Notice of Intent

Under 310 CMR 10.00 Massachusetts
Wetlands Protection Act Regulations and the
City of Boston Wetlands Ordinance Chapter VII-I.IV

Herb Chambers Honda of Boston
710-720 Morrissey Blvd, Boston, MA

CHA Project Number: 059051

Submitted to:
Boston Conservation Commission
1 City Hall Square
Boston, MA 02201

Applicant:
Herb Chambers of Woburn LLC
c/o The Herb Chambers Companies
259 McGrath Highway
Somerville, MA 02145

Prepared by:

CHA

1 Faneuil Hall Marketplace
Boston, MA, 02109
Phone: (617) 451-2717

September 2021

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LIST OF ACRONYMS & ABBREVIATIONS

BCB	Boston City Base (vertical datum)
BFE	Base Flood Elevation
BMP	Best Management Practice
BVW	Bordering Vegetated Wetland
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HSG	Hydrologic Soil Group
IWPA	Interim Wellhead Protection Area
LSCSF	Land Subject To Coastal Storm Flowage
MAHW	Mean Annual High-Water
MassDEP	Massachusetts Department of Environmental Protection
NAVD	North American Vertical Datum
NRCS	Natural Resources Conservation Service
SFHA	Special Flood Hazard Area
SHGW	Seasonal High Groundwater
SWMSH	Stormwater Management Standards Handbook
Tc	Time of Concentration
TSS	Total Suspended Solids
USGS	United States Geological Survey

1.0 NOTICE OF INTENT (NOI) FORMS

City of Boston Environment

NOTICE OF INTENT APPLICATION FORM

Boston Wetlands Ordinance

City of Boston Code, Ordinances, Chapter 7-1.4

Boston File Number

MassDEP File Number

A. GENERAL INFORMATION

1. Project Location

710-720 Morrissey Blvd	Boston	02122
a. Street Address	b. City/Town	c. Zip Code
	1600251001	
f. Assessors Map/Plat Number	g. Parcel /Lot Number	

2. Applicant

James	Xaros	The Herb Chambers Companies
a. First Name	b. Last Name	c. Company

259 McGrath Highway
d. Mailing Address

Somerville	MA	02145
e. City/Town	f. State	g. Zip Code

617-666-8333	617-666-8448	jxaros@herbchambers.com
h. Phone Number	i. Fax Number	j. Email address

3. Property Owner

		Herb Chambers of Woburn LLC
a. First Name	b. Last Name	c. Company

720 Morrissey Blvd
d. Mailing Address

Boston	MA	02122
e. City/Town	f. State	g. Zip Code

617-666-8333		
h. Phone Number	i. Fax Number	j. Email address

❑ Check if more than one owner

(If there is more than one property owner, please attach a list of these property owners to this form.)

4. Representative (if any)

Kelly	Killeen	CHA Consulting, Inc.
a. First Name	b. Last Name	c. Company

141 Longwater Dr #104
d. Mailing Address

Norwell	MA	02061
e. City/Town	f. State	g. Zip Code

781-982-5434	781-982-5490	kkilleen@chacompanies.com
h. Phone Number	i. Fax Number	j. Email address

5. Is any portion of the proposed project jurisdictional under the Massachusetts Wetlands Protection Act M.G.L. c. 131 §40?

☑ Yes ❑ No

If yes, please file the WPA Form 3 - Notice of Intent with this form

6. General Information

Redevelopment of an existing car dealership lot. Demo existing building and construct 4-story building with an approximately 28,600 sf footprint.

7. Project Type Checklist

a. ❑ Single Family Home
b. ❑ Residential Subdivision
c. ❑ Limited Project Driveway Crossing
d. ☑ Commercial/Industrial
e. ❑ Dock/Pier
f. ❑ Utilities
g. ❑ Coastal Engineering Structure
h. ❑ Agriculture – cranberries, forestry
i. ❑ Transportation
j. ❑ Other

8. Property recorded at the Registry of Deeds

Suffolk
a. County

146
b. Page Number

60631
c. Book

d. Certificate # (if registered land)

9. Total Fee Paid

$2,562.50
a. Total Fee Paid

$512.50
b. State Fee Paid

$2,050.00
c. City Fee Paid

B. BUFFER ZONE & RESOURCE AREA IMPACTS

Buffer Zone Only - Is the project located only in the Buffer Zone of a resource area protected by the Boston Wetlands Ordinance?

❑ Yes ☑ No

1. Coastal Resource Areas

Resource Area	**Resource Area Size**	**Proposed Alteration***	**Proposed Migitation**
❑ *Coastal Flood Resilience Zone*	*Square feet*	*Square feet*	*Square feet*
❑ *25-foot Waterfront Area*	*Square feet*	*Square feet*	*Square feet*
❑ *100-foot Salt Marsh Area*	*Square feet*	*Square feet*	*Square feet*
❑ *Riverfront Area*	*Square feet*	*Square feet*	*Square feet*

2. Inland Resource Areas

Resource Area	**Resource Area Size**	**Proposed Alteration***	**Proposed Migitation**
❑ *Inland Flood Resilience Zone*	*Square feet*	*Square feet*	*Square feet*
❑ *Isolated Wetlands*	*Square feet*	*Square feet*	*Square feet*
❑ *Vernal Pool*	*Square feet*	*Square feet*	*Square feet*
❑ *Vernal Pool Habitat (vernal pool + 100 ft. upland area)*	*Square feet*	*Square feet*	*Square feet*
❑ *25-foot Waterfront Area*	*Square feet*	*Square feet*	*Square feet*
❑ *Riverfront Area*	*Square feet*	*Square feet*	*Square feet*

C. OTHER APPLICABLE STANDARDS & REQUIREMENTS

1. What other permits, variances, or approvals are required for the proposed activity described herein and what is the status of such permits, variances, or approvals?

BPDA Large Project Review - BCDC approval obtained on 7/6/21
BWSC Site Plan Review - Plans resubmitted (revision #2) on 6/9/21
Boston Board of Appeals - Application not yet submitted
Boston Parks and Recreation - Application not yet submitted
Boston Landmarks Commission - Application not yet submitted
Boston Public Works Department/PIC - Application not yet submitted
Boston Inspectional Services Department - Application not yet submitted
Department of Conservation & Recreation - Application not yet submitted
Boston Transportation Department - Application not yet submitted

2. 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://www.mass.gov/dfwele/dfw/nhesp/nhregmap.htm.

☐ Yes ☑ No

If *yes*, the project is subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18).

A. Submit Supplemental Information for Endangered Species Review

☐ Percentage/acreage of property to be altered:

(1) within wetland Resource Area ____________ percentage/acreage

(2) outside Resource Area ____________ percentage/acreage

☐ Assessor's Map or right-of-way plan of site

3. Is any portion of the proposed project within an Area of Critical Environmental Concern?

☐ Yes ☑ No

If yes, provide the name of the ACEC: ____________________________________

4. Is the proposed project subject to provisions of the Massachusetts Stormwater Management Standards?

- ☑ *Yes. Attach a copy of the Stormwater Checklist & Stormwater Report as required.*
  - ☐ *Applying for a Low Impact Development (LID) site design credits*
  - ☑ *A portion of the site constitutes redevelopment*
  - ☑ *Proprietary BMPs are included in the Stormwater Management System*
- ☐ *No. Check below & include a narrative as to why the project is exempt*
  - ☐ *Single-family house*
  - ☐ *Emergency road repair*
  - ☐ *Small Residential Subdivision (less than or equal to 4 single family houses or less than or equal to 4 units in a multifamily housing projects) with no discharge to Critical Areas*

5. Is the proposed project subject to Boston Water and Sewer Commission Review?

☑ Yes ☐ No

D. 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 Protection Ordinance.

Signature of Applicant — 9/21/21 Date

Signature of Property Owner (if different) — Date

Signature of Representative (if any) — 9.21.21 Date

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Boston
City/Town

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

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

A. General Information

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

710-720 Morrissey Blvd — a. Street Address
Boston — b. City/Town
02122 — c. Zip Code

Latitude and Longitude:
42.297432 — d. Latitude
-71.048370 — e. Longitude

f. Assessors Map/Plat Number
1600251001 — g. Parcel /Lot Number

2. Applicant:

James — a. First Name
Xaros — b. Last Name
The Herb Chambers Companies — c. Organization
259 McGrath Highway — d. Street Address
Somerville — e. City/Town
MA — f. State
02145 — g. Zip Code
617-666-8333 — h. Phone Number
617-666-8448 — i. Fax Number
jxaros@herbchambers.com — j. Email Address

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

a. First Name
b. Last Name
Herb Chambers of Woburn LLC — c. Organization
720 Morrissey Blvd — d. Street Address
Boston — e. City/Town
MA — f. State
02122 — g. Zip Code
617-666-8333 — h. Phone Number
i. Fax Number
j. Email address

4. Representative (if any):

Kelly — a. First Name
Killeen — b. Last Name
CHA Consulting, Inc. — c. Company
141 Longwater Dr #104 — d. Street Address
Norwell — e. City/Town
MA — f. State
02061 — g. Zip Code
781-982-5434 — h. Phone Number
i. Fax Number
kkilleen@chacompanies.com — j. Email address

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

$1,050 — a. Total Fee Paid
$512.50 — b. State Fee Paid
$537.50 — c. City/Town Fee Paid

Massachusetts Department of Environmental Protection
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Provided by MassDEP:

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Boston
City/Town

A. General Information (continued)

6. General Project Description:

Redevelopment of an existing car dealership lot. Demo existing building and construct 4-story building with an approximately 28,600 sf footprint.

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

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

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

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

2. Limited Project Type

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

8. Property recorded at the Registry of Deeds for:

Suffolk
a. County

b. Certificate # (if registered land)

60631
c. Book

146
d. Page Number

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

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

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

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

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ 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	2. square feet
	3. cubic yards dredged	

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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Provided by MassDEP:

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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

	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	106,940 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 Mass GIS
   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 https://www.mass.gov/ma-endangered-species-act-mesa-regulatory-review).
Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

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

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

(c) ☐ MESA filing fee (fee information available at https://www.mass.gov/how-to/how-to-file-for-a-mesa-project-review).
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, https://www.mass.gov/service-details/exemptions-from-review-for-projectsactivities-in-priority-habitat; 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@mass.gov

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@mass.gov

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

c. ☐ Is this an aquaculture project?   d. ☐ Yes ☒ No

If yes, include a copy of the Division of Marine Fisheries Certification Letter (M.G.L. c. 130, § 57).

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

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

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

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

   b. ACEC

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

   a. ☐ Yes ☒ No

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

   a. ☐ Yes ☒ No

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

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

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

      2. ☒ A portion of the site constitutes redevelopment

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

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

      1. ☐ Single-family house

      2. ☐ Emergency road repair

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

D. Additional Information

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

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

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

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

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

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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.

Site Development Plans for Herb Chambers Honda of Boston
a. Plan Title

CHA Consulting, Inc.
b. Prepared By

Kelly Killeen
c. Signed and Stamped by

06/09/2021
d. Final Revision Date

1" = 20'
e. Scale

f. Additional Plan or Document Title

01/31/2020
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:

1246
2. Municipal Check Number

9/17/21
3. Check date

1244
4. State Check Number

9/17/21
5. Check date

Herb Chambers of Woburn, LLC
6. Payor name on check: First Name

7. Payor name on check: Last Name

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

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

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Boston
City/Town

F. Signatures and Submittal Requirements

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

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

1. Signature of Applicant — 2. Date: 9/21/21

3. Signature of Property Owner (if different) — 4. Date

5. Signature of Representative (if any) — 6. Date: 9.21.21

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

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

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

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

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

NOI Wetland Fee Transmittal Form

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

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

tab

return

A. Applicant Information

1. Location of Project:

710-720 Morrissey Blvd	Boston
a. Street Address	b. City/Town
c. Check number	d. Fee amount

2. Applicant Mailing Address:

James		Xaros	
a. First Name		b. Last Name	
The Herb Chambers Companies			
c. Organization			
259 McGrath Highway			
d. Mailing Address			
Somerville		MA	02145
e. City/Town		f. State	g. Zip Code
617-666-8333	617-666-8448	jxaros@herbchambers.com	
h. Phone Number	i. Fax Number	j. Email Address	

3. Property Owner (if different):

a. First Name		b. Last Name	
Herb Chambers of Woburn LLC			
c. Organization			
720 Morrissey Blvd			
d. Mailing Address			
Boston		MA	02122
e. City/Town		f. State	g. Zip Code
617-666-8333			
h. Phone Number	i. Fax Number	j. Email Address	

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

B. Fees

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

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

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

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

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

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

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

B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee
Category 3 b. Each building (for development) including site.	1	$1,050	$1,050

Step 5/Total Project Fee: ______

Step 6/Fee Payments:

Total Project Fee: $1,050
a. Total Fee from Step 5

State share of filing Fee: $512.50
b. 1/2 Total Fee **less $**12.50

City/Town share of filling Fee: $537.50
c. 1/2 Total Fee **plus** $12.50

C. Submittal Requirements

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

Department of Environmental Protection
Box 4062
Boston, MA 02211

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

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

Checklist for Filing a Notice of Intent with Boston Conservation Commission

In order for the Boston Conservation Commission to effectively process your Notice of Intent, BCC requests that you complete the checklist below and include it with your submission. If you should need assistance please contact Commission Staff: 617-635-3850 (cc@boston.gov).

Please Submit the Following to the Conservation Commission:

- ☑ Two copies (a signed original and 1 copy) of a completed Notice of Intent (WPA Form 3)
- ☑ Two copies (a signed original and 1 copy) of a completed Boston Notice of Intent (Local Form)
- ☑ Two copies of plans (reduced to 11" X 17") in their final form with engineer's stamp affixed supporting calculations and other documentation necessary to completely describe the proposed work and mitigating measures. Plans must include existing conditions, the proposed project, erosion controls and mitigation measures, grading and spot elevations and all wetland resource areas and associated buffer zones. Some projects may require both an aerial view of the plans along with a profile view of plans depending on the scope of work.
- ☑ Two copies of an 8 ½" x 11" section of the USGS quadrangle map of the area, containing sufficient information for the Conservation Commission and the Department to locate the site of the work.
- ☑ (If applicable) Two copies the Federal Emergency Management Agency Flood Insurance Rate Map for the project site. FEMA Flood Maps: https://msc.fema.gov/portal.
- ☐ Two copies of the determination regarding the Natural Heritage and Endangered Species Program: Review Section C. Other Applicable Standards and Requirements of the Notice of Intent, page 4 of 8, pertaining to wildlife habitat. The Conservation Commission and the Natural Heritage & Endangered Species Program have the maps necessary to make this determination.
- ☑ (If applicable) Two hard copies of a Stormwater Report to document compliance with the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q), including associated drainage calculations for rooftops, parking lots, driveways, etc., for the required design storm events.
- ☑ (If applicable) A narrative detailing best management practices for stormwater management as set forth in the Stormwater Management Standards of the Massachusetts Department of Environmental Protection and any separate standards and guidelines prepared by the City and the Boston Water and Sewer Commission.
- ☑ (If applicable) Two hard copies of the Checklist for Stormwater Report
- ☑ Details of the stormwater management system, including: catch basins, oil separating tanks, detention basins, outfalls, sewer connections, etc.
- ☐ Any photographs related to the project representing the wetland resource areas.
- ☑ Two copies of a detailed project narrative describing the following: an overview of the entire project, the work proposed within wetland resource areas and/or buffer zones; how the performance standards specific to the wetland resource areas will be met (listing out each performance standard); a consideration of the effect that projected sea level rise, changes in storm intensity and frequency, and other consequences of climate change may have on the resource areas and proposed activities; construction equipment and material involved; and measures to protect wetland resource areas and mitigate impacts. The applicant shall also include narrative on how they plan to integrate climate change and adaptation planning considerations into their project to promote climate resilience to protect and promote Resource Area Values and functions into the future.
- ☑ Two copies of an Abutters List, Affidavit of Service and Abutter Notification, filed concurrently with the Notice of Intent. Abutter notices shall be sent in both English and the second most commonly spoken language(s) in the neighborhood(s) where the project is proposed. Notices shall also include Babel notice cards for additional translation and language access services. All abutters within 300' of the project

property line must be notified including those in a neighboring municipality. In such an instance, a copy of the filing must also be sent to the local Conservation Commission of the neighboring municipality. EXCEPTION: When work is in land under water bodies and waterways or on a tract of land greater than 50 acres, written notification must only be given to abutters within 300 feet of the "project site."

- ☑ Two copies of the BPDA Climate Resiliency Checklist (for new buildings). This can be completed online at http://www.bostonplans.org/planning/planning-initiatives/article-37-green-building-guidelines. Please print the pdf that you will receive via email after completion and include it in your submission.

- ☑ **Electronic copies.** Documents may be submitted via email, or via an email link to downloadable documents.

To minimize the use of non-recyclable materials ***please do not include vinyl or plastic binders, bindings, folders or covers with the filing.*** Staples and binder clips are good choices.

2.0 EXECUTIVE SUMMARY

1.0 INTRODUCTION

On behalf of the Applicant, The Herb Chambers Companies, CHA Consulting Inc. (CHA) is filing this Notice of Intent (NOI) for the proposed construction of Herb Chambers Honda of Boston located at 710-720 Morrissey Boulevard in the Dorchester Neighborhood of Boston. The project proposes the demolition of an existing car dealership building and redevelopment of the site into a new, state-of-the-art, Honda automotive dealership. The proposed building will be contemporary in style, featuring a streamlined design. It is presently expected to be four stories high, with a maximum height of approximately 65 feet. The proposed building footprint measures approximately 28,400 square feet with a total floor area of 112,600 square feet. The building will feature showrooms, offices, service bays, vehicle storage, and customer amenities. Approximately 215 automobiles are proposed to be located within the building (including inventory). Site improvements include grading, replacement of pavement and concrete surfaces, restriping of the parking lot, upgrades to the existing drainage and utility services, and lighting. 170 exterior parking spaces are proposed including perimeter landscaping features as well as planted islands within the parking lot to provide additional greenspace.

The proposed work will occur within the jurisdiction of the Wetland Protections Act (310 CMR 10.00) and the City of Boston Wetlands Ordinance (Chapter VII-I.IV). Proposed construction activities will occur within a FEMA Special Flood Hazard Area (SFHA), Zone AE, with an established based flood elevation of 10’ (NAVD88 datum), which translates to elevation 16.5’ Boston City Base (BCB). The Boston Planning and Development Agency (BPDA) has also mapped this area within their Sea Level Rise – Flood Hazard Area, based on projected sea level rise over the next 50 years. The Sea Level Rise - Base Flood Elevation (SLR-BFE) in this area has been established as 19.5’ (BCB). The project site is not located within any wetland resource areas or buffer zones, any riverfront areas, Area of Critical Environmental Concern (ACEC), nor a National Heritage and Endangered Species Program (NHESP) Estimated Habitat of Rare Wildlife.

2.0 EXISTING CONDITIONS

The existing parcel of land is approximately 2.1 acres in size and is located at the corner of Victory Road and Freeport Street. The site supports a one-story, 18,000 square foot building with ancillary parking, which has historically been used as a car dealership. The project site is bounded by Morrissey Boulevard to the West, Victory Road to the North, Freeport Street to the East, and an abutting parcel now or formerly owned by Seven-Eleven, Inc. to the South. Businesses within the vicinity of the site include a 7-Eleven convenience store adjacent to the South, Expressway Toyota to the North across Victory Road, and a proposed tile warehouse facility directly across Morrissey Boulevard to the west which is currently under construction. The surrounding area is generally commercial and retail buildings. The site is located west of Interstate 93 and the Neponset River, and features site entrances on the adjacent Morrissey Boulevard, Victory Road, and Freeport Street.

The existing site drainage infrastructure includes catch basins and a piped conveyance system that connects to the municipal drainage system located in Freeport Street. The existing drainage system on the site is outdated and does not provide opportunity for stormwater recharge.

3.0 ENVIRONMENTAL RESOURCE AREAS

The MassGIS mapping tool, OLIVER, and the Boston Planning and Development Agency (BPDA) Zoning Viewer was utilized to research protected resource areas under the jurisdiction of the Wetlands Protection Act (WPA) and the City of Boston Wetlands Ordinance (BWO). Each of the resource areas are described below, and various figures and plans are provided herein.

3.1 LAND SUBJECT TO COASTAL STORM FLOWAGE

The project site is located within Special Flood Hazard Area (SFHA), Zone AE, as shown on the Federal Emergency Management Agency (FEMA) Federal Insurance Rate Map (FIRM), Panel 91, Map 25025C0091J, dated March 16, 2016 (see Figure 4). A SFHA is an area which is subject to inundation by the 1% annual chance flood (100-year storm). Since the source of flooding is the tidally influenced Dorchester Bay, the inundated area is also considered a Land Subject to Coastal Storm Flowage (LSCSF). The base flood elevation (BFE) published by FEMA is 10 feet (NAVD 88), which translates to 16.5 feet, Boston City Base (BCB). LSCSF's and SFHA's are jurisdictional under the WPA, the BWO, and Article 25 of the Boston Zoning Code. Refer to Section 8 of the

Executive Summary for more information regarding the relationship between the proposed project and the surrounding LSCSF.

3.2 WILDLIFE HABITAT

A review of the Massachusetts Natural Heritage data layers provided through MassGIS show no Natural Heritage & Endangered Species Program (NHESP) Estimated Habitat and/or Priority Habitat of rare upland or wetland wildlife. Further, no Certified Vernal Pools or Potential Vernal Pools are located at or in the immediate vicinity of the project site (See Figure 3).

3.3 SPECIAL RESOURCES

The site is not located within an Area of Critical Environmental Concern (ACEC), Outstanding Resource Water (ORW), Surface Water Protection Area (Zone A & B), or DEP Zone II/Interim Wellhead Protection Area.

4.0 PROPOSED PROJECT

The proposed project includes the demolition of the existing building and the redevelopment of the site to include a four-story state-of-the-art Honda automotive dealership with associated parking lot and landscape and utility improvements. The project proposes modifications to all site entrances, and the addition of green space and pedestrian amenities, which include two pocket parks with benches and plantings at the northeast and northwest corners of the site. The addition of landscaped areas along the perimeter of the site and within the parking lot results is an overall decrease in impervious area by approximately 10,000 square feet. In accordance with the Boston Water and Sewer Commission (BWSC) regulations, stormwater is proposed to be captured and routed to subsurface infiltration chambers which are sized to hold 1.25 inches of stormwater over the impervious areas of the site. The stormwater system is designed with an overflow pipe to connect to the municipal drainage system within the Freeport Street Right-of-Way. The proposed building's electric, gas, and water services will be connected to the respective mains within Freeport Street, and the building's sewer will be connected ot the City's sewer main within Victory Road. The project construction will be broken up into three phases in order to keep the current Honda business operational. The construction sequence in Section 6.0 describes the proposed breakdown of construction activities and associated work areas for each of the three phases. The proposed improvements and associated phasing are further illustrated in the attached plan set (See Appendix C).

5.0 ALTERNATIVE ANALYSIS

An alternatives analysis has been performed to demonstrate that there are no practicable and substantially equivalent alternatives to the proposed design. Review and consideration of practicable alternatives include impacts to environmental interests, proposed property use, project purpose, cost, existing technology, and logistics.

5.1 NO ACTION ALTERNATIVE

One alternative is the “No Action” option. The site currently contains a single story, outdated building & infrastructure surrounded by a paved parking area. The property appears somewhat rundown, commensurate with the age of the facility, and is not necessarily an asset to the community. Nearby properties of similar description have been recently improved or are slated to begin construction.

Under this “No Action” alternative, the site will remain 100% impervious. The existing stormwater management systems provides no infiltration or recharge capabilities, and as such, provides limited stormwater runoff attenuation, treatment, or recharge. Additionally, the building’s finish floor elevation is currently half a foot below the FEMA flood elevation, and about 5-feet lower than the Boston Planning and Development Agency (BPDA) Sea Level Rise – Design Flood Elevation. With the “No-Action” alternative, the property will continue to be dated, underutilized and a missed opportunity to provide the potential community benefits that a new state-of-the-art development could offer.

5.2 PREFERRED ALTERNATIVE (PROPOSED)

The preferred alternative offers environmental and economic benefits, and aligns with the City’s Climate Resiliency goals to the maximum extent practicable given the challenges of the site and its surroundings. The preferred project proposes to demolish the existing building and construct a new, contemporary style, 4-story building, containing a total of about 112,600 square feet and will include showrooms, offices, service bays, vehicle storage, and customer and employee amenities. It is anticipated that this new facility design will enhance the customer and employee experience, providing a sustainable and pleasing asset to the community.

The project proposes to raise the finish floor of the proposed building 2-feet higher than the existing building to mitigate potential flood damage caused by storms and sea level rise. The site will also be raised accordingly, allowing the installation of stormwater infrastructure that will provide stormwater runoff attenuation, treatment, and infiltration while maintaining a reasonable relationship to abutting streets and properties. Underground stormwater chamber systems will provide 10,600 cubic feet of rainfall storage beneath the parking lot. Green space is provided along the entire perimeter of the parking area and interior landscape islands are also proposed. The overall quantity of impervious surface within the project area will be reduced by approximately 10,000 square feet under this “Preferred” alternative. This reduction in impervious area reduces pollutants, stormwater runoff rates and volumes, and heat island effects generated at the site.

Logistically, the multi-story footprint of the proposed building provides the needed area for the proposed use. The addition of interior vehicular storage reduces the exterior inventory and allows for improved vehicular circulation within the site as well as added greenspace that is absent in the current condition. The additional landscape area provides for a more pleasing visual of the property, adds to the pedestrian experience, and offers the added benefit of snow storage.

Economically, the property will no longer be underutilized and undervalued. The proposed use will provide jobs and will increase annual revenue to the City, including an increase in property tax revenue.

Based on the above, this “Preferred” alternative provides many benefits and is considered an ideal development proposal for this property.

5.3 CLIMATE RESILIENCY COMPLIANT ALTERNATIVE

Along with the “Preferred” alternative design, a “Climate Resiliency Compliant” (CRC) alternative was considered. The BPDA has mapped the project site within their Sea Level Rise - Flood Hazard Area, which has a recommended finish floor elevation (FFE) of 20.5’ (Boston City Base elevation datum). This recommended FFE, also known as the Sea Level Rise – Design Flood Elevation (SLR-DFE), is 5-feet higher than the existing FFE and 3-feet higher than the proposed FFE in the “Preferred” alternative. In order for the building elevation to be raised, the surrounding site would need to be raised accordingly.

This alternative would provide additional protection from flooding caused by severe storms and sea level rise, however, the SLR-DFE would have negative logistical impacts on the site. Unlike other developments, the proposed dealership requires vehicular access into the building for servicing of cars and access to the higher floors for inventory storage. In other words, it would be impractical to put the building on stilts as is common with residential homes near the coast. Further, due to the size of the site and its proximity to the surrounding roads and properties, 5-feet is an extreme change in grade over the minimal distance which exists between the building and its surroundings. In the CRC alternative there would be a 6.5’ grade change from Morrissey Boulevard to the building, and a 4.5’ grade change from Freeport Street. The site entrances on Freeport Street and Morrissey Boulevard would need to be closed, restricting access to the site, and replaced with retaining walls to account for these grade differences. Useable space for parking and landscaping would be reduced due to the need for additional sloping areas and the retaining walls, and site circulation would be negatively impacted. Further, the height of the proposed building would likely need to be increased to accommodate additional floors to compensate for the useable area lost.

In addition to the logistical drawbacks listed above, the CRC alternative would also have a considerable negative impact on the economic feasibility of the project. The additional cost associated with raising the site and building would likely be prohibitive.

5.4 CONCLUSION

The preferred design alternative is the most practical option for improving an underdeveloped and underutilized parcel within the City, as well as addressing the City’s goals in planning for a sustainable future. The proposed development greatly improves an outdated drainage system and raises the site as much as practicably possible. All things considered, the preferred design alternative will have significant positive environmental, community, and economic impacts to the Dorchester neighborhood of the City.

6.0 GENERAL CONSTRUCTION SEQUENCE

The following section provides construction details and highlights the general construction sequence associated with the site redevelopment. The project is proposed to take place during Spring/Summer 2022. The existing dealership is proposed to remain in operation during construction and will therefore be accomplished in three phases. Refer to Appendix C for the Project Plans.

6.1 EROSION AND SEDIMENT CONTROL/DEWATERING

Siltsocks for erosion and sediment control (ESC) will be installed at the limits of the work area prior to the commencement of construction activities for each phase as shown on the project plan set (See Appendix C). Silt sacks will also be installed in catch basins to prevent sediment from entering the existing storm drainage system.

6.2 INSTALLATION OF CONSTRUCTION ENTRANCES

Stabilized construction entrances will be installed in the proposed phased locations shown on the Demolition and Phasing Plans in accordance with the construction detail provided in the plan set. Existing pavement will be removed within the limits of the proposed construction entrance to accommodate the crushed stone entrance.

6.3 DEMOLITION

The existing building, utilities and paved surfaces will be demolished in phases and removed from the project site. Phase 1 demolition will occur north of the existing building and will generally consist of asphalt removal. Phase 2 demolition includes razing the southerly portion of the existing building, asphalt removal, and utility disconnections in the southern portion of the site. Phase 3 demolition will remove the remaining portion of the existing building and asphalt surfaces in the northerly portion of the site. All demolition materials will be discarded in an environmentally appropriate location as designated by the Local and State regulatory agencies.

6.4 INSTALLATION OF UTILITIES & SUBSURFACE STORM DRAINAGE

The proposed storm drainage system and utilities will be installed in phases in accordance with the project plans. The proposed storm drainage system incorporates Best Management Practices (BMPs) as described in the Massachusetts DEP Stormwater Management Standards and the Boston Water and Sewer Commission guidelines. Compliance with these standards is further explained in Section 7 of this document. The bulk of the proposed subsurface storm drainage system will be installed in Phase 1, including three (3) underground stormwater infiltration systems and connection to the existing City infrastructure in Freeport Street. Catch basins, drain manholes, and piping will be installed in all construction phases to serve the portions of the site as they are constructed.

6.5 FOUNDATION/BUILDING CONSTRUCTION

Detailed site subsurface investigations have been conducted at the site and geotechnical analyses performed. Based on the data collected, it is anticipated that the proposed building will be supported by pressure injected footings (PIFs), with a ground floor consisting of a reinforced concrete structural slab. Foundation construction for this option will require limited excavations, typically not exceeding about 5 ft in depth, including installation of footings, pile caps, slabs, and other conventional building structural elements.

