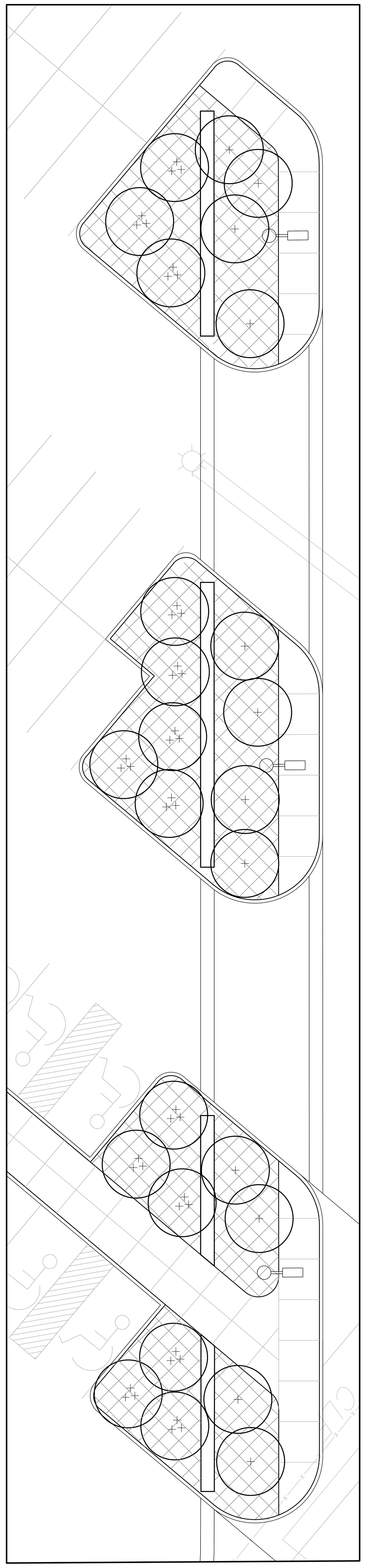
Drawing No. **L3.0**



2 SOUTH ENTRY PLANTING PLAN ENLARGEMENT
SCALE: 1" = 10'



1 TYPICAL PARKING ISLAND PLAN ENLARGEMENT
SCALE: 1" = 10'



1 PARKING SCREEN PLANTING PLAN ENLARGEMENT
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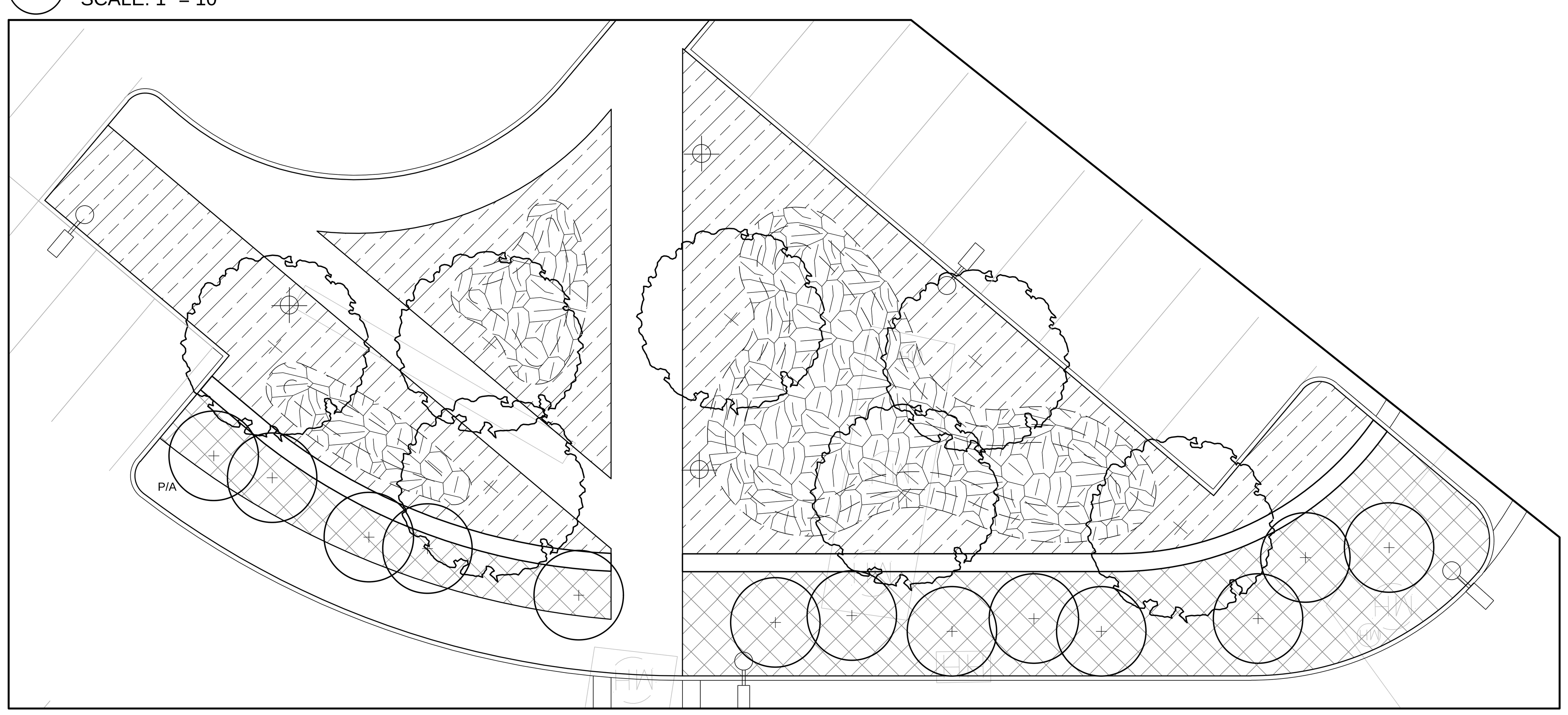

3 RAIN GARDEN PLANTING PLAN ENLARGEMENT
SCALE: 1" = 10'

GRAPHIC SCALE
0 5' 10' 20' 40'

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	AA/AS	JC/AA	JC	2018.05.04

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MASSACHUSETTS JOHN HENRY COPLEY, JR. No. 756 REGISTERED LANDSCAPE ARCHITECT

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THE BEAT

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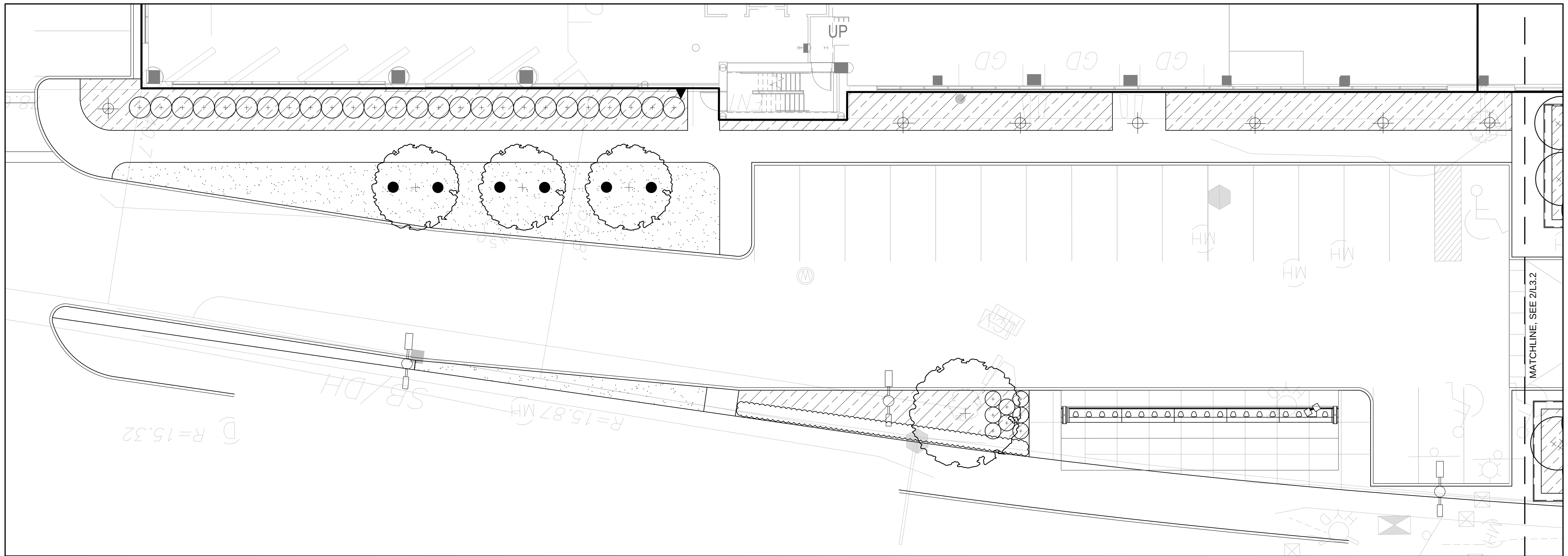
Title
PLANTING ENLARGEMENT PLANS SOUTH

Project No.
218421012

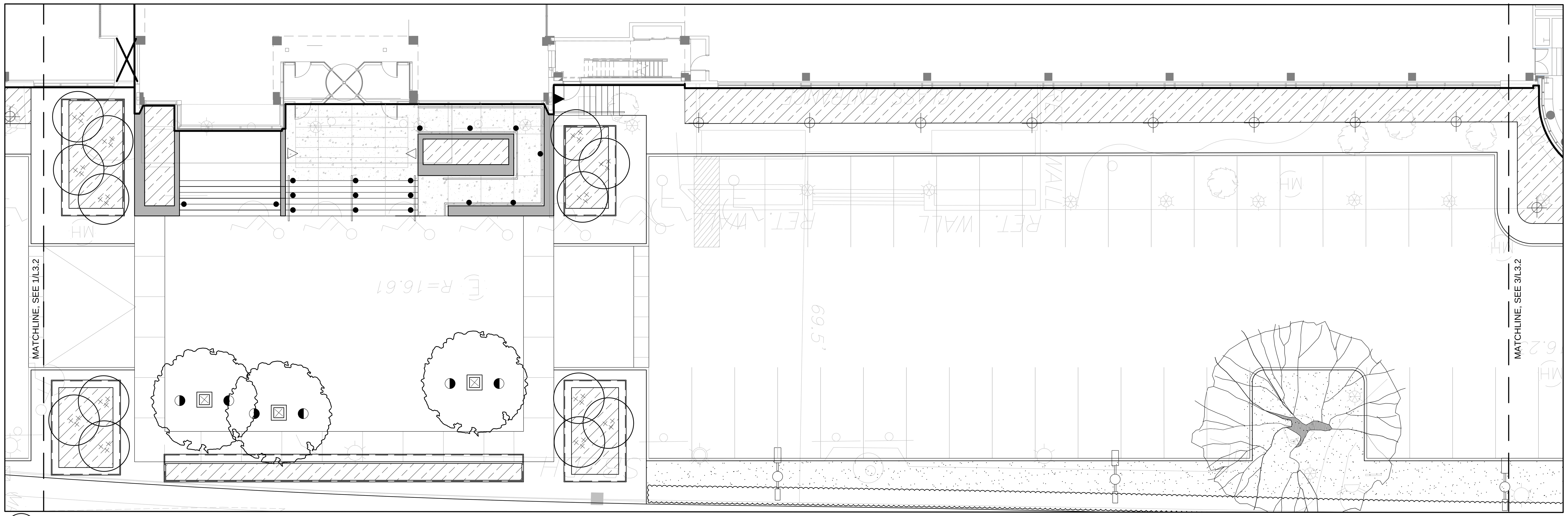
Scale
1" = 10' - 0"

Revision

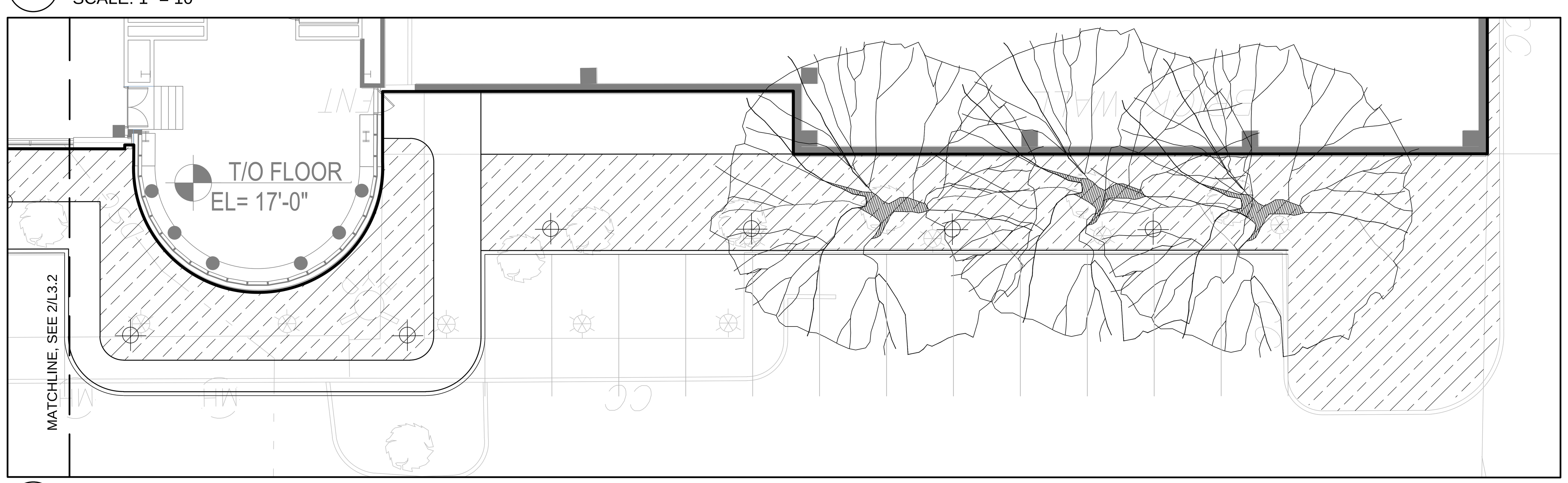
Drawing No.
L3.1



1 EAST ENTRY PLANTING PLAN ENLARGEMENT 'A'
SCALE: 1" = 10'



2 EAST ENTRY PLANTING PLAN ENLARGEMENT 'B'
SCALE: 1" = 10'



3 EAST ENTRY PLANTING PLAN ENLARGEMENT 'C'
SCALE: 1" = 10'

GRAPHIC SCALE
0 5' 10' 20' 40'

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THE BEAT

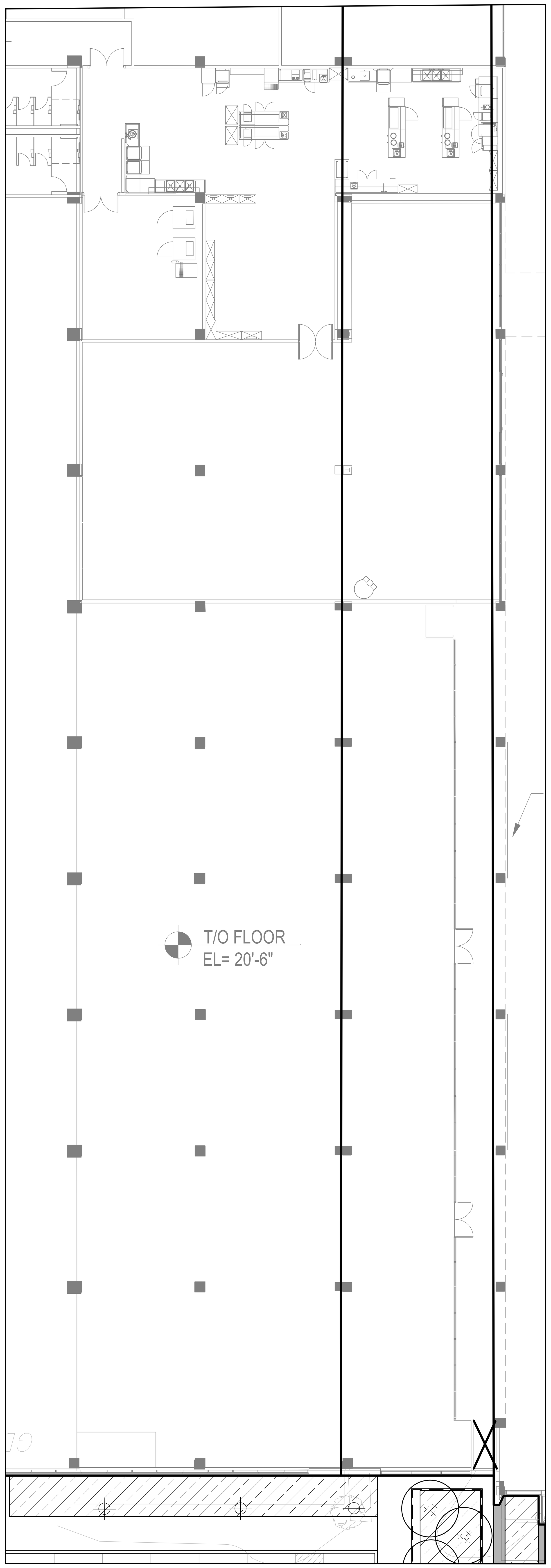
135 WILLIAM T MORRISSEY BLVD, BOSTON, MA 02125

Title
PLANTING ENLARGEMENT PLANS
EAST
1" = 40' - 0"

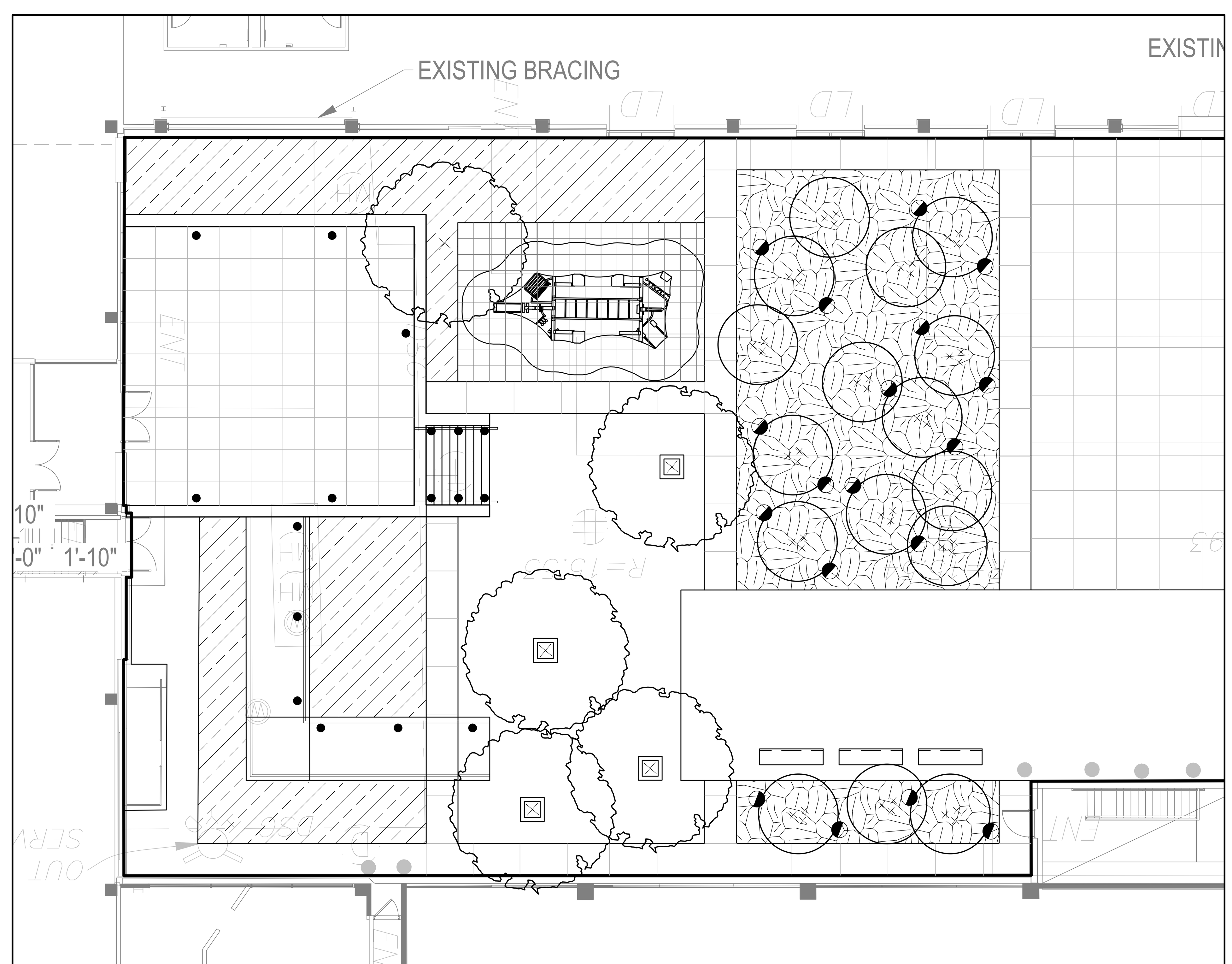
Project No. 218421012
Scale 1" = 10' - 0"

Revision

Drawing No.
L3.2



1 ROOF TERRACE PLANTING PLAN ENLARGEMENT
SCALE: 1" = 10"



1 NORTH ENTRY PLANTING PLAN ENLARGEMENT
SCALE: 1" = 10"

GRAPHIC SCALE
0 5' 10' 20' 40'

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DESIGN DEVELOPMENT			2018.05.04

File Name: N/A	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
	AA/AS	JC/AA	JC	2018.05.04

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135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

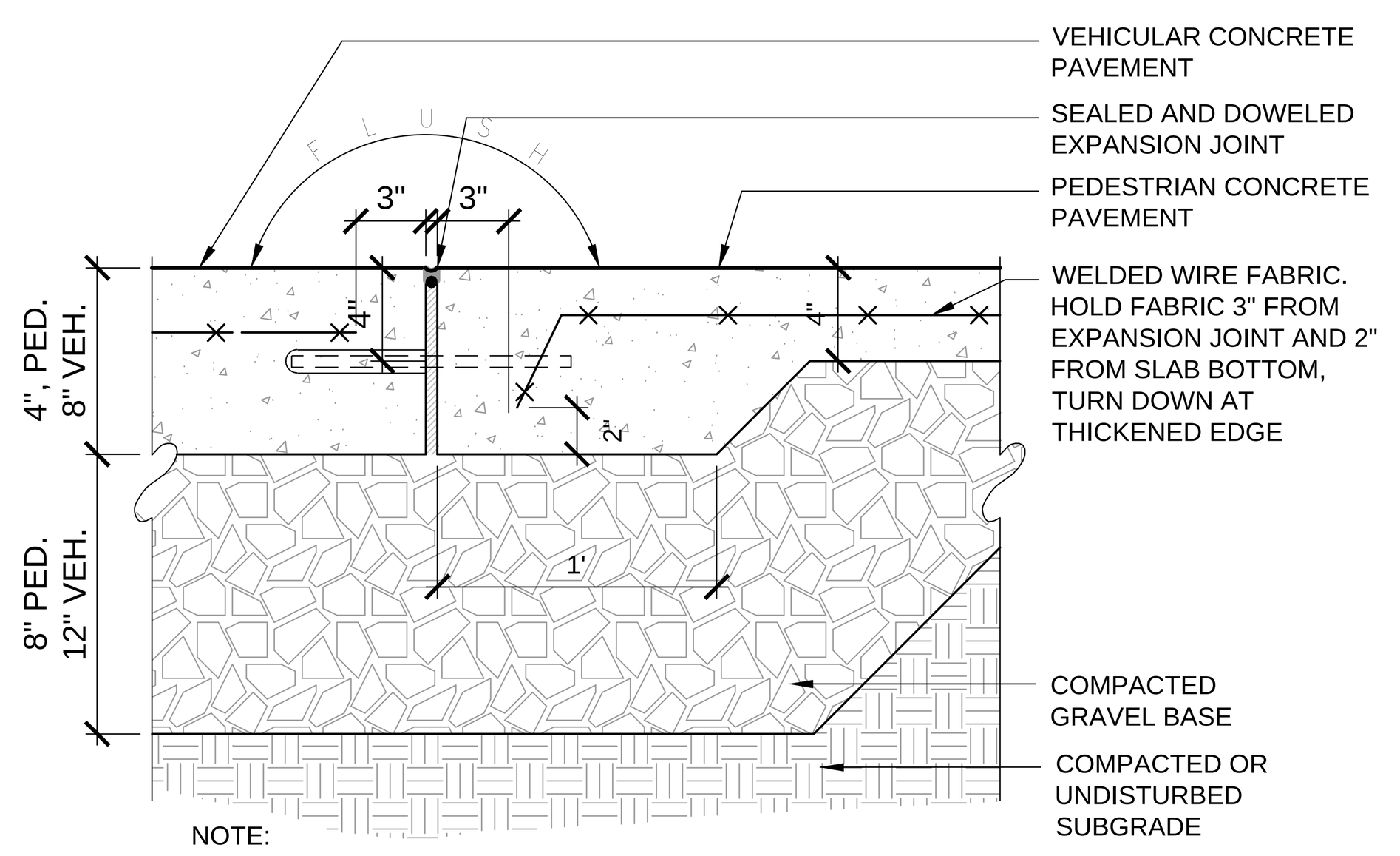
Title
PLANTING ENLARGEMENT PLANS
NORTH AND ROOF TERRACE

Project No.
218421012

Scale
1" = 10' - 0"

Revision

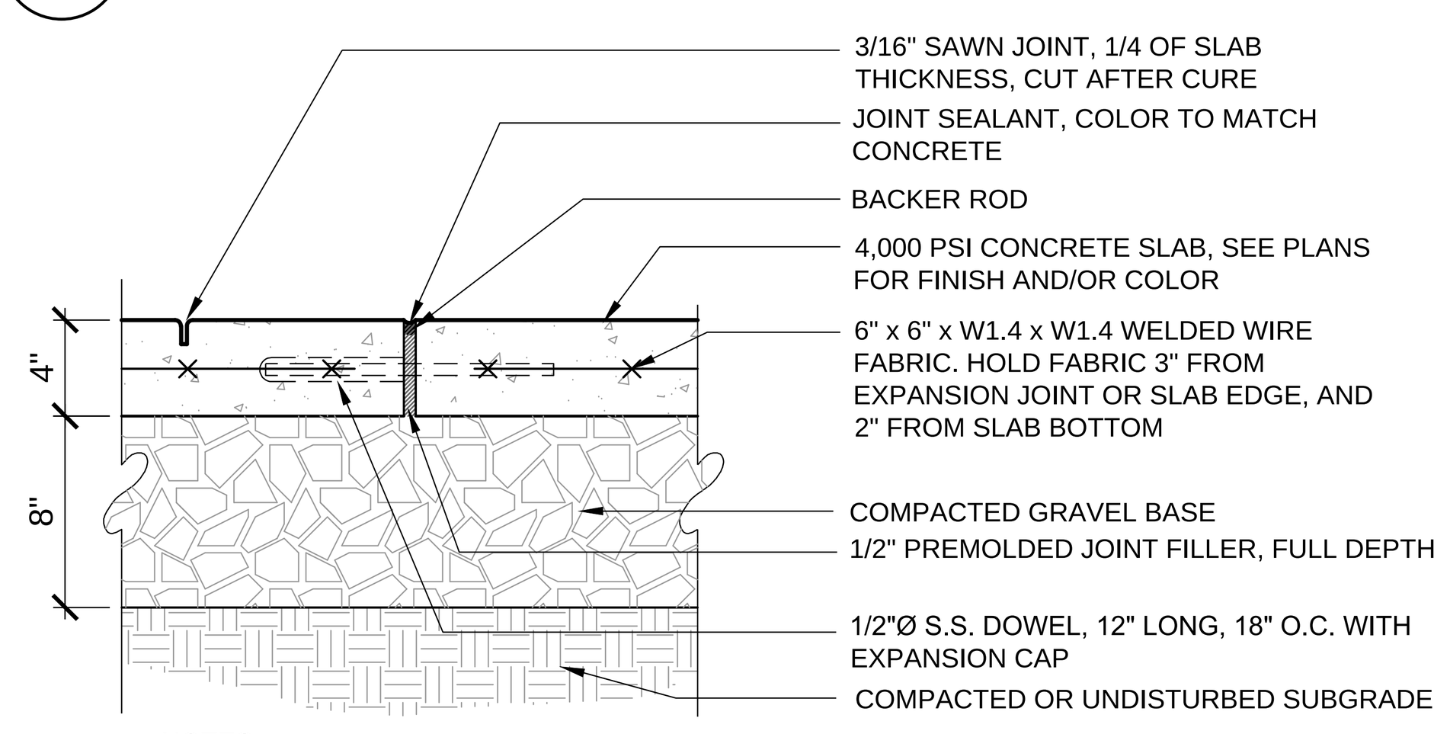
Drawing No.
L3.3



NOTE:
1. PROVIDE 12" DEEP X 8" WIDE THICKENED EDGE AT JOINT WITH BITUMINOUS PAVEMENT OR PLANTING BEDS.

JOINT AT CONCRETE PAVEMENT

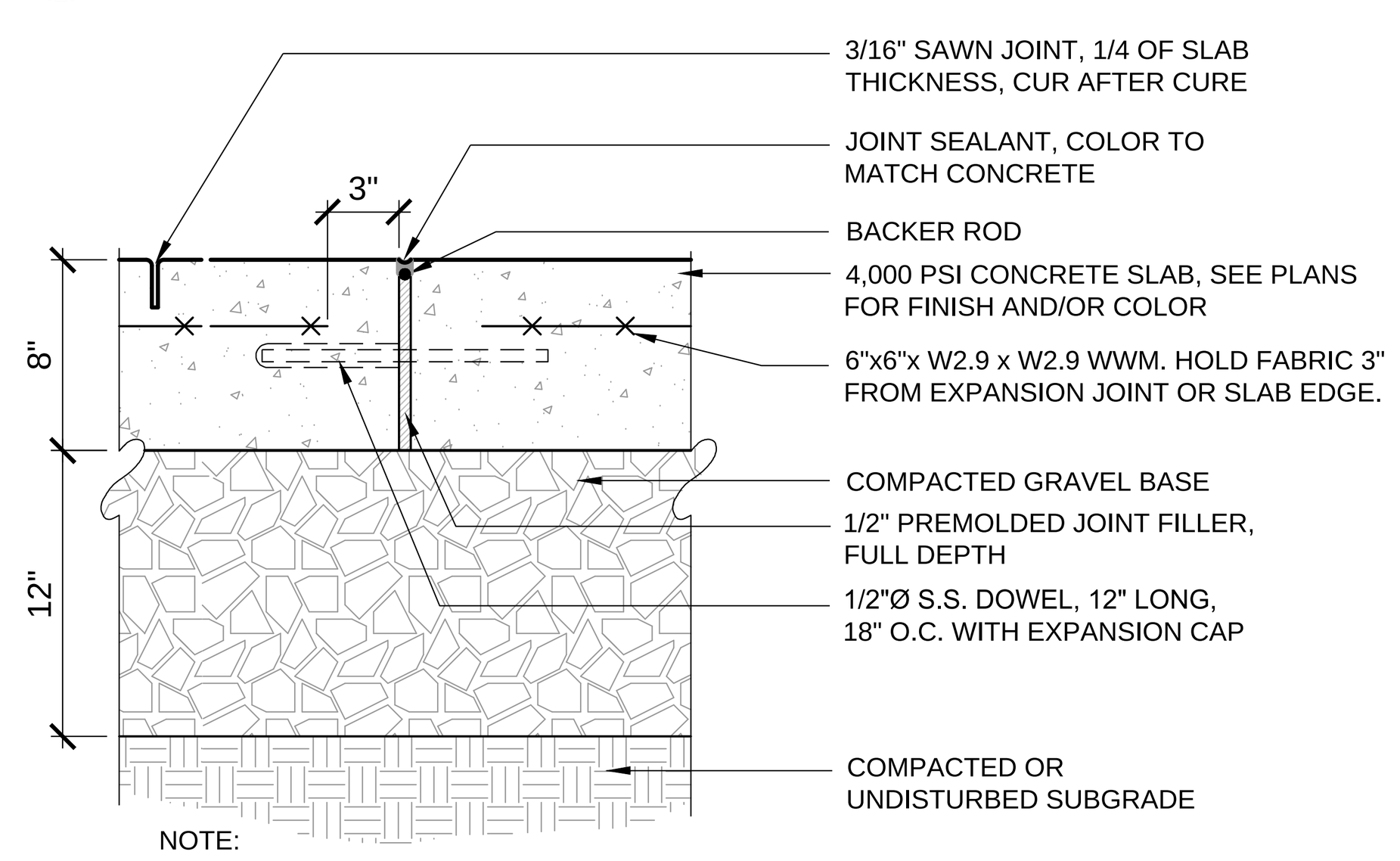
SCALE: 1-1/2"=1'-0"



NOTES:
1. CONTROL JOINTS EVERY 5' UNLESS OTHERWISE SHOWN ON PLAN
2. EXPANSION JOINTS EVERY 20' UNLESS OTHERWISE SHOWN ON PLAN
3. PROVIDE 10" DEEP THICKENED EDGE AT PLANTING BEDS, 6" WIDTH