6.6 FINE GRADING, PAVING, ETC.

Fine grading and paving will also be phased as indicated on the project plans. Phase 1 fine grading and paving will occur north of the building. Paving in this phase will be limited to binder course only with final top course to be applied in Phase 3. Phase 2 will see grading/excavation associated with the proposed building foundation and remaining southern portion of the parking lot. Finish grading for the southern portion of the project site will be completed and asphalt pavement installed. The pavement installation will include final preparation of the sub-foundation and various base layers. Typically, the base course of pavement will be applied as early as possible with the finish paving course being installed near completion. Curbing, cement concrete sidewalks, and other access ways around the proposed building will be installed per plan during this stage of construction. Pavement markings, lighting, signage, and other related amenities will also be installed at this time. Final application of the top course of pavement in the northerly portion of the parking lot will occur in Phase 3 along with pavement markings, lighting, signage, and other related amenities in this area.

6.7 SITE STABILIZATION

The final stage of the project is landscaping, and restoration and stabilization of all exposed surfaces. Disturbed areas will be landscaped, mulched, or seeded in accordance with the landscape requirements. Permanent restoration and revegetation measures serve to control erosion and sedimentation by establishing a vegetative cover. In the event that weather conditions prevent final restoration, temporary erosion and sedimentation measures will be employed until the weather is suitable for final cleanup. A final inspection will ensure that the project site is cleared of all project debris and that erosion and sedimentation controls are functioning properly. Once the site has been stabilized, newly installed catch basins and the subsurface drainage system will be inspected for sediment deposits and cleaned if necessary.

7.0 STORMWATER STANDARDS

The following section describes how the proposed project addresses and complies with the requirements of the 2008 MassDEP Stormwater Management Standards. The project qualifies as a redevelopment project, however, the stormwater management system has been designed to fully comply with the Standards as a new development project.

Standard 1- No New Untreated Discharges **-** *No new stormwater system conveyances will discharge untreated runoff or cause erosion in wetlands or waters of the Commonwealth*.

All new stormwater system conveyances are treated prior to discharge and result in no erosion occurring on site. The drainage system has been designed to direct stormwater runoff into underground infiltration systems equipped with geofabric lined isolator chambers prior to discharge to the existing city system.

Standard 2- Peak Rate Attenuation - Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

The overall impervious area is being decreased through the addition of landscape islands throughout the site in the post-developed condition. In addition, subsurface infiltration systems are proposed which did not exist in the pre-developed condition. This combination will allow stormwater to infiltrate into the ground and result in a decrease in peak discharge rates and volumes to the existing City system. Refer to the Stormwater Report that accompanies this Notice of Intent for additional details.

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

There is a net decrease in impervious area on the site, therefore recharge is not required. However, recharge will be provided through the use of subsurface infiltration chambers to meet the Boston Water and Sewer Commission's infiltration/water quality volume requirement of 1.25-inch over all impervious area. The subsurface infiltration systems consist of Retain-It ® chambers set on a stone bed. The recharge volume is stored and infiltrated below the outlet control structure's weir elevation. Refer to the Required Recharge Volume calculations provided in the Stormwater Report that accompanies this Notice of Intent.

Standard 4-Water Quality- Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:

a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained.
b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and
c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

The project proposes to use deep sump catch basins with hooded outlets to provide pretreatment, removing 25% TSS per the MassDEP Stormwater Handbook. The stormwater then flows to one of the subsurface infiltration systems to provide an additional 80%TSS removal for a total of 85% TSS removal for the treatment train. A Long-Term Pollution Prevention Plan is included in conjunction with the Operation and Maintenance Plan required by Standard 9 that addresses source control and pollution prevention.

<u>Standard 5-Land Uses with Higher Potential Pollutant Loads</u>- For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated there under at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

This Standard is not applicable to the site. The project's intended use is not considered a Land Use with Higher Potential Pollutant Load (LUHPPL).

<u>Standard 6- Critical Areas</u>- Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

This Standard is not applicable to the site. The project is not located within a critical area.

<u>Standard 7- Redevelopment and Other Projects Subject to the Standards only to the maximum extent practicable</u> - A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

This project is considered a redevelopment under the Stormwater Management Standards. However, it has been designed to fully comply with the Massachusetts Stormwater Standards.

<u>Standard 8- Construction Period Pollution Prevention Plan and Erosion and Sedimentation Control</u> A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented. The project's limit of work is greater than 1 acre and construction of the project will require coverage under the EPA NPDES Construction General Permit. A Stormwater Pollution Prevention Plan (SWPPP) will be submitted prior to construction.

The project will require coverage under the EPA NPDES Construction General Permit and a Stormwater Pollution Prevention Plan (SWPPP) will be submitted prior to construction.

<u>Standard 9- Operation and Maintenance Plan</u>- A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

An Operation and Maintenance Plan has been customized to fit the design of the proposed development (See the attached Stormwater Report). Provisions to maintain runoff control devices have been assured through non-structural, structural, and construction management approaches.

<u>*Standard 10- Prohibition of Illicit Discharges*</u>*- All illicit discharges to the stormwater management system are prohibited*.

The Operation and Maintenance plan required by Standard 9 includes measures to prevent illicit discharges. An illicit discharge statement is provided in the Stormwater Report located in Appendix D.

8.0 CLIMATE RESILIENCY

Climate change and climate resiliency have been a focal point for the City of Boston in recent years. As such, the City teamed up with multiple participants to prepare the Climate Ready Boston Report in December of 2019, and a Coastal Resilience Solutions for Dorchester in October of 2020. These reports outline the potential impacts of climate change within the City of Boston, and potential solutions to combat these impacts within specific neighborhoods of the City. A Climate Resiliency Checklist is included in Appendix A of this report which outlines how the proposed project will address the projected impacts and conform with the potential solutions. A detailed description of this information is also summarized below.

As described in the Climate Ready Boston Report, projected greenhouse gas (GHG) emissions will potentially lead to impacts such as extreme temperature, sea level rise, extreme precipitation, and storms. The proposed building will be equipped with high efficiency equipment applications with environmentally approved refrigerants that account for GHC reduction applications with the deployment of new sustainability and adaptation strategies as they become feasible at the Project site. The building will also be LEED certifiable, and the Proponent will continue to evaluate energy conservation strategies during the design phase of the project.

Climate Ready Boston anticipates future storm events to become more frequent and intense, which could exacerbate sea level rise. Currently, the 10-year, 24-hour design storm is approximately 5.25" which is expected to increase to 6" by the end of the century. The proposed project is conservatively designed to comply with the 6" requirement, and proposes to mitigate the 100-year, 24-hour design storm of 8.83" as specified by the NOAA Atlas-14 point precipitation frequency estimates. This is accomplished through the reduction of impervious area on site in conjunction with the installation of underground drainage chambers which are sized to infiltrate/recharge up to 1.25" of stormwater over the project site.

The project site is mapped within the BPDA Sea Level Rise – Flood Hazard Area, which has a Sea Level Rise – Base Flood Elevation (SLR-BFE) of 19.5' and a Sea Level Rise – Design Flood Elevation (SLR-DFE) of 20.5' (Boston City Base vertical datum). The proposed project meets these requirements to the greatest extent practicable, and has raised the finish floor elevation of the proposed building to elevation 17.5', which is 1-foot higher than the FEMA base flood elevation, and 2-feet higher than the existing building's finish floor elevation. Due to buildings function as a car dealership and service center, the first floor of the building is required to match the grades of the surrounding drive lanes. The restricting factor with raising the finish floor higher than proposed is the surrounding elevations of the adjacent access roads. At the site entrance on Morrissey Boulevard the existing elevation of the access road is 13.7', which is approximately 4' below the proposed finish floor elevation. With the size and shape of the site, achieving a finish floor elevation of 20.5' would only be achievable through retaining walls along the site's boundary, and even then, an entrance from either Morrissey Boulevard or Freeport Street would be impractical.

In summary, the proposed project is designed to reduce greenhouse gas emissions and to improve the site's drainage system to handle future, more intense, storm events. Although challenging, the site will also be raised to the maximum extent practicable to minimize the future impacts of sea level rise.

9.0 REGULATORY COMPLIANCE

9.1 COMPLIANCE WITH THE WETLANDS PROTECTION ACT AND THE CITY OF BOSTON WETLANDS ORDINANCE

The Wetlands Protection Act (WPA) and Regulations (310 CMR 10.00) and the City of Boston Wetlands Ordinance (BWO) presume that Areas Subject to Protection, i.e. wetlands, water resources, flood prone areas, waterbodies, and their associated 100-foot buffer zones, serve in the capacity of the protection of private or public water supply and quality; protection of public or private groundwater supply and quality; short term and long term flood control; erosion and sedimentation control; storm damage prevention including coastal storm flowage; protection of surface water supply and quality, including water pollution control; flood conveyance and storage; protection of fisheries, land containing shellfish, wildlife habitat, rare and endangered plant and animal species and habitat, wetland plant habitat, and recreation; and to protect the health, safety, and welfare of the public, and to mitigate the impacts from climate change.

The following discussion identifies the various values and interests of the WPA and BWO and the means in which the proposed project will avoid, reduce and/or mitigate for change/loss of the current roles of the various resource areas. The proposed project has been designed to comply with both the WPA Regulations including the Stormwater Management Standards, as well as the BWO.

9.1.1 Protection of Private or Public Water Supplies

Water supply is defined under the WPA as any source or volume of surface or ground water demonstrated to be in public or private use or approved for public/private water supply by M.G.L. c. 111 § 160 under the Department of Environmental Protection.

Installation of Best Management Practice (BMPs) erosion and sediment control (ESC) measures at project limits of work prior to ground disturbance will protect surface water resources during construction activities associated with site development. Installation of new Stormwater Best Management Practices (BMPs) that include deep sump-hooded catch basins, and subsurface stormwater treatment and recharge systems will provide additional protection. Source control will be provided with a reduction in impervious area on the site post construction. Maintenance of ESC measures until all bare areas are fully stabilized and/or revegetated, long-term operation and maintenance of stormwater management features, and source control will ensure long-term protection to surface and groundwater resources within the project area.

9.1.2 Groundwater Supply

Groundwater supply is defined under the WPA as the water below the earth's surface in the zone of saturation. No MassDEP Zone II, Zone I or Interim Wellhead Protection Areas occur on the property. The proposed project is expected to improve protection of groundwater supply with the installation of the Stormwater BMPs and source controls noted above. Adverse impact to existing groundwater within the general project area is not anticipated.

9.1.3 Provision of Flood Control and Storm Damage Prevention

Storm Damage Prevention is defined as the prevention of damage caused by water from storms, including, but not limited to, erosion and sedimentation, damage to vegetation, property or buildings or damage caused by flooding, water-borne debris or water-borne ice. According to the Federal Emergency Management Agency (FEMA) Federal Insurance Rate Map (FIRM), Panel 91, Map 25025C0091J for Suffolk County, dated March 16, 2016, the project site is located within a SFHA, Zone AE (See Figure 4). The addition of stormwater BMPs will improve flood control and mitigate storm damage prevention at the site. Additionally, the elevation of the building's first floor and overall site will be raised above the 100-YR flood elevation to reduce potential damage from flooding.

9.1.4 Prevention of Pollution

Prevention of pollution is defined as the prevention or reduction of contamination of surface or groundwater. Timing and installation of Erosion and Sedimentation Control BMPs prior to construction as well as maintenance of these measures following construction until all bare areas are stabilized and/or fully revegetated will limit sedimentation/pollution during the various phases of construction. Incorporation of stormwater BMPs will improve stormwater quality by removal of suspended solids and other pollutants prior to discharge to the City of Boston's drainage system. Source control will also be implemented at the site to limit potential pollution transmission.

9.1.5 Protection of Wildlife Habitat/Fisheries

No National Heritage Endangered Species Program (NHESP) estimated or Priority Habitat of rare-listed species; NHESP Bio Map Core Habitat; Certified Vernal Pools or Potential Vernal Pools are located within the subject property.

9.1.6 Mitigation of Impacts from Climate Change

Impacts from climate change include extreme heat; increased frequency, intensity, and amounts of precipitation, storm surges, rising water levels, and droughts. The project proposes to mitigate these impacts by incorporating high efficiency building systems to reduce energy consumption. The project also proposed the reduction of impervious surface area on the site, and incorporates shade trees, shrubs, and reflective roofing and glazing materials to reduce the heat-island effect. On-site stormwater retention/infiltration facilities will be installed that will attenuate stormwater runoff rates and volumes leaving the site, so reducing flooding impacts. Additionally, the proposed building finish floor elevation and adjacent site grades will be raised above the FEMA flood elevation to minimize storm damage.

9.1.7 Summary

In summary, the proposed project is designed to protect the interests identified in the WPA and BWO, and fully complies with the WPA, BWO, and the Massachusetts Stormwater Standards. Erosion and sediment controls (ESC) are proposed to prevent the disturbance of the surrounding resource areas during and after construction. The proposed development improves water quality through source control and utilization of Best Management Practices (BMPs), including Stormwater Best Management Practices (SBMPs). Stormwater runoff rates and volumes leaving the site will be reduced with the installation of proposed subsurface stormwater chamber systems and the overall reduction in impervious area on the site. The elevation of the proposed building and the surrounding site grades will be raised to the maximum extent practicable to provide protect against flood damage, and the building and site design incorporate features that will mitigate impacts from climate change.

3.0 FIGURES

CHA

1 Faneuil Hall Marketplace, South Market Building
Boston, MA 02109-6117
617.451.2717 . www.chacompanies.com

LOCUS PLAN

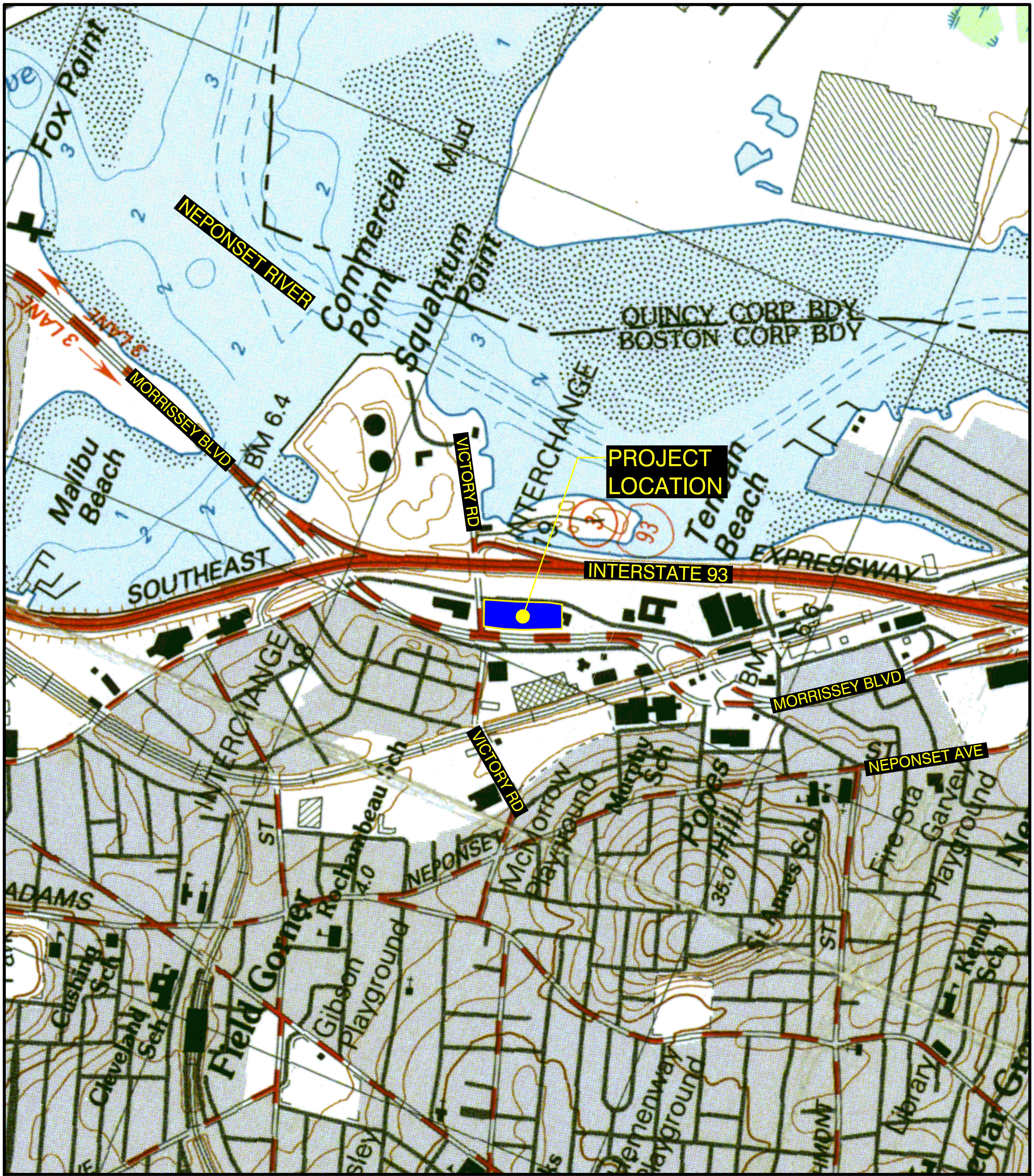
HERB CHAMBERS HONDA
710-720 MORRISSEY BOULEVARD
BOSTON, MA

PROJECT NO. 059051

DATE: 08/02/2021

FIGURE-1

File: V:\PROJECTS\ANY\K5\059051.000\CADD\FIGURES\31554-14001_NOI_FIGURES.DWG



LEGEND

PROJECT LOCATION

0 1,000 2,000

Scale in feet

CHA

1 Faneuil Hall Marketplace, South Market Building
Boston, MA 02109-6117
617.451.2717 . www.chacompanies.com

USGS PLAN

HERB CHAMBERS HONDA
710-720 MORRISSEY BOULEVARD
BOSTON, MA

PROJECT NO.
059051

DATE: 08/02/2021

FIGURE-2

File: V:\PROJECTS\ANY\K5\059051.000\CADD\FIGURES\31554-14001_NOI_FIGURES.DWG

LEGEND

PROJECT LOCATION

POTENTIAL VERNAL POOL

NHESP PRIORITY HABITATS OF RARE SPECIES

NHESP CERTIFIED VERNAL POOL

NHESP ESTIMATED HABITATS OF RARE WILDLIFE

0 500 1,000

Scale in feet

CHA
1 Faneuil Hall Marketplace, South Market Building
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617.451.2717 . www.chacompanies.com

NHESP HABITAT PLAN

HERB CHAMBERS HONDA
710–720 MORRISSEY BOULEVARD
BOSTON, MA

PROJECT NO. 059051

DATE: 08/02/2021

FIGURE-3

File: V:\PROJECTS\ANY\K5\059051.000\CADD\FIGURES\31554-14001_NOI_FIGURES.DWG

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

PROJECT LOCATION

FEMA ZONE VE = COASTAL FLOOD ZONE WITH VELOCITY HAZARD (WAVE ACTION); BASE FLOOD ELEVATIONS DETERMINED

FEMA ZONE AE = BASE FLOOD ELEVATIONS DETERMINED

0 500 1,000
Scale in feet

CHA
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617.451.2717 . www.chacompanies.com

FEMA PLAN

HERB CHAMBERS HONDA
710-720 MORRISSEY BOULEVARD
BOSTON, MA

PROJECT NO. 059051

DATE: 08/02/2021

FIGURE-4

File: V:\PROJECTS\ANY\K5\059051.000\CADD\FIGURES\31554-14001_FIGURES - FEMA.DWG

LEGEND

PROJECT LOCATION

NHESP ESTIMATED HABITATS OF RARE WILDLIFE

0 500 1,000

Scale in feet

CHA

1 Faneuil Hall Marketplace, South Market Building
Boston, MA 02109-6117
617.451.2717 . www.chacompanies.com

AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACEC) PLAN

HERB CHAMBERS HONDA
710-720 MORRISSEY BOULEVARD
BOSTON, MA

PROJECT NO. 059051

DATE: 08/02/2021

FIGURE-5

File: V:\PROJECTS\ANY\K5\059051.000\CADD\FIGURES\31554-14001_NOI_FIGURES.DWG

4.0 ABUTTER INFORMATION AND NOTIFICATION

Certification of Translation Accuracy

Translation of **Abutter Notification Covid-19 Form_Fillable** from **English** to **Creole**

As an authorized representative of RushTranslate, a professional translation services agency, I hereby certify that the above-mentioned document has been translated by an experienced, qualified and competent professional translator, fluent in the above-mentioned language pair and that, in my best judgment, the translated text truly reflects the content, meaning, and style of the original text and constitutes in every respect a complete and accurate translation of the original document. This document has not been translated for a family member, friend, or business associate.

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A copy of the translation is attached to this certification.

Mike Bortscheller
Authorized Representative
Order Date: September 8, 2021

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City of Boston
Environment

City of Boston
Mayor Kim Janey

AVI POU PWOPRIYETÈ YO
KOMISYON KONSÈVASYON nan BOSTON

An akò avèk Lwa Pwoteksyon zòn imid Massachusetts yo, Chapit 131, Seksyon 40, Lwa Jeneral Massachusetts, ak òdonans zòn imid Boston yo, yo avize w kòm yon opozan nan yon pwojè ki depoze nan Komisyon Konsèvasyon nan Boston.

A. **Konpayi Herb Chambers** yo te depoze yon avi sou entansyon nan Komisyon Konsèvasyon nan Boston pou mande pèmisyon pou chanje yon zòn ki sijè pou pwoteksyon anba Lwa Pwoteksyon zòn imid yo (Chapit 131, seksyon 40, Lwa Jeneral) ak òdonans sou zòn imid Boston yo.

B. Adrès lo kote yo pwopoze aktivite a se **710-720 Morrissey Boulevard**.

C. Pwojè a prevwa **yon reyamenajman teren konsesyonè machin ki deja egziste, ki gen ladan demolisyon yon batiman ki deja egziste ak konstriksyon yon batiman k'ap gen kat etaj ak yon sipèfisi sou sòl la apeprè 28,600 pi2.**

D. Ou ka jwenn kopi Avi sou entansyon an lè w kontakte Komisyon Konsèvasyon nan Boston nan **CC@boston.gov**.

E. Ou ka jwenn kopi Avi sou entansyon an nan men **Reprezantan Moun ki fè Demand lan** lè ou kontakte yo nan **(781) 982-5400** ant **9è di maten ak 4è nan laprè midi, Lendi jiska Vandredi.**

F. An akò avèk Dekrè Commonwealth Massachusetts la ki Sispann Sèten Dispozisyon Lwa sou Reyinyon Piblik, odyans piblik la ap fèt **vityèlman** nan adrès sa https://zoom.us/j/6864582044. Si ou pa kapab jwenn aksè ak entènèt la, ou ka rele nan 1-929-205-6099, antre ID Reyinyon ki se 686 458 2044 # epi sèvi ak # kòm ID patisipan ou.

G. Ou ka jwenn enfòmasyon konsènan dat ak lè odyans piblik la nan men **Komisyon Konsèvasyon nan Boston** pa imèl sou **CC@boston.gov** oswa rele **(617) 635-3850** ant nan lè **9è nan maten rive 5è na laprè midi, Lendi jiska Vandredi.**

REMAK: Avi sou odyans piblik la, ki gen ladan dat li, lè li, ak kote, yo pral pibliye omwen senk (5) jou davans nan **Boston Herald la**.

REMAK: Avi sou odyans piblik la, ki gen ladan dat li, lè li, ak kote, yo pral pibliye sou www.boston.gov/public-notices epi 8è davans nan Boston City Hall lan. Si ou ta renmen fè kòmantè, ou ka ale nan odyans piblik la oswa voye kòmantè alekri bay CC@boston.gov oswa Boston City Hall, Environment Department, Room 709, 1 City Hall Square, Boston, MA 02201

REMAK: Si ou ta renmen fè kòmantè, ou ka ale nan odyans piblik la oswa voye kòmantè alekri bay CC@boston.gov oswa Boston City Hall, Environment Department, Room 709, 1 City Hall Square, Boston, MA 02201

REMAK: Ou ka kontakte Komisyon Konsèvasyon nan Boston oswa Depatman Pwoteksyon Anviwonman Biwo Rejyonal Nòdès la pou plis enfòmasyon sou aplikasyon sa a oswa Lwa Pwoteksyon zòn imid yo. Pou kontakte DEP, rele: Rejyon Nòdès la (978) 694-3200.

REMAK: Si w gen plan pou patisipe nan odyans piblik la epi ou bezwen entèpretasyon, tanpri avize anplwaye yo nan CC@boston.gov avan midi lavèl avan odyans lan.

CITY of BOSTON
1 CITY HALL SQUARE BOSTON, MA 02201-2021 | ROOM 709 | 617-635-3850 | ENVIRONMENT@BOSTON.GOV

Certification of Translation Accuracy

Translation of **Notification** from **English** to **Vietnamese**

As an authorized representative of RushTranslate, a professional translation services agency, I hereby certify that the above-mentioned document has been translated by an experienced, qualified and competent professional translator, fluent in the above-mentioned language pair and that, in my best judgment, the translated text truly reflects the content, meaning, and style of the original text and constitutes in every respect a complete and accurate translation of the original document. This document has not been translated for a family member, friend, or business associate.

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A copy of the translation is attached to this certification.

Mike Bortscheller
Authorized Representative
Order Date: September 8, 2021

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263976
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City of Boston
Environment

City of Boston
Mayor Kim Janey

THÔNG BÁO CHO CHỦ NHÀ ĐẤT LÁNG GIỀNG
ỦY BAN BẢO TỒN BOSTON

Theo Đạo luật Bảo vệ Đất đầm lầy Massachusetts, Luật Chung của Massachusetts, Chương 131, Khoản 40, và Sắc lệnh Đất đầm lầy Boston, theo đây, quý vị được thông báo với tư cách là chủ nhà đất láng giềng với một dự án được đệ trình lên Ủy ban Bảo tồn Boston.

A. **Các công ty Herb Chambers** đã đệ trình Thông báo Ý định đến Ủy ban Bảo tồn Boston để xin phép thay đổi một Khu vực cần được Bảo vệ theo Đạo luật Bảo vệ Đất đầm lầy (Luật Chung, Chương 131, Khoản 40) và Sắc lệnh Đất đầm lầy Boston.

B. Địa chỉ của lô đất nơi hoạt động được đề xuất là **710-720 Morrissey Boulevard.**

C. Dự án liên quan đến việc **tái phát triển một lô đất đại lý ô tô hiện có, bao gồm việc phá bỏ một tòa nhà hiện có và xây dựng một tòa nhà 4 tầng với diện tích khoảng 28.600 dấu chân vuông**.

D. Quý vị có thể nhận được các bản sao của Thông báo Ý định bằng cách liên hệ với Ủy ban Bảo tồn Boston theo địa chỉ CC@boston.gov.

E. Quý vị có thể nhận được bản sao của Thông báo Ý định từ **Đại diện của Người nộp đơn** bằng cách liên hệ với họ theo số (**781) 982-5400** trong khoảng thời gian từ **9 giờ sáng đến 4 giờ chiều, từ thứ 2 đến thứ 6.**

F. Theo Lệnh Hành pháp của Khối thịnh vượng chung Massachusetts về Đình chỉ Một số Điều khoản của Luật họp công khai, phiên điều trần công khai sẽ diễn ra **trực tuyến** tại https://zoom.us/j/6864582044. Nếu quý vị không thể truy cập internet, quý vị có thể gọi 1-929-205-6099, nhập ID cuộc họp là 686 458 2044 # và sử dụng # làm ID người tham gia của quý vị.

G. Thông tin liên quan đến ngày và giờ của buổi điều trần công khai có thể nhận được từ **Ủy ban Bảo tồn Boston** bằng cách gửi email đến CC@boston.gov hoặc gọi **(617) 635-3850** trong khoảng thời gian từ **9 giờ sáng đến 5 giờ chiều, từ thứ 2 đến thứ 6.**

LƯU Ý: Thông báo về phiên điều trần công khai, bao gồm ngày, giờ và địa điểm, sẽ được đăng trước ít nhất năm (5) ngày trên tờ **Boston Herald.**

LƯU Ý: Thông báo về buổi điều trần công khai, bao gồm ngày, giờ và địa điểm, sẽ được đăng trên www.boston.gov/public-notices và tại Tòa thị chính Boston trước ít nhất bốn mươi tám (48) giờ. Nếu quý vị muốn đóng góp ý kiến, quý vị có thể tham dự buổi điều trần công khai hoặc gửi ý kiến bằng văn bản đến CC@boston.gov hoặc Tòa thị chính Boston, Sở Môi trường, Phòng 709, 1 City Hall Square, Boston, MA 02201

LƯU Ý: Nếu quý vị muốn đóng góp ý kiến, quý vị có thể tham dự buổi điều trần công khai hoặc gửi ý kiến bằng văn bản đến CC@boston.gov hoặc Tòa thị chính Boston, Sở Môi trường, Phòng 709, 1 City Hall Square, Boston, MA 02201

LƯU Ý: Quý vị cũng có thể liên hệ với Ủy ban Bảo tồn Boston hoặc Văn phòng Khu vực Đông Bắc của Sở Bảo vệ Môi trường (DEP) để biết thêm thông tin về đơn đăng ký này hoặc Đạo luật Bảo vệ Đất đầm lầy. Để liên hệ với DEP, hãy gọi: Khu vực Đông Bắc: (978) 694-3200.

LƯU Ý: Nếu quý vị dự định tham dự buổi điều trần công khai và cần thông dịch, vui lòng thông báo cho nhân viên tại **CC@boston.gov** trước 12 giờ trưa trước ngày diễn ra buổi điều trần.

CITY of BOSTON
1 CITY HALL SQUARE BOSTON, MA 02201-2021 | ROOM 709 | 617-635-3850 | ENVIRONMENT@BOSTON.GOV

City of Boston
Environment

City of Boston
Mayor Kim Janey

AFFIDAVIT OF SERVICE
FOR ABUTTER NOTIFICATION

Under the Massachusetts Wetlands Protection Act and Boston Wetlands Ordinance

I, **Tyler King, CHA Consulting, Inc.**, hereby certify under pains and penalties of perjury that that at least one week prior to the public hearing, I gave notice to abutters in compliance with the second paragraph of Massachusetts General Laws Chapter 131, section 40, and the DEP Guide to Abutter Notification dated April 8, 1994, in connection with the following matter:

> A **Notice of Intent** was filed under the Massachusetts Wetlands Protection Act and/or the Boston Wetlands Ordinance by **the Herb Chambers Companies** for **the redevelopment of an existing car dealership lot, including the demolition of an existing building and the construction of a 4-story building with an approximately 28,600 sf footprint** located at **710-720 Morrissey Boulevard.**

The Abutter Notification Form, the list of abutters to whom it was given, and their addresses are attached to this Affidavit of Service.

Name 9.24.21
Date

City of Boston Environment

City of Boston Mayor Kim Janey

NOTIFICATION TO ABUTTERS
BOSTON CONSERVATION COMMISSION

In accordance with the Massachusetts Wetlands Protection Act, Massachusetts General Laws Chapter 131, Section 40, and the Boston Wetlands Ordinance, you are hereby notified as an abutter to a project filed with the Boston Conservation Commission.

A. **The Herb Chambers Companies** has filed a Notice of Intent with the Boston Conservation Commission seeking permission to alter an Area Subject to Protection under the Wetlands Protection Act (General Laws Chapter 131, section 40) and Boston Wetlands Ordinance.

B. The address of the lot where the activity is proposed is **710-720 Morrissey Boulevard.**

C. The project involves **the redevelopment of an existing car dealership lot, including the demolition of an existing building and the construction of a 4-story building with an approximately 28,600 sf footprint**.

D. Copies of the Notice of Intent may be obtained by contacting the Boston Conservation Commission at **CC@boston.gov**.

E. Copies of the Notice of Intent may be obtained from **the Applicant's Representative** by contacting them at (**781) 982-5400** between the hours of **9AM and 4PM, Monday through Friday.**

F. In accordance with the Commonwealth of Massachusetts Executive Order Suspending Certain Provisions of the Open Meeting Law, the public hearing will take place **virtually** at https://zoom.us/j/6864582044. If you are unable to access the internet, you can call 1-929-205-6099, enter Meeting ID 686 458 2044 # and use # as your participant ID.

G. Information regarding the date and time of the public hearing may be obtained from the **Boston Conservation Commission** by emailing **CC@boston.gov** or calling **(617) 635-3850** between the hours of **9 AM to 5 PM, Monday through Friday.**

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

NOTE: Notice of the public hearing, including its date, time, and place, will be posted on www.boston.gov/public-notices and in Boston City Hall not less than forty-eight (48) hours in advance. If you would like to provide comments, you may attend the public hearing or send written comments to CC@boston.gov or Boston City Hall, Environment Department, Room 709, 1 City Hall Square, Boston, MA 02201

NOTE: If you would like to provide comments, you may attend the public hearing or send written comments to CC@boston.gov or Boston City Hall, Environment Department, Room 709, 1 City Hall Square, Boston, MA 02201

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

NOTE: If you plan to attend the public hearing and need interpretation, please notify staff at CC@boston.gov by 12 PM the day before the hearing.

THÔNG BÁO CHO CHỦ NHÀ ĐẤT LÁNG GIỀNG
ỦY BAN BẢO TỒN BOSTON

Theo Đạo luật Bảo vệ Đất đầm lầy Massachusetts, Luật Chung của Massachusetts, Chương 131, Khoản 40, và Sắc lệnh Đất đầm lầy Boston, theo đây, quý vị được thông báo với tư cách là chủ nhà đất láng giềng với một dự án được đệ trình lên Ủy ban Bảo tồn Boston.

A. **Các công ty Herb Chambers** đã đệ trình Thông báo Ý định đến Ủy ban Bảo tồn Boston để xin phép thay đổi một Khu vực cần được Bảo vệ theo Đạo luật Bảo vệ Đất đầm lầy (Luật Chung, Chương 131, Khoản 40) và Sắc lệnh Đất đầm lầy Boston.

B. Địa chỉ của lô đất nơi hoạt động được đề xuất là **710-720 Morrissey Boulevard.**

C. Dự án liên quan đến việc **tái phát triển một lô đất đại lý ô tô hiện có, bao gồm việc phá bỏ một tòa nhà hiện có và xây dựng một tòa nhà 4 tầng với diện tích khoảng 28.600 dấu chân vuông**.

D. Quý vị có thể nhận được các bản sao của Thông báo Ý định bằng cách liên hệ với Ủy ban Bảo tồn Boston theo địa chỉ **CC@boston.gov.**

E. Quý vị có thể nhận được bản sao của Thông báo Ý định từ **Đại diện của Người nộp đơn** bằng cách liên hệ với họ theo số **(781) 982-5400** trong khoảng thời gian từ **9 giờ sáng đến 4 giờ chiều, từ thứ 2 đến thứ 6.**

F. Theo Lệnh Hành pháp của Khối thịnh vượng chung Massachusetts về Đình chỉ Một số Điều khoản của Luật họp công khai, phiên điều trần công khai sẽ diễn ra **trực tuyến** tại **https://zoom.us/j/6864582044.** Nếu quý vị không thể truy cập internet, quý vị có thể gọi 1-929-205-6099, nhập ID cuộc họp là 686 458 2044 # và sử dụng # làm ID người tham gia của quý vị.

G. Thông tin liên quan đến ngày và giờ của buổi điều trần công khai có thể nhận được từ **Ủy ban Bảo tồn Boston** bằng cách gửi email đến **CC@boston.gov** hoặc gọi **(617) 635-3850** trong khoảng thời gian từ **9 giờ sáng đến 5 giờ chiều, từ thứ 2 đến thứ 6.**

LƯU Ý: Thông báo về phiên điều trần công khai, bao gồm ngày, giờ và địa điểm, sẽ được đăng trước ít nhất năm (5) ngày trên tờ **Boston Herald.**

LƯU Ý: Thông báo về buổi điều trần công khai, bao gồm ngày, giờ và địa điểm, sẽ được đăng trên **www.boston.gov/public-notices** và tại Tòa thị chính Boston trước ít nhất bốn mươi tám (48) giờ. Nếu quý vị muốn đóng góp ý kiến, quý vị có thể tham dự buổi điều trần công khai hoặc gửi ý kiến bằng văn bản đến **CC@boston.gov** hoặc Tòa thị chính Boston, Sở Môi trường, Phòng 709, 1 City Hall Square, Boston, MA 02201

LƯU Ý: Nếu quý vị muốn đóng góp ý kiến, quý vị có thể tham dự buổi điều trần công khai hoặc gửi ý kiến bằng văn bản đến **CC@boston.gov** hoặc Tòa thị chính Boston, Sở Môi trường, Phòng 709, 1 City Hall Square, Boston, MA 02201

LƯU Ý: Quý vị cũng có thể liên hệ với Ủy ban Bảo tồn Boston hoặc Văn phòng Khu vực Đông Bắc của Sở Bảo vệ Môi trường (DEP) để biết thêm thông tin về đơn đăng ký này hoặc Đạo luật Bảo vệ Đất đầm lầy. Để liên hệ với DEP, hãy gọi: Khu vực Đông Bắc: (978) 694-3200.

LƯU Ý: Nếu quý vị dự định tham dự buổi điều trần công khai và cần thông dịch, vui lòng thông báo cho nhân viên tại **CC@boston.gov** trước 12 giờ trưa trước ngày diễn ra buổi điều trần.

AVI POU PWOPRIYETÈ YO
KOMISYON KONSÈVASYON nan BOSTON

An akò avèk Lwa Pwoteksyon zòn imid Massachusetts yo, Chapit 131, Seksyon 40, Lwa Jeneral Massachusetts, ak òdonans zòn imid Boston yo, yo avize w kòm yon opozan nan yon pwojè ki depoze nan Komisyon Konsèvasyon nan Boston.

A. **Konpayi Herb Chambers** yo te depoze yon avi sou entansyon nan Komisyon Konsèvasyon nan Boston pou mande pèmisyon pou chanje yon zòn ki sijè pou pwoteksyon anba Lwa Pwoteksyon zòn imid yo (Chapit 131, seksyon 40, Lwa Jeneral) ak òdonans sou zòn imid Boston yo.

B. Adrès lo kote yo pwopoze aktivite a se **710-720 Morrissey Boulevard**.

C. Pwojè a prevwa **yon reyamenajman teren konsesyonè machin ki deja egziste, ki gen ladan demolisyon yon batiman ki deja egziste ak konstriksyon yon batiman k'ap gen kat etaj ak yon sipèfisi sou sòl la apeprè 28,600 pi2.**

D. Ou ka jwenn kopi Avi sou entansyon an lè w kontakte Komisyon Konsèvasyon nan Boston nan **CC@boston.gov**.

E. Ou ka jwenn kopi Avi sou entansyon an nan men **Reprezantan Moun ki fè Demand lan** lè ou kontakte yo nan **(781) 982-5400** ant **9è di maten ak 4è nan laprè midi, Lendi jiska Vandredi.**

F. An akò avèk Dekrè Commonwealth Massachusetts la ki Sispann Sèten Dispozisyon Lwa sou Reyinyon Piblik, odyans piblik la ap fèt **vityèlman** nan adrès sa https://zoom.us/j/6864582044. Si ou pa kapab jwenn aksè ak entènèt la, ou ka rele nan 1-929-205-6099, antre ID Reyinyon ki se 686 458 2044 # epi sèvi ak # kòm ID patisipan ou.

G. Ou ka jwenn enfòmasyon konsènan dat ak lè odyans piblik la nan men **Komisyon Konsèvasyon nan Boston** pa imèl sou **CC@boston.gov** oswa rele **(617) 635-3850** ant nan lè **9è nan maten rive 5è na laprè midi, Lendi jiska Vandredi.**

REMAK: Avi sou odyans piblik la, ki gen ladan dat li, lè li, ak kote, yo pral pibliye omwen senk (5) jou davans nan **Boston Herald la**.

REMAK: Avi sou odyans piblik la, ki gen ladan dat li, lè li, ak kote, yo pral pibliye sou www.boston.gov/public-notices epi 8è davans nan Boston City Hall lan. Si ou ta renmen fè kòmantè, ou ka ale nan odyans piblik la oswa voye kòmantè alekri bay CC@boston.gov oswa Boston City Hall, Environment Department, Room 709, 1 City Hall Square, Boston, MA 02201

REMAK: Si ou ta renmen fè kòmantè, ou ka ale nan odyans piblik la oswa voye kòmantè alekri bay CC@boston.gov oswa Boston City Hall, Environment Department, Room 709, 1 City Hall Square, Boston, MA 02201

REMAK: Ou ka kontakte Komisyon Konsèvasyon nan Boston oswa Depatman Pwoteksyon Anviwonman Biwo Rejyonal Nòdès la pou plis enfòmasyon sou aplikasyon sa a oswa Lwa Pwoteksyon zòn imid yo. Pou kontakte DEP, rele: Rejyon Nòdès la (978) 694-3200.

REMAK: Si w gen plan pou patisipe nan odyans piblik la epi ou bezwen entèpretasyon, tanpri avize anplwaye yo nan CC@boston.gov avan midi lavèl avan odyans lan.

BABEL NOTICE

English:

IMPORTANT! This document or application contains **important information** about your rights, responsibilities and/or benefits. It is crucial that you understand the information in this document and/or application, and we will provide the information in your preferred language at no cost to you. If you need them, please contact us at cc@boston.gov or 617-635-3850.

Spanish:

¡IMPORTANTE! Este documento o solicitud contiene **información importante** sobre sus derechos, responsabilidades y/o beneficios. Es fundamental que usted entienda la información contenida en este documento y/o solicitud, y le proporcionaremos la información en su idioma preferido sin costo alguno para usted. Si los necesita, póngase en contacto con nosotros en el correo electrónico cc@boston.gov o llamando al 617-635-3850.

Haitian Creole:

AVI ENPÒTAN! Dokiman oubyen aplikasyon sa genyen **enfòmasyon ki enpòtan** konsènan dwa, responsablite, ak/oswa benefis ou yo. Li enpòtan ke ou konprann enfòmasyon ki nan dokiman ak/oubyen aplikasyon sa, e n ap bay enfòmasyon an nan lang ou prefere a, san ou pa peye anyen. Si w bezwen yo, tanpri kontakte nou nan cc@boston.gov oswa 617-635-3850.

Traditional Chinese:

非常重要！這份文件或是申請表格包含關於您的權利，責任，和／或福利的重要信息。請您務必完全理解這份文件或申請表格的全部信息，這對我們來說十分重要。我們會免費給您提供翻譯服務。如果您有需要請聯系我們的郵箱 cc@boston.gov 電話# 617-635-3850..

Vietnamese:

QUAN TRỌNG! Tài liệu hoặc đơn yêu cầu này chứa **thông tin quan trọng** về các quyền, trách nhiệm và/hoặc lợi ích của bạn. Việc bạn hiểu rõ thông tin trong tài liệu và/hoặc đơn yêu cầu này rất quan trọng, và chúng tôi sẽ cung cấp thông tin bằng ngôn ngữ bạn muốn mà không tính phí. Nếu quý vị cần những dịch vụ này, vui lòng liên lạc với chúng tôi theo địa chỉ cc@boston.gov hoặc số điện thoại 617-635-3850.

Simplified Chinese:

非常重要！这份文件或是申请表格包含关于您的权利，责任，和／或福利的重要信息。请您务必完全理解这份文件或申请表格的全部信息，这对我们来说十分重要。我们会免费给您提供翻译服务。如果您有需要请联系我们的邮箱 cc@boston.gov 电话# 617-635-3850.

Cape Verdean Creole:

INPURTANTI! Es dukumentu ó aplikason ten **informason inpurtanti** sobri bu direitus, rasponsabilidadis i/ó benefísius. Ê krusial ki bu intendi informason na es dukumentu i/ó aplikason ó nu ta da informason na língua di bu preferênsia sen ninhun kustu pa bó. Si bu prisiza del, kontata-nu na cc@boston.gov ó 617-635-3850.

Arabic:

مهم! يحتوي هذا المستند أو التطبيق على معلومات مهمة حول حقوقك ومسؤولياتك أو فوائدك. من الأهمية أن تفهم المعلومات الواردة في هذا المستند أو التطبيق. سوف نقدم المعلومات بلغتك المفضلة دون أي تكلفة عليك. إذا كنت في حاجة إليها، يرجى الاتصال بنا على cc@boston.gov أو 617-635-3850.

Russian:

ВАЖНО! В этом документе или заявлении содержится **важная информация** о ваших правах, обязанностях и/или льготах. Для нас очень важно, чтобы вы понимали приведенную в этом документе и/или заявлении информацию, и мы готовы бесплатно предоставить вам информацию на предпочитаемом вами языке. Если Вам они нужны, просьба связаться с нами по адресу электронной почты cc@boston.gov, либо по телефону 617-635-3850.

Portuguese:

IMPORTANTE! Este documento ou aplicativo contém **Informações importantes** sobre os seus direitos, responsabilidades e/ou benefícios. É importante que você compreenda as informações contidas neste documento e/ou aplicativo, e nós iremos fornecer as informações em seu idioma de preferência sem nenhum custo para você. Se precisar deles, fale conosco: cc@boston.gov ou 617-635-3850.

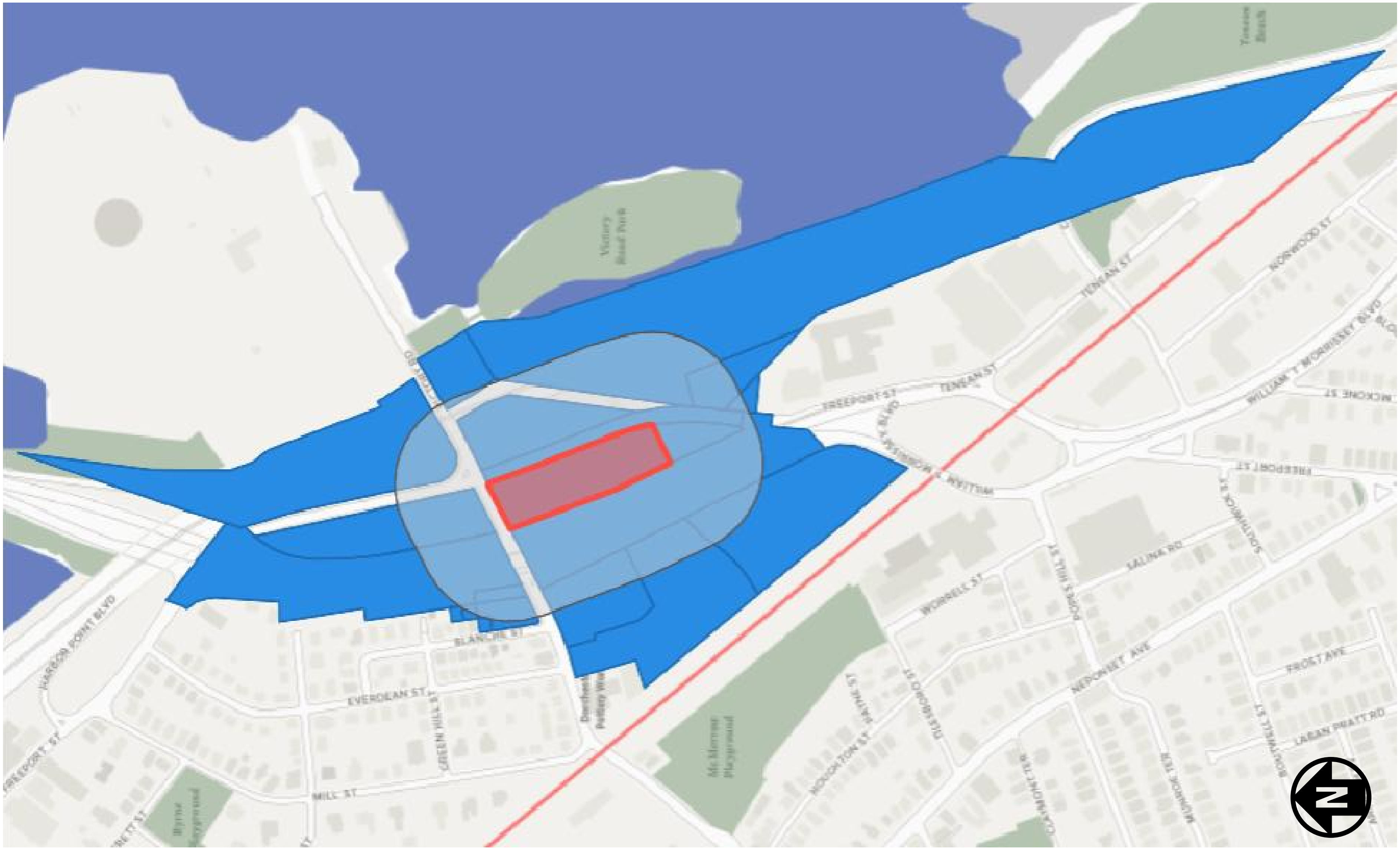
French:

IMPORTANT ! Ce document ou cette demande contient des **informations importantes** concernant vos droits, responsabilités et/ou avantages. Il est essentiel que vous compreniez les informations contenues dans ce document et/ou cette demande, que nous pouvons vous communiquer gratuitement dans la langue de votre choix. Si vous en avez besoin, veuillez nous contacter à cc@boston.gov ou au 617-635-3850.

OC

Large Print

File: V:\PROJECTS\ANY\K5\059051.000\CADD\FIGURES\31554-ABUTTER'S FIGURE.DWG



LEGEND

PROJECT LOCATION

300' BUFFER

NOTIFIED ABUTTERS

NOTES

1. ABUTTERS MAP IS FROM CITY OF BOSTON ABUTTER MAILING LIST GENERATOR.
2. FIGURE IS NOT TO SCALE.

CHA
1 Faneuil Hall Marketplace, South Market Building
Boston, MA 02109-6117
617.451.2717 . www.chacompanies.com

ABUTTERS MAP

HERB CHAMBERS HONDA
710-720 MORRISSEY BOULEVARD
BOSTON, MA

PROJECT NO. 059051

DATE: 08/06/2021

AB-001

List of Abutters
Herb Chambers - Honda of Boston
710-720 Morrissey Boulevard, Dorchester, MA

PARCEL ID	PARCEL ADDRESS	OWNER	ADDRESSEE	MAILING ADDRESS	CITY	STATE	ZIPCODE
1600255000	741 779 WM T MORRISSEY BL	LAMBERT FERDINAND G TRSTS	C/O WIFRED LAMBERT	735 MORRISSEY BLVD	DORCHESTER	MA	02122
1602569000	TENEAN ST	COMMONWEALTH OF MA		TENEAN ST	DORCHESTER	MA	02122
1600162000	34 BLANCHE ST	ZHAO REVOCABLE TRUST	C/O JENNY LO ZHAO	34 BLANCHE ST	DORCHESTER	MA	02122
1600251002	730 WM T MORRISSEY BL	SEVEN-ELEVEN INC		PO BOX 711	DALLAS	TX	75221
1600155000	WM T MORRISSEY BL	BROOKS RAYMOND ETAL		26 BLANCHE	DORCHESTER	MA	02122
1600251000	WM T MORRISSEY BL	COMMWLTH OF MASS		WM T MORRISSEY BLVD	DORCHESTER	MA	02122
1602590010	FREEPORT ST	STRAZZULA PHILLIP A JR TS		780 MORRISSEY BLVD	DORCHESTER	MA	02122
1602592000	FREEPORT ST	STRAZZULA MATTHEW J		780 WM T MORRISSEY BLVD	DORCHESTER	MA	02125
1600251001	710 720 WM T MORRISSEY BL	HERB CHAMBERS OF WOBURN LLC	HC OF WOBURN LLC	47 EASTERN BLVD	GLASTONBURY	CT	06033
1600231000	VICTORY RD	COMM OF MASS DPW		VICTORY RD	DORCHESTER	MA	02122
1600222000	650 700 WM T MORRISSEY BL	EXPRESSWAY MOTORS LLC MASS LLC	R C BOCH C/O EXPRESSWAY MTRS	700 MORRISSEY BLVD	DORCHESTER	MA	02122
1600247000	729 WM T MORRISSEY BL	NEW CREEK II LLC	KIMCO RLTY CORP ATT: PROP TAX	3333 NEW HYDE PK RD #100	NEW HYDE PARK	NY	11042
1600250000	711 WM T MORRISSEY BL	MADISON PARTNERS LLC MASS LLC	C/O MARGARET A SHEEHAN	57 DEDHAM AVE	NEEDHAM HEIGHTS	MA	02122
1600159010	VICTORY RD	CHAU CHOW REAL ESTATE LLC MASS LLC		699 WM T MORRISSEY BL	DORCHESTER	MA	02122
1600156000	WM T MORRISSEY BL	HOBBS SARAH THERESA		30 BLANCHE ST	DORCHESTER	MA	02122
1600252001	FREEPORT ST	COMMWLTH OF MASS		FREEPORT	DORCHESTER	MA	02122
1600225000	FREEPORT ST	COMMONWLTH OF MASS		FREEPORT	DORCHESTER	MA	02122
1600220000	FREEPORT ST	COMMONWLTH OF MASS		FREEPORT ST	DORCHESTER	MA	02122
1600159000	699 WM T MORRISSEY BL	CHAU CHOW REAL ESTATE LLC MASS LLC	C/O CHAU CHOW REAL EST LLC	669 WM T MORRISSEY BL	DORCHESTER	MA	02122
1600252000	FREEPORT ST	CITY OF BOSTON		FREEPORT	DORCHESTER	MA	02122

5.0 FILING FEE INFORMATION

Calculated Filing Fee Statement

Under the MA Department of Environmental Protection (DEP) Wetlands Protection Act (WPA), the fee for proposed activities associated with this Notice of Intent filing are included within Category 3.

Category 3(b): Construction of each building (for development) including site. The fee for Category 3(b) is $1,050.00

(1) Building Including Site X $1,050.00 = $1,050.00

<u>WPA Filing Fee:</u>

Total WPA Required Fees = $1,050.00
State Share of WPA Filing Fee: ($ 1,050/2) - $12.50 = $ 512.50
Town Share of WPA Filing Fee: ($ 1,050/2) + $12.50 = $ 537.50

<u>Note</u>: The City of Boston does not accept the municipal portion of the state fee.

<u>City of Boston Filing Fees:</u>

The City of Boston requires filing fees in addition to the filing fees under the WPA.

Pursuant to the City of Boston Title 14 Section 450 requires the following fees payable to the City of Boston for Notice of Intent processing:

Projects with fair cost greater than $100,000, the fee shall be .075% of the fair cost provided, however the fee shall be no more than $1,500.00.

Proposed Automobile Dealership = (1) Project X $1,500.00 = $1,500.00

The Boston Conservation Commission has adopted additional fees under the Boston Wetlands Ordinance. Notice of Intent, Category 3 = $ 550.00

Category 3(b): Construction of each building (for development) including site.

(1) Building Including Site X $ 550.00 = $ 550.00

Total City of Boston Filling Fee = $1,500.00 + $ 550.00 = $2,050.00

<u>Total Project Filing Fees:</u>

Total State Filing Fee =	**$512.50**
Total City Filing Fee =	**$2,050.00**

<u>Note</u>: Public notification in a local newspaper is required for public hearings under the WPA and Boston Wetland Ordinance. The Boston Conservation Commission uses the Boston Herald for notification purposes and the Boston Herald bills the applicant for the public legal notice.

6.0 APPENDICIES

APPENDIX A

Climate Resiliency Checklist

Boston Planning & Development Agency
Climate Resiliency Report Summary

Submitted: 09/24/2021 10:51:32

A.1 - Project Information

Project Name:	Herb Chambers Honda of Boston			
Project Address:	710-720 Morrissey Boulevard, Boston, MA 02125			
Filing Type:	Initial (PNF, EPNF, NPC or other substantial filing)			
Filing Contact:	Tyler King	CHA Consulting, Inc.	tking@chacompanies.com	781-792-2277
Is MEPA approval required?	No	MEPA date:		

A.2 - Project Team

Owner / Developer:	Herb Chambers of Woburn, LLC c/o The Herb Chambers Companies
Architect:	The Curtis Architectural Group
Engineer:	CHA Consulting, Inc.
Sustainability / LEED:	Commercial Construction Consulting, Inc.
Permitting:	
Construction Management:	TBD

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Auto Sales and Service
List the First Floor Uses:	Auto Sales and Service
List any Critical Site Infrastructure and or Building Uses:	None

Site and Building:

Site Area (SF):	92139	Building Area (SF):	28600
Building Height (Ft):	65	Building Height (Stories):	4
Existing Site Elevation – Low (Ft BCB):	14.0	Existing Site Elevation – High (Ft BCB):	18.2
Proposed Site Elevation – Low (Ft BCB):	13.8	Proposed Site Elevation – High (Ft BCB):	18.2
Proposed First Floor Elevation (Ft BCB):	17.5	Below grade spaces/levels (#):	0

Article 37 Green Building:

LEED Version - Rating System:	v4 New Construction	LEED Certification:	No

Proposed LEED rating:	Certified	Proposed LEED point score (Pts.):	44

Building Envelope:

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

Roof:	35	Exposed Floor :	N/A
Foundation Wall:	N/A	Slab Edge (at or below grade):	19

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

Area of Opaque Curtain Wall & Spandrel Assembly:	1.51	Wall & Spandrel Assembly Value:	N/A
Area of Framed & Insulated / Standard Wall:	72.97	Wall Value:	18.6
Area of Vision Window:	22.79	Window Glazing Assembly Value:	0.38
		Window Glazing SHGC:	0.38
Area of Doors:	2.73	Door Assembly Value :	0.37

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	Loads and energy use will be determined based on the various areas and use types. Calculations will utilize annual average usage and weather data		
Annual Electric (kWh):	520000	Peak Electric (kW):	160
Annual Heating (MMbtu/hr):	2300	Peak Heating (MMbtu):	2.5
Annual Cooling (Tons/hr):	27000	Peak Cooling (Tons):	370
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):	36.2

Back-up / Emergency Power System

Electrical Generation Output (kW):	0	Number of Power Units:	0
System Type (kW):	0	Fuel Source:	0

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

Electric (kW):	0	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): 490

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

Energy efficiency will be a major consideration of the design team. High efficiency HVAC systems and lighting will be specified. New controls will be installed for all systems. Programmable thermostats will reduce energy usage during off hours. Energy conservation consideration will continue as the project progresses

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

High Efficiency Glass and shading co-efficiency

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

All new systems will meet or exceed the requirements of International Energy Conservation Code (IECC) and the International Mechanical Code (IMC)

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

The installation of a photovoltaic system is being investigated

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

Not anticipated

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

Not anticipated

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 shall include high efficiency equipment applications with environmentally approved refrigerants that account for GHC reduction applications with the 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	Annual Cooling Degree Days	805

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:

To reduce heat-island effect, reduction of impervious surface, additional shade trees and shrubs, high-reflective roofing materials and glazing applications

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:

Feasibility of the latest building materials to be incorporated in, walls, structures, and additional landscape elements shall be evaluated. Use of high-efficiency HVAC systems that shall have capacity to accommodate future temperature set point requirements 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:

Natural ventilation, external shading devices, incorporation of energy efficient insulation types in accordance with the IECC

D - Extreme Precipitation Events

Boston Planning & Development Agency
Climate Resiliency Report Summary

boston planning & development agency

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)	8.83

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

Reduction of impervious surfaces & on-site drainage infrastructure improvements

D.2 - Extreme Precipitation - Adaptation Strategies

Describe how site and building systems will be adapted to efficiently accommodate future more significant rain events (e.g. rainwater harvesting, on-site storm water retention, bio swales, green roofs):

On-site stormwater retention/infiltration via underground drainage chambers and outlet control structures, and the reduction of impervious surfaces with the installation of landscaped islands within the site

E – Sea Level Rise and Storms

Under any plausible greenhouse gas emissions scenario, the sea level in Boston will continue to rise throughout the century. This will increase the number of buildings in Boston susceptible to coastal flooding and the likely frequency of flooding for those already in the floodplain.