PEDESTRIAN CONCRETE PAVEMENT

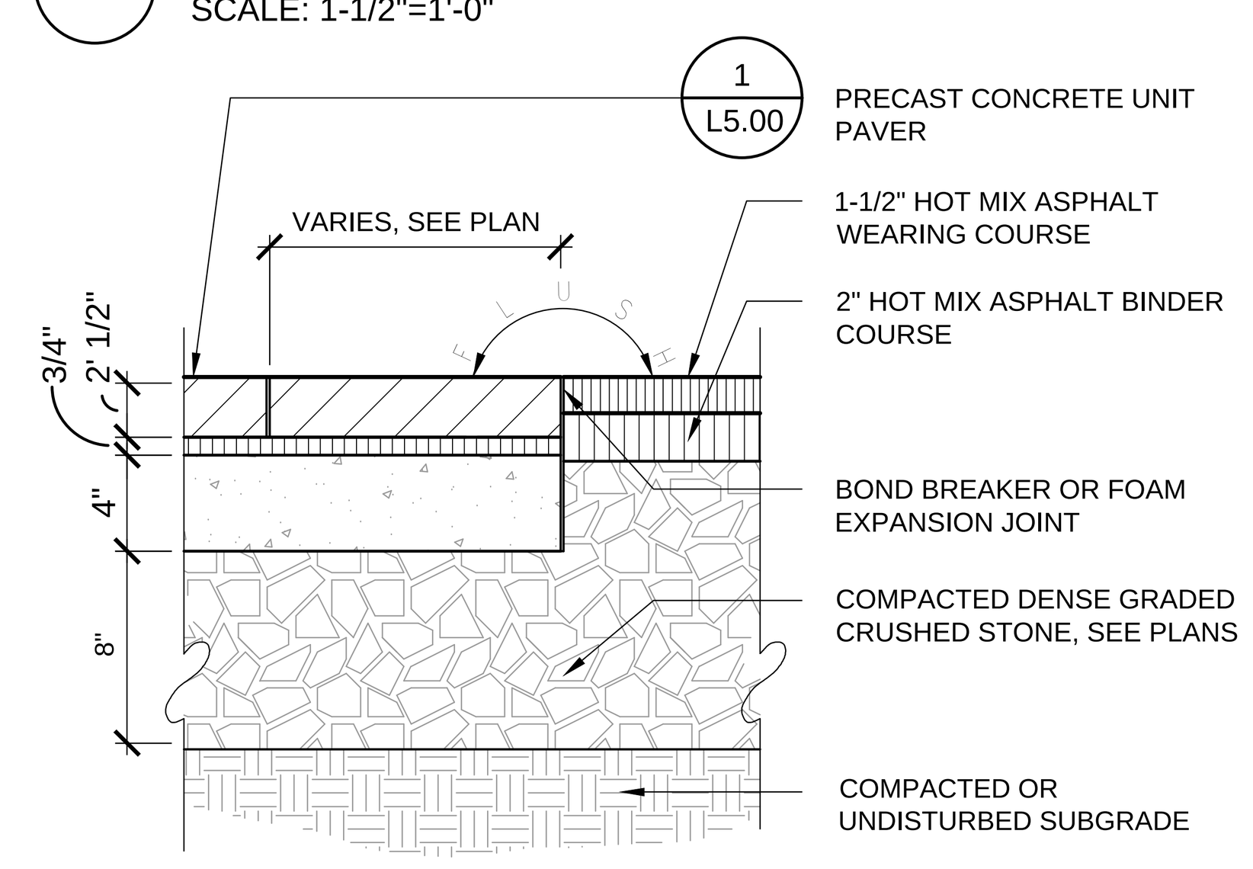
SCALE: 1-1/2"=1'-0"



NOTE:
1. CONTROL JOINTS EVERY 5' O.C. UNLESS OTHERWISE SHOWN ON PLAN.
2. EXPANSION JOINTS EVERY 20' O.C. UNLESS OTHERWISE SHOWN ON PLAN.
3. PROVIDE 12" DEEP X 6" WIDE THICKENED EDGE AT JOINT WITH BITUMINOUS PAVEMENT OR PLANTING BEDS.

VEHICULAR CONCRETE PAVEMENT

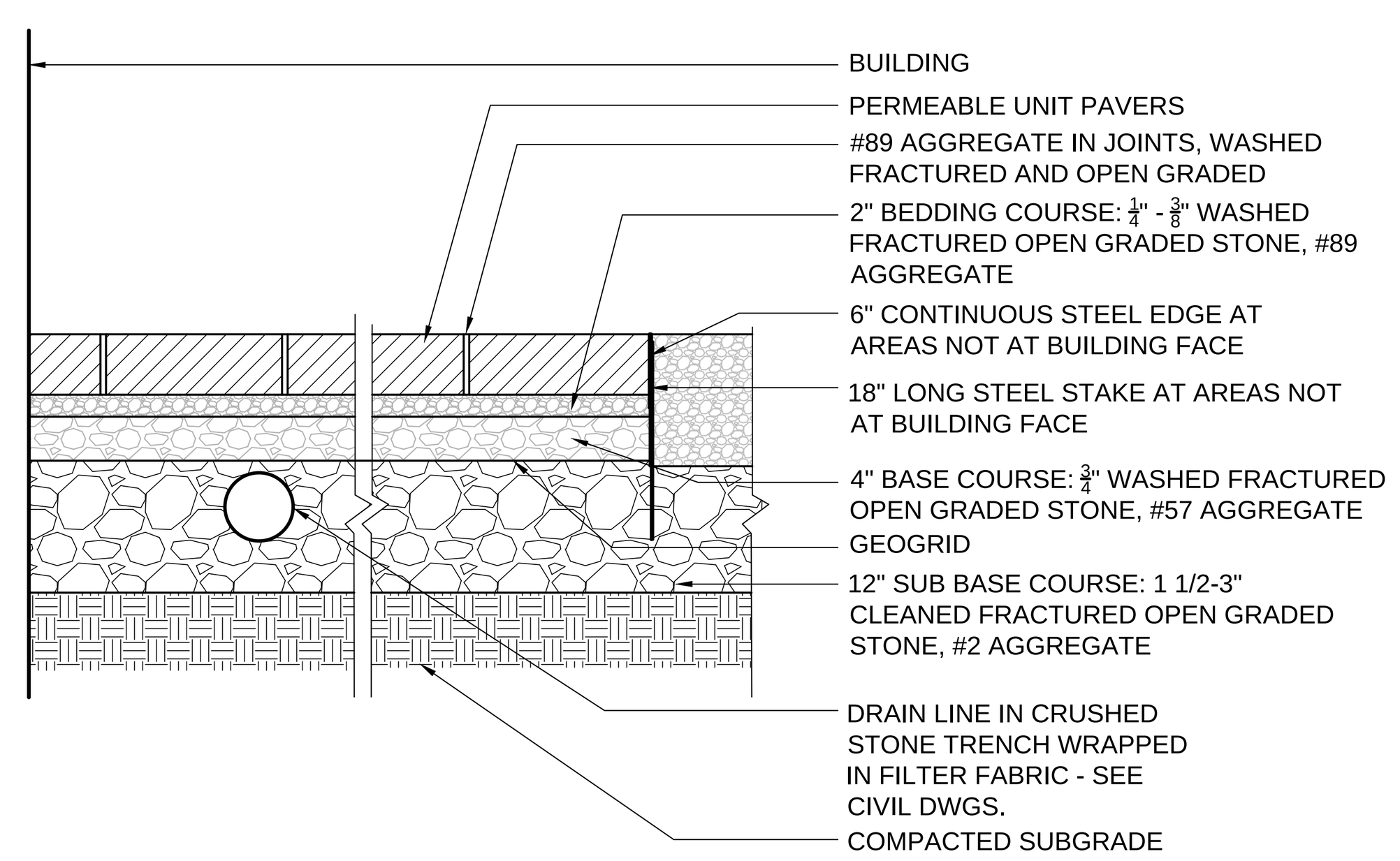
SCALE: 1-1/2"=1'-0"



NOTE:
1. EXPANSION JOINT EVERY 20'-0" O.C., OR AS SHOWN ON THE DRAWINGS.

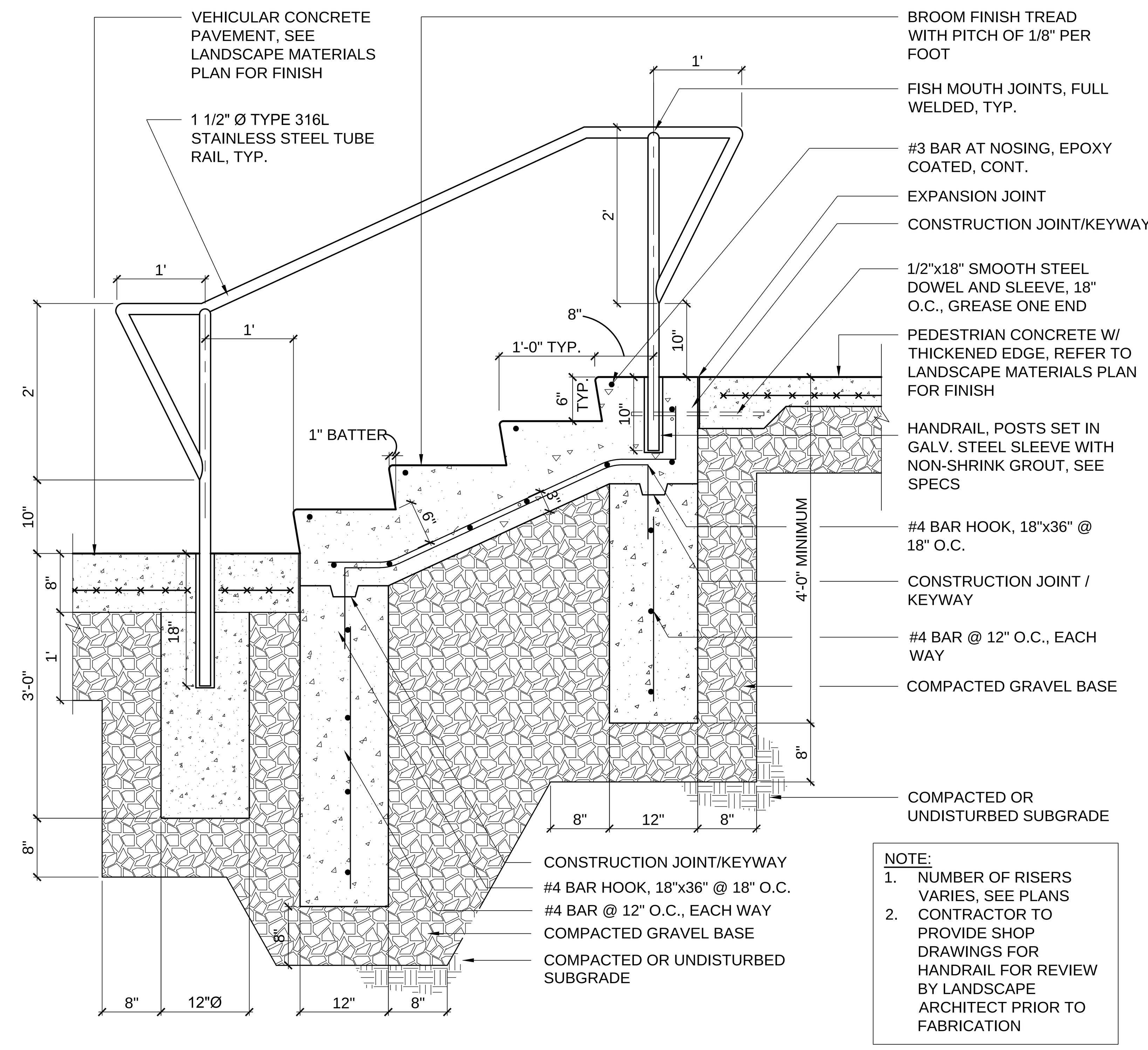
UNIT PAVERS AT BITUMINOUS CONC.

SCALE: 1-1/2"=1'-0"



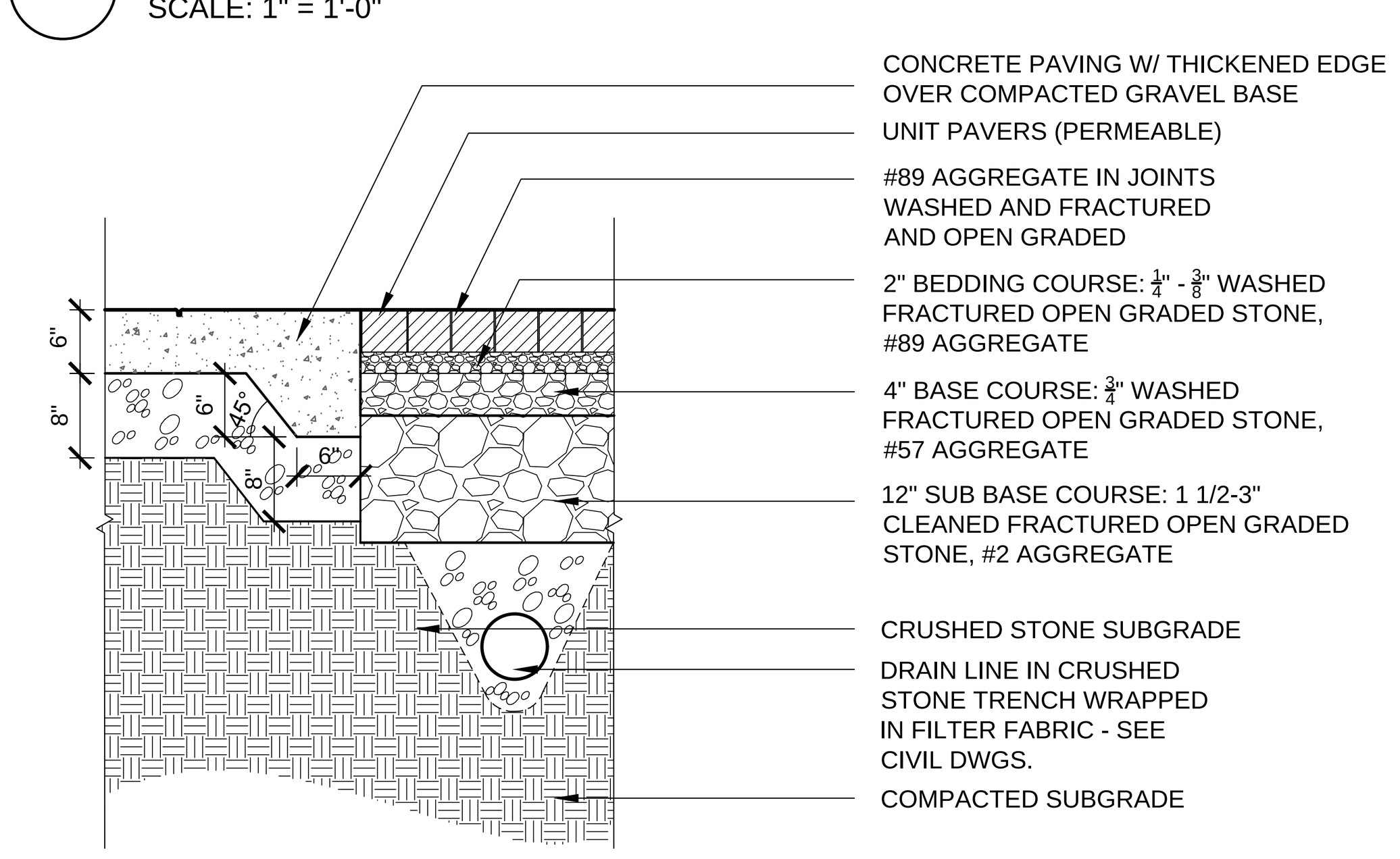
PERMEABLE UNIT PAVER - PEDESTRIAN

SCALE: 3/4" = 1'-0"



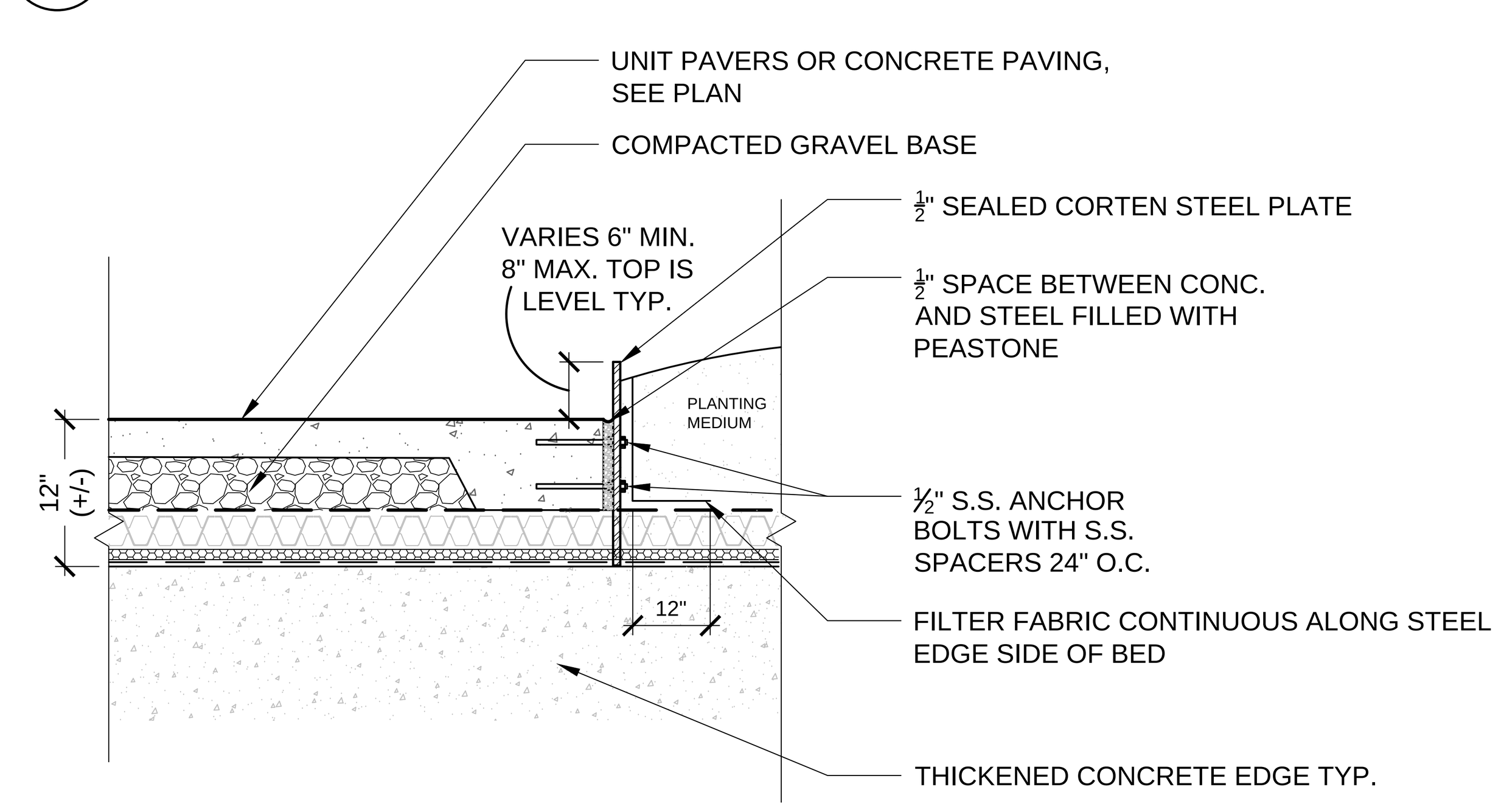
CONCRETE STAIRS AND HANDRAIL

SCALE: 1" = 1'-0"