Is any portion of the site in a FEMA Special Flood Hazard Area?	Yes	What Zone:	AE
		What is the current FEMA SFHA Zone Base Flood Elevation for the site (Ft BCB)?	16.5

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):	17.5
What are the Site Elevations at Building (Ft BCB)?	16.8-17.5	What is the Accessible Route Elevation (Ft BCB)?	16.5-17.5

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 in both stormwater and wastewater outlet pipes prior to exiting the site

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.:

Based on the existing elevation of the site and the elevation of its surrounding access roads, the existing grades will need to be closely matched. The site will be raised out of the FEMA flood plain and backflow prevention devices will be installed on all exiting storm and wastewater outlets. Where practicable, mechanical & other utility equipment will be raised above finish floor and if possible, out of the SLR-BFE

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 provided throughout the building. Bathrooms will be located on the second floor for use in the case of a flood emergency

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

Inventory, display and service automobiles will be moved offsite to other Chambers inland and/or upland sites in the Greater Boston area and moved back after the weather event. All moveable furniture, fixtures, tools and business machines will be moved up ramps and/or elevators to the 2nd, 3rd and 4th floors and returned after the weather event

E.2 – Sea Level Rise and Storms – Adaptation Strategies

Describe future site design and or infrastructure adaptation strategies for responding to sea level rise including future elevating of site areas and access routes, barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Underground drainage systems will be installed beneath the parking areas to provide stormwater storage which does not currently exist on the site

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

Consideration of the installation of temporary flood gates at the vehicular entrances. Pending the final location of proposed mechanical/electrical systems, provisions for relocation to upper floors as sea level rise continues in future decades will also be considered

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

APPENDIX B

Exhibits

LEGEND:

- BUILDING LINE
- PARCEL BOUNDARY LINE
- EASEMENT LINE
- ADJOINING PARCEL LINE
- STREET/HIGHWAY LINE
- EDGE OF ASPHALT
- EDGE OF CONCRETE
- EDGE OF GRAVEL/CRUSHED STONE
- ELECTRIC LINE
- FENCE LINE
- OVERHEAD UTILITY LINE W/POWER POLE
- GAS LINE
- UNDERGROUND UTILITY LINE
- SEWER LINE
- DRAIN LINE
- CABLE/COMMUNICATION LINE
- WATER LINE
- UTILITY POLE
- GUY POLE
- LIGHT POLE
- GUY WIRE
- MANHOLE
- ELECTRIC MANHOLE
- ELECTRIC HAND HOLE
- ELECTRIC BOX
- BOLLARD
- POST
- SINGLE POST SIGN
- DOUBLE POST SIGN
- HANDICAP ICON
- DECIDUOUS TREE
- REBAR
- IRON ROD
- WATER MANHOLE
- IRRIGATION CONTROL VALVE
- WATER HAND HOLE
- WATER METER
- WATER SHUT OFF
- WATER VALVE
- HYDRANT
- SEWER MANHOLE
- GAS SHUT OFF
- GAS VALVE
- GAS METER
- TELEPHONE MANHOLE
- ROUND CATCH BASIN
- SQUARE CATCH BASIN
- STORM MANHOLE
- INVERT
- ROOF DRAIN

GENERAL NOTES:

1. THE EXISTING CONDITIONS INFORMATION SHOWN HEREON IS THE RESULT OF AN ON-THE-GROUND SURVEY PERFORMED BY CHA CONSULTING, INC. IN OCTOBER OF 2018.
2. ALL DEED REFERENCES ARE TO SUFFOLK COUNTY REGISTRY OF DEEDS UNLESS OTHERWISE NOTED.
3. LOCUS OWNER OF RECORD:

   BLOOMRICH REALTY 1990 TRUST (HENRY BLOOM & MARK J LEVINSON TRUSTEES)
   DEED BOOK 16376 PAGE 102
   PARCEL ID 1600251001

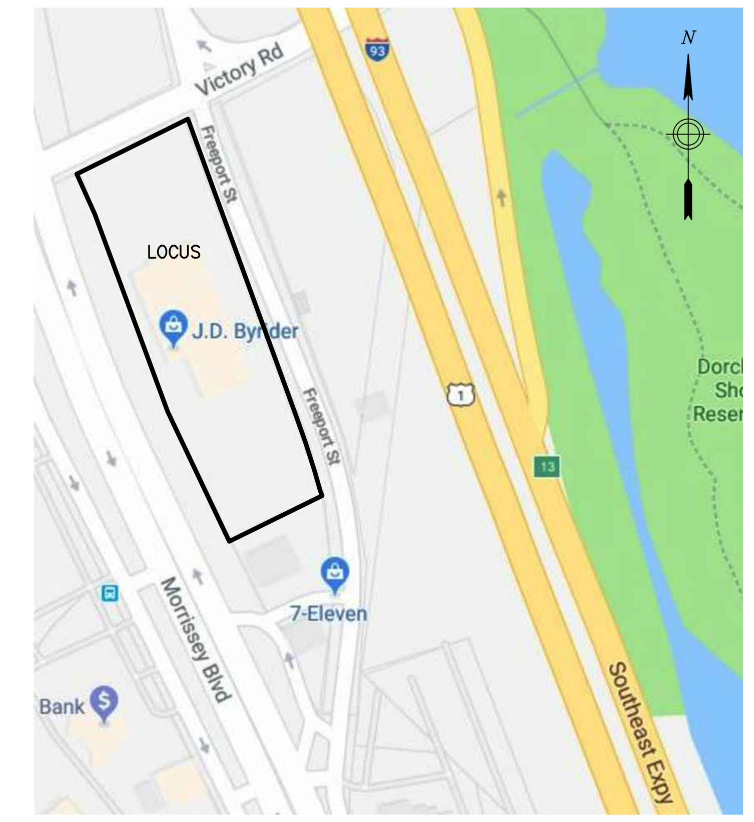
4. TOPOGRAPHY, CONTOURS AND BENCHMARKS ARE BASED ON AN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). TEMPORARY BENCHMARKS, REFERENCED TO THE DATUM ARE INDICATED ON THE SURVEY.

   IN THE EVENT THAT BENCHMARKS (TBM'S), ESTABLISHED FOR THIS PROJECT AND PUBLISHED ON THIS SURVEY ARE DESTROYED, NOT RECOVERABLE OR A DISCREPANCY IS FOUND, THE USER SHOULD NOTIFY THIS FIRM IN WRITING PRIOR TO COMMENCING OR CONTINUING ANY WORK.

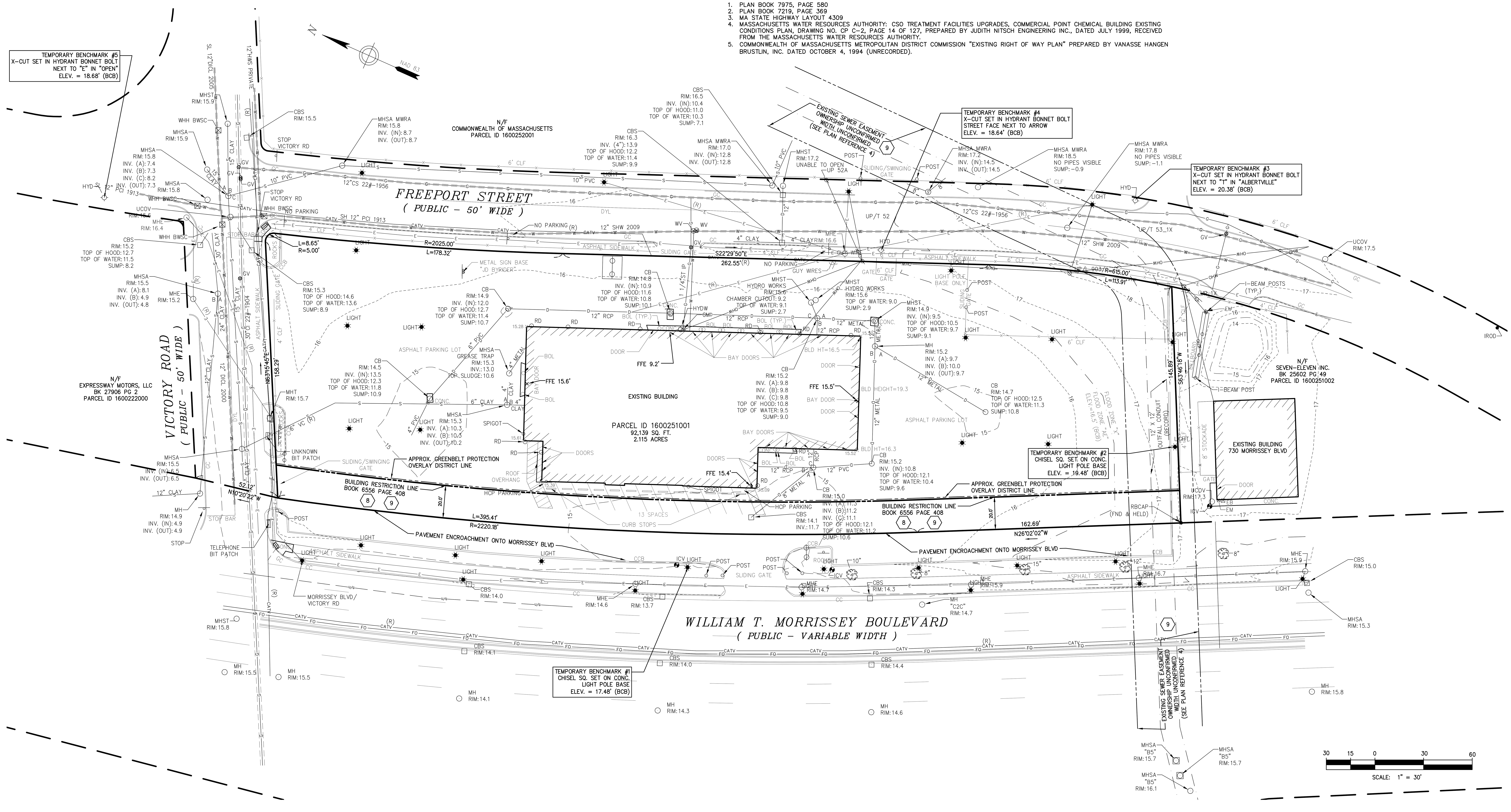
5. THE PROJECT AREA IS PARTIALLY LOCATED IN FLOOD ZONE "AE" (EL. 10'), BASE FLOOD ELEVATIONS DETERMINED, AND PARTIALLY LOCATED IN FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS SHOWN ON FLOOD INSURANCE RATE MAP FOR THE CITY OF BOSTON, COMMUNITY PANEL NUMBER 25025C0091J, EFFECTIVE DATE MARCH 16, 2016.
6. THE LOCUS PARCEL IS LOCATED IN THE CITY OF BOSTON, DORCHESTER NEIGHBORHOOD DISTRICT AND COMMUNITY COMMERCIAL SUBDISTRICT AND IS PARTIALLY LOCATED IN THE GREENBELT PROTECTION OVERLAY DISTRICT AS DEFINED BY THE CITY OF BOSTON ZONING MAP #5C. MINIMUM SETBACK REQUIREMENTS ARE:

   FRONT SETBACK:..................N/A'
   SIDE SETBACK:.....................N/A'
   REAR SETBACK:.....................20'

7. LOCATION OF SUBSURFACE UTILITIES SHOWN HEREON ARE APPROXIMATE AND ADDITIONAL UTILITIES MAY EXIST THAT ARE NOT SHOWN ON THIS PLAN. LOCATIONS ARE COMPILED FROM UTILITY PLANS OF RECORD AND DIG-SAFE FIELD MARKINGS. RIM AND INVERT INFORMATION HAS BEEN COMPILED AND FIELD VERIFIED WHERE POSSIBLE. THIS PLAN IS NOT TO BE USED FOR CONSTRUCTION. PRIOR TO ANY CONSTRUCTION, CONTACT DIG-SAFE (1-800-344-7233) TO FIELD VERIFY LOCATION OF ALL UTILITIES.
8. PLAN REFERENCES:
   1. PLAN BOOK 7975, PAGE 580
   2. PLAN BOOK 7219, PAGE 369
   3. MA STATE HIGHWAY LAYOUT 4309
   4. MASSACHUSETTS WATER RESOURCES AUTHORITY: CSO TREATMENT FACILITIES UPGRADES, COMMERCIAL POINT CHEMICAL BUILDING EXISTING CONDITIONS PLAN, DRAWING NO. CP C-2, PAGE 14 OF 127, PREPARED BY JUDITH NITSCH ENGINEERING INC., DATED JULY 1999, RECEIVED FROM THE MASSACHUSETTS WATER RESOURCES AUTHORITY.
   5. COMMONWEALTH OF MASSACHUSETTS METROPOLITAN DISTRICT COMMISSION "EXISTING RIGHT OF WAY PLAN" PREPARED BY VANASSE HANGEN BRUSTLIN, INC. DATED OCTOBER 4, 1994 (UNRECORDED).



LOCUS MAP
(NOT TO SCALE)



CHA
141 Longwater Drive - Suite 104
Norwell, MA 02061
781.982.5400 • www.chacompanies.com

HONDA

HERB CHAMBERS
HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER,
MA 02122

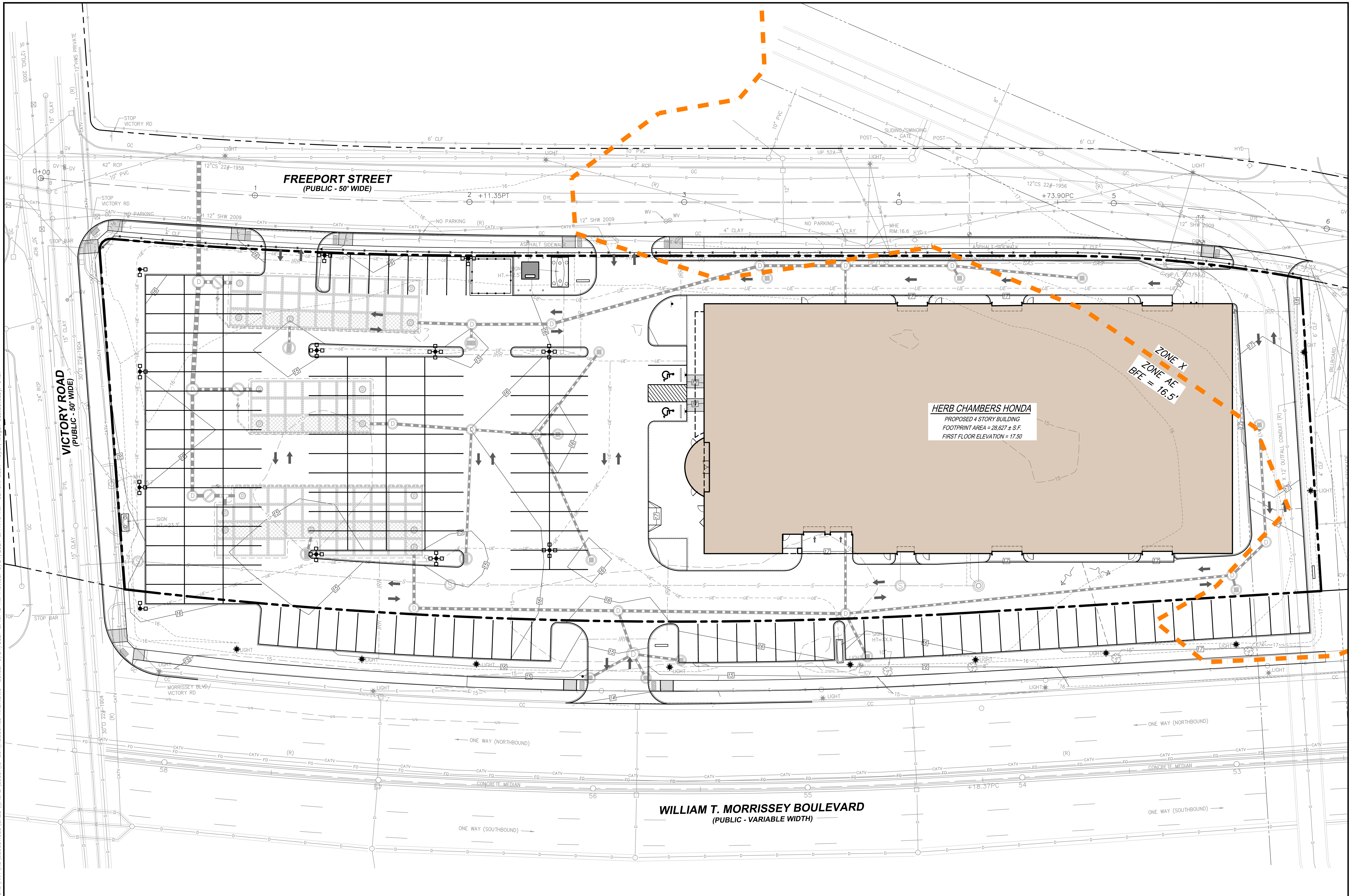
PROPOSED SITE
DEVELOPMENT PLANS
FOR
HERB CHAMBERS
HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date

EXISTING
CONDITIONS

Designed By:	Drawn By:	Checked By:
Issue Date: 9/6/2019	Project No: 31554-14000	Scale:

Drawing No.:
EC-001



PROPOSED DISTURBANCE				
	AREA DESCRIPTION	DISTURBANCE AREA (S.F.)	PROPOSED IMPERVIOUS AREA (S.F.)	PROPOSED PERVIOUS AREA (S.F.)
RESOURCE AREA	FEMA FLOOD PLAIN	106,940±	92,360±	14,580±

LEGEND

FEMA FLOOD ELEVATION CONVERTED TO BOSTON CITY BASE (BCB) = 16.5'

CHA
1 Faneuil Hall Marketplace, South Market Building
Boston, MA 02109-6117
617.451.2717 . www.chacompanies.com

0 20 40
Scale in feet

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT
06033

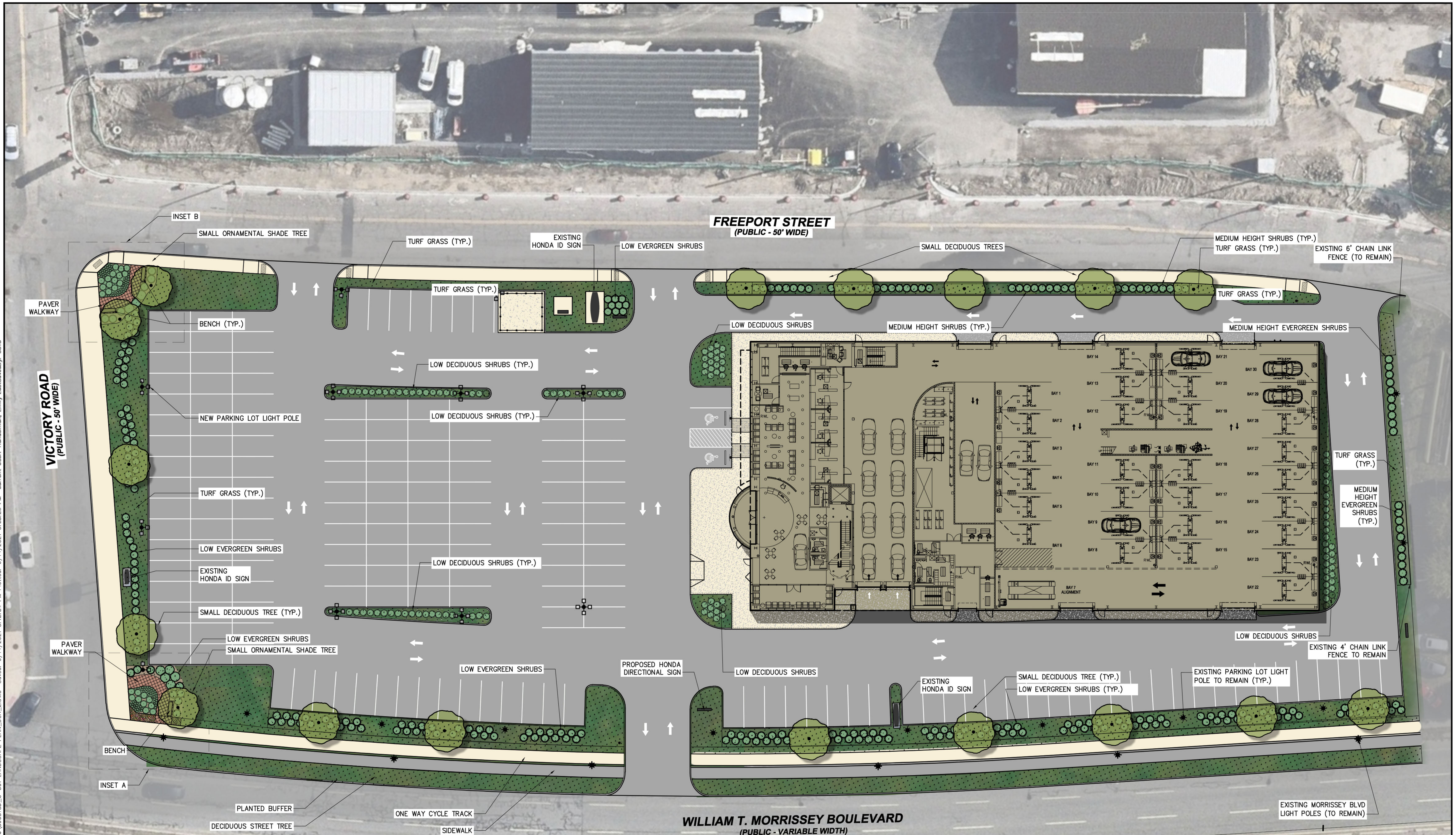
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date

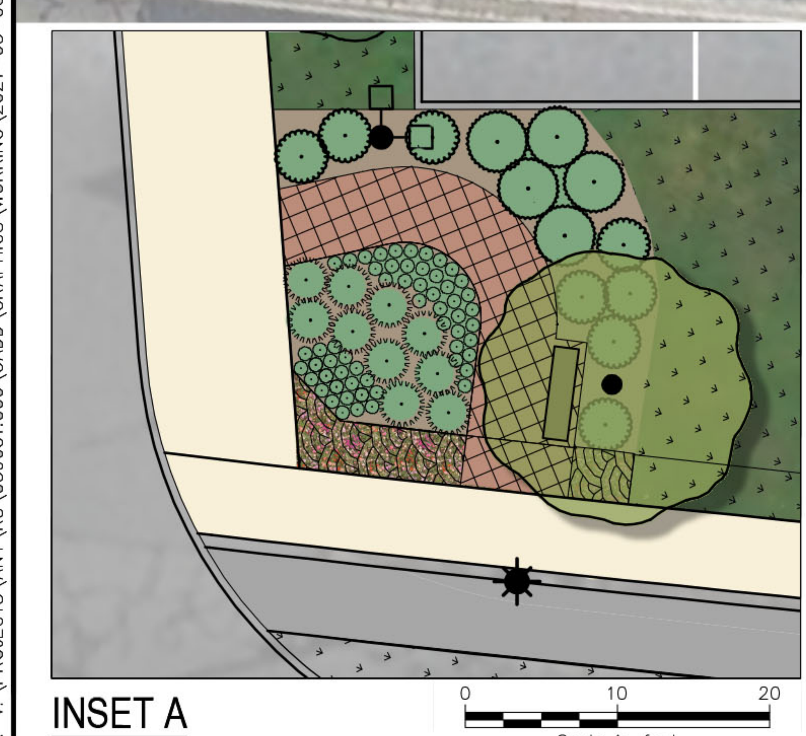
RESOURCE AREA PLAN

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date: 09/24/2021	Project No: 059051	Scale: 1"=20'

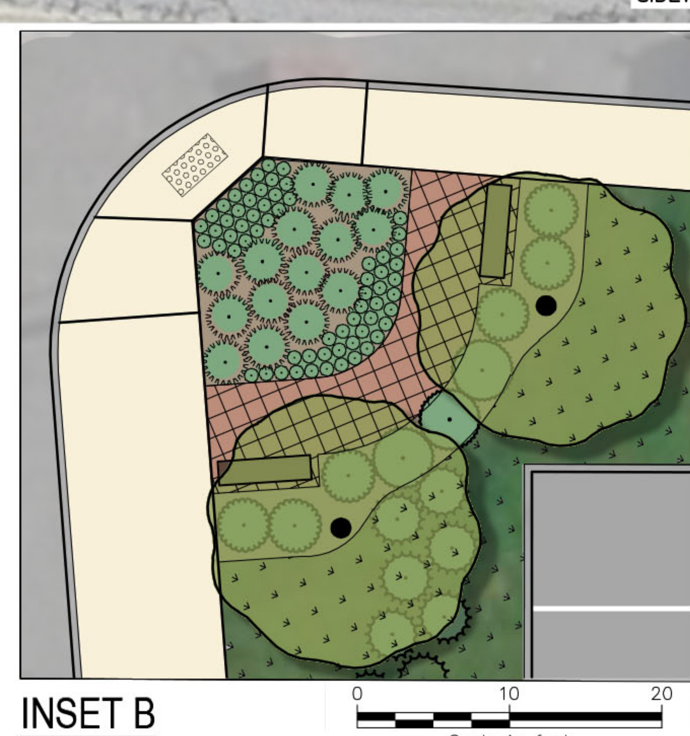
Drawing No.:
C-801



LANDSCAPE PLAN



INSET A



INSET B

File: V:\PROJECTS\ANY\K5\059051.000\CADD\GRAPHICS\WORKING\2021-05-06\59051CD_C-501 LANDSCAPE PLAN_DCR_2.DWG Saved: 6/14/2021 5:12:34 PM Plotted: 6/14/2021 5:39:28 PM Current User: Handelman, Emily LastSavedBy: 5513

CHA
141 Longwater Drive - Suite 104
Norwell, MA 02061
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HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA 02122

PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date

LANDSCAPE CONCEPT

Designed By:	Drawn By:	Checked By:
JFK	JFK	NJS
Issue Date: 04/15/2020	Project No: 059051	Scale: AS SHOWN

Drawing No.:
LS-C01

APPENDIX C

Project Plans (separate cover)

APPENDIX D

Stormwater Report (separate cover)

CHA

Stormwater Report
Herb Chambers Honda of Boston
710-720 Morrissey Blvd, Boston, MA

CHA Project Number: 059051

Prepared for:
The Herb Chambers Companies
259 McGrath Highway
Somerville, MA 02143

Prepared by:

CHA

141 Longwater Drive, Suite 104
Norwell, Massachusetts 02061
Phone: (781) 982-5400
Fax: (781) 982-5490

January 2020
Revised June 2020

TABLE OF CONTENTS

LIST OF APPENDICES

Appendix A	Custom Soil Resource Report for Norfolk and Suffolk Counties, Massachusetts, prepared by, USDA and NRCS Geotechnical Design Investigation and Recommendations Report prepared by Hailey and Aldrich, Inc. and dated January 29, 2020

LIST OF ACRONYMS & ABBREVIATIONS

BFE	Base Flood Elevation
BMP	Best Management Practice
BVW	Bordering Vegetated Wetland
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
HSG	Hydrologic Soil Group
IWPA	Interim Wellhead Protection Area
MAHW	Mean Annual High-Water
MassDEP	Massachusetts Department of Environmental Protection
NAVD	North American Vertical Datum
NRCS	Natural Resources Conservation Service
SHGW	Seasonal High Groundwater
SWMSH	Stormwater Management Standards Handbook
Tc	Time of Concentration
TSS	Total Suspended Solids
USGS	United States Geological Survey

Section 1.0

Narrative

1.0 NARRATIVE

1.1 EXECUTIVE SUMMARY

The project site is located at 710-720 Morrissey Blvd in the Dorchester Neighborhood of the City of Boston. The proposed redevelopment project intends to demolish the existing car dealership building and a renovate the site into a new, state-of-the-art, Honda auto dealership. The proposed building will be contemporary in style, featuring a streamlined design. It is presently expected to be four (4) stories high, with a maximum height of approximately 65 feet. The proposed building footprint measures approximately 28,400 square feet with a total floor area of 112,600 square feet. The building will feature showrooms, offices, service bays, vehicle storage, and customer amenities. Approximately 200 automobiles are proposed to be located within the building (including inventory). Externally, approximately 170 parking spaces are proposed throughout the site with landscaped areas around them to provide additional greenspace. Additional site improvements include; grading, restriping of the parking lot, replacement of pavement and concrete surfaces, and upgrades to the existing drainage and utility services.

The existing site includes a catch basins inlet and piped drainage system that connects to the municipal drainage system located in Freeport Street. The municipal system ultimately discharges to an existing 12-foot x 12-foot culvert and reaches the Neponset River. The existing on-site drainage system provides a hydrodynamic separator structure but no detention or infiltration for stormwater runoff.

The existing parking lot is relatively level, and the elevation varies between elevation 18’ and elevation 15’ based on Boston City Base vertical datum (refer to the attached site plans for additional information). The site is located within a special flood hazard area (SFHA), FEMA Zone AE as shown on the FIRM Map Number 25025C0091J dated March 16, 2016 (see Figure 3). A SFHA is an area which is subject to inundation by the 1% annual chance flood. This particular Zone AE has a base flood elevation of 10 feet (NAVD 88) which translates to 16.5’ in Boston City Base vertical datum. Additional information about the proposed building’s finish floor elevations and floodplain volumes are included on the project’s site plan set. The site is not located within any surface water protection areas, wellhead protection areas, or within a habitat area designated by the Natural Heritage and Endangered Species Program (NHESP).

The project includes a new building with a footprint of approximately 28,400 square feet, and associated parking lot and landscaping improvements. The addition of landscaped areas along the perimeter of the site and within the parking lot results is an overall decrease in impervious area. The proposed project will decrease total impervious area from 2.57 acres to 2.32 acres (0.25 acre or 10,670± sq.ft. reduction). Stormwater runoff from the paved and sidewalk areas is proposed to be collected by a series of deep sump catch basins and piped to new Retain-It ® subsurface infiltration chambers. These subsurface drainage systems will consist of a stone bed with chambers and isolator chambers, for enhanced water quality, beneath the parking area (see Section 1.6 for more details on the isolator chambers). These systems have been sized to infiltrate a minimum of 1.25 inches of stormwater runoff as required by the Boston Water and Sewer Commission. The stone bedding below and around the chambers are assumed to have a 30% void ratio. The stormwater system proposes an overflow pipe to connect to the municipal drainage system within the Freeport Street Right-of-Way. The required TSS removal is achieved through the use of deep sump hooded catch basins, and the aforementioned subsurface infiltration chambers.

The project includes improvements to the stormwater management system that have been designed to comply with the requirements of the MassDEP Stormwater Standards (2008) and Boston Water and Sewer Commission Regulations as a redevelopment project. The proposed improvements are shown on the attached site development plans prepared by CHA, 141 Longwater Park Drive, Norwell, Massachusetts.