PERMEABLE UNIT PAVERS AT CONCRETE PAVING

SCALE: 3/4" = 1'-0"

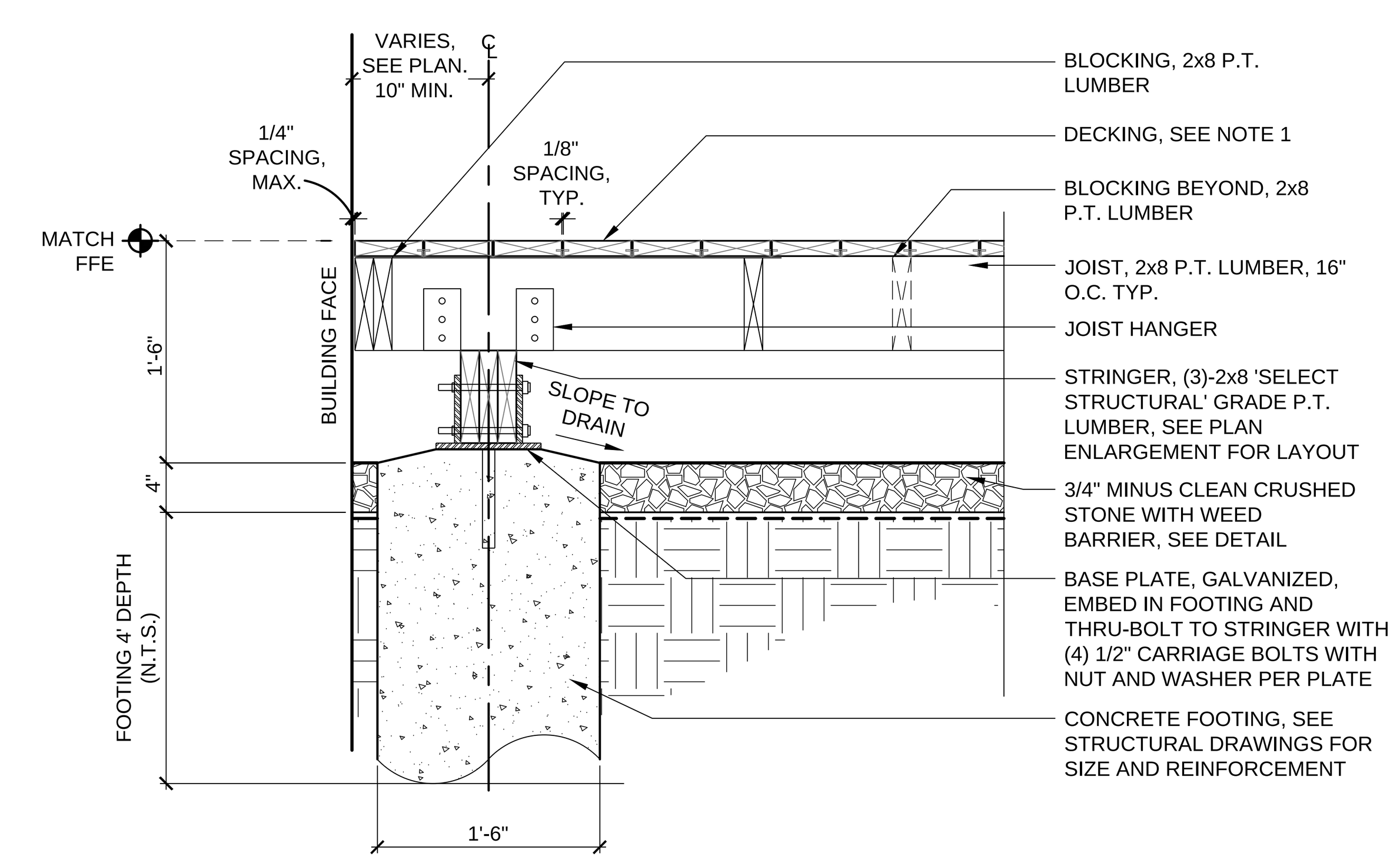


NOTE:
1. PROVIDE SHOP DRAWING PRIOR TO FABRICATION.

CORTEN STEEL PLANTER EDGE

SCALE: 3/4" = 1'-0"

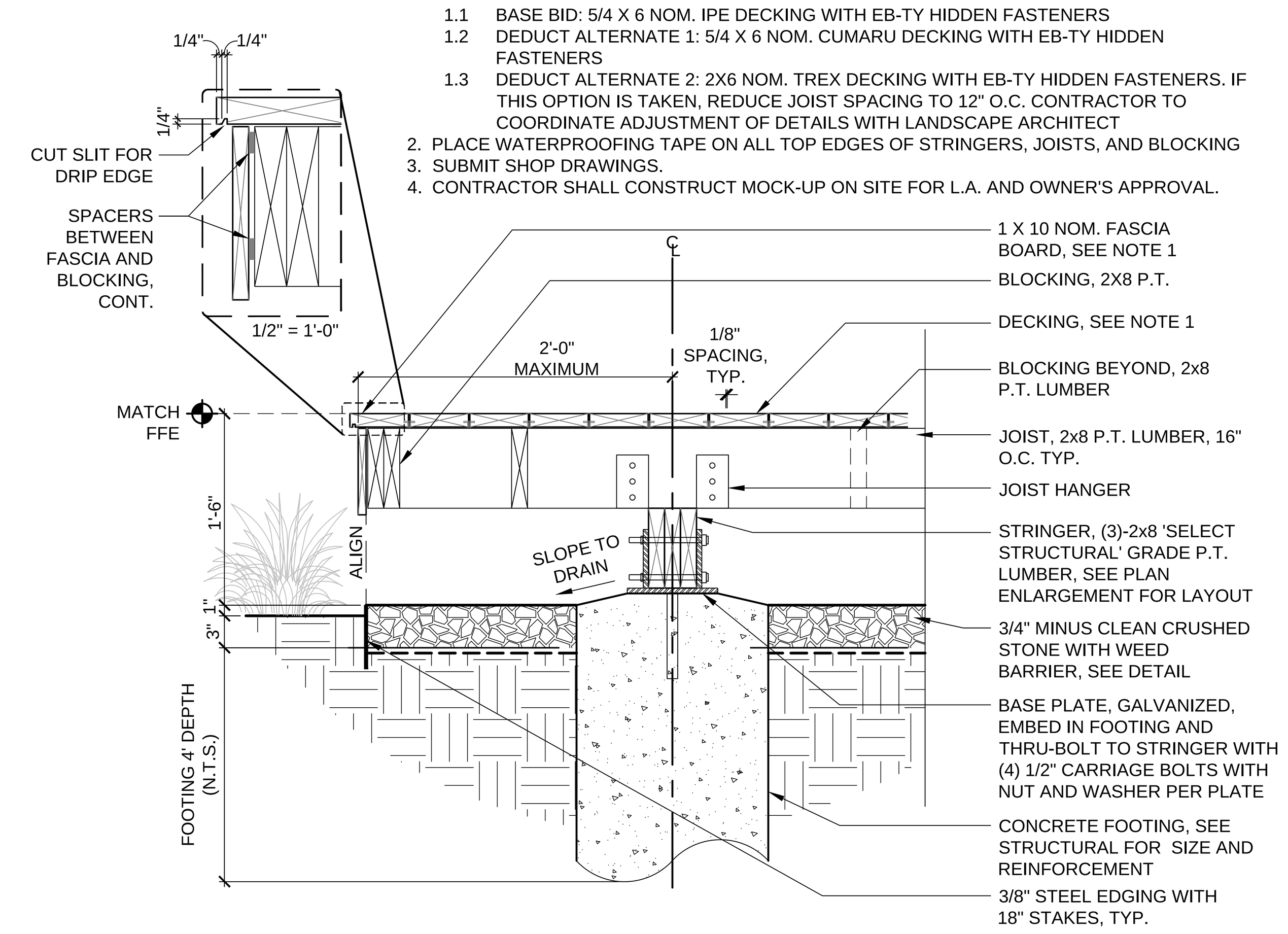
NOTES:
1. REFER TO 'WOOD DECK SECTION' NOTES



WOOD DECKING AT BUILDING

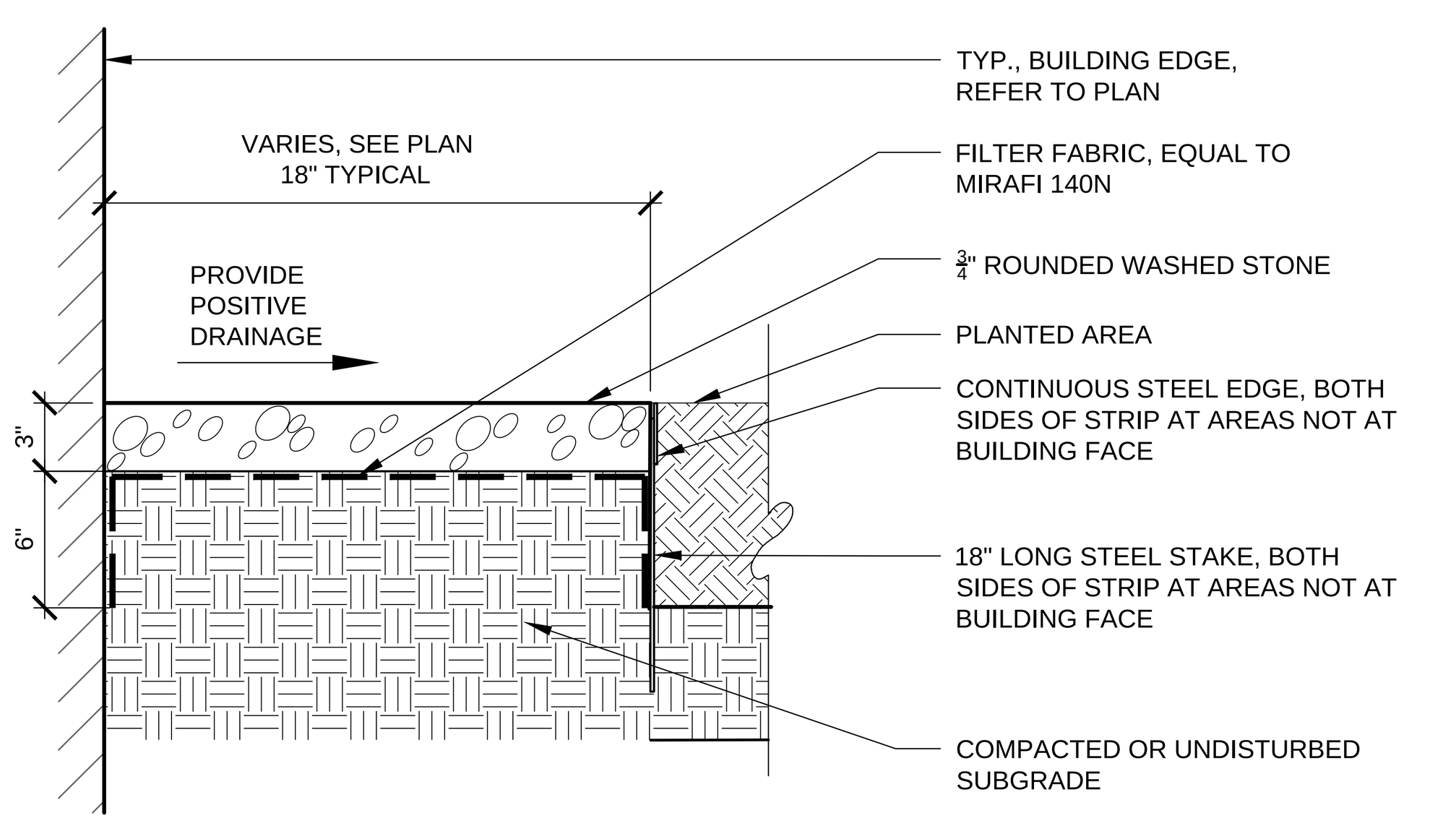
SCALE: 1" = 1'-0"

NOTES:
1. DECKING AND FASCIA BOARD TO BE AS FOLLOWS:
   1.1 BASE BID: 5/4 X 6 NOM. IPE DECKING WITH EB-TY HIDDEN FASTENERS
   1.2 DEDUCT ALTERNATE 1: 5/4 X 6 NOM. CUMARU DECKING WITH EB-TY HIDDEN FASTENERS
   1.3 DEDUCT ALTERNATE 2: 2X6 NOM. TREX DECKING WITH EB-TY HIDDEN FASTENERS. IF THIS OPTION IS TAKEN, REDUCE JOIST SPACING TO 12" O.C. CONTRACTOR TO COORDINATE ADJUSTMENT OF DETAILS WITH LANDSCAPE ARCHITECT
2. PLACE WATERPROOFING TAPE ON ALL TOP EDGES OF STRINGERS, JOISTS, AND BLOCKING
3. SUBMIT SHOP DRAWINGS.
4. CONTRACTOR SHALL CONSTRUCT MOCK-UP ON SITE FOR L.A. AND OWNER'S APPROVAL.



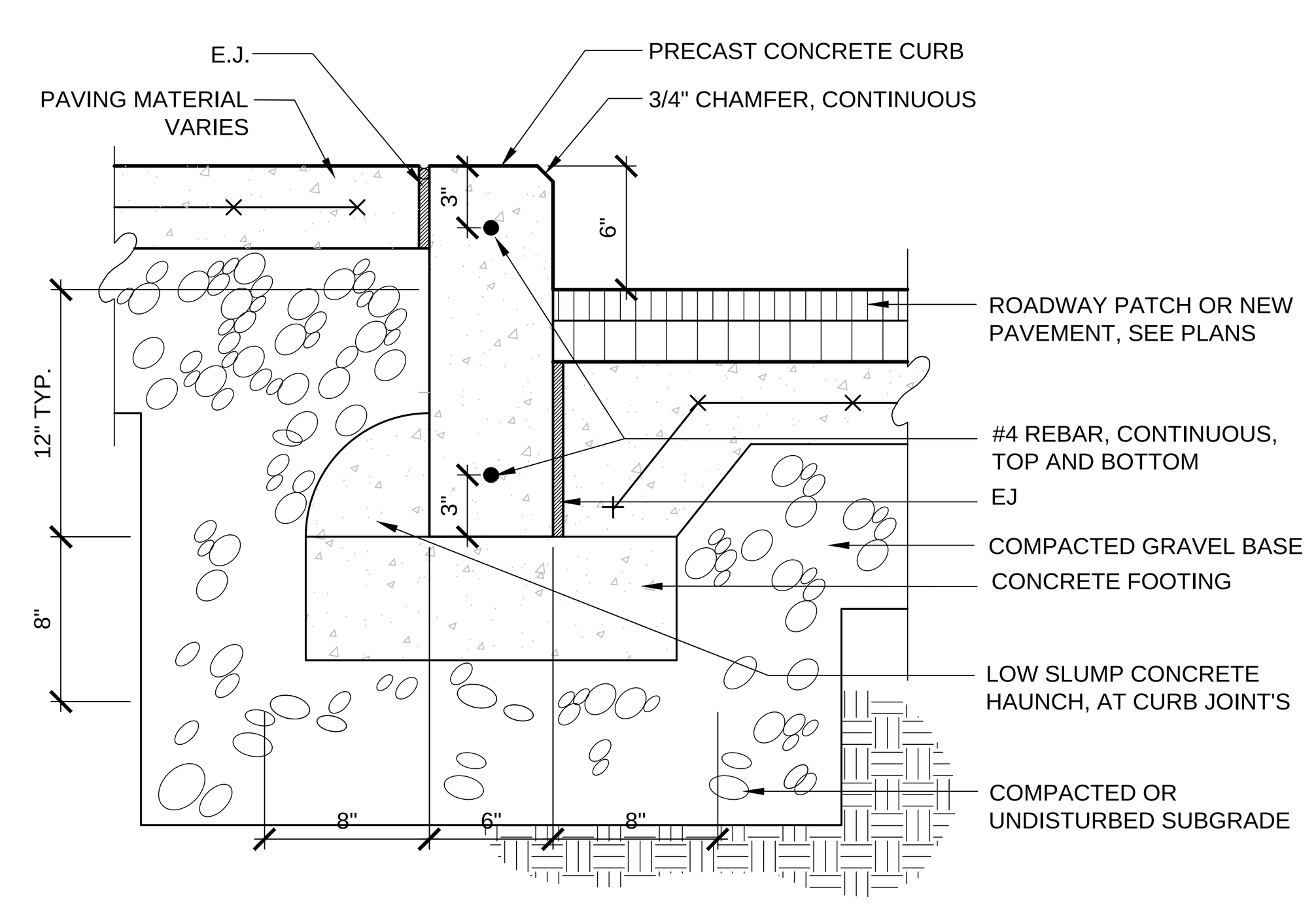
WOOD DECKING

SCALE: 1" = 1'-0"