1.2 OBJECTIVE OF CALCULATIONS

The purpose of this stormwater analysis is to examine the stormwater runoff from the proposed improvements based upon the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards. The goals of the stormwater management system design for this project are to provide improved water quality, stormwater recharge to the maximum extent practical, and to protect the surrounding area from any potential flooding and/or environmental impacts. The following analysis includes stormwater routing calculations performed using the 2-year, 10-year, 25-year, and 100-year frequency, Type III, 24-hour SCS design storms.

1.3 METHODOLOGY

The HydroCAD Stormwater Modeling System computer program, version 10.00, by HydroCAD Software Solutions LLC is used to develop stormwater runoff rates and volumes for the existing and proposed conditions at the project site. The HydroCAD software is a hydrograph generation and routing program similar to TR-20. Additional information about how HydroCAD performs calculations is available upon request.

Design points were chosen at down gradient points in the drainage areas to compare development conditions for each of the following SCS Type III 24-hour design storm events. The design storm frequencies and corresponding rainfall depths were compiled from NOAA Atlas-14 "Precipitation-Frequency Atlas of the United States" and have been estimated as follows for Boston:

Storm Frequency (Years)	Rainfall Depth (Inches)
2	3.26
10	4.90
25	6.19
100	8.83

The curve number or CN is a land sensitive coefficient that dictates the relationship between total rainfall depth and direct stormwater runoff. Based upon the cover in each sub-watershed a weighted average CN value was determined. The area, CN values, and time of concentration were entered into HydroCAD to develop hydrographs for the pre and post-developed conditions.

Drainage area maps for both pre- and post-development conditions have been included in this submission in Section 3.3.

1.4 SITE HYDROLOGY

Hydrologic soil groups (HSG) are used primarily to estimate runoff from precipitation in engineering calculations. HSG designations vary from "A" to "D" with "A" having the highest infiltration rate and "D" the slowest. The delineated soil boundaries from the Natural Resources Conservation Service (NRCS) soil survey show that the site consists of mainly of Urban Land which has no HSG designation. Based on preliminary boring data, the in-situ soils were found to be sand to sandy loam likely to promote infiltration and an HSG designation of B was utilized. A conservative infiltration rate of 1.02 in/hr corresponds to sandy loam on the Rawls' Rates table. Groundwater levels were observed at elevation 8' Boston City Base Vertical Datum (BCB). Additional soil information can be found in Appendix A and includes "Custom Soil Resource Report for Norfolk and Suffolk Counties, Massachusetts" by the NRCS, and the "Geotechnical Design Investigation and Recommendations" report prepared by Hailey and Aldrich, Inc. and dated January 29, 2020

1.4.1 PRE-DEVELOPED HYDROLOGY

The existing condition hydrology consists of Design Point (DP-1) in the Freeport Street Right-of-Way, which is the municipal drainage system; and DP-2 which is assumed as the adjacent roadways.

Below is a description of all the subcatchment area that were broken out for the existing site. Drainage area plans for both pre- and post-development conditions have been included in this report in Section 3.3

Existing Conditions Subcatchment Area 1S
This subcatchment contains the existing building roof and parking area of the existing dealership. Stormwater runoff is collected via roof drains, downspouts, and catch basins and piped to the existing water quality structure. The water quality structure then discharges to Freeport St municipal drainage structure designated DP-1.

Existing Conditions Subcatchment Area 2S
This subcatchment is summarized as the area surrounding the parking lot where stormwater runoff flows overland and out to one of the surrounding streets. The surrounding streets are considered DP-2.

1.4.2 POST DEVELOPED HYDROLOGY

The proposed site improvement project includes the removal and replacement of an existing car dealership with an updated building and utility services. The project also includes associated site improvements including re-grading the site, modification of landscaping, restriping of the parking lot, installation of pavement and concrete surfaces, and upgrades to drainage system.

The proposed hydrology consists of Design Points (DP-1) in the Freeport Street Right-of-Way, which is the municipal drainage system; and DP-2 which is assumed as the adjacent roadways.

Below is a description of all the subcatchment areas that were broken out for the post-developed site. Drainage area plans for both pre- and post-development conditions have been included in this submission in Section 3.3.

Proposed Conditions Subcatchment Area 1S

This subcatchment contains the eastern half of the proposed roof area and the eastern portion of the parking lot. Stormwater runoff from this subcatchment is collected through catch basins and a piped system and conveyed to the underground Retain-It ® infiltration system (UG-1) that allows for infiltration and groundwater recharge. UG-1 is equipped with an overflow pipe, proposed to connect to the municipal system within Freeport Street (DP-1). The predominant ground cover type is impervious pavement and roof.

Proposed Conditions Subcatchment Area 2S

This subcatchment contains the portion of the parking lot directly north of the proposed building. Stormwater runoff from this subcatchment is collected through catch basins and a piped system and conveyed to the underground Retain-It ® infiltration system (UG-2) that allows for infiltration and groundwater recharge. UG-2 is equipped with an overflow pipe, proposed to connect to the municipal system within Freeport Street (DP-1). The predominant ground cover type is impervious pavement.

Proposed Conditions Subcatchment Area 3S

This subcatchment contains a portion of the parking lot that is west and north of the proposed building and western half of the proposed roof area. Stormwater runoff from this subcatchment is collected through catch basins and a piped system and conveyed to the underground Retain-It ® infiltration system (UG-3). UG-3 allows for infiltration and groundwater recharge. UG-3 is equipped with an overflow pipe, proposed to connect to the municipal system within Freeport Street (DP-1). The predominant ground cover type is impervious pavement and roof.

Proposed Conditions Subcatchment Area 4S

This subcatchment is summarized as the area surrounding the parking lot/drive aisles where stormwater runoff flows overland and out to one of the surrounding streets (DP-2).

1.5 STORMWATER MANAGEMENT

The project includes a Stormwater Management System that has been designed to satisfy and comply with the requirements of the MassDEP Stormwater Standards (2008) to the *"maximum extent practicable for redevelopments"* as outlined in the Applicability section of Chapter 1 of the Stormwater Management Standards.

The following is an explanation on how the proposed project will address the 2008 MassDEP Stormwater Management Policy.

Standard 1: No New Untreated Discharges – No new stormwater system conveyances will discharge untreated runoff or cause erosion in wetlands or waters of the Commonwealth.

All new stormwater system conveyances are treated prior to discharge and result in no erosion occurring on site. The drainage system has been designed to direct stormwater runoff into underground infiltration systems equipped with geofabric lined isolator chambers.

Standard 2: Peak Rate Attenuation – Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

The overall impervious area is being decreased through the addition of landscape islands throughout the site in the post-developed condition. In addition, subsurface infiltration systems are proposed which did not exist in the pre-developed condition. This combination will allow stormwater to infiltrate into the ground and result in a decrease in peak discharge rates and volumes to the municipal system.

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

There is a net decrease in impervious area on the site, therefore recharge is not required. However, recharge will be provided through the use of subsurface infiltration chambers to meet the Boston Water and Sewer Commission's infiltration/ water quality volume requirement of 1.25-inch times all impervious area. The subsurface infiltration systems consist of manufactured chambers set on a stone bed. The required recharge volume is stored and infiltrated below the outlet control structure's weir elevation. Refer to the Required Recharge Volume calculations provided in this report in Section 4.2.

Standard 4: Water Quality – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS).
This Standard is met when:

a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;
b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and
c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

The project employs deep sump hooded catch basins (25% TSS removal), and Retain-It ® systems equipped with isolator chambers to achieve removal of at least 80% TSS for the conveyance system per the Massachusetts DEP Stormwater Management Standards. The Long-Term Pollution Prevention Plan is included in conjunction with the Operation and Maintenance Plan required by Standard 9 (see Section 2 of this report).

Standard 5: Land Uses with Higher Potential Pollutant Loads – For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated there under at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

This Standard is not applicable to the site. The project is not considered a LUHPPL (Land Use with Higher Potential Pollutant Load).

Standard 6: Critical Areas – Critical areas are Outstanding Resource Waters as designated in 314 CMR 4.00, Special Resource Waters as designated in 314 CMR 4.00, recharge areas for public water supplies as defined in 310 CMR 22.02 (Zone Is, Zone IIs, and Interim Wellhead Protection Areas for groundwater sources and Zone (A)s for surface water sources.)

This Standard is not applicable to the site. The project is not located within any critical areas.

Standard 7: Redevelopment and Other Projects Subject to the Standards only to the maximum extent practicable – A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

This project is considered a redevelopment under the Stormwater Management Standards. However, it has been designed to fully comply with the Massachusetts Stormwater Standards.

Standard 8: Construction Period Pollution Prevention Plan and Erosion and Sedimentation Control – A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

The project will require coverage under the EPA NPDES Construction General Permit and the SWPPP will be submitted prior to construction.

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

An Operation and Maintenance Plan has been customized to fit the design of the proposed development (see Section 2). Provisions to maintain runoff control devices have been assured through non-structural, structural, and construction management approaches.

Standard 10: Prohibition of Illicit Discharges – All illicit discharges to the stormwater management system are prohibited.

The Operation and Maintenance plan required by Standard 9 includes measures to prevent illicit discharges.

1.6 BEST MANAGEMENT PRACTICES (BMPs)

A treatment train of deep sump catch basins, Retain-It ® Isolator Chambers, and subsurface infiltration chamber systems are proposed to treat stormwater runoff on the site. See Section 4.1 for the Total Suspended Solids (TSS) Calculations. A description of the devices incorporated is indicated below.

1.6.1 PROPOSED STRUCTURAL AND TREATMENT BMPs

1. DEEP SUMP HOODED CATCH BASINS

Deep sump hooded catch basins are modified versions of inlet structures installed to collect and convey stormwater on the site. The deep sumps, typically a 4-ft dimension below the outlet pipe invert, are most effective if placed "off-line"; that is they do not have inlet pipes. The catch basins contain traps or hoods on the outlet pipes and serve as pretreatment for other downstream BMPs. Deep sump hooded catch basins will be installed throughout the site to promote gravitational settlement of sediment and to remove trash, debris, sediment and a limited amount of oil and grease from stormwater runoff. To ensure maximum capacity and efficiency, the sumps will be inspected four times a year and cleaned when half of the available capacity of the deep sump has been used or at a minimum of quarterly and at the end of construction.

2. ISOLATOR CHAMBERS

The Isolator Chambers is a series of Retain-It ® chambers surrounded with filtration fabric and equipped with one or more manholes for access. The chambers are wrapped in fabric and provide settling and filtration. Stormwater runoff is first directed to the Isolator Chambers where they capture sediment, thereby protecting the rest of the underground system consisting of standard chambers on a stone bed. Isolator Chambers will be inspected routinely and cleaned in accordance with manufacturer's recommendations.

3. SUBSURFACE INFILTRATION/RECHARGE SYSTEMS

Subsurface infiltration systems consisting of precast concrete chambers (Retain-It ®) set on a stone bed are proposed to infiltrate and recharge storm runoff. The chamber systems aim to provide peak flow reduction, stormwater runoff volume reduction, and TSS removal for various storm events. The proposed system drains down completely between storm events due to the large footprint of the stone bed. Manhole risers and manufacturer recommended inspection ports are proposed at the ground surface to allow inspection and maintenance access.

1.7 HYDRAULICS AND PIPE SIZING

The closed-conveyance storm drain collection system was analyzed using the Rational Method.

> **Q = CiA,** for estimating runoff where "C" is a coefficient dependent on land cover, "i" is storm intensity in in/hr based upon published I-D-F curves, and "A" is area in acres. "Q" or flow is calculated in cubic feet per second.

The project site and access road were subdivided by catch basin or inlets based upon drainage areas tributary to each. A "C" value for each area was assigned based upon overall character of land. "C" values typically range from 0.9 in paved/impervious conditions to 0.3 for grass and landscaped areas. To be conservative, runoff calculations for this Project were assumed to be completely impervious. Point Precipitation Frequency Estimates from NOAA Atlas 14 data at the Boston, Massachusetts location were used to establish the rainfall rate for the 25-year event.

Pipe hydraulic design was completed using Manning's full flow capacity equation for circular pipe with an n-value of 0.013 for PVC.

> **Q = 1.49/n AR2/3 S1/2,** where, n is coefficient depending on channel roughness, A is area of flow, R is the hydraulic radius, and S is the channel slope.

1.8 SUMMARY OF HYDROLOGY & STORMWATER CALCULATIONS

The results of the pre and post-development hydrology calculations provided in Section 3 are summarized in the following tables. The table corresponds to the design points as indicated on the drainage area maps and hydrograph routing calculations.

TOTAL RUNOFF PEAK FLOW RATE (CFS)
DESIGN POINT 1 (DP-1)

STORM SCS 24-HR	EXISTING	PROPOSED	DIFFERENCE
2-YEAR	7.35	1.69	-5.66
10-YEAR	11.13	8.80	-2.33
25-YEAR	14.09	12.46	-1.63
100-YEAR	20.14	18.70	-1.44

TOTAL VOLUME (AF)
DESIGN POINT 1 (DP-1)

STORM SCS 24-HR	EXISTING	PROPOSED	DIFFERENCE
2-YEAR	0.586	0.110	-0.476
10-YEAR	0.902	0.370	-0.532
25-YEAR	1.152	0.589	-0.563
100-YEAR	1.662	1.064	-0.598

TOTAL RUNOFF PEAK FLOW RATE (CFS)
DESIGN POINT 2 (DP-2)

STORM SCS 24-HR	EXISTING	PROPOSED	DIFFERENCE
2-YEAR	0.79	0.33	-0.46
10-YEAR	1.51	0.95	-0.56
25-YEAR	2.11	1.52	-0.59
100-YEAR	3.33	2.80	-0.53

TOTAL VOLUME (AF)
DESIGN POINT 2 (DP-2)

STORM SCS 24-HR	EXISTING	PROPOSED	DIFFERENCE
2-YEAR	0.056	0.029	-0.027
10-YEAR	0.108	0.070	-0.038
25-YEAR	0.151	0.109	-0.042
100-YEAR	0.243	0.199	-0.044

The proposed project design reduces the peak flow rates generated in the post development conditions at Design Points DP-1 and DP-2 for the listed design storm events. The design also reduces volume at DP-1 and DP-2 for the listed storm events.

1.9 CONCLUSION

In conclusion, the project provides a reduction in post-developed rates and volumes of runoff through structural approaches and design of stormwater Best Management Practices (BMPs). The design provides TSS removal, water quality treatment, and recharge exceeding the existing conditions.

It is our professional opinion that the proposed development project will not adversely affect the surrounding drainage patterns. The following routing calculations, Best Management Practice design, and associated documentation within this report have been prepared to illustrate that runoff from the project has been mitigated.

1.10 REFERENCES

1. Commonwealth of Massachusetts, Department of Environmental Protection, Stormwater Management Standards Handbook. Volumes 1-3 February 2008 (DEP Stormwater Management Policy 2008).

2. Commonwealth of Massachusetts, Department of Environmental Protection. 310 CMR 10.00: Massachusetts Wetlands Protection Act Regulations. 2008.

3. Commonwealth of Massachusetts, Department of Environmental Protection. 314 CMR 4.00: Massachusetts Surface Water Quality Standards. 2007.

4. Commonwealth of Massachusetts, Department of Environmental Protection. 314 CMR 9.00: Massachusetts Water Quality Regulations. 2008.

5. United States Department of Agriculture, Natural Resources Conservation Services Urban Hydrology for Small Watersheds, Technical Release 55 (TR-55). June 1986.

6. United States Department of Agriculture, Natural Resources Conservation Services Project Formulation Hydrology Program System, Technical Release 20 (TR-20). Oct. 2004.

1.11 GENERAL CONSTRUCTION SEQUENCING

The following section provides construction details and highlights the general construction sequence and timing of earthmoving activities. The project will be phased in order to maintain operation of the existing building during construction. The overall project will be generally broken down into the following phases (refer to the Project Plans for more details):

- Establish Erosion and Sediment Controls around the work area
- Demolition (ex. building, structures, driveways)
- Site clearing and grading, drainage, utility, and roadway installation
- Building construction
- Final utility connections, and permanent stabilization

A. Pre-construction Meeting

An on-site meeting will be conducted by the Owner's Representative prior to the start of construction activity. A copy of the Stormwater Pollution Prevention Plan (SWPPP) and NPDES Construction General Permit (CGP) will be provided to applicable parties, Authorities, and City Departments.

B. Installation of Erosion Controls

Erosion and sedimentation controls (i.e. silt sock and inlet protection) will be installed at the limits of work and within the existing catch basins, as applicable. Tree protection will be installed around trees specified to remain within the limit of work. Structures to remain shall also be visibly flagged/protected.

C. Installation of Construction Entrance

Construction entrances will be installed in the locations as shown on the demolition plans in accordance with the construction detail provided in the plan set. Existing pavement will be removed within the limits of the proposed construction entrances to accommodate the crushed stone entrance.

D. Demolition

Demolition activities will be phased throughout the duration of construction. Generally, demolition activities will include the removal of any existing building, utilities services, and pavement within the specific work area in accordance with the Construction Plans. Other miscellaneous construction debris will be removed from the property and transported to an appropriate destination for disposal according to Federal, State and Local guidelines; this includes but is not limited to existing drainage pipes.

E. Excavation and Rough Grading

The specific work areas will be rough graded in accordance with the proposed grading as shown on the plans. If suitable topsoil is found, it will be removed and stockpiled within the project limits.

E. Installation of Underground Drainage Chambers

This phase of construction will involve the installation of the underground drainage chambers and nearby drainage structures. This work will be performed in the northern parking area before any existing building demolition occurs.

F. Building Construction

This phase of construction will involve the installation of the building including the proposed foundation and vertical construction of the building. All building waste is to be properly disposed of in dumpsters. While this phase commences, other site construction activities will be taking place.

G. Installation of Drainage and Utilities

Utility relocations and modifications, including water, gas, and electric, are anticipated to occur in conjunction with the drainage work. Temporary sediment basins will be constructed at this time on an as-needed basis to collect stormwater runoff during construction. Stockpiles will be established in designated areas as shown on project plans. All temporary/inactive stockpile areas will be encompassed by straw bales or other approved erosion control devices to control sediment laden runoff as necessary and will be temporarily seeded, mulched or covered with plastic, as necessary. Material stabilization will be in accordance with the SWPPP.

H. Fine Grading, Paving, Etc.

The fine grading and shaping will commence along with the installation of curbing to prepare for paving operations. Areas outside of the parking lot will be shaped and prepped for loam, seed, or other treatments. Paving operations will begin with the installation of both binder and finish course layers.

I. Permanent / Final Site Stabilization

The final phase of the project involves final parking lot paving, landscaping, and restoration and stabilization of all exposed surfaces. Curb installation, final parking lot paving, and final landscaping will be performed upon completion construction.

Disturbed areas will be landscaped, mulched or seeded in accordance with the landscape requirements. Permanent restoration and revegetation measures serve to control erosion and sedimentation by establishing a vegetative cover. In the event that weather conditions prevent final restoration, temporary erosion and sedimentation measures will be employed until the weather is suitable for final cleanup. A final inspection will ensure that the project site is cleared of all project debris and that erosion and sedimentation controls are functioning properly. Once the site has been stabilized, newly installed catch basins and the subsurface recharge/infiltration system will be inspected for sediment deposits and cleaned if necessary.

Section 1.12

Figures

LEGEND

PROJECT LOCATION

0 500 1,000

Scale in feet

CHA

141 Longwater Drive
Norwell, MA 02061
Main: (781) 982-5400 www.chacompanies.com

LOCUS PLAN

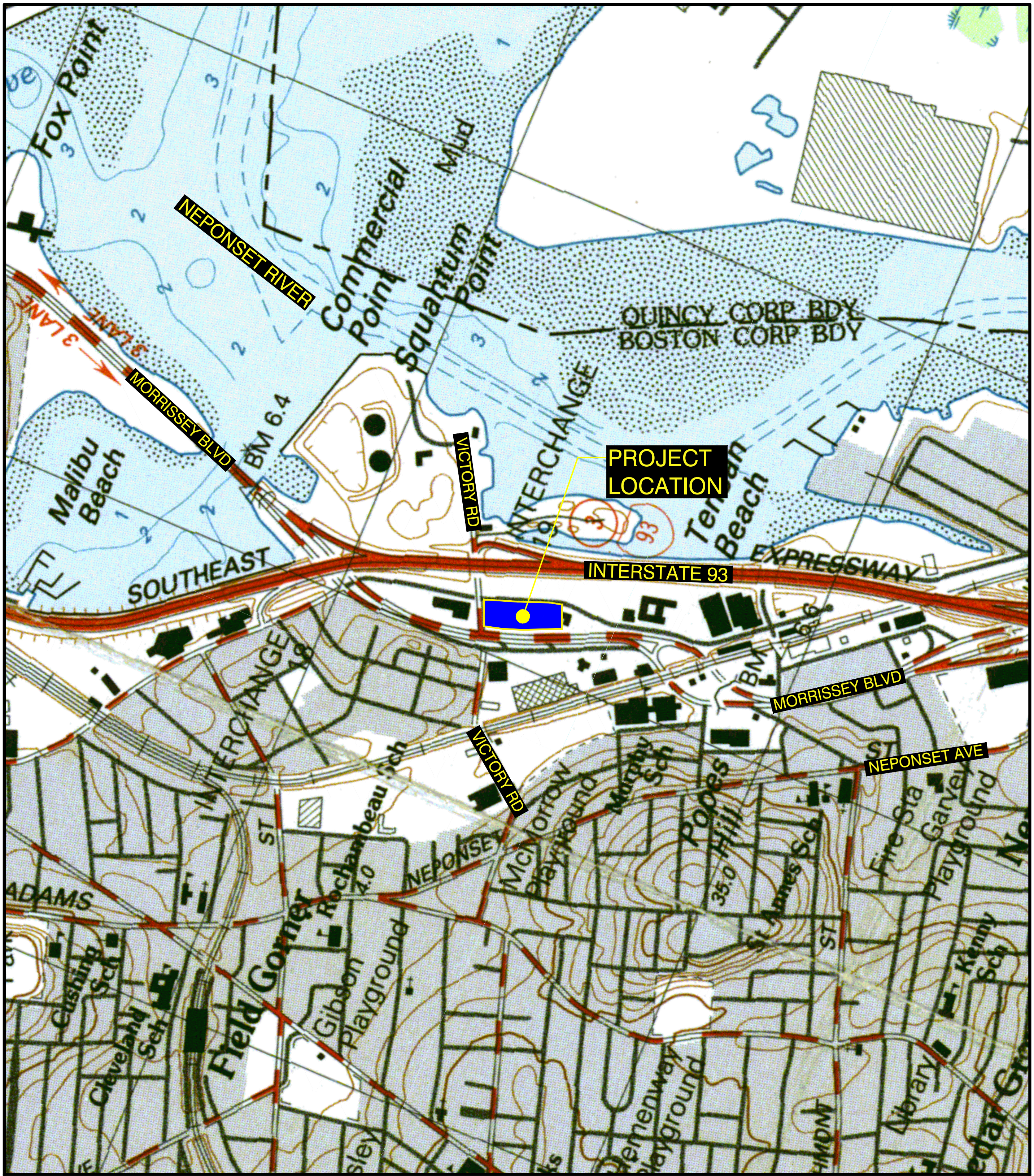
HERB CHAMBERS HONDA
710-720 MORRISSEY BOULEVARD
BOSTON, MA

PROJECT NO. 059051

DATE: 12/19/2019

FIGURE-1

File: \\CHA-LLP.COM\PROJ\PROJECTS\ANY\K5\059051.000\CADD\FIGURES\31554-14001_FIGURES.DWG



LEGEND

PROJECT LOCATION

0 1,000 2,000

Scale in feet

141 Longwater Drive
Norwell, MA 02061
Main: (781) 982-5400 www.chacompanies.com

USGS PLAN

HERB CHAMBERS HONDA
710-720 MORRISSEY BOULEVARD
BOSTON, MA

PROJECT NO.
059051

DATE: 12/19/2019

FIGURE-2

File: \\CHA-LLP.COM\PROJ\PROJECTS\ANY\K5\059051.000\CADD\FIGURES\31554-14001_FIGURES.DWG

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

PROJECT LOCATION

FEMA ZONE VE = COASTAL FLOOD ZONE WITH VELOCITY HAZARD (WAVE ACTION); BASE FLOOD ELEVATIONS DETERMINED

FEMA ZONE AE = BASE FLOOD ELEVATIONS DETERMINED

0 500 1,000

Scale in feet

CHA

141 Longwater Drive
Norwell, MA 02061
Main: (781) 982-5400 www.chacompanies.com

FEMA PLAN

HERB CHAMBERS HONDA
710-720 MORRISSEY BOULEVARD
BOSTON, MA

PROJECT NO. 059051

DATE: 12/19/19

FIGURE-3

File: \\CHA-LLP.COM\PROJ\PROJECTS\ANY\K5\059051.000\CADD\FIGURES\31554-14001_FIGURES - FEMA.DWG

Section 2.0

Long-Term Pollution Prevention and Operation and Maintenance Plan

LONG-TERM STORMWATER POLLUTION PREVENTION AND OPERATION & MAINTENANCE PLAN TO COMPLY WITH STORMWATER STANDARDS 4, 6, & 9

APPLICABILITY

This document identifies constituents of concern that have the potential to contaminate stormwater from the proposed automobile dealership at the parcel located at 710-720 Morrissey Blvd, Boston, MA and provides a framework of Best Management Practices (BMPs) for handling stormwater runoff. It also outlines an inspection and maintenance program to ensure continued effectiveness of the proposed stormwater management system. The proposed BMP's are shown on the plans prepared by CHA, 141 Longwater Drive, Suite 104, Norwell, Massachusetts.

PROJECT OVERVIEW:

The proposed Herb Chambers Honda of Boston project, an automobile dealership project, is located at 710-720 Morrissey Blvd, Boston, MA. The project includes the demolition of an existing building and parking lot, construction of a new Honda dealership building, and associated surface and utility improvements to support the project.

Appended to this document is a sample maintenance form and a chart describing the anticipated frequency of tasks.

OWNER AND RESPONSIBLE PARTY:

Owner and Responsible Party:

The Herb Chambers Companies
259 McGrath Highway, 2nd Floor
Somerville, MA 02143

Day-to-day Operation and Maintenance:

Maintenance Company hired by Owner.

CONSTRUCTION MANAGEMENT:

A construction manager with adequate knowledge and experience on projects of similar size and scope shall be employed to oversee all site work related to construction. The contractor shall incorporate the appropriate techniques to control sediment and erosion pollution during construction in accordance with the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas and any conditions of approval from the local Approval Authority.

The design incorporates measures to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities. The information contained herein and within the permit drawings identifies construction period pollution prevention measures, responsible parties, erosion control measures, BMPs for collecting and treating runoff and groundwater during construction[1], site stabilization measures (i.e. gravel, seed, pavement, etc.), operations and maintenance plan & long-term pollution prevention plan.

Care should be taken when constructing stormwater control structures. Light earth-moving equipment shall be used to excavate in the vicinity of the recharge area. Use of heavy-equipment causes excessive compaction of the soils beneath the underground recharge system resulting in reduced infiltration capacity. At no time shall temporary infiltration areas or settling basins be constructed in the vicinity of the proposed underground recharge system in order to prevent the soils from becoming clogged with sediment.

ON-GOING MAINTENANCE CONTRACT

The non-structural and structural approaches recommended below, as well as the required BMP maintenance, will be completed by an appropriate contractor. Adequate personnel with appropriate training and access to proper equipment will be available to complete the tasks. Future responsible parties must be notified of their responsibility to operate and maintain the system in perpetuity.

LIVING DOCUMENT PROVISIONS

Due to the difficulty of identifying all sources of potential stormwater contamination and maintenance activities, this document should be updated as necessary to reflect new procedures, technologies or requirements.

[1] Should the need for de-watering arise during construction at the site, groundwater will be pumped directly from the work area into geotextile filter bags, temporary settling basins, or portable fractionation tanks (depending on the nature and volume of water encountered) which will act as sediment traps during construction. Groundwater discharge points will be setback from the edge of the resource areas and monitored by qualified personnel (wetland scientist, licensed site professional, civil engineer, etc.) to ensure no impacts to resource areas and compliance with applicable Federal and state regulations. All discharges will be free from visible floating, suspended, and settleable solids that would impair the functions of the nearby drainage systems, wetlands, or downstream rivers. Refer to the details provided on the drawing set for additional information.

MAINTENANCE LOG

The Responsible Party shall develop and maintain a log of inspections, maintenance, repairs, and disposal (including location of disposal) during the life of the project. Records will be maintained for at least 3 years and be made available to the Massachusetts Department of Environmental Protection or the City of Boston in accordance with the provisions of the Massachusetts Stormwater Handbook.

MINIMIZING EXPOSURE

The Responsible Party will minimize exposure of potential pollutant sources, including debris, from coming into contact with precipitation and being picked up by stormwater and carried into drains and surface waters using the following steps:

- Storing all containerized materials in a protected, secure location away from drains and plainly labeled.
- Containing all activities that can generate sources of contaminants from reaching the receiving water or the stormwater management system.
- Securing any equipment or supplies so that they are not transported during storm events into receiving waters or stormwater management system.

BEST MANAGEMENT PRACTICES (BMP) MAINTENANCE

The proposed stormwater management system has been designed with appropriate BMPs aimed at reducing the pollutants discharge based upon the development of the Site. All BMPs require regular maintenance to function as intended. Some management measures have simple maintenance requirements; others are more involved. The Responsible Party must have all BMPs regularly inspected to ensure they are operating properly on an as needed basis, including during runoff events exceeding 0.5 inches of rainfall.

A description of the non-structural and structural approaches to be incorporated is indicated below. The following best management practices are proposed to be incorporated into the stormwater management design to reduce source runoff and improve stormwater runoff discharge quality. The Responsible Party will regularly inspect all BMPs to ensure they are operating properly. If any deficiencies are identified during these inspections, action to resolve it will be initiated and documented on the maintenance log.

NON-STRUCTURAL BEST MANAGEMENT PRACTICES (BMPs)

PUBLIC AWARENESS

Periodically, the property management shall issue a reminder to its employees to prevent dumping or releasing pollutants to the storm drains, the ground, the wetlands, and abutting streets.

PARKING LOT

As street sweeping is a BMP under DEP guidelines, this non-structural BMP is an effective removal of Total Suspended Solids (TSS) in a comprehensive stormwater management program. At the property owner's discretion, a maintenance program of parking lot sweeping with a High Efficiency Vacuum Sweeper or a Regenerative Air Sweeper to reduce sediment accumulation in the deep sump catch basins and subsurface systems. Sweeping should be conducted four times annually (April 1, June 1, September 1, and November1) of each year.