GRAVEL MAINTENANCE STRIP

SCALE: 1-1/2" = 1'-0"



6" PRECAST CONCRETE CURB

SCALE: 1-1/2"=1'-0"

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Notes

DESIGN DEVELOPMENT			2018.05.04
SCHEMATIC DESIGN			2018.03.09
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File Name: N/A	AA/AS	JC/AA	JC	2018.05.04
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

MASSACHUSETTS REGISTERED LANDSCAPE ARCHITECT JOHN HENRY CO... No. 756

Client/Project Logo

Nordblom

Client/Project
NORDBLOM

THE BEAT

135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

Title
LANDSCAPE SITE DETAILS:
PAVING AND STEPS

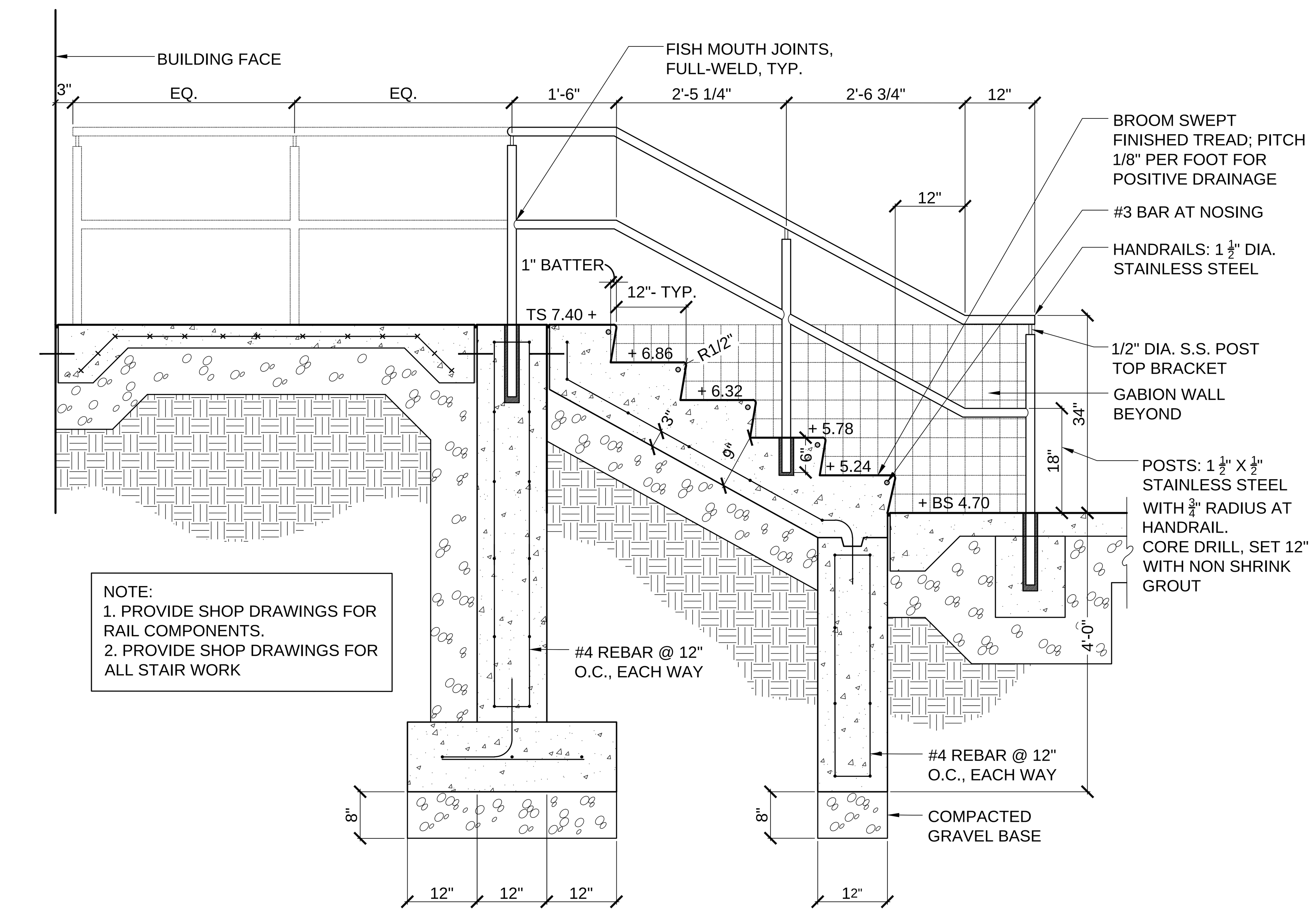
Project No.
218421012

Scale

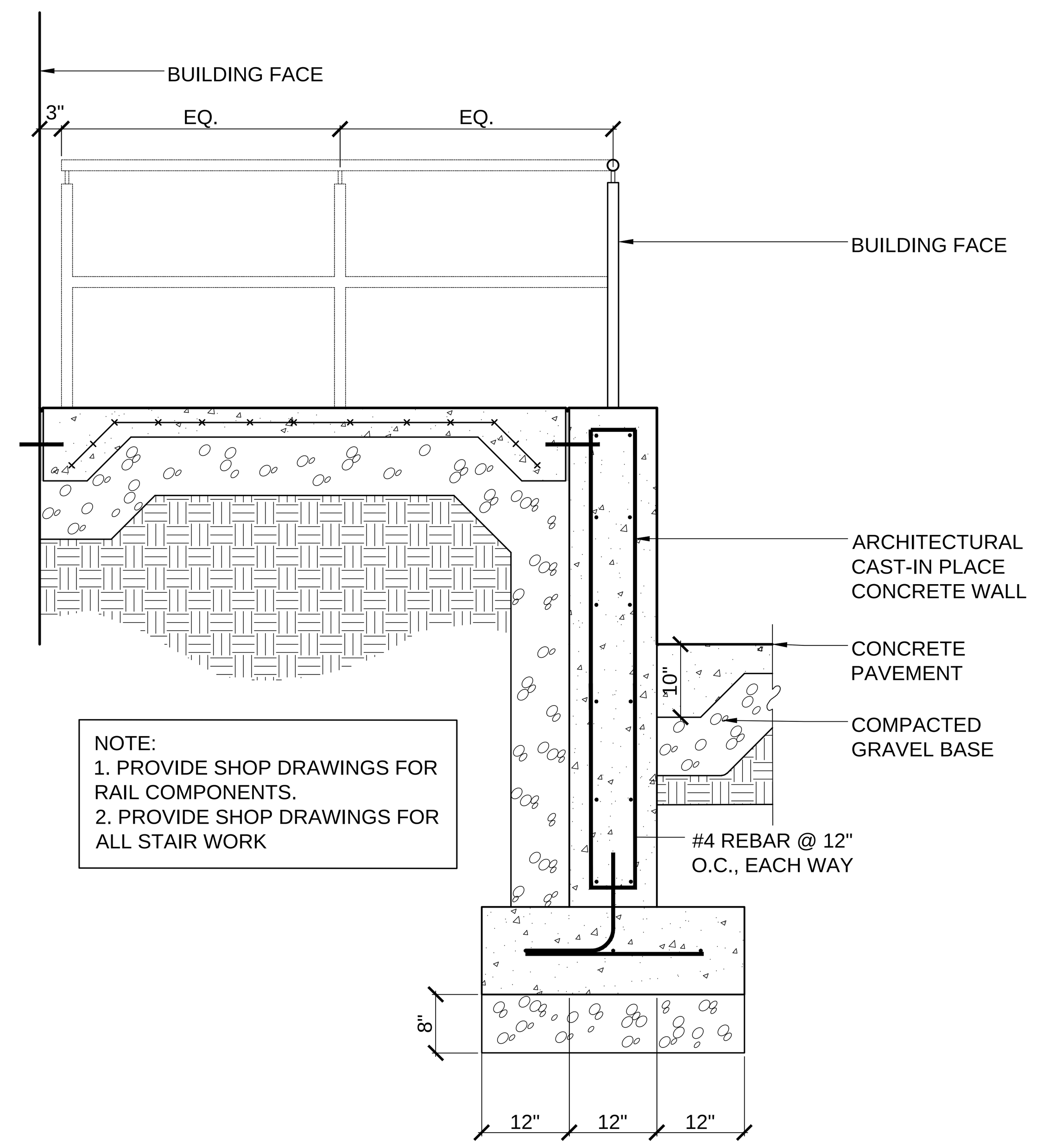
Revision

Drawing No.
L5.0

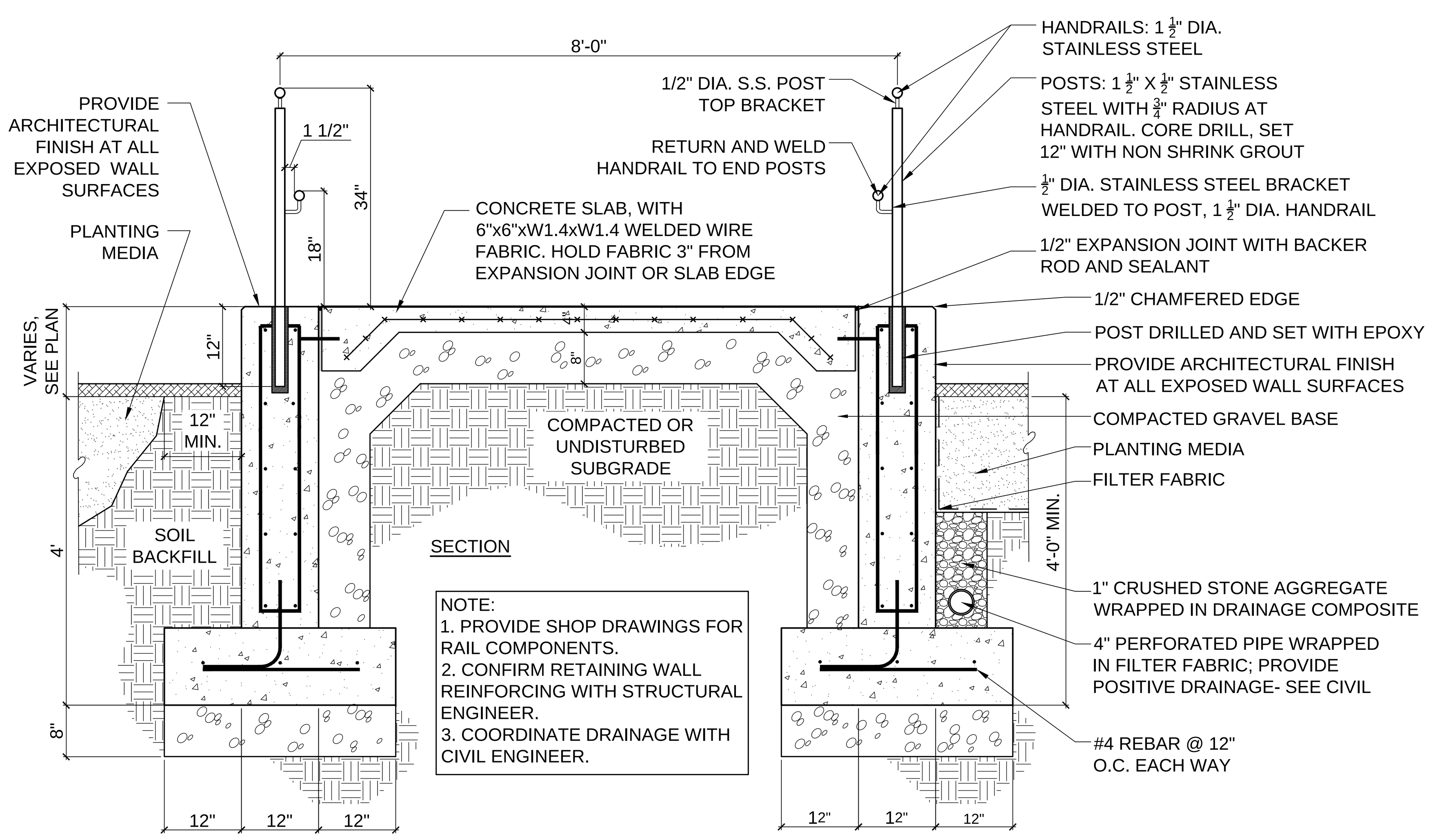
ORIGINAL SHEET - ARCH E1



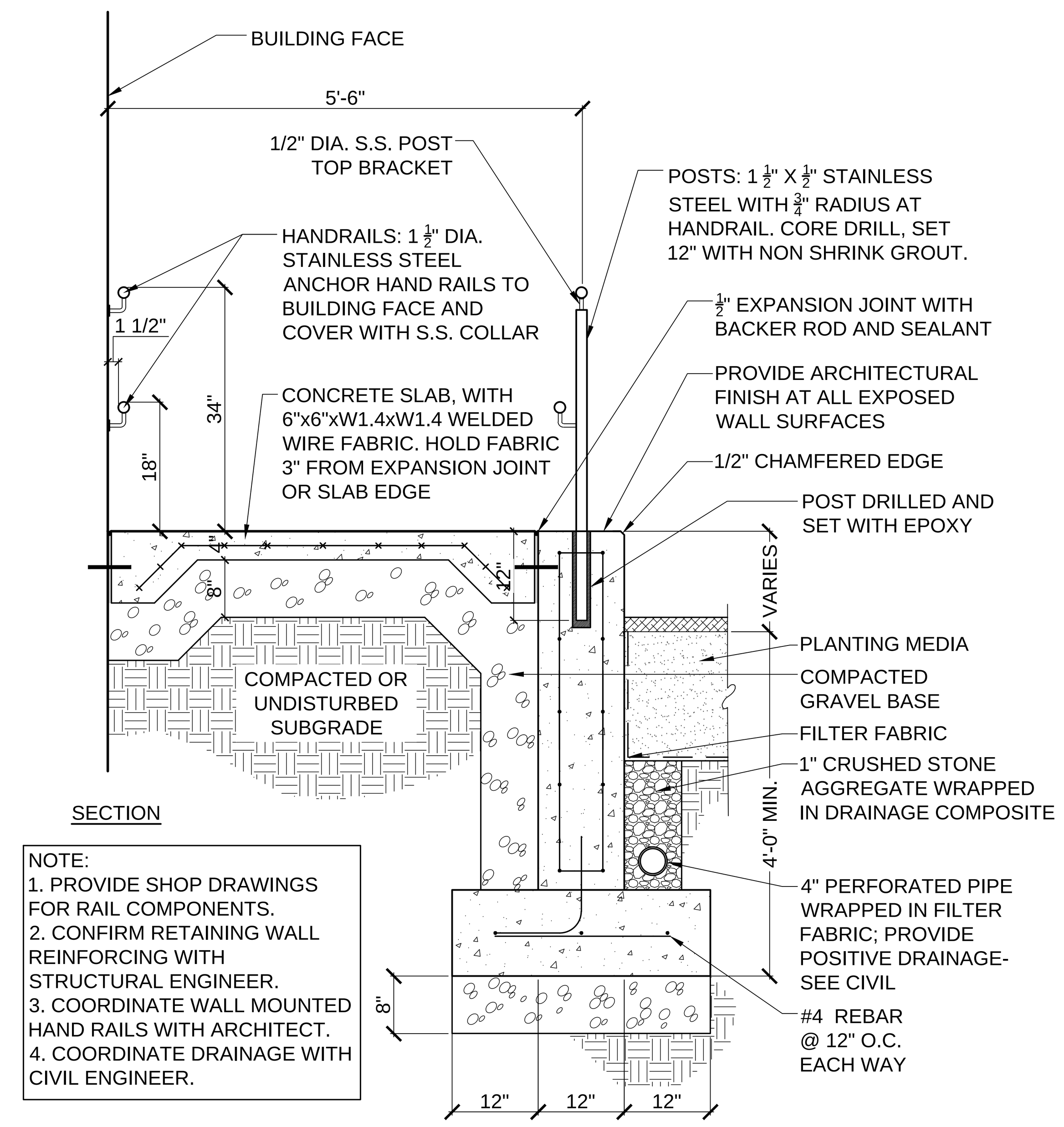
STEEL HANDRAILS AT CONCRETE STAIRS
SCALE: 3/4"=1'-0"



ARCHITECTURAL CONCRETE WALL AT RAMP
SCALE: 3/4"=1'-0"



STEEL HANDRAILS AT CONCRETE RAMP
SCALE: 3/4"=1'-0"



STEEL HANDRAILS AT CONCRETE RAMP
SCALE: 3/4"=1'-0"