GRADING

The impervious areas of the site shall be graded as gently as possible, generally not more than 8% slopes to reduce runoff velocities. Steep slopes will be permanently vegetated to dissipate energy and reduce potential erosion. No constructed vegetated slopes should exceed 3H:1V without providing additional reinforcement. Steep slopes may require soil reinforcement and additional vegetation.

FLOW OVER VEGETATED AREAS

Wherever possible, runoff from paved areas and snowmelt shall be directed over vegetated areas to promote settlement of suspended solids before entering a wetland or resource area.

SNOW STORAGE AND DEICING

Designated snow storage areas will be provided around the parking areas and other pervious locations which will drain towards the formal drainage system. The snow storage areas are proposed away from pedestrian and vehicular access areas that would impinge upon safe circulation.

In the interest of reducing the volume of dissolved salt that enters the watershed, the operator of the development will rely on sand alone where traction on snowy surfaces is the primary objective. However, parking areas, driveways, and sidewalks which require deicing for safety during winter months will typically be treated with a mixture of 90% sand and 10% road salt (NaCl). The applicant is open to suggestions for alternative to the use of road salt, although a cursory review of the literature indicates that many of the more familiar alternative (CMA, KA) have their own potential environmental drawbacks.

FERTILIZER:

Slow release organic fertilizers will be used in landscape areas to limit nutrient transport to groundwater and the wetland area. Application will be limited to 3 lbs. per 1000 square feet of lawn area.

WASTE MANAGEMENT:

Solid waste will be contained within dumpsters in the loading area. Waste deposition in these receptacles will be consistent with state and local permits. The covers and doors of the dumpsters will be kept closed to limit rainwater/wildlife intrusion.

STRUCTURAL BEST MANAGEMENT PRACTICES:

Prior to final completion and full occupancy of the development, it is recommended that a representative of the Contractor, Manufacturer, and/or Engineer either designing or building the facility for the owner properly instruct the Responsible Party as to the maintenance practices required to responsibly maintain the effectiveness of the drainage system. These frequencies and requirements are recommendations to maintain minimum effectiveness in most typical environments. Ultimately, the Responsible Party will implement the procedures and frequencies as they see fit under their current plan and inspect the systems as needed to maintain minimum effectiveness as recommended by the manufacturer. The following maintenance of structural BMPs will be implemented:

DEEP SUMP CATCH BASINS AND MANHOLE STRUCTURES

Catch basins shall be cleaned, in dry weather, when half of the sump capacity is filled or at a minimum quarterly or as required through periodic inspection. Cleaning will take place at the completion of construction and in early spring after sanding of roadways has ceased, or as needed depending on the frequency of major storm events (greater than 1-inch of rainfall). All manholes shall be inspected at least once annually or as dictated by the Responsible Party. Any obstructions, sediment, and debris that could potentially cause clogs shall be removed within the conveyance system as necessary. Inverts, grates, and hoods shall be checked and replaced as necessary to maintain hydraulic effectiveness.

SUBSURFACE INFILTRATION SYSTEM

The subsurface system has been designed with riser structures at grade to aid the removal of sediment and debris accumulating in the structure. The subsurface drainage systems provide the required recharge volume. Once the system goes online, inspections should occur after each storm event for the first few months to ensure proper stabilization, function, and to ensure that the outlets remain free of obstructions. Preventative maintenance shall be performed at least twice per year and after every major storm event (> 1.5" of rainfall) and shall include removal of accumulated sediment, inspection of the infiltration structure, and monitoring of groundwater to ensure proper operation of the system. Important items to check for include differential settlement, cracking, breakout, clogging of outlets and vents, and root infestation. Water levels should be checked and recorded against rainfall amounts to verify that the drainage system is working properly and draining within 72 hours. If they do not drain within 72 hours, corrective action should be taken.

ISOLATOR CHAMBERS

The Isolator Chambers in all the underground infiltration systems shall be inspected twice per year and cleaned at least once per year and in accordance with the manufacturer's recommendations. Periodic inspections performed by the responsible party may dictate cleaning on a more frequent basis depending on the suspended solids loading. During construction accumulated sediment may need to be removed more frequently. Conduct jetting and vactoring annually or when inspection shows that maintenance is necessary. See attached maintenance documentation from the manufacturer.

OUTLET CONTROL STRUCTURES

The outlet control structures (OCS) detain the water utilizing weirs to control the outlet flow and are below grade with access via covers to grade. Although the outlet control structures should not have much debris, they should be inspected to make sure there are not concrete issues or residual debris. Sand accumulation within the OCS is a sign there is an issue with the upstream stormwater treatment device. The OCS shall be inspected once per year. It may be necessary to clean the structure and the use of a vacuum truck may be necessary.

SPILL CONTROL:

Since the site is a car dealership, it is likely the most frequent spills with be those of petroleum products. Thus, it is recommended that a contingency plan to address the spillage/release of petroleum products and any hazardous material be implemented for the facility. The recommendation includes that the property manager have all DEP emergency spill response information posted on-site at all times. It is also recommended an emergency spill response kit including absorbent pillows be stored on-site along with instructions for the kit, a copy of applicable regulations regarding spills, and a list of individuals to contact (local and state officials) in the event of a spill.

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

LONG-TERM OPERATION AND MAINTENANCE BUDGET:

Consistent with Standard 9 of the Massachusetts Department of Environmental Protection Stormwater Handbook (February 2008) the approximate cost of inspections and maintenance based on the abovementioned post-construction activities and frequencies is as follows:

- Pavement Sweeping - $3,000 per year based on annual sweepings.
- Deep Sump Catch Basins - inspection/cleaning - $250 per year/per catch basin based on quarterly inspections and sediment removal of both single and double grate deep sump catch basins.
- Underground Infiltration/Detention Systems - inspection - $1,000 per year based on semi-annual inspections. Cleaning/debris removal - $1,000 per year for accumulated sediment and trash removal.

Additional costs may be incurred if it is determined during routine inspections of the BMP's that further corrective actions are necessary.

LONG TERM STRUCTURAL BEST MANAGEMENT PRACTICE INSPECTION & MAINTENANCE MATRIX AFTER CONSTRUCTION

Note: BMP's shall be visually inspected and repaired by a qualified party in accordance with the following chart. Note these are minimum inspection criteria/frequencies and should be adjusted throughout the project lifespan as required to maintain effectiveness. Refer to maintenance standards for drainage facilities and structural best management practices in the "Recommended Long-Term Stormwater Pollution Prevention Plan."

Conventional & LID Best Management Practices	Recommended Minimum Inspection & Maintenance Frequency	Erosion/Scouring	Tree Growth Hazards	Differential Settlement/Seepage	Structural Damage/Obstructions	Trash & Debris	Removal of Accumulated Sediment	Slope Integrity	*Mow Vegetation/Poor Vegetation Coverage	Remove/Reset Filter Fabric & Stone As Required	Remove & Replace Hardwood mulch/media	Vac Truck Sediment & Contaminants	Remove/Reset Riprap as Required
Catch Basin	*Annually*		☑	☑	☑	☑	☑					☑	
Outlet Structure	*Semi-Annual*	☑		☑	☑	☑	☑					☑	
Isolation Row	*Semi-Annual / Per Manufacturer*			☑	☑	☑	☑					☑	
Detention/Infiltration	*Semi-Annual*			☑	☑	☑	☑					☑	

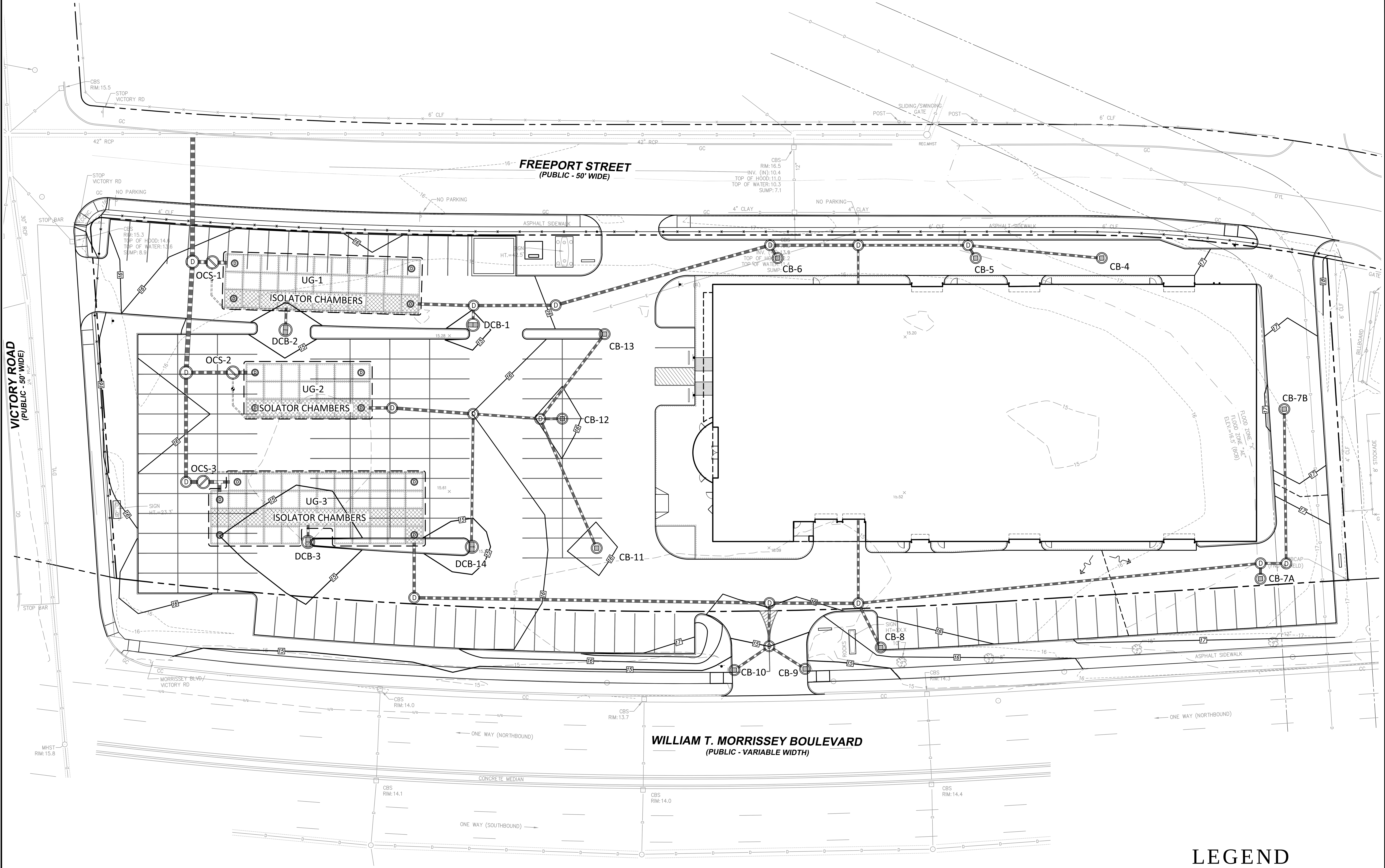
Stormwater BMP Inspection and Maintenance Log

Facility Name	
Address	
Begin Date	End Date

Date	BMP ID#	BMP Description	Inspected by:	Cause for Inspection	Exceptions Noted	Comments and Actions Taken

Instructions: Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary.

- BMP ID# — Always use ID# from the Operation and Maintenance Manual or Approved Plans.
- Inspected by — Note all inspections and maintenance on this form, including the required independent annual inspection.
- Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.
- Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.
- Comments and actions taken — Describe any maintenance done and need for follow-up.



LEGEND

CB-1	DEEP SUMP CATCH BASIN
UG-1	UNDERGROUND INFILTRATION SYSTEM
OCS-1	OUTLET CONTROL STRUCTURE

CHA
1 Faneuil Hall Marketplace, South Market Building
Boston, MA 02109-6117
617.451.2717 . www.chacompanies.com

0 20 40
Scale in feet

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

BMP LOCATION PLAN

Designed By:	Drawn By:	Checked By:
TK/JM	TK/JM	KK
Issue Date:	Project No:	Scale:
01/31/2020	059051	1"=20'

Drawing No.:
DR-BMP

OWNERS MAINTENANCE MANUAL

retain-it, LLC
560 Salmon Brook Street
Granby, CT 06035
(860) 413-3050

retain-it ®

Owners Maintenance Manual

Table of Contents

Description

retain-it ® is a subsurface Storm Water Management system constructed of precast concrete structures. They are installed in a side by side configuration creating a continuous internal flow channel integrated throughout the system. Systems are constructed with designated inlet and outlet modules, some with multiple inlets and outlets depending on the site storm water system layout. Infiltration systems typically have an inlet and sidewalls/ base constructed on a stone infiltration blanket with geofabric installed at the native soil interface. Other systems incorporate outlet flow control devices. Detention systems are typically lined with a watertight membrane and have inlet and outlet control devices.

The retain-it ® system can consist of multiple varying layouts, with no two the same. Given this, it should be noted that the operation and maintenance requirements are very similar regardless of the intended layout. It is important that the end user know the specific elements of each system so as to understand how best to optimize it's operation.

Installation per Design: Operation is simple to follow where the installation was performed in accordance with the design specifications, drawings and calculations. Specifics shall be identified in the design drawings. As-built drawings will benefit the locating of specific design modules where the system has been buried below a parking lot area. Optional access manholes or removable grates may be installed above every inlet/outlet pipe and at critical design elements designated by the design.

Daily Operation and Long Term Maintenance: In general, daily usage of the system is self sufficient and will operate without requiring any outside assistance, except for periodic inspection to verify optimal performance and maintenance for removal of collected pollutants. A longer term maintenance program should incorporate a more thorough inspection of the all elements of the system to verify proper operating condition. This is more important with the infiltration type of systems where the soil infiltration surface may become restricted due to fine particle build up. Long term maintenance should include provisions for cleaning and removal of collected solids, oils and debris from the system.

System Operation: The system operational function is initiated according to rainfall runoff flows entering the structure. Internally, the runoff flows in a set pattern or sequence throughout the module layout in accordance with the hydraulic design conditions. The flows primarily operate on system head derived from the changes in elevation from the internal water surface and the outlet invert elevation. Some designs incorporate internal flow controls to satisfy hydraulic conditions that enhance water quality treatment or other intended purposes. Modified systems may incorporate a pump, but in general there are no mechanical apparatus required.

End user operations primarily consist of inspection and maintenance of the system over time.

Periodic Inspection: Important note - All storm water management systems react differently depending on the conditions that are characteristic to the contributing water shed. Variables such as storm intensity, runoff flow rates, site geology, surface stabilization and pollution load will affect the system operation. As does the inspection and maintenance frequency to ensure optimum effectiveness.

Inspections should be done periodically, with a greater number scheduled during the system start up and less frequently as the operator becomes familiar with the system performance characteristics. It is recommended that the end user keep records of the performance using the inspection log record sheet found in the back of this manual. These records shall identify the cycle of maintenance “system calibration” required for the specific applications based on the contributing water shed variables operating under “normal” conditions.

Please note that immediate maintenance may be required during “non-normal” events such as during adverse weather conditions or emergency fuel spills. See information on emergency spills in this manual.

Visual inspection of all assessable components shall be performed throughout the lifetime of the system. Access has been supplied at critical points to monitor hydraulic performance and removed pollutants buildup.

Standard Maintenance:

After construction has been completed and all disturbed surfaces have been stabilized by means of vegetation, asphalt or concrete surfaces, and all drainage system components have been constructed and are free of construction debris and sediments; then the storm water management system can be considered in an operational status.

Periodic visual inspections will help to identify issues of concern.The usual indicators are signs of slow flows, backed up water, visible oil, trash and debris or an excessive amount of sediment in the storage area.

Normal operational flows can be observed to flow freely at the predicted design elevations, from the inlet to the outlet module, following a serpintine path thru the storage and attenuation modules. Note that some modules are designed to permanently retain water where others may hold water and slowly release it over a typical 24 hour period. During a storm water event, the flows and water surface elevations will fluctuate from a low flow to a high flow/ storage status. The storage modules should fill during the event and drain down within a 24 hour period after the event has stopped. All pipes, orifices, weirs and standpipes should pass flows freely and at optimum capacity.

Standard maintenance is performed using a vacuum truck to suction the accumulated sediments, oils and greases and trash and debris from the system. Whereas an on-site maintenance staff can remove these items by hand, it is preferred that the vacuum truck be used as dictated by specific system conditions. When a specialized module designed to have a permanent water level is used, the vacuum truck should pump the liquid level down to inspect the below water elevation structures and sump storage areas.

Oils and greases can be handled by on-site staff by utilizing absorbent products that soak up the oils (and not) converting the oils from a liquid into a manageable solid form. These oil soaked absorbent materials should be disposed of in an approved manner.

Sediments, trash and debris shall be removed and disposed of in an approved manner.

Any indications of hazardous material, determined by visual inspection, testing, smell or abnormality, should be reported and handled per appropriate regulations.

Flow Conditions

System operators should familiarize themselves with proper hydraulic flow condition indicators, acceptable depths of sedimentation, debris and trash build up, and concentrations of oils and greases.

Hydraulic flow conditions are those that are established by the design as either a flow/storage or as a water quality treatment function. Both have performance characteristics that can be visually identified so as to determine the effective and efficient operation of the system.

The engineering design drawings should note the various expected water surface level elevations that are achieved during different design storms within the various modules. Since it is difficult for a visual inspection to coincide with the exact time given water elevations are predicted, the following guidelines are given for evaluation.

Visual Inspection Guide:

<u>Internal Flow Evaluation</u>

Low flow: water should flow freely from the inlet to the outlet, travelling the intended attenuation path thru the system with the water surface elevation below the structure beam height (12” deep), the system should drain completely 24 hours after a storm event,

Medium flow: the system should hold and maintain a water level during the 24 hour storm event and yet continually fill as the storm increases or drain downward as the event recedes. Flow within the system should occur freely from inlet to outlet only being restricted when a flow control structure has been integrally designed in place. Flow control devices may result in a water level backing up either temporarily or permanently; noting devices such as water quality modules may require a permanent water level to operate properly (see water quality treatment). Other system applications should drain completely 24 hours after a storm event.

High flow: the system should fill to the maximum design storm water level elevation (hydraulic grade line) per design. In most cases, that is the highest storage elevation available in the system, at the underside of the module top slab, or the invert of the overflow pipe. As the storm event recedes, the water level should begin to drain down via flow thru the system and discharge. The system should drain completely within 24 hours after a storm event.

Pollutant Storage Capacities

<u>Oil and Grease</u>

Oil and Grease Collection (with optional Oil water separator module specified) - Oil and grease accumulation is generally a function related to vehicle parking lot and drive areas, oil generating land uses or emergency spill conditions. It is important to maintain the system from accumulating excessive volumes of oils in that they may wash over into other sections of the system potentially clogging and reducing the infiltration capacity, blocking control devices and contaminating the overall system. The following standards apply.

Oil should not accumulate more than a visible sheen on the water surface in the oil water separation module only. A sheen is described as a fine, thin oil layer on the water surface identified by the glossy rainbow colors. A dipstick (dry wooden stick) can be used as a probe to determine the thickness of oil on the surface.

Accumulated oils could be associated with insufficient maintenance or a potential large volume oil resource. Any accumulation of oil should be promptly maintained by an experienced waste handler. Emergency spills such as those generated by an accidental spill shall be contained and removed immediately before the next storm event. Spills shall be handled in accordance with local environmental regulations. See spill and accumulated oil maintenance procedures.

Sediments

Sediments (with optional primary grit module or sedimentation modules specified) - Sediments shall be periodically removed from the system as they accumulate within the designated storage modules. The inlet modules are generally equipped with a sediment storage sump located in the base of the inlet structure. Inspection should be performed after major storm events or a minimum of annually, unless a different inspection cycle has been determined to be sufficient. Inspection shall consist of using a probe to determine the presence of and depth of the accumulated solids. Access is via the 24" manhole.

Note that excessive volumes of sediments will reduce the performance and efficiency of the system. Regional accumulations of solids such as those associated with ice and snow, may result in large springtime volumes of sand and gravels used for traction and ice control.

Trash and Debris

Trash and Debris (with optional trash and debris module specified) - Trash and debris accumulates in the inlet module in three forms; floating debris, neutrally buoyant, and heavy material. The floating debris is visible from the access manhole floating on the water surface in the form of but not limited to wood, paper, plastic, foam, bottles and cans. The neutrally buoyant material resides below the surface and combines with the natural flow regime of the system. It is hard to detect and can only be recognized when at a high concentration appears as a thickening of the water viscosity. Heavier material will simply settle to the sump base and combine with the sediments.

Note that trash and debris typically cause the most problems when they become lodged in a flow control device such as an outlet elbow, riser pipe, and orifice or weir structure. This can be detected visibly when the system is pumped down during maintenance. It can also be evaluated as a condition when flow is impeded and the water level backs up higher than the design elevations.

Emergency Spill Conditions (with optional emergency spill control module specified):

Emergency spill conditions are defined as an excessive accumulation of hydrocarbons such as oil, gasoline, diesel fuel, transmission oil or antifreeze usually resulting from an accidental discharge. Excessive accumulation is described as any amount larger than a thin "sheen" visible on the water surface.

Care should be given in handling these types of fluids. The incident should be reported to the appropriate authorities and should be mitigated by a hazardous waste consultant approved for such matters.

retain-it ®

Maintenance Log

Storm Water Management System

Location: ID #:

Date	Inspection Notes	Inspector

Note the following conditions:

Inlet Module

Outlet Module

Water Quality Module

Oil Elbow

Oil Accumulation

Sedimentation Accumulation

Trash and Debris Quantity

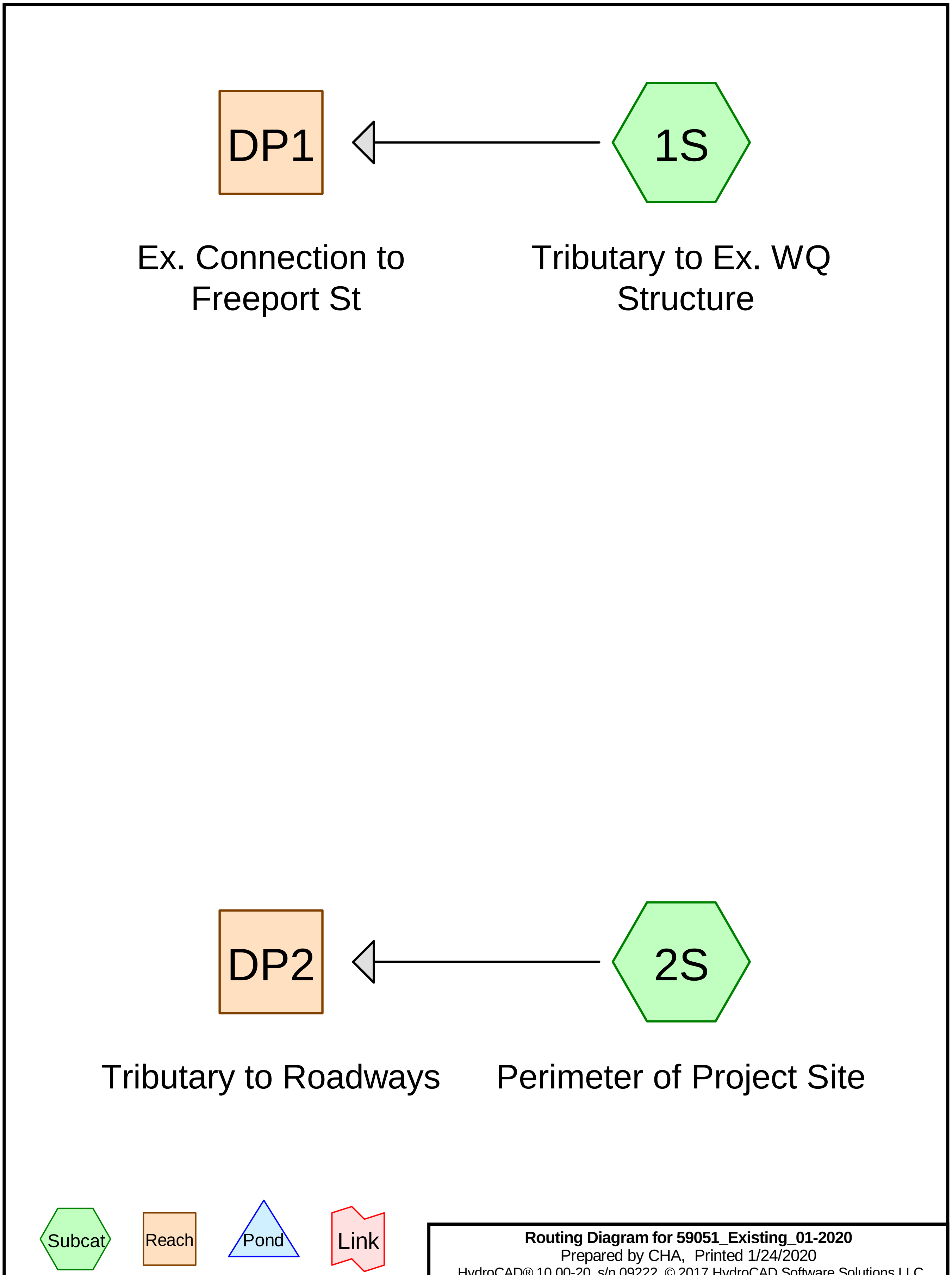
Flow Conditions

Flow Control Outlet Structure

Overflow Pipe

Section 3.0

Hydrology & Hydraulic Modeling



Routing Diagram for 59051_Existing_01-2020
Prepared by CHA, Printed 1/24/2020
HydroCAD® 10.00-20 s/n 09222 © 2017 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.199	61	>75% Grass cover, Good, HSG B (2S)
2.157	98	Paved parking, HSG B (1S, 2S)
0.412	98	Roofs, HSG B (1S)
2.768	**95**	**TOTAL AREA**

Time span=0.00-80.00 hrs, dt=0.01 hrs, 8001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary to Ex. WQ Runoff Area=101,160 sf 100.00% Impervious Runoff Depth=3.03"
Tc=6.0 min CN=98 Runoff=7.35 cfs 0.586 af

Subcatchment 2S: Perimeter of Project Site Runoff Area=19,425 sf 55.29% Impervious Runoff Depth=1.52"
Tc=6.0 min CN=81 Runoff=0.79 cfs 0.056 af

Reach DP1: Ex. Connection to Freeport St Inflow=7.35 cfs 0.586 af
Outflow=7.35 cfs 0.586 af

Reach DP2: Tributary to Roadways Inflow=0.79 cfs 0.056 af
Outflow=0.79 cfs 0.056 af

Total Runoff Area = 2.768 ac Runoff Volume = 0.642 af Average Runoff Depth = 2.78"
7.20% Pervious = 0.199 ac 92.80% Impervious = 2.569 ac

Summary for Subcatchment 1S: Tributary to Ex. WQ Structure

Runoff = 7.35 cfs @ 12.08 hrs, Volume= 0.586 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.26"

Area (sf)	CN	Description
83,200	98	Paved parking, HSG B
17,960	98	Roofs, HSG B
101,160	98	Weighted Average
101,160		100.00% Impervious Area

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

Summary for Subcatchment 2S: Perimeter of Project Site

Runoff = 0.79 cfs @ 12.09 hrs, Volume= 0.056 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.26"

Area (sf)	CN	Description
10,740	98	Paved parking, HSG B
8,685	61	>75% Grass cover, Good, HSG B
19,425	81	Weighted Average
8,685		44.71% Pervious Area
10,740		55.29% Impervious Area

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

Summary for Reach DP1: Ex. Connection to Freeport St

Inflow Area = 2.322 ac,100.00% Impervious, Inflow Depth = 3.03" for 2-Year event
Inflow = 7.35 cfs @ 12.08 hrs, Volume= 0.586 af
Outflow = 7.35 cfs @ 12.08 hrs, Volume= 0.586 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Reach DP2: Tributary to Roadways

Inflow Area = 0.446 ac, 55.29% Impervious, Inflow Depth = 1.52" for 2-Year event
Inflow = 0.79 cfs @ 12.09 hrs, Volume= 0.056 af
Outflow = 0.79 cfs @ 12.09 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Time span=0.00-80.00 hrs, dt=0.01 hrs, 8001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary to Ex. WQ Runoff Area=101,160 sf 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=11.13 cfs 0.902 af

Subcatchment 2S: Perimeter of Project Site Runoff Area=19,425 sf 55.29% Impervious Runoff Depth=2.90"
Tc=6.0 min CN=81 Runoff=1.51 cfs 0.108 af

Reach DP1: Ex. Connection to Freeport St Inflow=11.13 cfs 0.902 af
Outflow=11.13 cfs 0.902 af

Reach DP2: Tributary to Roadways Inflow=1.51 cfs 0.108 af
Outflow=1.51 cfs 0.108 af

Total Runoff Area = 2.768 ac Runoff Volume = 1.010 af Average Runoff Depth = 4.38"
7.20% Pervious = 0.199 ac 92.80% Impervious = 2.569 ac

Summary for Subcatchment 1S: Tributary to Ex. WQ Structure

Runoff = 11.13 cfs @ 12.08 hrs, Volume= 0.902 af, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
83,200	98	Paved parking, HSG B
17,960	98	Roofs, HSG B
101,160	98	Weighted Average
101,160		100.00% Impervious Area

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

Summary for Subcatchment 2S: Perimeter of Project Site

Runoff = 1.51 cfs @ 12.09 hrs, Volume= 0.108 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
10,740	98	Paved parking, HSG B
8,685	61	>75% Grass cover, Good, HSG B
19,425	81	Weighted Average
8,685		44.71% Pervious Area
10,740		55.29% Impervious Area

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

Summary for Reach DP1: Ex. Connection to Freeport St

Inflow Area = 2.322 ac,100.00% Impervious, Inflow Depth = 4.66" for 10-Year event
Inflow = 11.13 cfs @ 12.08 hrs, Volume= 0.902 af
Outflow = 11.13 cfs @ 12.08 hrs, Volume= 0.902 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Reach DP2: Tributary to Roadways

Inflow Area = 0.446 ac, 55.29% Impervious, Inflow Depth = 2.90" for 10-Year event
Inflow = 1.51 cfs @ 12.09 hrs, Volume= 0.108 af
Outflow = 1.51 cfs @ 12.09 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Time span=0.00-80.00 hrs, dt=0.01 hrs, 8001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary to Ex. WQ Runoff Area=101,160 sf 100.00% Impervious Runoff Depth=5.95"
Tc=6.0 min CN=98 Runoff=14.09 cfs 1.152 af