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DESIGN DEVELOPMENT			2018.05.04
Issued/Revision	By	Appd	YYYY.MM.DD
File Name: N/A	AA/AS	JC/AA	JC	2018.05.04
	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

Client/Project Logo

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NORDBLOM

THE BEAT

135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

Title
LANDSCAPE SITE DETAILS:
PAVING AND STEPS

Project No.
218421012

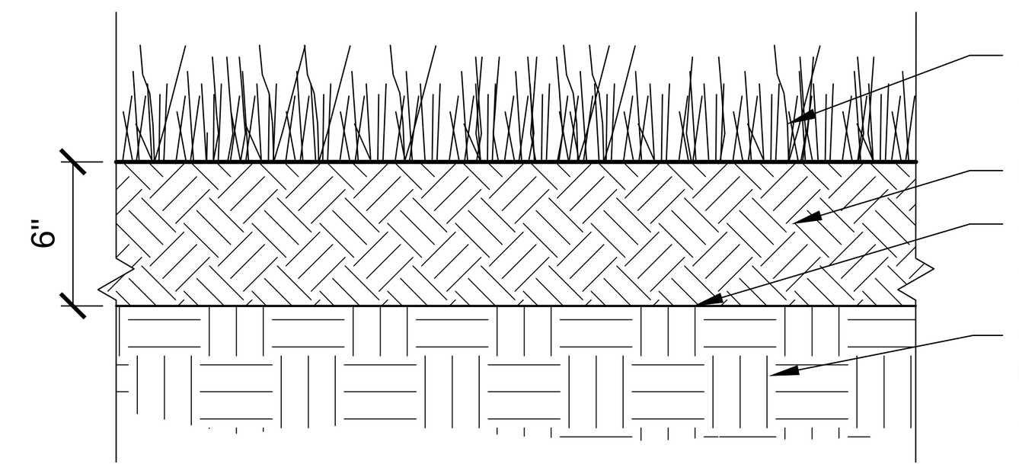
Scale

Revision

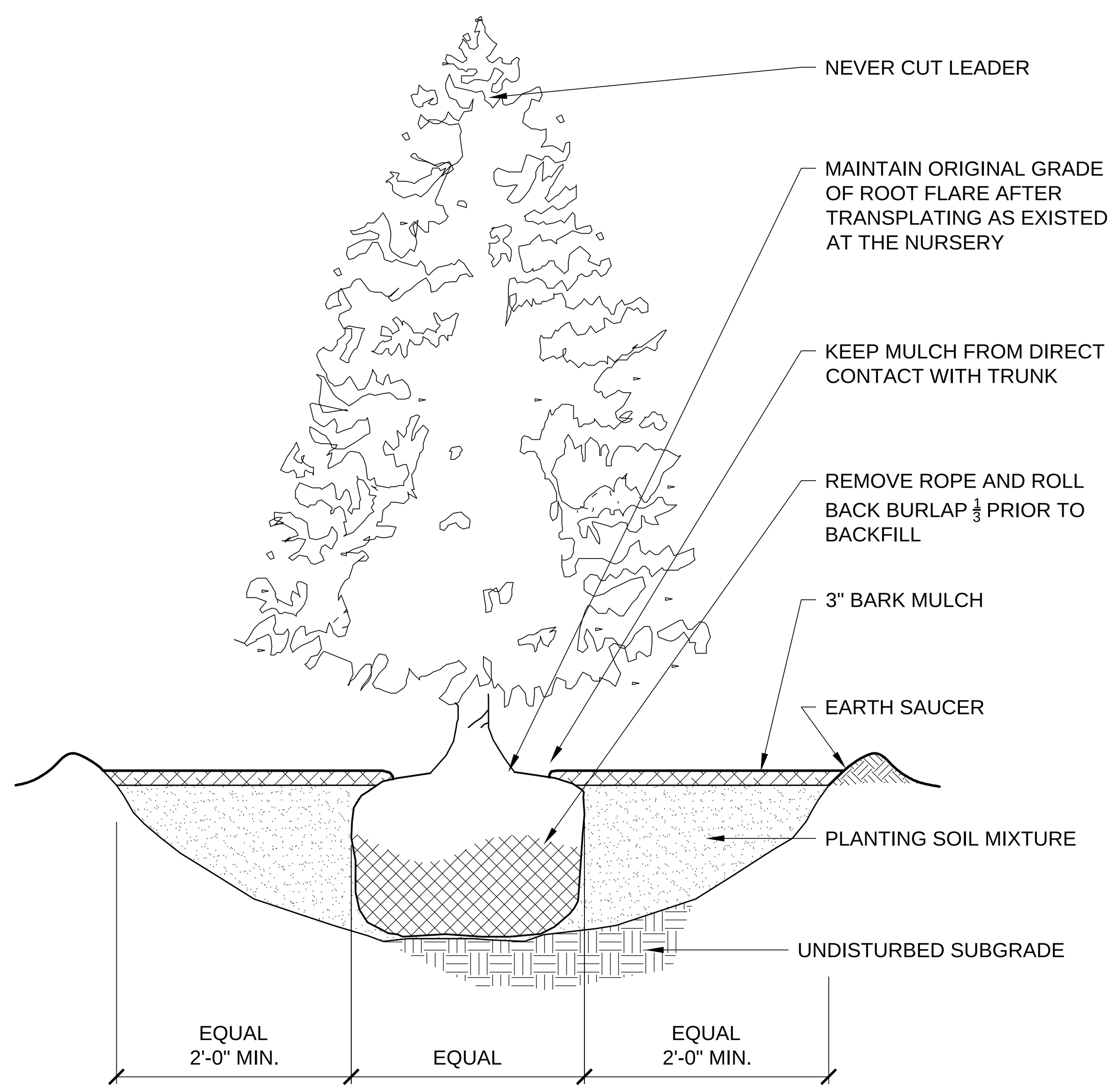
Drawing No.
L5.1

ORIGINAL SHEET - ARCH E1

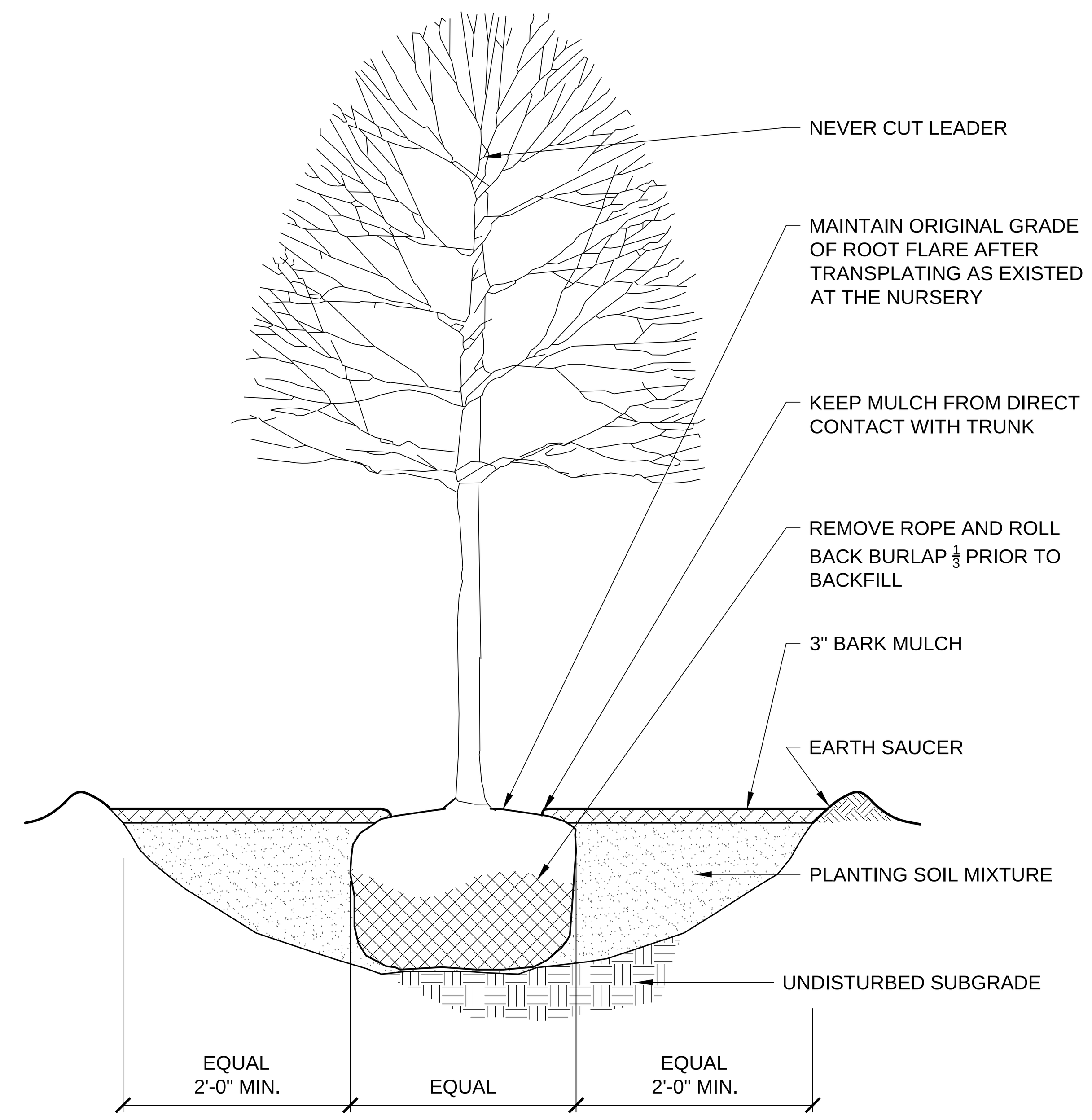
1 2 3 4 5 6



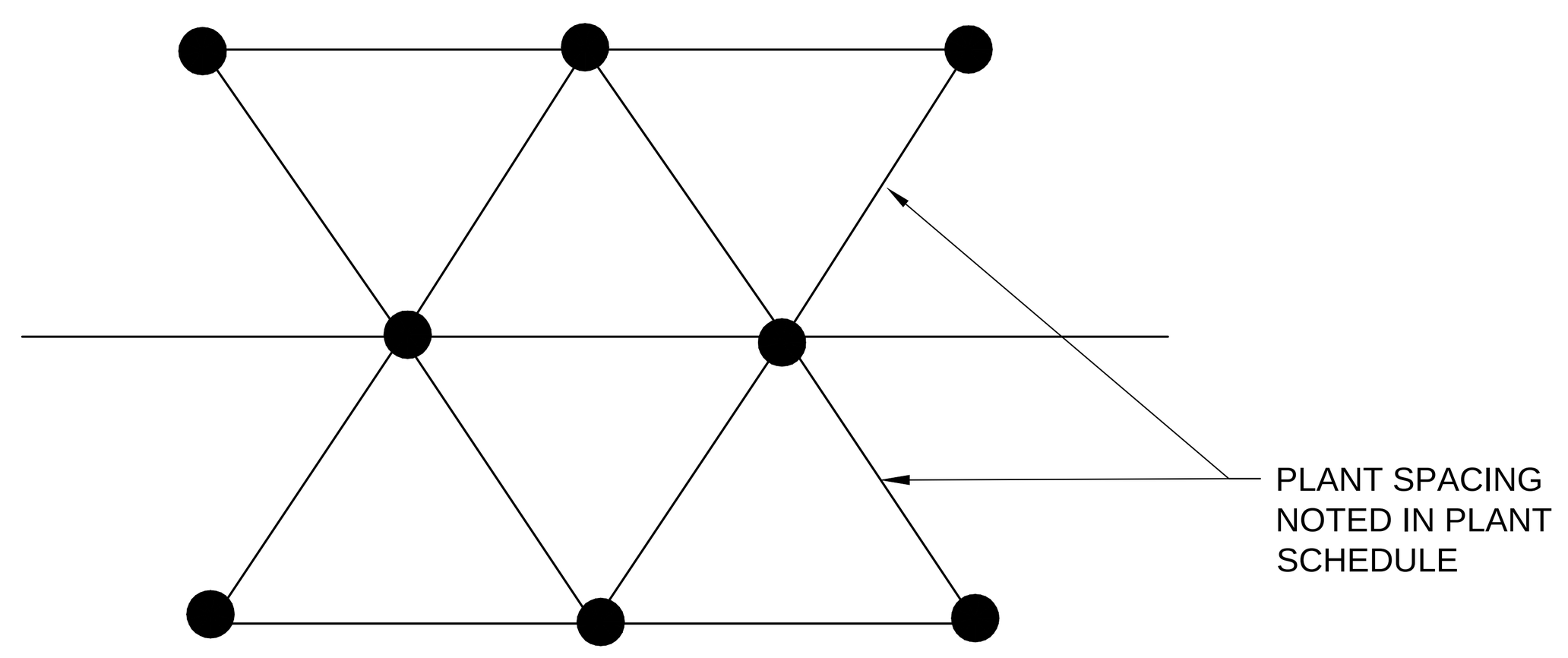
LAWN SEED MIX
SCALE: 1-1/2" = 1'-0"

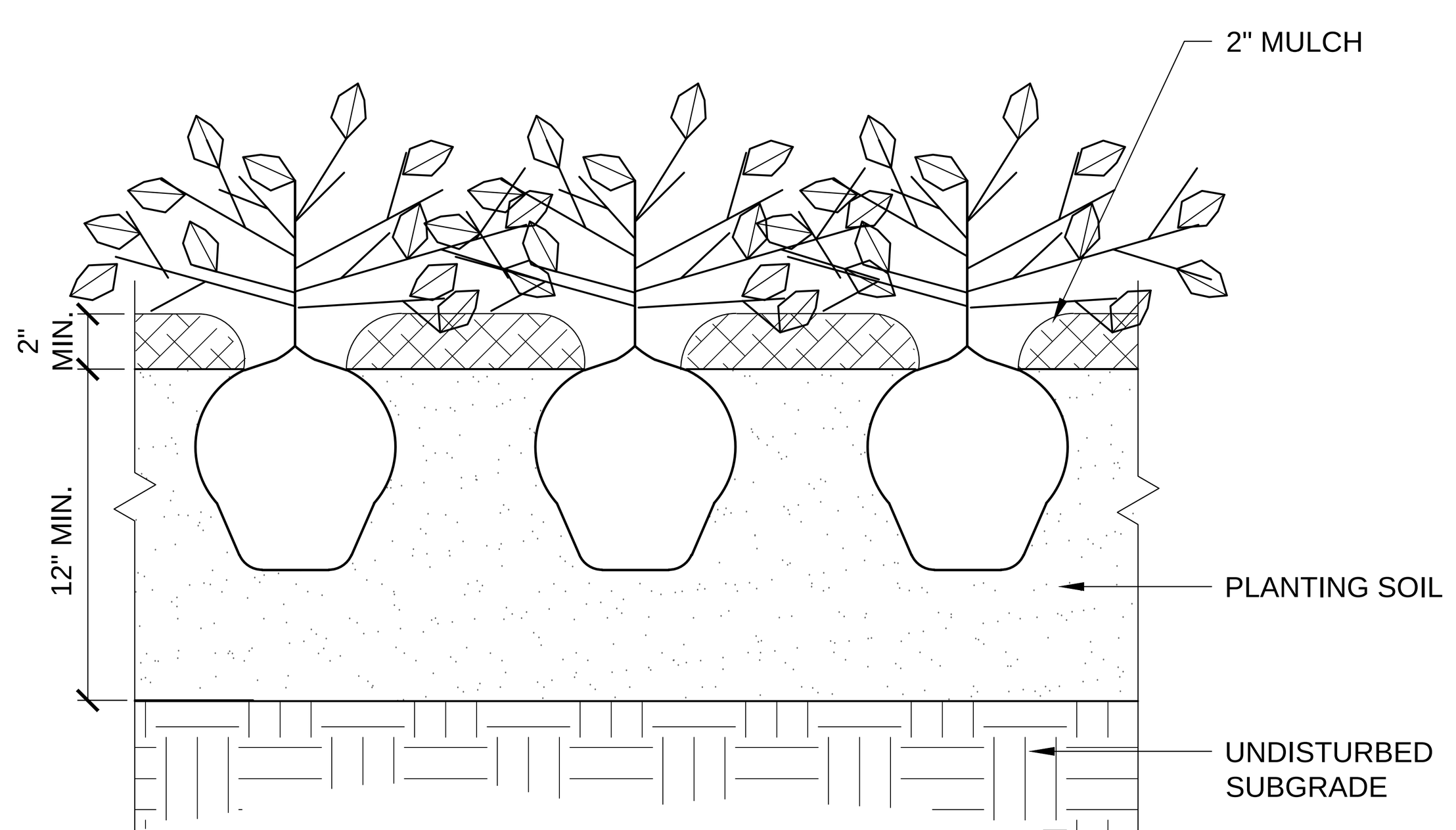


EVERGREEN TREE PLANTING
SCALE: 3/4"=1'-0"