Subcatchment 2S: Perimeter of Project Site Runoff Area=19,425 sf 55.29% Impervious Runoff Depth=4.06"
Tc=6.0 min CN=81 Runoff=2.11 cfs 0.151 af

Reach DP1: Ex. Connection to Freeport St Inflow=14.09 cfs 1.152 af
Outflow=14.09 cfs 1.152 af

Reach DP2: Tributary to Roadways Inflow=2.11 cfs 0.151 af
Outflow=2.11 cfs 0.151 af

Total Runoff Area = 2.768 ac Runoff Volume = 1.303 af Average Runoff Depth = 5.65"
7.20% Pervious = 0.199 ac 92.80% Impervious = 2.569 ac

Summary for Subcatchment 1S: Tributary to Ex. WQ Structure

Runoff = 14.09 cfs @ 12.08 hrs, Volume= 1.152 af, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.19"

Area (sf)	CN	Description
83,200	98	Paved parking, HSG B
17,960	98	Roofs, HSG B
101,160	98	Weighted Average
101,160		100.00% Impervious Area

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

Summary for Subcatchment 2S: Perimeter of Project Site

Runoff = 2.11 cfs @ 12.09 hrs, Volume= 0.151 af, Depth= 4.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.19"

Area (sf)	CN	Description
10,740	98	Paved parking, HSG B
8,685	61	>75% Grass cover, Good, HSG B
19,425	81	Weighted Average
8,685		44.71% Pervious Area
10,740		55.29% Impervious Area

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

Summary for Reach DP1: Ex. Connection to Freeport St

Inflow Area = 2.322 ac,100.00% Impervious, Inflow Depth = 5.95" for 25-Year event
Inflow = 14.09 cfs @ 12.08 hrs, Volume= 1.152 af
Outflow = 14.09 cfs @ 12.08 hrs, Volume= 1.152 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Reach DP2: Tributary to Roadways

Inflow Area = 0.446 ac, 55.29% Impervious, Inflow Depth = 4.06" for 25-Year event
Inflow = 2.11 cfs @ 12.09 hrs, Volume= 0.151 af
Outflow = 2.11 cfs @ 12.09 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Time span=0.00-80.00 hrs, dt=0.01 hrs, 8001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary to Ex. WQ Runoff Area=101,160 sf 100.00% Impervious Runoff Depth=8.59"
Tc=6.0 min CN=98 Runoff=20.14 cfs 1.662 af

Subcatchment 2S: Perimeter of Project Site Runoff Area=19,425 sf 55.29% Impervious Runoff Depth=6.53"
Tc=6.0 min CN=81 Runoff=3.33 cfs 0.243 af

Reach DP1: Ex. Connection to Freeport St Inflow=20.14 cfs 1.662 af
Outflow=20.14 cfs 1.662 af

Reach DP2: Tributary to Roadways Inflow=3.33 cfs 0.243 af
Outflow=3.33 cfs 0.243 af

Total Runoff Area = 2.768 ac Runoff Volume = 1.905 af Average Runoff Depth = 8.26"
7.20% Pervious = 0.199 ac 92.80% Impervious = 2.569 ac

Summary for Subcatchment 1S: Tributary to Ex. WQ Structure

Runoff = 20.14 cfs @ 12.08 hrs, Volume= 1.662 af, Depth= 8.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.83"

Area (sf)	CN	Description
83,200	98	Paved parking, HSG B
17,960	98	Roofs, HSG B
101,160	98	Weighted Average
101,160		100.00% Impervious Area

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

Summary for Subcatchment 2S: Perimeter of Project Site

Runoff = 3.33 cfs @ 12.09 hrs, Volume= 0.243 af, Depth= 6.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.83"

Area (sf)	CN	Description
10,740	98	Paved parking, HSG B
8,685	61	>75% Grass cover, Good, HSG B
19,425	81	Weighted Average
8,685		44.71% Pervious Area
10,740		55.29% Impervious Area

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

Summary for Reach DP1: Ex. Connection to Freeport St

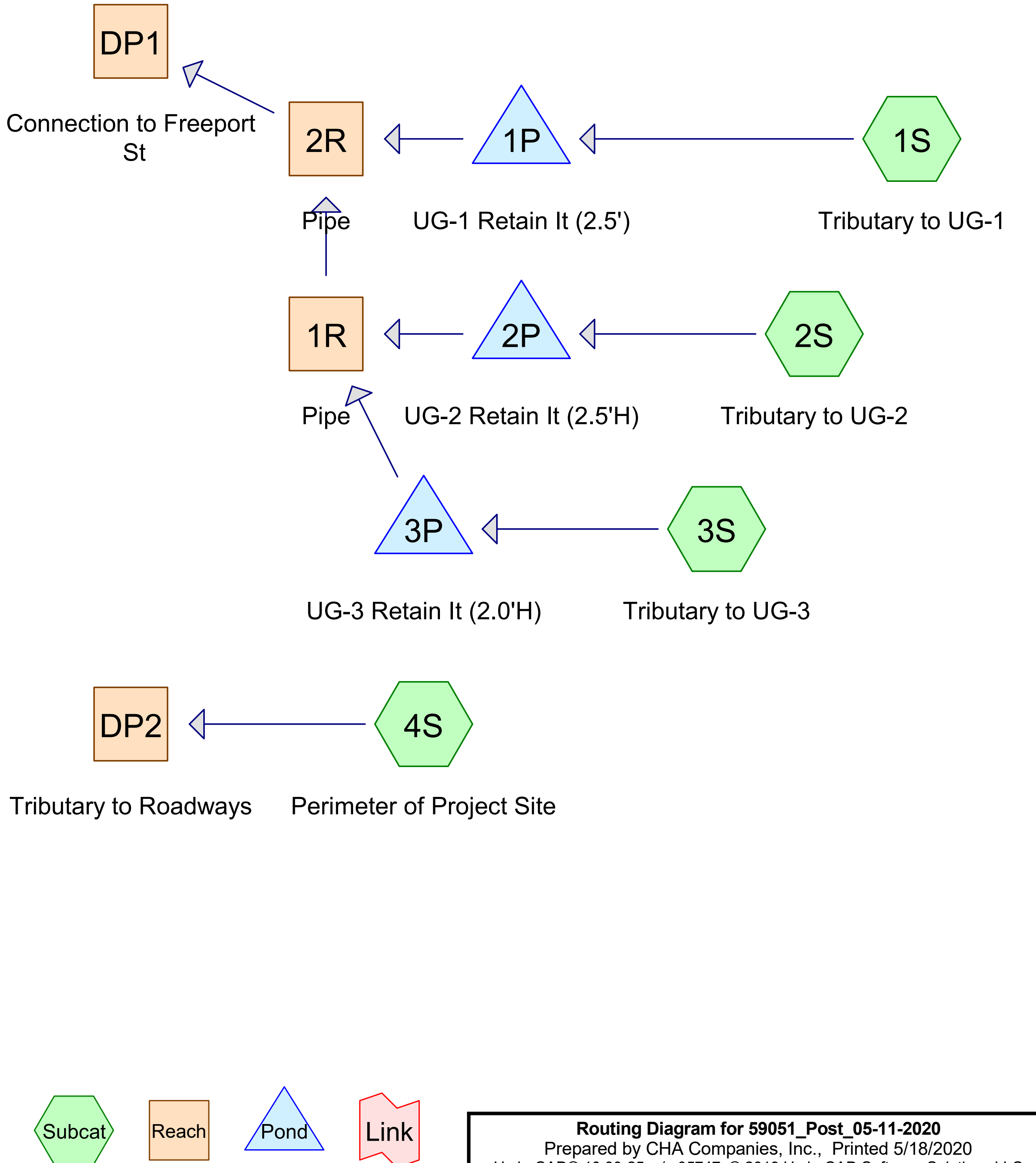
Inflow Area = 2.322 ac,100.00% Impervious, Inflow Depth = 8.59" for 100-Year event
Inflow = 20.14 cfs @ 12.08 hrs, Volume= 1.662 af
Outflow = 20.14 cfs @ 12.08 hrs, Volume= 1.662 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Reach DP2: Tributary to Roadways

Inflow Area = 0.446 ac, 55.29% Impervious, Inflow Depth = 6.53" for 100-Year event
Inflow = 3.33 cfs @ 12.09 hrs, Volume= 0.243 af
Outflow = 3.33 cfs @ 12.09 hrs, Volume= 0.243 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs



Routing Diagram for 59051_Post_05-11-2020
Prepared by CHA Companies, Inc., Printed 5/18/2020
HydroCAD® 10.00-25 s/n 05747 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.445	61	>75% Grass cover, Good, HSG B (4S)
1.661	98	Paved parking, HSG B (1S, 2S, 3S, 4S)
0.662	98	Roofs, HSG B (1S, 3S)
2.768	**92**	**TOTAL AREA**

Time span=0.00-80.00 hrs, dt=0.01 hrs, 8001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary to UG-1 Runoff Area=36,425 sf 100.00% Impervious Runoff Depth=3.03"
Tc=6.0 min CN=98 Runoff=2.65 cfs 0.211 af

Subcatchment 2S: Tributary to UG-2 Runoff Area=21,205 sf 100.00% Impervious Runoff Depth=3.03"
Tc=6.0 min CN=98 Runoff=1.54 cfs 0.123 af

Subcatchment 3S: Tributary to UG-3 Runoff Area=40,820 sf 100.00% Impervious Runoff Depth=3.03"
Tc=6.0 min CN=98 Runoff=2.97 cfs 0.236 af

Subcatchment 4S: Perimeter of Project Site Runoff Area=22,140 sf 12.42% Impervious Runoff Depth=0.67"
Tc=6.0 min CN=66 Runoff=0.33 cfs 0.029 af

Reach 1R: Pipe Avg. Flow Depth=0.29' Max Vel=3.63 fps Inflow=1.01 cfs 0.065 af
24.0" Round Pipe n=0.013 L=46.0' S=0.0100 '/' Capacity=22.62 cfs Outflow=1.01 cfs 0.065 af

Reach 2R: Pipe Avg. Flow Depth=0.37' Max Vel=4.23 fps Inflow=1.69 cfs 0.110 af
24.0" Round Pipe n=0.013 L=52.0' S=0.0100 '/' Capacity=22.62 cfs Outflow=1.69 cfs 0.110 af

Reach DP1: Connection to Freeport St Inflow=1.69 cfs 0.110 af
Outflow=1.69 cfs 0.110 af

Reach DP2: Tributary to Roadways Inflow=0.33 cfs 0.029 af
Outflow=0.33 cfs 0.029 af

Pond 1P: UG-1 Retain It (2.5') Peak Elev=11.78' Storage=4,167 cf Inflow=2.65 cfs 0.211 af
Discarded=0.06 cfs 0.166 af Primary=0.71 cfs 0.045 af Outflow=0.77 cfs 0.211 af

Pond 2P: UG-2 Retain It (2.5'H) Peak Elev=11.71' Storage=2,482 cf Inflow=1.54 cfs 0.123 af
Discarded=0.04 cfs 0.101 af Primary=0.34 cfs 0.021 af Outflow=0.38 cfs 0.123 af

Pond 3P: UG-3 Retain It (2.0'H) Peak Elev=11.18' Storage=4,581 cf Inflow=2.97 cfs 0.236 af
Discarded=0.07 cfs 0.193 af Primary=0.67 cfs 0.044 af Outflow=0.75 cfs 0.236 af

Total Runoff Area = 2.768 ac Runoff Volume = 0.599 af Average Runoff Depth = 2.60"
16.08% Pervious = 0.445 ac 83.92% Impervious = 2.323 ac

Summary for Subcatchment 1S: Tributary to UG-1

Runoff = 2.65 cfs @ 12.08 hrs, Volume= 0.211 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.26"

Area (sf)	CN	Description
22,070	98	Paved parking, HSG B
14,355	98	Roofs, HSG B
36,425	98	Weighted Average
36,425		100.00% Impervious Area

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

Summary for Subcatchment 2S: Tributary to UG-2

Runoff = 1.54 cfs @ 12.08 hrs, Volume= 0.123 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.26"

Area (sf)	CN	Description
21,205	98	Paved parking, HSG B
21,205		100.00% Impervious Area

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

Summary for Subcatchment 3S: Tributary to UG-3

Runoff = 2.97 cfs @ 12.08 hrs, Volume= 0.236 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.26"

Area (sf)	CN	Description
26,320	98	Paved parking, HSG B
14,500	98	Roofs, HSG B
40,820	98	Weighted Average
40,820		100.00% Impervious Area

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

Summary for Subcatchment 4S: Perimeter of Project Site

Runoff = 0.33 cfs @ 12.11 hrs, Volume= 0.029 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.26"

Area (sf)	CN	Description
2,750	98	Paved parking, HSG B
19,390	61	>75% Grass cover, Good, HSG B
22,140	66	Weighted Average
19,390		87.58% Pervious Area
2,750		12.42% Impervious Area

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

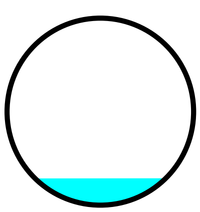
Summary for Reach 1R: Pipe

Inflow Area = 1.424 ac,100.00% Impervious, Inflow Depth = 0.55" for 2-Year event
Inflow = 1.01 cfs @ 12.45 hrs, Volume= 0.065 af
Outflow = 1.01 cfs @ 12.46 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 3.63 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 0.4 min

Peak Storage= 13 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 22.62 cfs

24.0" Round Pipe
n= 0.013
Length= 46.0' Slope= 0.0100 '/'
Inlet Invert= 9.12', Outlet Invert= 8.66'



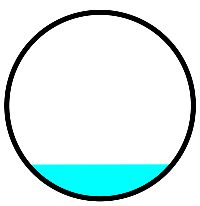
Summary for Reach 2R: Pipe

Inflow Area = 2.260 ac,100.00% Impervious, Inflow Depth = 0.59" for 2-Year event
Inflow = 1.69 cfs @ 12.45 hrs, Volume= 0.110 af
Outflow = 1.69 cfs @ 12.45 hrs, Volume= 0.110 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 4.23 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 0.4 min

Peak Storage= 21 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 22.62 cfs

24.0" Round Pipe
n= 0.013
Length= 52.0' Slope= 0.0100 '/'
Inlet Invert= 8.66', Outlet Invert= 8.14'



Summary for Reach DP1: Connection to Freeport St

Inflow Area =	2.260 ac,100.00% Impervious,	Inflow Depth = 0.59"	for 2-Year event	
Inflow =	1.69 cfs @	12.45 hrs, Volume=	0.110 af	
Outflow =	1.69 cfs @	12.45 hrs, Volume=	0.110 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Reach DP2: Tributary to Roadways

Inflow Area =	0.508 ac, 12.42% Impervious,	Inflow Depth = 0.67"	for 2-Year event	
Inflow =	0.33 cfs @	12.11 hrs, Volume=	0.029 af	
Outflow =	0.33 cfs @	12.11 hrs, Volume=	0.029 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: UG-1 Retain It (2.5')

Inflow Area =	0.836 ac,100.00% Impervious,	Inflow Depth = 3.03"	for 2-Year event	
Inflow =	2.65 cfs @	12.08 hrs, Volume=	0.211 af	
Outflow =	0.77 cfs @	12.41 hrs, Volume=	0.211 af,	Atten= 71%, Lag= 19.6 min
Discarded =	0.06 cfs @	7.74 hrs, Volume=	0.166 af	
Primary =	0.71 cfs @	12.41 hrs, Volume=	0.045 af	

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 11.78' @ 12.41 hrs Surf.Area= 2,340 sf Storage= 4,167 cf

Plug-Flow detention time= 507.1 min calculated for 0.211 af (100% of inflow)
Center-of-Mass det. time= 507.2 min (1,263.2 - 756.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.26'	568 cf	**90.00'W x 26.00'L x 3.67'H Field A**
			8,580 cf Overall - 6,688 cf Embedded = 1,892 cf x 30.0% Voids
#2A	9.76'	4,542 cf	**retain_it retain_it 2.5'** x 33 Inside #1
			Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf
			Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf
			11 Rows adjusted for 92.4 cf perimeter wall
		5,110 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	11.66'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	9.26'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 7.74 hrs HW=9.27' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.71 cfs @ 12.41 hrs HW=11.78' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.71 cfs @ 1.15 fps)

Summary for Pond 2P: UG-2 Retain It (2.5'H)

Inflow Area = 0.487 ac,100.00% Impervious, Inflow Depth = 3.03" for 2-Year event
Inflow = 1.54 cfs @ 12.08 hrs, Volume= 0.123 af
Outflow = 0.38 cfs @ 12.46 hrs, Volume= 0.123 af, Atten= 76%, Lag= 22.5 min
Discarded = 0.04 cfs @ 8.12 hrs, Volume= 0.101 af
Primary = 0.34 cfs @ 12.46 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 11.71' @ 12.46 hrs Surf.Area= 1,508 sf Storage= 2,482 cf

Plug-Flow detention time= 498.5 min calculated for 0.123 af (100% of inflow)
Center-of-Mass det. time= 498.6 min (1,254.6 - 756.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.33'	382 cf	**58.00'W x 26.00'L x 3.67'H Field A**
			5,529 cf Overall - 4,256 cf Embedded = 1,273 cf x 30.0% Voids
#2A	9.83'	2,883 cf	**retain_it retain_it 2.5'** x 21 Inside #1
			Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf
			Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf
			7 Rows adjusted for 66.0 cf perimeter wall
		3,265 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	11.63'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	9.33'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 8.12 hrs HW=9.34' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.34 cfs @ 12.46 hrs HW=11.71' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.34 cfs @ 0.90 fps)

Summary for Pond 3P: UG-3 Retain It (2.0'H)

Inflow Area =	0.937 ac,100.00% Impervious,	Inflow Depth = 3.03"	for 2-Year event	
Inflow =	2.97 cfs @	12.08 hrs, Volume=	0.236 af	
Outflow =	0.75 cfs @	12.45 hrs, Volume=	0.236 af,	Atten= 75%, Lag= 22.0 min
Discarded =	0.07 cfs @	8.31 hrs, Volume=	0.193 af	
Primary =	0.67 cfs @	12.45 hrs, Volume=	0.044 af	

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 11.18' @ 12.45 hrs Surf.Area= 3,172 sf Storage= 4,581 cf

Plug-Flow detention time= 419.1 min calculated for 0.236 af (100% of inflow)
Center-of-Mass det. time= 419.1 min (1,175.2 - 756.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.06'	709 cf	**122.00'W x 26.00'L x 3.17'H Field A** 10,045 cf Overall - 7,680 cf Embedded = 2,365 cf x 30.0% Voids
#2A	9.56'	4,895 cf	**retain_it retain_it 2.0'** x 45 Inside #1 Inside= 84.0"W x 24.0"H => 13.78 sf x 8.00'L = 110.3 cf Outside= 96.0"W x 32.0"H => 21.33 sf x 8.00'L = 170.7 cf 15 Rows adjusted for 68.0 cf perimeter wall
		5,604 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.57'	**18.0" Round Culvert** L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 9.57' / 9.12' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	11.06'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	9.06'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.07 cfs @ 8.31 hrs HW=9.07' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.67 cfs @ 12.45 hrs HW=11.18' (Free Discharge)
└─**1=Culvert** (Passes 0.67 cfs of 6.23 cfs potential flow)
  └─**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.67 cfs @ 1.13 fps)

Time span=0.00-80.00 hrs, dt=0.01 hrs, 8001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary to UG-1 Runoff Area=36,425 sf 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=4.01 cfs 0.325 af

Subcatchment 2S: Tributary to UG-2 Runoff Area=21,205 sf 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=2.33 cfs 0.189 af

Subcatchment 3S: Tributary to UG-3 Runoff Area=40,820 sf 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=4.49 cfs 0.364 af

Subcatchment 4S: Perimeter of Project Site Runoff Area=22,140 sf 12.42% Impervious Runoff Depth=1.66"
Tc=6.0 min CN=66 Runoff=0.95 cfs 0.070 af

Reach 1R: Pipe Avg. Flow Depth=0.67' Max Vel=5.92 fps Inflow=5.43 cfs 0.227 af
24.0" Round Pipe n=0.013 L=46.0' S=0.0100 '/' Capacity=22.62 cfs Outflow=5.42 cfs 0.227 af

Reach 2R: Pipe Avg. Flow Depth=0.87' Max Vel=6.75 fps Inflow=8.82 cfs 0.370 af
24.0" Round Pipe n=0.013 L=52.0' S=0.0100 '/' Capacity=22.62 cfs Outflow=8.80 cfs 0.370 af

Reach DP1: Connection to Freeport St Inflow=8.80 cfs 0.370 af
Outflow=8.80 cfs 0.370 af

Reach DP2: Tributary to Roadways Inflow=0.95 cfs 0.070 af
Outflow=0.95 cfs 0.070 af

Pond 1P: UG-1 Retain It (2.5') Peak Elev=12.02' Storage=4,605 cf Inflow=4.01 cfs 0.325 af
Discarded=0.06 cfs 0.182 af Primary=3.43 cfs 0.143 af Outflow=3.49 cfs 0.325 af

Pond 2P: UG-2 Retain It (2.5'H) Peak Elev=11.88' Storage=2,691 cf Inflow=2.33 cfs 0.189 af
Discarded=0.04 cfs 0.112 af Primary=2.02 cfs 0.077 af Outflow=2.05 cfs 0.189 af

Pond 3P: UG-3 Retain It (2.0'H) Peak Elev=11.42' Storage=5,185 cf Inflow=4.49 cfs 0.364 af
Discarded=0.07 cfs 0.214 af Primary=3.45 cfs 0.150 af Outflow=3.52 cfs 0.364 af

Total Runoff Area = 2.768 ac Runoff Volume = 0.949 af Average Runoff Depth = 4.11"
16.08% Pervious = 0.445 ac 83.92% Impervious = 2.323 ac

Summary for Subcatchment 1S: Tributary to UG-1

Runoff = 4.01 cfs @ 12.08 hrs, Volume= 0.325 af, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
22,070	98	Paved parking, HSG B
14,355	98	Roofs, HSG B
36,425	98	Weighted Average
36,425		100.00% Impervious Area

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

Summary for Subcatchment 2S: Tributary to UG-2

Runoff = 2.33 cfs @ 12.08 hrs, Volume= 0.189 af, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
21,205	98	Paved parking, HSG B
21,205		100.00% Impervious Area

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

Summary for Subcatchment 3S: Tributary to UG-3

Runoff = 4.49 cfs @ 12.08 hrs, Volume= 0.364 af, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
26,320	98	Paved parking, HSG B
14,500	98	Roofs, HSG B
40,820	98	Weighted Average
40,820		100.00% Impervious Area

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

Summary for Subcatchment 4S: Perimeter of Project Site

Runoff = 0.95 cfs @ 12.10 hrs, Volume= 0.070 af, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
2,750	98	Paved parking, HSG B
19,390	61	>75% Grass cover, Good, HSG B
22,140	66	Weighted Average
19,390		87.58% Pervious Area
2,750		12.42% Impervious Area

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

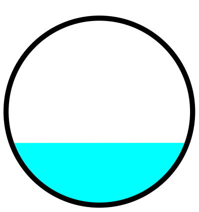
Summary for Reach 1R: Pipe

Inflow Area = 1.424 ac,100.00% Impervious, Inflow Depth = 1.91" for 10-Year event
Inflow = 5.43 cfs @ 12.14 hrs, Volume= 0.227 af
Outflow = 5.42 cfs @ 12.14 hrs, Volume= 0.227 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 5.92 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.04 fps, Avg. Travel Time= 0.4 min

Peak Storage= 42 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 22.62 cfs

24.0" Round Pipe
n= 0.013
Length= 46.0' Slope= 0.0100 '/'
Inlet Invert= 9.12', Outlet Invert= 8.66'



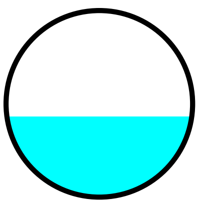
Summary for Reach 2R: Pipe

Inflow Area = 2.260 ac,100.00% Impervious, Inflow Depth = 1.96" for 10-Year event
Inflow = 8.82 cfs @ 12.14 hrs, Volume= 0.370 af
Outflow = 8.80 cfs @ 12.14 hrs, Volume= 0.370 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.75 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.17 fps, Avg. Travel Time= 0.4 min

Peak Storage= 68 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.87'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 22.62 cfs

24.0" Round Pipe
n= 0.013
Length= 52.0' Slope= 0.0100 '/'
Inlet Invert= 8.66', Outlet Invert= 8.14'



Summary for Reach DP1: Connection to Freeport St

Inflow Area = 2.260 ac,100.00% Impervious, Inflow Depth = 1.96" for 10-Year event
Inflow = 8.80 cfs @ 12.14 hrs, Volume= 0.370 af
Outflow = 8.80 cfs @ 12.14 hrs, Volume= 0.370 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Reach DP2: Tributary to Roadways

Inflow Area = 0.508 ac, 12.42% Impervious, Inflow Depth = 1.66" for 10-Year event
Inflow = 0.95 cfs @ 12.10 hrs, Volume= 0.070 af
Outflow = 0.95 cfs @ 12.10 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: UG-1 Retain It (2.5')

Inflow Area = 0.836 ac,100.00% Impervious, Inflow Depth = 4.66" for 10-Year event
Inflow = 4.01 cfs @ 12.08 hrs, Volume= 0.325 af
Outflow = 3.49 cfs @ 12.13 hrs, Volume= 0.325 af, Atten= 13%, Lag= 2.7 min
Discarded = 0.06 cfs @ 6.07 hrs, Volume= 0.182 af
Primary = 3.43 cfs @ 12.13 hrs, Volume= 0.143 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 12.02' @ 12.13 hrs Surf.Area= 2,340 sf Storage= 4,605 cf

Plug-Flow detention time= 373.1 min calculated for 0.325 af (100% of inflow)
Center-of-Mass det. time= 373.1 min (1,121.4 - 748.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.26'	568 cf	**90.00'W x 26.00'L x 3.67'H Field A**
			8,580 cf Overall - 6,688 cf Embedded = 1,892 cf x 30.0% Voids
#2A	9.76'	4,542 cf	**retain_it retain_it 2.5'** x 33 Inside #1
			Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf
			Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf
			11 Rows adjusted for 92.4 cf perimeter wall
		5,110 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	11.66'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	9.26'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 6.07 hrs HW=9.27' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=3.43 cfs @ 12.13 hrs HW=12.02' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 3.43 cfs @ 1.95 fps)

Summary for Pond 2P: UG-2 Retain It (2.5'H)

Inflow Area = 0.487 ac,100.00% Impervious, Inflow Depth = 4.66" for 10-Year event
Inflow = 2.33 cfs @ 12.08 hrs, Volume= 0.189 af
Outflow = 2.05 cfs @ 12.13 hrs, Volume= 0.189 af, Atten= 12%, Lag= 2.6 min
Discarded = 0.04 cfs @ 6.39 hrs, Volume= 0.112 af
Primary = 2.02 cfs @ 12.13 hrs, Volume= 0.077 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 11.88' @ 12.13 hrs Surf.Area= 1,508 sf Storage= 2,691 cf

Plug-Flow detention time= 369.1 min calculated for 0.189 af (100% of inflow)
Center-of-Mass det. time= 369.2 min (1,117.5 - 748.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.33'	382 cf	**58.00'W x 26.00'L x 3.67'H Field A**
			5,529 cf Overall - 4,256 cf Embedded = 1,273 cf x 30.0% Voids
#2A	9.83'	2,883 cf	**retain_it retain_it 2.5'** x 21 Inside #1
			Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf
			Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf
			7 Rows adjusted for 66.0 cf perimeter wall
		3,265 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	11.63'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	9.33'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 6.39 hrs HW=9.34' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=2.01 cfs @ 12.13 hrs HW=11.88' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 2.01 cfs @ 1.63 fps)

Summary for Pond 3P: UG-3 Retain It (2.0'H)

Inflow Area = 0.937 ac,100.00% Impervious, Inflow Depth = 4.66" for 10-Year event
Inflow = 4.49 cfs @ 12.08 hrs, Volume= 0.364 af
Outflow = 3.52 cfs @ 12.15 hrs, Volume= 0.364 af, Atten= 22%, Lag= 3.7 min
Discarded = 0.07 cfs @ 6.65 hrs, Volume= 0.214 af
Primary = 3.45 cfs @ 12.15 hrs, Volume= 0.150 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 11.42' @ 12.15 hrs Surf.Area= 3,172 sf Storage= 5,185 cf

Plug-Flow detention time= 315.2 min calculated for 0.364 af (100% of inflow)
Center-of-Mass det. time= 315.3 min (1,063.7 - 748.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.06'	709 cf	**122.00'W x 26.00'L x 3.17'H Field A** 10,045 cf Overall - 7,680 cf Embedded = 2,365 cf x 30.0% Voids
#2A	9.56'	4,895 cf	**retain_it retain_it 2.0'** x 45 Inside #1 Inside= 84.0"W x 24.0"H => 13.78 sf x 8.00'L = 110.3 cf Outside= 96.0"W x 32.0"H => 21.33 sf x 8.00'L = 170.7 cf 15 Rows adjusted for 68.0 cf perimeter wall
		5,604 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.57'	**18.0" Round Culvert** L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 9.57' / 9.12' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	11.06'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	9.06'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.07 cfs @ 6.65 hrs HW=9.07' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=3.44 cfs @ 12.15 hrs HW=11.42' (Free Discharge)
└─**1=Culvert** (Passes 3.44 cfs of 7.04 cfs potential flow)
  └─**2=Sharp-Crested Rectangular Weir** (Weir Controls 3.44 cfs @ 1.95 fps)

Time span=0.00-80.00 hrs, dt=0.01 hrs, 8001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary to UG-1 Runoff Area=36,425 sf 100.00% Impervious Runoff Depth=5.95"
Tc=6.0 min CN=98 Runoff=5.07 cfs 0.415 af

Subcatchment 2S: Tributary to UG-2 Runoff Area=21,205 sf 100.00% Impervious Runoff Depth=5.95"
Tc=6.0 min CN=98 Runoff=2.95 cfs 0.241 af

Subcatchment 3S: Tributary to UG-3 Runoff Area=40,820 sf 100.00% Impervious Runoff Depth=5.95"
Tc=6.0 min CN=98 Runoff=5.69 cfs 0.465 af