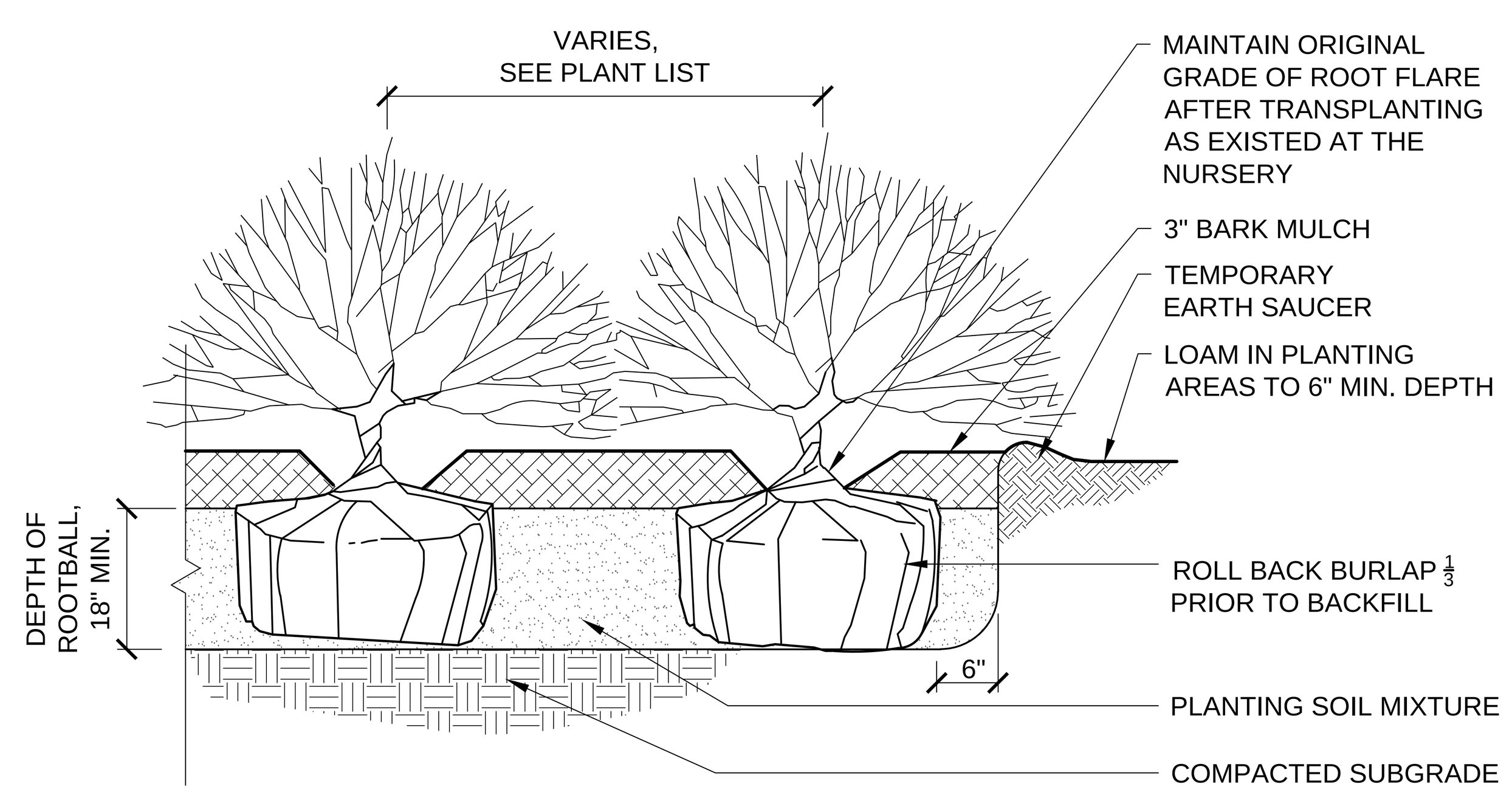


DECIDUOUS TREE PLANTING
SCALE: 3/4" = 1'-0"



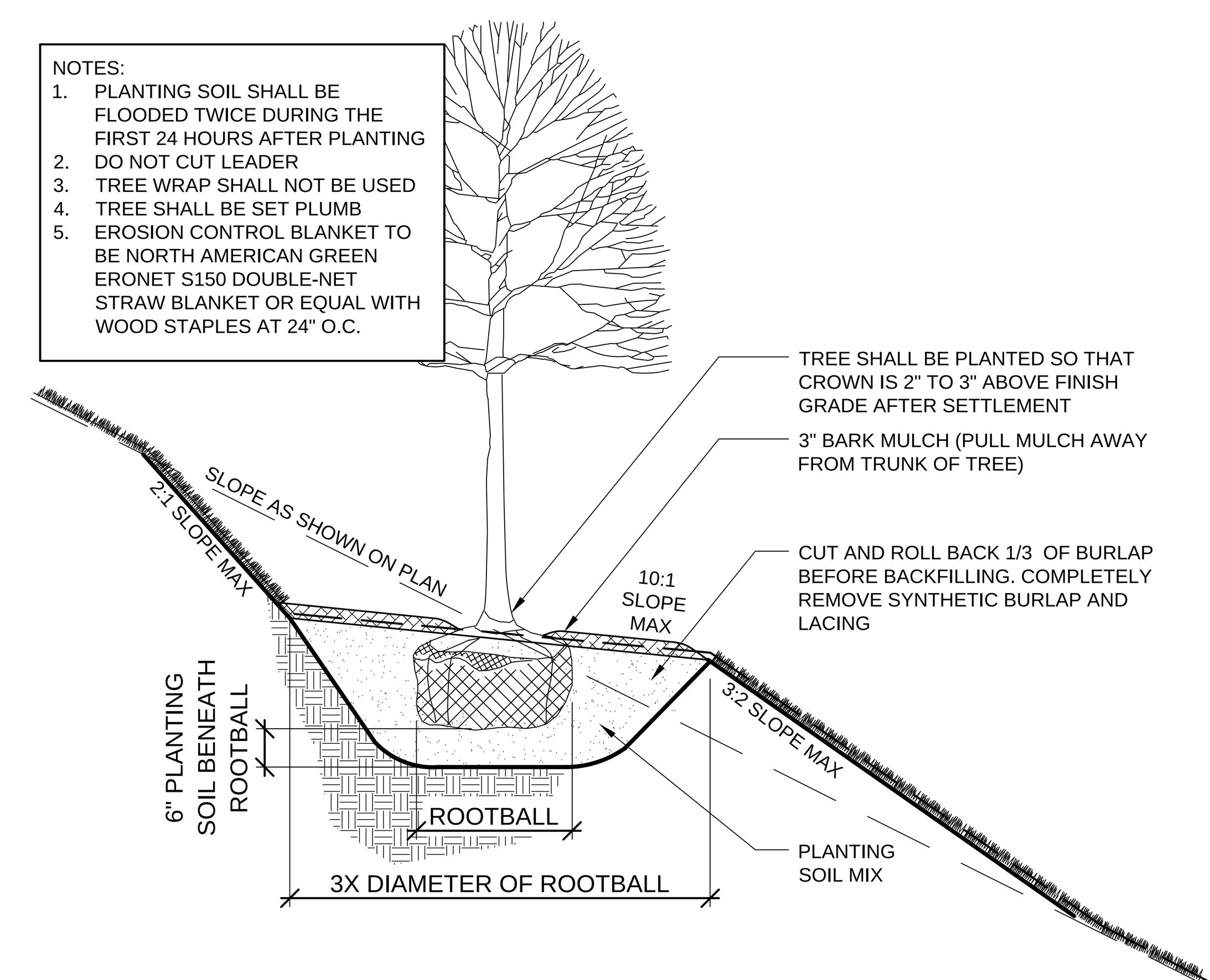


GROUNDCOVER AND PERENNIAL PLANTING
SCALE: 2" = 1'-0"



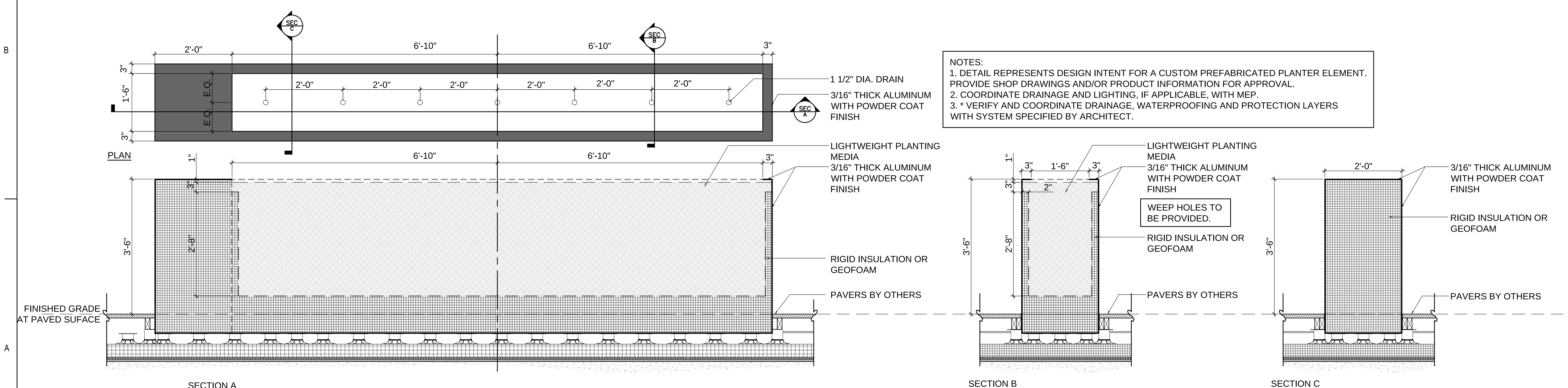
SHRUB PLANTING
SCALE: 3/4" = 1'-0"

NOTES:
1. PLANTING SOIL SHALL BE FLOODED TWICE DURING THE FIRST 24 HOURS AFTER PLANTING
2. DO NOT CUT LEADER
3. TREE WRAP SHALL NOT BE USED
4. TREE SHALL BE SET PLUMB
5. EROSION CONTROL BLANKET TO BE NORTH AMERICAN GREEN ERONET S150 DOUBLE-NET STRAW BLANKET OR EQUAL WITH WOOD STAPLES AT 24" O.C.



TREE PLANTING ON SLOPE
SCALE: 1" = 1'-0"

NOTES:
1. DETAIL REPRESENTS DESIGN INTENT FOR A CUSTOM PREFABRICATED PLANTER ELEMENT. PROVIDE SHOP DRAWINGS AND/OR PRODUCT INFORMATION FOR APPROVAL.
2. COORDINATE DRAINAGE AND LIGHTING, IF APPLICABLE, WITH MEP.
3. * VERIFY AND COORDINATE DRAINAGE, WATERPROOFING AND PROTECTION LAYERS WITH SYSTEM SPECIFIED BY ARCHITECT.



RAISED STREETSCAPE PLANTER
SCALE: 3/4" = 1'-0"

E D C B A

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Notes

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DESIGN DEVELOPMENT			2018.05.04

File Name: N/A	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
	AA/AS	JC/AA	JC	2018.05.04

Permit/Seal
MASSACHUSETTS JOHN HENRY COPLEY No. 736 REGISTERED LANDSCAPE ARCHITECT

Client/Project Logo
Nordblom

Client/Project
NORDBLOM

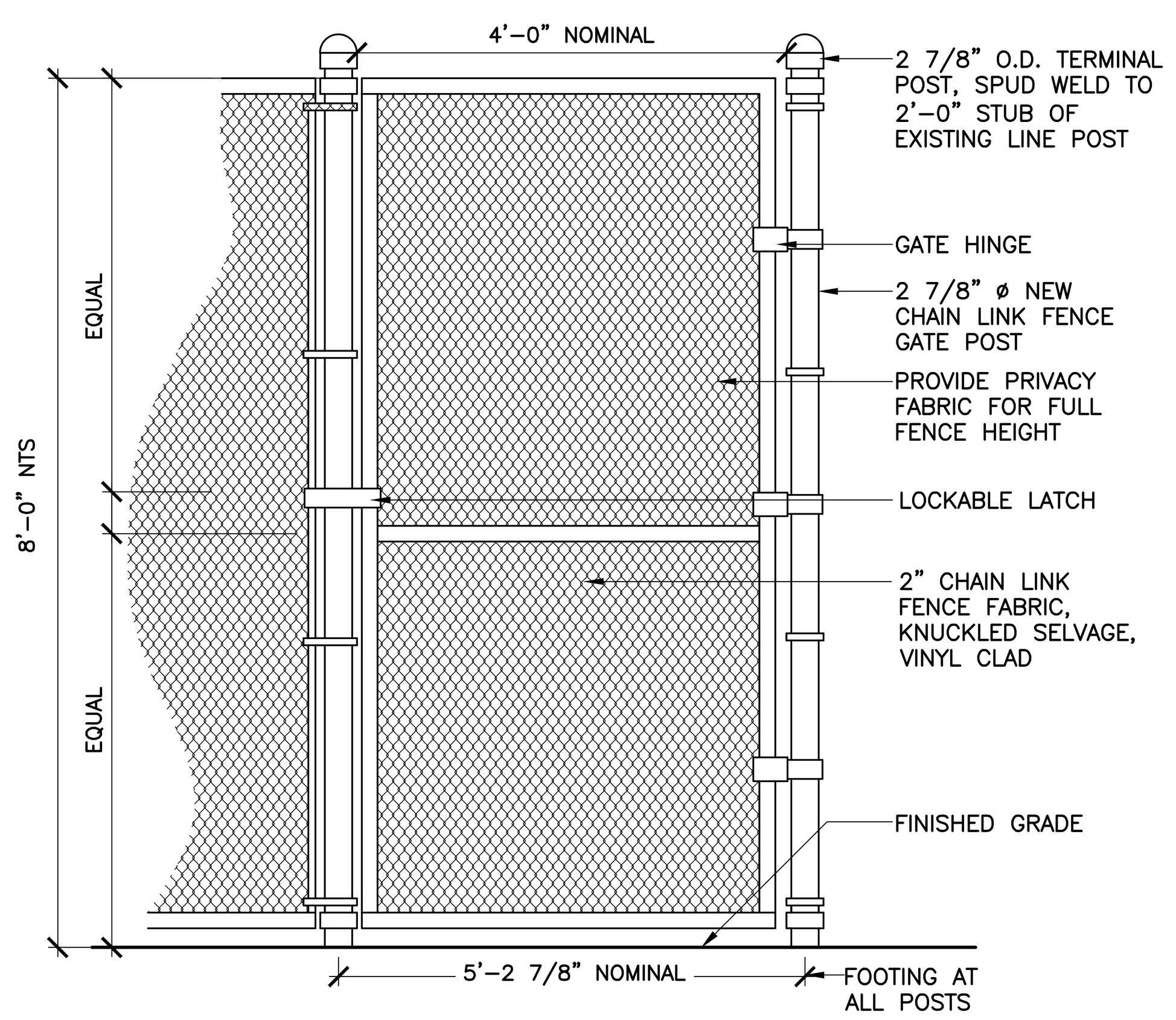
THE BEAT

135 WILLIAM T MORRISSEY BLVD. BOSTON, MA 02125

Title
LANDSCAPE SITE DETAILS

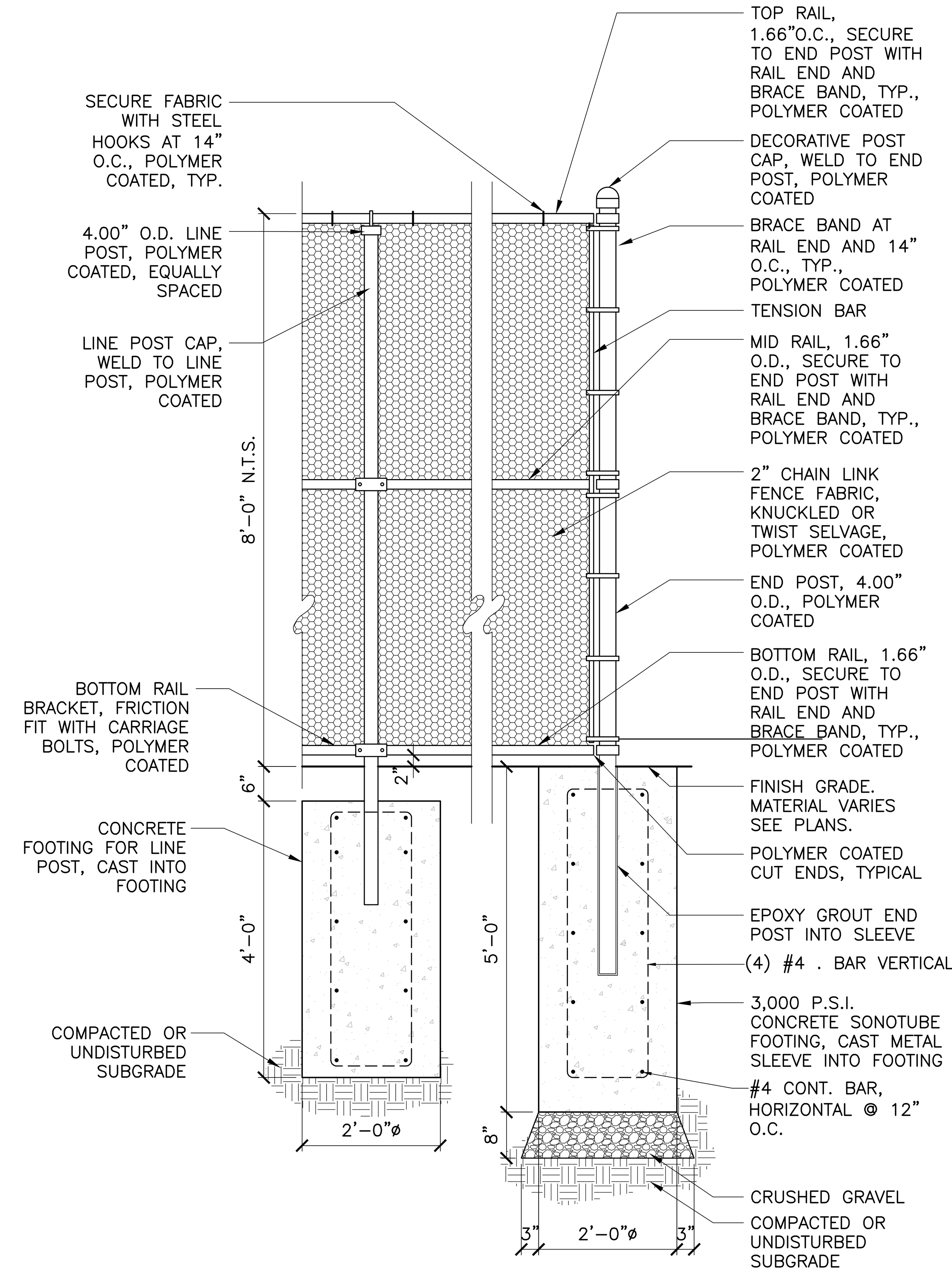
Project No. 218421012
Scale
Revision
Drawing No. **L5.2**

ORIGINAL SHEET - ARCH E1



SINGLE SWING CHAIN LINK GATE

SCALE: NOT TO SCALE



8' HEIGHT COATED CHAINLINK FENCE

SCALE: 3/4" = 1'-0"

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Issued/Revision	By	Appd	YYYY.MM.DD
DESIGN DEVELOPMENT			2018.05.04

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	Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Permit/Seal

MASSACHUSETTS JOHN HENRY COPLEY No. 736 REGISTERED LANDSCAPE ARCHITECT

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THE BEAT

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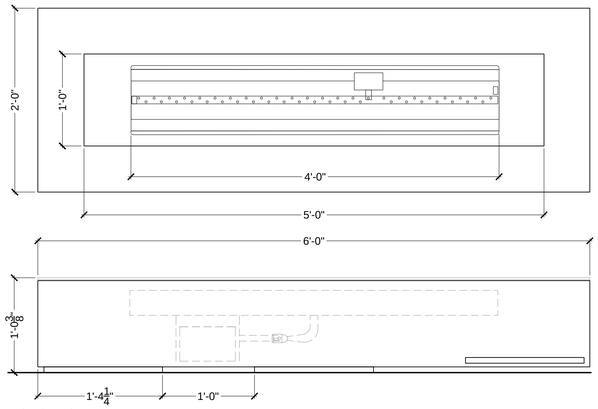
Title
LANDSCAPE SITE DETAILS

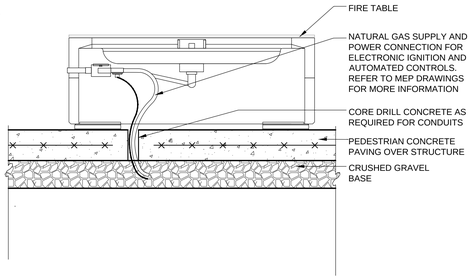
Project No.
218421012

Scale

Revision

Drawing No.
L5.3



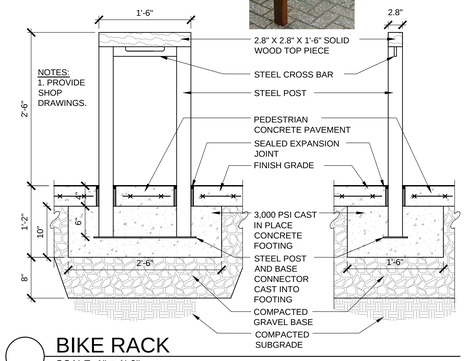


PRODUCT INFO:

1. 72" LONG PRECAST CONCRETE FIRE TABLE WITH STAINLESS STEEL TOP.
2. MODEL: "ROBATA" AS MANUFACTURED BY PALOFORM; T: 888.823.8883; PALOFORM.COM, OR APPROVED EQUAL.
3. BURNER SHALL BE NATURAL GAS LIN-(E)-48 W/ELECTRONIC IGNITION AND AUTOMATED SHUT-OFF TIMER.
4. HEAT OUTPUT SHALL BE 80,000 BTU/H.
5. PROVIDE STAINLESS STEEL COVER PLATE.
6. CONCRETE COLOR SHALL BE SELECTED BY LANDSCAPE ARCHITECT FROM STANDARD COLORS AND FINISHES.
7. BURNER TRAY SHALL BE FILLED WITH MANUFACTURER-SUPPLIED BLACK CRUSHED GLASS OR APPROVED EQUAL.
8. PROVIDE SHOP DRAWINGS.
9. COMPLY WITH ALL LOCAL FIRE CODES AND APPROVALS.

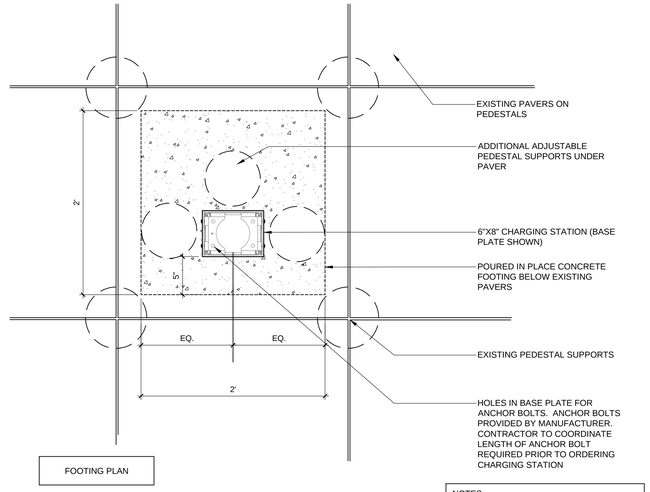
TABLE TOP GAS APPLIANCE

SCALE: 1-1/2" = 1'-0"



BIKE RACK

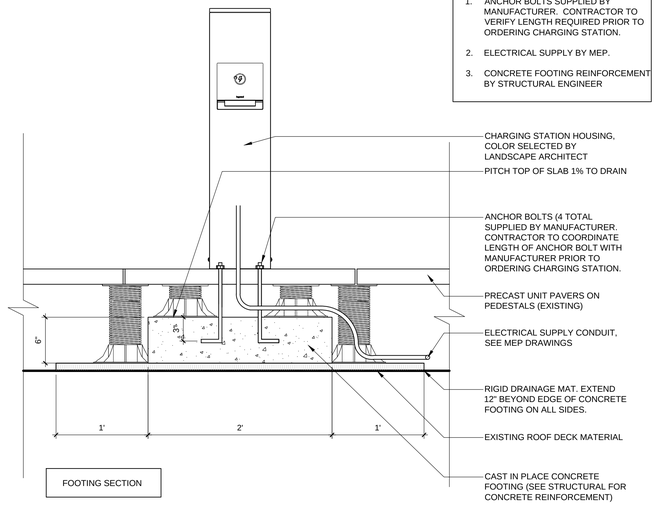
SCALE: 1" = 1'-0"



FOOTING PLAN

NOTES:

1. ANCHOR BOLTS SUPPLIED BY MANUFACTURER. CONTRACTOR TO VERIFY LENGTH REQUIRED PRIOR TO ORDERING CHARGING STATION.
2. ELECTRICAL SUPPLY BY MEP.
3. CONCRETE FOOTING REINFORCEMENT BY STRUCTURAL ENGINEER



FOOTING SECTION

DEVICE CHARGING STATION

SCALE: 1-1/2" = 1'-0"

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Notes

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	Dwn.	Dsgn.	Chkd. YYYY.MM.DD

Permit/Seal

MASSACHUSETTS JOHN HENRY COPLEY No. 736 REGISTERED LANDSCAPE ARCHITECT

Client/Project Logo

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Client/Project
NORDBLOM

THE BEAT

135 WILLIAM T MORRISSEY BLVD, BOSTON, MA 02125

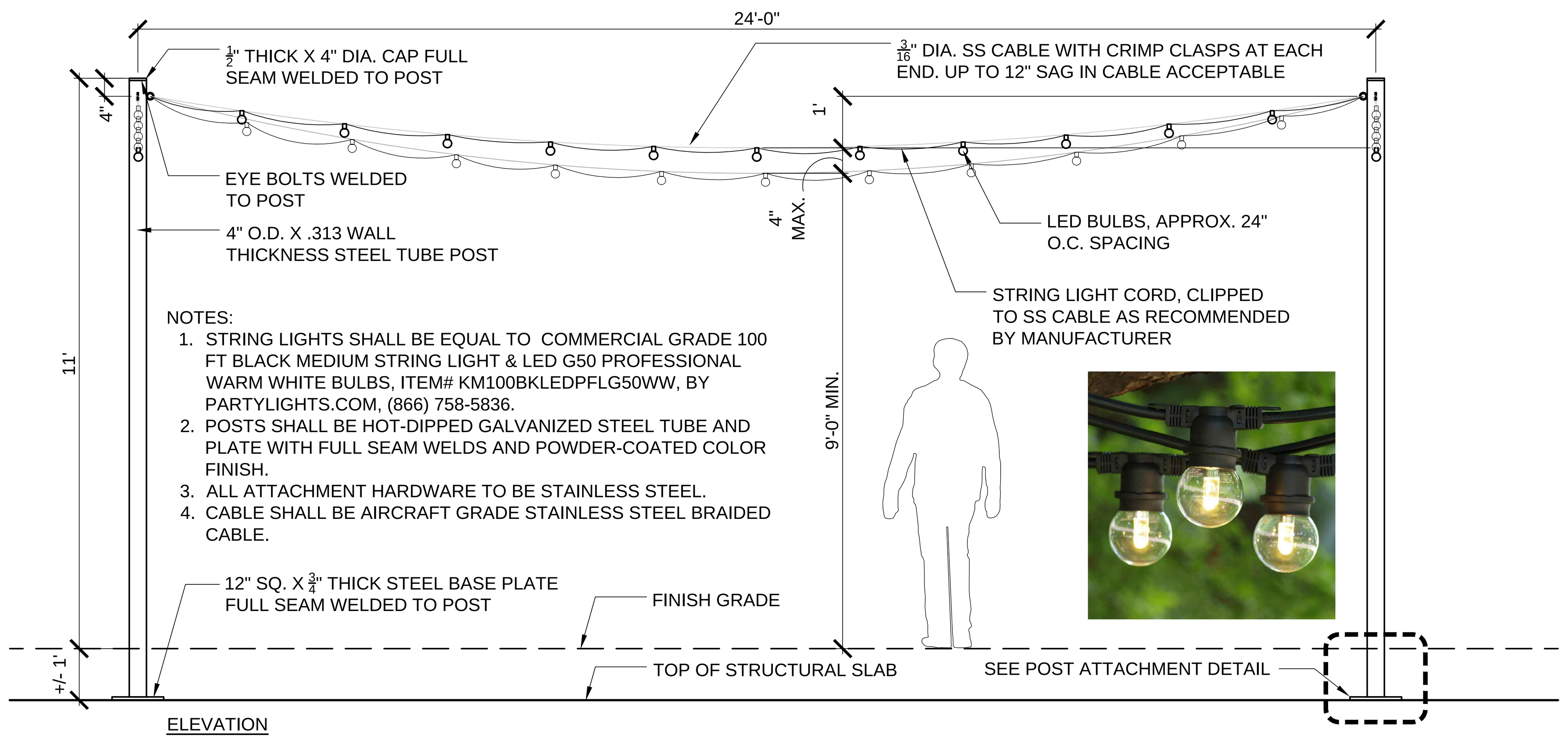
Title
LANDSCAPE SITE DETAILS

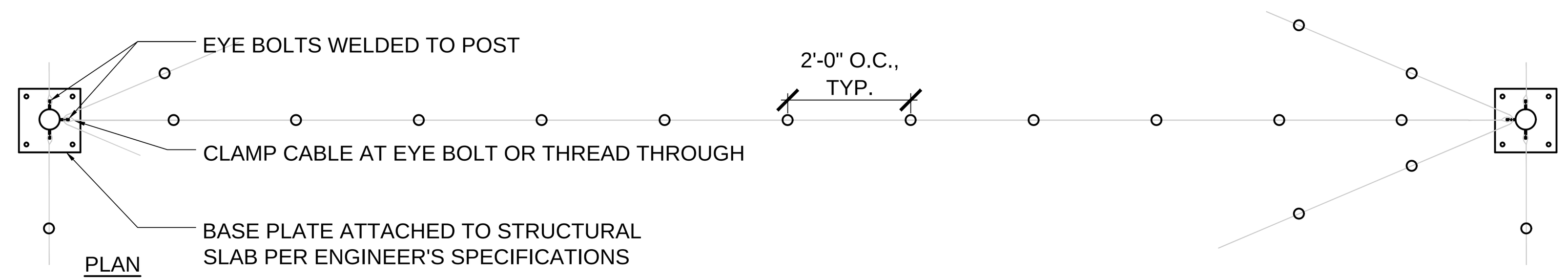
Project No.
218421012

Scale

Revision

Drawing No.
L5.4

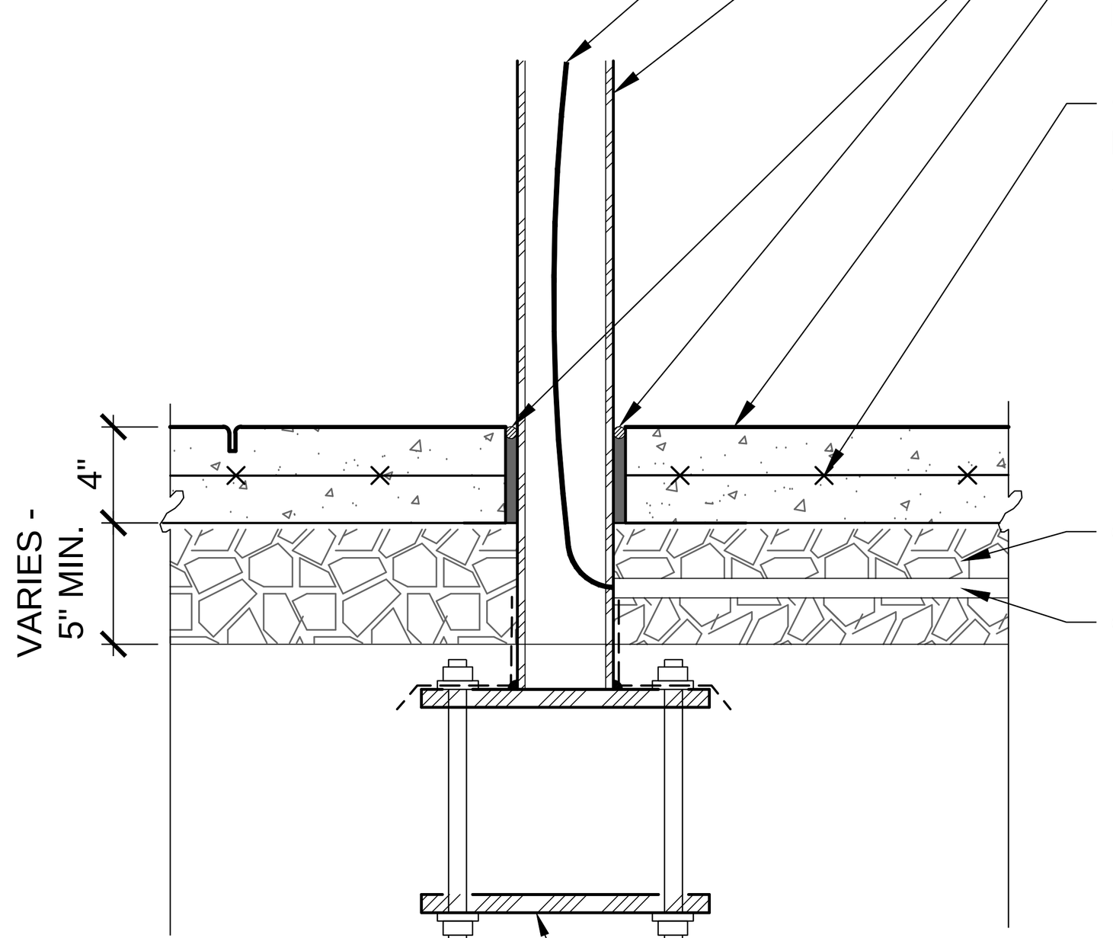




CATENARY LIGHTS

SCALE: 1/2" = 1'-0"

NOTES:
1. POSTS SHALL BE HOT-DIPPED GALVANIZED STEEL TUBE AND PLATE WITH FULL SEAM WELDS AND POWDER-COATED COLOR FINISH.
2. ALL ATTACHMENT HARDWARE TO BE STAINLESS STEEL.



CATENARY LIGHTS BASE

SCALE: 1-1/2" = 1'-0"

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Permit/Seal

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THE BEAT

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Title
LANDSCAPE SITE DETAILS

Project No.
218421012

Scale

Revision

Drawing No.
L5.5