Subcatchment 4S: Perimeter of Project Site Runoff Area=22,140 sf 12.42% Impervious Runoff Depth=2.58"
Tc=6.0 min CN=66 Runoff=1.52 cfs 0.109 af

Reach 1R: Pipe Avg. Flow Depth=0.81' Max Vel=6.54 fps Inflow=7.82 cfs 0.363 af
24.0" Round Pipe n=0.013 L=46.0' S=0.0100 '/' Capacity=22.62 cfs Outflow=7.80 cfs 0.363 af

Reach 2R: Pipe Avg. Flow Depth=1.06' Max Vel=7.38 fps Inflow=12.48 cfs 0.589 af
24.0" Round Pipe n=0.013 L=52.0' S=0.0100 '/' Capacity=22.62 cfs Outflow=12.46 cfs 0.589 af

Reach DP1: Connection to Freeport St Inflow=12.46 cfs 0.589 af
Outflow=12.46 cfs 0.589 af

Reach DP2: Tributary to Roadways Inflow=1.52 cfs 0.109 af
Outflow=1.52 cfs 0.109 af

Pond 1P: UG-1 Retain It (2.5') Peak Elev=12.10' Storage=4,762 cf Inflow=5.07 cfs 0.415 af
Discarded=0.06 cfs 0.189 af Primary=4.69 cfs 0.226 af Outflow=4.74 cfs 0.415 af

Pond 2P: UG-2 Retain It (2.5'H) Peak Elev=11.94' Storage=2,764 cf Inflow=2.95 cfs 0.241 af
Discarded=0.04 cfs 0.117 af Primary=2.79 cfs 0.124 af Outflow=2.83 cfs 0.241 af

Pond 3P: UG-3 Retain It (2.0'H) Peak Elev=11.52' Storage=5,451 cf Inflow=5.69 cfs 0.465 af
Discarded=0.07 cfs 0.226 af Primary=5.05 cfs 0.238 af Outflow=5.12 cfs 0.465 af

Total Runoff Area = 2.768 ac Runoff Volume = 1.230 af Average Runoff Depth = 5.33"
16.08% Pervious = 0.445 ac 83.92% Impervious = 2.323 ac

Summary for Subcatchment 1S: Tributary to UG-1

Runoff = 5.07 cfs @ 12.08 hrs, Volume= 0.415 af, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.19"

Area (sf)	CN	Description
22,070	98	Paved parking, HSG B
14,355	98	Roofs, HSG B
36,425	98	Weighted Average
36,425		100.00% Impervious Area

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

Summary for Subcatchment 2S: Tributary to UG-2

Runoff = 2.95 cfs @ 12.08 hrs, Volume= 0.241 af, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.19"

Area (sf)	CN	Description
21,205	98	Paved parking, HSG B
21,205		100.00% Impervious Area

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

Summary for Subcatchment 3S: Tributary to UG-3

Runoff = 5.69 cfs @ 12.08 hrs, Volume= 0.465 af, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.19"

Area (sf)	CN	Description
26,320	98	Paved parking, HSG B
14,500	98	Roofs, HSG B
40,820	98	Weighted Average
40,820		100.00% Impervious Area

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

Summary for Subcatchment 4S: Perimeter of Project Site

Runoff = 1.52 cfs @ 12.09 hrs, Volume= 0.109 af, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.19"

Area (sf)	CN	Description
2,750	98	Paved parking, HSG B
19,390	61	>75% Grass cover, Good, HSG B
22,140	66	Weighted Average
19,390		87.58% Pervious Area
2,750		12.42% Impervious Area

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

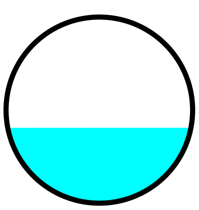
Summary for Reach 1R: Pipe

Inflow Area = 1.424 ac,100.00% Impervious, Inflow Depth = 3.06" for 25-Year event
Inflow = 7.82 cfs @ 12.12 hrs, Volume= 0.363 af
Outflow = 7.80 cfs @ 12.12 hrs, Volume= 0.363 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 6.54 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.03 fps, Avg. Travel Time= 0.4 min

Peak Storage= 55 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.81'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 22.62 cfs

24.0" Round Pipe
n= 0.013
Length= 46.0' Slope= 0.0100 '/'
Inlet Invert= 9.12', Outlet Invert= 8.66'



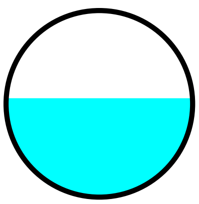
Summary for Reach 2R: Pipe

Inflow Area = 2.260 ac,100.00% Impervious, Inflow Depth = 3.13" for 25-Year event
Inflow = 12.48 cfs @ 12.12 hrs, Volume= 0.589 af
Outflow = 12.46 cfs @ 12.12 hrs, Volume= 0.589 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 7.38 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.22 fps, Avg. Travel Time= 0.4 min

Peak Storage= 88 cf @ 12.12 hrs
Average Depth at Peak Storage= 1.06'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 22.62 cfs

24.0" Round Pipe
n= 0.013
Length= 52.0' Slope= 0.0100 '/'
Inlet Invert= 8.66', Outlet Invert= 8.14'



Summary for Reach DP1: Connection to Freeport St

Inflow Area =	2.260 ac,100.00% Impervious,	Inflow Depth = 3.13"	for 25-Year event	
Inflow =	12.46 cfs @	12.12 hrs, Volume=	0.589 af	
Outflow =	12.46 cfs @	12.12 hrs, Volume=	0.589 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Reach DP2: Tributary to Roadways

Inflow Area =	0.508 ac, 12.42% Impervious,	Inflow Depth = 2.58"	for 25-Year event	
Inflow =	1.52 cfs @	12.09 hrs, Volume=	0.109 af	
Outflow =	1.52 cfs @	12.09 hrs, Volume=	0.109 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: UG-1 Retain It (2.5')

Inflow Area =	0.836 ac,100.00% Impervious,	Inflow Depth = 5.95"	for 25-Year event	
Inflow =	5.07 cfs @	12.08 hrs, Volume=	0.415 af	
Outflow =	4.74 cfs @	12.11 hrs, Volume=	0.415 af,	Atten= 7%, Lag= 1.8 min
Discarded =	0.06 cfs @	4.36 hrs, Volume=	0.189 af	
Primary =	4.69 cfs @	12.11 hrs, Volume=	0.226 af	

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 12.10' @ 12.11 hrs Surf.Area= 2,340 sf Storage= 4,762 cf

Plug-Flow detention time= 309.9 min calculated for 0.415 af (100% of inflow)
Center-of-Mass det. time= 310.0 min (1,054.7 - 744.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.26'	568 cf	**90.00'W x 26.00'L x 3.67'H Field A** 8,580 cf Overall - 6,688 cf Embedded = 1,892 cf x 30.0% Voids
#2A	9.76'	4,542 cf	**retain_it retain_it 2.5'** x 33 Inside #1 Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf 11 Rows adjusted for 92.4 cf perimeter wall
		5,110 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	11.66'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	9.26'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 4.36 hrs HW=9.27' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=4.68 cfs @ 12.11 hrs HW=12.10' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 4.68 cfs @ 2.17 fps)

Summary for Pond 2P: UG-2 Retain It (2.5'H)

Inflow Area = 0.487 ac,100.00% Impervious, Inflow Depth = 5.95" for 25-Year event
Inflow = 2.95 cfs @ 12.08 hrs, Volume= 0.241 af
Outflow = 2.83 cfs @ 12.11 hrs, Volume= 0.241 af, Atten= 4%, Lag= 1.4 min
Discarded = 0.04 cfs @ 4.89 hrs, Volume= 0.117 af
Primary = 2.79 cfs @ 12.11 hrs, Volume= 0.124 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 11.94' @ 12.11 hrs Surf.Area= 1,508 sf Storage= 2,764 cf

Plug-Flow detention time= 309.1 min calculated for 0.241 af (100% of inflow)
Center-of-Mass det. time= 309.1 min (1,053.8 - 744.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.33'	382 cf	**58.00'W x 26.00'L x 3.67'H Field A** 5,529 cf Overall - 4,256 cf Embedded = 1,273 cf x 30.0% Voids
#2A	9.83'	2,883 cf	**retain_it retain_it 2.5'** x 21 Inside #1 Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf 7 Rows adjusted for 66.0 cf perimeter wall
		3,265 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	11.63'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	9.33'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 4.89 hrs HW=9.34' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=2.79 cfs @ 12.11 hrs HW=11.94' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 2.79 cfs @ 1.82 fps)

Summary for Pond 3P: UG-3 Retain It (2.0'H)

Inflow Area = 0.937 ac,100.00% Impervious, Inflow Depth = 5.95" for 25-Year event
Inflow = 5.69 cfs @ 12.08 hrs, Volume= 0.465 af
Outflow = 5.12 cfs @ 12.12 hrs, Volume= 0.465 af, Atten= 10%, Lag= 2.3 min
Discarded = 0.07 cfs @ 5.41 hrs, Volume= 0.226 af
Primary = 5.05 cfs @ 12.12 hrs, Volume= 0.238 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 11.52' @ 12.12 hrs Surf.Area= 3,172 sf Storage= 5,451 cf

Plug-Flow detention time= 267.7 min calculated for 0.465 af (100% of inflow)
Center-of-Mass det. time= 267.8 min (1,012.5 - 744.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.06'	709 cf	**122.00'W x 26.00'L x 3.17'H Field A** 10,045 cf Overall - 7,680 cf Embedded = 2,365 cf x 30.0% Voids
#2A	9.56'	4,895 cf	**retain_it retain_it 2.0'** x 45 Inside #1 Inside= 84.0"W x 24.0"H => 13.78 sf x 8.00'L = 110.3 cf Outside= 96.0"W x 32.0"H => 21.33 sf x 8.00'L = 170.7 cf 15 Rows adjusted for 68.0 cf perimeter wall
		5,604 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.57'	**18.0" Round Culvert** L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 9.57' / 9.12' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	11.06'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	9.06'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.07 cfs @ 5.41 hrs HW=9.07' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=5.05 cfs @ 12.12 hrs HW=11.52' (Free Discharge)
└─**1=Culvert** (Passes 5.05 cfs of 7.37 cfs potential flow)
  └─**2=Sharp-Crested Rectangular Weir** (Weir Controls 5.05 cfs @ 2.22 fps)

Time span=0.00-80.00 hrs, dt=0.01 hrs, 8001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Tributary to UG-1 Runoff Area=36,425 sf 100.00% Impervious Runoff Depth=8.59"
Tc=6.0 min CN=98 Runoff=7.25 cfs 0.599 af

Subcatchment 2S: Tributary to UG-2 Runoff Area=21,205 sf 100.00% Impervious Runoff Depth=8.59"
Tc=6.0 min CN=98 Runoff=4.22 cfs 0.348 af

Subcatchment 3S: Tributary to UG-3 Runoff Area=40,820 sf 100.00% Impervious Runoff Depth=8.59"
Tc=6.0 min CN=98 Runoff=8.13 cfs 0.671 af

Subcatchment 4S: Perimeter of Project Site Runoff Area=22,140 sf 12.42% Impervious Runoff Depth=4.70"
Tc=6.0 min CN=66 Runoff=2.80 cfs 0.199 af

Reach 1R: Pipe Avg. Flow Depth=1.04' Max Vel=7.31 fps Inflow=12.02 cfs 0.660 af
24.0" Round Pipe n=0.013 L=46.0' S=0.0100 '/' Capacity=22.62 cfs Outflow=12.00 cfs 0.660 af

Reach 2R: Pipe Avg. Flow Depth=1.39' Max Vel=8.05 fps Inflow=18.75 cfs 1.064 af
24.0" Round Pipe n=0.013 L=52.0' S=0.0100 '/' Capacity=22.62 cfs Outflow=18.70 cfs 1.064 af

Reach DP1: Connection to Freeport St Inflow=18.70 cfs 1.064 af
Outflow=18.70 cfs 1.064 af

Reach DP2: Tributary to Roadways Inflow=2.80 cfs 0.199 af
Outflow=2.80 cfs 0.199 af

Pond 1P: UG-1 Retain It (2.5') Peak Elev=12.23' Storage=5,000 cf Inflow=7.25 cfs 0.599 af
Discarded=0.06 cfs 0.195 af Primary=6.80 cfs 0.404 af Outflow=6.86 cfs 0.599 af

Pond 2P: UG-2 Retain It (2.5'H) Peak Elev=12.03' Storage=2,869 cf Inflow=4.22 cfs 0.348 af
Discarded=0.04 cfs 0.122 af Primary=4.04 cfs 0.227 af Outflow=4.08 cfs 0.348 af

Pond 3P: UG-3 Retain It (2.0'H) Peak Elev=11.74' Storage=5,562 cf Inflow=8.13 cfs 0.671 af
Discarded=0.07 cfs 0.238 af Primary=8.01 cfs 0.433 af Outflow=8.09 cfs 0.670 af

Total Runoff Area = 2.768 ac Runoff Volume = 1.817 af Average Runoff Depth = 7.88"
16.08% Pervious = 0.445 ac 83.92% Impervious = 2.323 ac

Summary for Subcatchment 1S: Tributary to UG-1

Runoff = 7.25 cfs @ 12.08 hrs, Volume= 0.599 af, Depth= 8.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.83"

Area (sf)	CN	Description
22,070	98	Paved parking, HSG B
14,355	98	Roofs, HSG B
36,425	98	Weighted Average
36,425		100.00% Impervious Area

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

Summary for Subcatchment 2S: Tributary to UG-2

Runoff = 4.22 cfs @ 12.08 hrs, Volume= 0.348 af, Depth= 8.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.83"

Area (sf)	CN	Description
21,205	98	Paved parking, HSG B
21,205		100.00% Impervious Area

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

Summary for Subcatchment 3S: Tributary to UG-3

Runoff = 8.13 cfs @ 12.08 hrs, Volume= 0.671 af, Depth= 8.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.83"

Area (sf)	CN	Description
26,320	98	Paved parking, HSG B
14,500	98	Roofs, HSG B
40,820	98	Weighted Average
40,820		100.00% Impervious Area

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

Summary for Subcatchment 4S: Perimeter of Project Site

Runoff = 2.80 cfs @ 12.09 hrs, Volume= 0.199 af, Depth= 4.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.83"

Area (sf)	CN	Description
2,750	98	Paved parking, HSG B
19,390	61	>75% Grass cover, Good, HSG B
22,140	66	Weighted Average
19,390		87.58% Pervious Area
2,750		12.42% Impervious Area

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

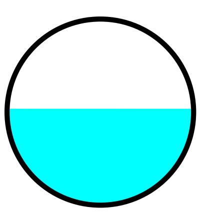
Summary for Reach 1R: Pipe

Inflow Area = 1.424 ac,100.00% Impervious, Inflow Depth = 5.56" for 100-Year event
Inflow = 12.02 cfs @ 12.10 hrs, Volume= 0.660 af
Outflow = 12.00 cfs @ 12.10 hrs, Volume= 0.660 af, Atten= 0%, Lag= 0.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 7.31 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.30 fps, Avg. Travel Time= 0.3 min

Peak Storage= 76 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.04'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 22.62 cfs

24.0" Round Pipe
n= 0.013
Length= 46.0' Slope= 0.0100 '/'
Inlet Invert= 9.12', Outlet Invert= 8.66'



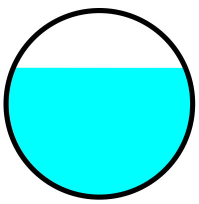
Summary for Reach 2R: Pipe

Inflow Area = 2.260 ac,100.00% Impervious, Inflow Depth = 5.65" for 100-Year event
Inflow = 18.75 cfs @ 12.10 hrs, Volume= 1.064 af
Outflow = 18.70 cfs @ 12.10 hrs, Volume= 1.064 af, Atten= 0%, Lag= 0.2 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Max. Velocity= 8.05 fps, Min. Travel Time= 0.1 min
Avg. Velocity = 2.67 fps, Avg. Travel Time= 0.3 min

Peak Storage= 121 cf @ 12.10 hrs
Average Depth at Peak Storage= 1.39'
Bank-Full Depth= 2.00' Flow Area= 3.1 sf, Capacity= 22.62 cfs

24.0" Round Pipe
n= 0.013
Length= 52.0' Slope= 0.0100 '/'
Inlet Invert= 8.66', Outlet Invert= 8.14'



Summary for Reach DP1: Connection to Freeport St

Inflow Area = 2.260 ac,100.00% Impervious, Inflow Depth = 5.65" for 100-Year event
Inflow = 18.70 cfs @ 12.10 hrs, Volume= 1.064 af
Outflow = 18.70 cfs @ 12.10 hrs, Volume= 1.064 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Reach DP2: Tributary to Roadways

Inflow Area = 0.508 ac, 12.42% Impervious, Inflow Depth = 4.70" for 100-Year event
Inflow = 2.80 cfs @ 12.09 hrs, Volume= 0.199 af
Outflow = 2.80 cfs @ 12.09 hrs, Volume= 0.199 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs

Summary for Pond 1P: UG-1 Retain It (2.5')

Inflow Area = 0.836 ac,100.00% Impervious, Inflow Depth = 8.59" for 100-Year event
Inflow = 7.25 cfs @ 12.08 hrs, Volume= 0.599 af
Outflow = 6.86 cfs @ 12.11 hrs, Volume= 0.599 af, Atten= 5%, Lag= 1.7 min
Discarded = 0.06 cfs @ 2.51 hrs, Volume= 0.195 af
Primary = 6.80 cfs @ 12.11 hrs, Volume= 0.404 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 12.23' @ 12.11 hrs Surf.Area= 2,340 sf Storage= 5,000 cf

Plug-Flow detention time= 231.1 min calculated for 0.598 af (100% of inflow)
Center-of-Mass det. time= 231.2 min (971.2 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.26'	568 cf	**90.00'W x 26.00'L x 3.67'H Field A** 8,580 cf Overall - 6,688 cf Embedded = 1,892 cf x 30.0% Voids
#2A	9.76'	4,542 cf	**retain_it retain_it 2.5'** x 33 Inside #1 Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf 11 Rows adjusted for 92.4 cf perimeter wall
		5,110 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	11.66'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	9.26'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 2.51 hrs HW=9.27' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=6.80 cfs @ 12.11 hrs HW=12.23' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 6.80 cfs @ 2.46 fps)

Summary for Pond 2P: UG-2 Retain It (2.5'H)

Inflow Area = 0.487 ac,100.00% Impervious, Inflow Depth = 8.59" for 100-Year event
Inflow = 4.22 cfs @ 12.08 hrs, Volume= 0.348 af
Outflow = 4.08 cfs @ 12.10 hrs, Volume= 0.348 af, Atten= 3%, Lag= 1.3 min
Discarded = 0.04 cfs @ 2.82 hrs, Volume= 0.122 af
Primary = 4.04 cfs @ 12.10 hrs, Volume= 0.227 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 12.03' @ 12.10 hrs Surf.Area= 1,508 sf Storage= 2,869 cf

Plug-Flow detention time= 231.9 min calculated for 0.348 af (100% of inflow)
Center-of-Mass det. time= 231.9 min (972.0 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.33'	382 cf	**58.00'W x 26.00'L x 3.67'H Field A** 5,529 cf Overall - 4,256 cf Embedded = 1,273 cf x 30.0% Voids
#2A	9.83'	2,883 cf	**retain_it retain_it 2.5'** x 21 Inside #1 Inside= 84.0"W x 30.0"H => 17.56 sf x 8.00'L = 140.4 cf Outside= 96.0"W x 38.0"H => 25.33 sf x 8.00'L = 202.7 cf 7 Rows adjusted for 66.0 cf perimeter wall
		3,265 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	11.63'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	9.33'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.04 cfs @ 2.82 hrs HW=9.34' (Free Discharge)
└─**2=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=4.03 cfs @ 12.10 hrs HW=12.03' (Free Discharge)
└─**1=Sharp-Crested Rectangular Weir** (Weir Controls 4.03 cfs @ 2.06 fps)

Summary for Pond 3P: UG-3 Retain It (2.0'H)

Inflow Area = 0.937 ac,100.00% Impervious, Inflow Depth = 8.59" for 100-Year event
Inflow = 8.13 cfs @ 12.08 hrs, Volume= 0.671 af
Outflow = 8.09 cfs @ 12.09 hrs, Volume= 0.670 af, Atten= 0%, Lag= 0.4 min
Discarded = 0.07 cfs @ 3.13 hrs, Volume= 0.238 af
Primary = 8.01 cfs @ 12.09 hrs, Volume= 0.433 af

Routing by Stor-Ind method, Time Span= 0.00-80.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 11.74' @ 12.09 hrs Surf.Area= 3,172 sf Storage= 5,562 cf

Plug-Flow detention time= 205.4 min calculated for 0.670 af (100% of inflow)
Center-of-Mass det. time= 205.0 min (945.0 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	9.06'	709 cf	**122.00'W x 26.00'L x 3.17'H Field A** 10,045 cf Overall - 7,680 cf Embedded = 2,365 cf x 30.0% Voids
#2A	9.56'	4,895 cf	**retain_it retain_it 2.0'** x 45 Inside #1 Inside= 84.0"W x 24.0"H => 13.78 sf x 8.00'L = 110.3 cf Outside= 96.0"W x 32.0"H => 21.33 sf x 8.00'L = 170.7 cf 15 Rows adjusted for 68.0 cf perimeter wall
		5,604 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	9.57'	**18.0" Round Culvert** L= 45.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 9.57' / 9.12' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	11.06'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Discarded	9.06'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.07 cfs @ 3.13 hrs HW=9.07' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=8.01 cfs @ 12.09 hrs HW=11.74' (Free Discharge)
└─**1=Culvert** (Inlet Controls 8.01 cfs @ 4.53 fps)
  └─**2=Sharp-Crested Rectangular Weir** (Passes 8.01 cfs of 8.97 cfs potential flow)

HERB CHAMBERS HOND OF BOSTON - STORM SEWER DESIGN

Project No. 59051
Project Herb Chambers Honda of Boston
Location 710-720 Morrissey Blvd
Boston, MA

Design Assumptions	
25	Year Storm
5	Minute Duration
8.7	in/hr Intensity for Boston, MA (Atlas-14)
0.013	Pipe Coefficient "n" (HDPE/RCP)

SHEET 1 OF 1
COMPUTED BY DR DATE 5/12/2020
CHECKED BY TK DATE 5/19/2020

DRAINAGE STRUCTURE		TRIBUTRARY AREA		RUNOFF COEFFICIENT	RUNOFF RATIONAL METHOD Q=Ca x C x i x A							PIPE								
FROM STRUCT.	TO STRUCT.	INCREM. (AC)	TOTAL	"C"	"Ca"	"Ca" X "C" X "A"	TIME OF FLOW TC(MIN)	TF(MIN)	RAINFALL INTENSITY (IN/HR)	DISCHARGE (Q) INCREM (CFS)	TOTAL (CFS)	LENGTH (FT)	DIA (IN)	SLOPE (FT/FT)	CAPACITY Q (CFS)	MEAN VELOCITY VF (FT/S)	AVAILABLE CAPACITY	FROM INVERT	TO INVERT	FROM STRUCTURE RIM
CB-4	DMH-10	0.05		0.90	1.1	0.05	5		8.7	0.44		57	12	0.005	2.55	3.24	2.11	13.43	13.14	16.30
CB-5	DMH-10	0.02		0.90	1.1	0.02	5		8.7	0.18		3	12	0.033	6.52	8.30	6.34	13.24	13.14	16.40
DMH-10	DMH-11		0.07								0.62	46	12	0.010	3.57	4.55	2.95	13.14	12.68	16.50
ROOF-1	DMH-11	0.33		0.90	1.1	0.33	5		8.7	2.84		16	10	0.020	3.10	5.69	0.27	13.00	12.68	16.67
DMH-11	DMH-12		0.40								3.46	36	15	0.010	6.47	5.28	3.02	12.68	12.32	16.70
CB-6	DMH-12	0.05		0.90	1.1	0.05	5		8.7	0.45		3	12	0.033	6.52	8.30	6.06	12.42	12.32	16.35
DMH-12	DMH-1		0.45								3.91	97	15	0.010	6.47	5.28	2.56	12.32	11.35	16.45
DMH-1	DMH-2		0.45								3.91	34	15	0.010	6.47	5.28	2.56	11.35	11.01	16.20
DCB-1	DMH-2	0.17		0.90	1.1	0.17	5		8.7	1.47		5	12	0.010	3.57	4.55	2.10	11.06	11.01	14.90
DMH-2	UG-1		0.62								5.38	24	15	0.010	6.47	5.28	1.10	11.01	10.77	15.05
DCB-2	UG-1	0.21		0.90	1.1	0.21	5		8.7	1.83		8	12	0.010	3.57	4.55	1.74	10.85	10.77	14.75
CB-11	DMH-9	0.11		0.90	1.1	0.11	5		8.7	0.91		60	12	0.010	3.57	4.55	2.66	11.50	10.90	15.84
CB-12	DMH-9	0.08		0.90	1.1	0.08	5		8.7	0.68		6	12	0.017	4.61	5.87	3.93	11.00	10.90	15.84
CB-13	DMH-9	0.10		0.90	1.1	0.10	5		8.7	0.86		45	12	0.010	3.57	4.55	2.70	11.35	10.90	16.00
DMH-9	DMH-4		0.29								2.46	27	12	0.010	3.63	4.63	1.18	10.90	10.62	15.90
DCB-14	DMH-4	0.20		0.90	1.1	0.20	5		8.7	1.73		56	12	0.005	2.52	3.21	0.79	10.90	10.62	14.75
DMH-4	DMH3		0.49								4.19	33	15	0.010	6.57	5.36	2.38	10.62	10.28	16.00
DMH-3	UG-2		0.49								4.19	9	15	0.010	6.47	5.28	2.28	10.28	10.19	15.78
CB-7a	DMH-13a	0.07		0.90	1.1	0.07	5		8.7	0.61		66	12	0.005	2.52	3.21	1.91	13.22	12.89	16.22
DMH-13a	DMH-13b		0.07								0.61	8	12	0.005	2.52	3.21	1.91	12.89	12.85	16.36
CB-7b	DMH-13b	0.12		0.90	1.1	0.11	5		8.7	1.00		3	12	0.017	4.61	5.87	3.61	12.90	12.85	16.00
DMH-13b	DMH-13c		0.19								1.61	179	12	0.005	2.53	3.22	0.92	12.85	11.95	16.19
CB-8	DMH-13c	0.11		0.90	1.1	0.11	5		8.7	0.96		19	12	0.011	3.66	4.66	2.70	12.48	12.28	15.60
ROOF-2	DMH-13c	0.33		0.90	1.1	0.33	5		8.7	2.87		36	10	0.020	3.10	5.69	0.24	13.00	12.28	16.67
DMH-13c	DMH-14		0.63								5.43	37	15	0.009	6.11	4.98	0.68	11.95	11.62	16.10
CB-9	DMH-15	0.05		0.90	1.1	0.05	5		8.7	0.39		16	12	0.005	2.52	3.21	2.13	11.78	11.70	14.40
CB-10	DMH-15	0.03		0.90	1.1	0.03	5		8.7	0.25		16	12	0.005	2.52	3.21	2.27	11.78	11.70	14.28
DMH-15	DMH-14		0.07								0.64	16	12	0.005	2.52	3.21	1.88	11.70	11.62	15.00
DMH-14	DMH-5		0.71								6.08	157	15	0.010	6.47	5.28	0.40	11.62	10.05	15.45
DMH-5	UG-3		0.71								6.08	23	15	0.010	6.61	5.39	0.53	10.05	9.81	15.40
DCB-3	UG-3	0.23		0.90	1.1	0.23	5		8.7	2.00		5	12	0.020	5.05	6.43	3.05	9.91	9.81	14.50
UG-3	OCS-3		0.94								8.07	4	18	0.015	12.89	7.30	4.82	9.81	9.75	-
OCS-3	DMH-6		0.94								8.07	4	18	0.020	14.88	8.43	6.81	9.65	9.57	15.53
DMH-6	DMH-7		0.94								8.07	45	18	0.010	10.52	5.96	2.45	9.57	9.12	15.63
UG-2	OCS-2		0.49								4.19	4	18	0.020	14.88	8.43	10.69	10.00	9.92	-
OCS-2	DMH-7		0.49								4.19	17	18	0.010	10.52	5.96	6.33	9.82	9.65	15.45
DMH-7	DMH-8		1.42								12.26	46	24	0.010	22.67	7.22	10.40	9.12	8.66	15.80
UG-1	OCS-1		0.84								7.20	4	18	0.020	14.88	8.43	7.68	10.00	9.92	-
OCS-1	DMH-8		0.84								7.20	4	18	0.020	14.88	8.43	7.68	9.82	9.74	15.76
DMH-8	Freeport		2.26								19.47	52	24	0.010	22.67	7.22	3.20	8.66	8.14	15.86

NOAA Atlas 14, Volume 10, Version 3
Location name: Dorchester, Massachusetts, USA*
Latitude: 42.2977°, Longitude: -71.0489°
Elevation: 7.28 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/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**3.62** (2.98-4.40)	**4.48** (3.67-5.46)	**5.88** (4.80-7.19)	**7.06** (5.71-8.69)	**8.68** (6.76-11.4)	**9.88** (7.51-13.3)	**11.2** (8.21-15.8)	**12.7** (8.68-18.4)	**15.0** (9.77-22.7)	**17.0** (10.8-26.3)
10-min	**2.56** (2.11-3.11)	**3.17** (2.60-3.86)	**4.18** (3.41-5.11)	**5.00** (4.06-6.16)	**6.14** (4.79-8.04)	**6.99** (5.32-9.41)	**7.90** (5.81-11.2)	**8.99** (6.14-13.0)	**10.6** (6.92-16.1)	**12.0** (7.61-18.6)
15-min	**2.01** (1.65-2.44)	**2.49** (2.04-3.03)	**3.27** (2.67-4.00)	**3.92** (3.18-4.83)	**4.82** (3.76-6.30)	**5.48** (4.18-7.38)	**6.20** (4.56-8.77)	**7.06** (4.81-10.2)	**8.34** (5.43-12.6)	**9.44** (5.97-14.6)
30-min	**1.37** (1.13-1.67)	**1.70** (1.39-2.07)	**2.24** (1.83-2.74)	**2.69** (2.18-3.31)	**3.30** (2.57-4.32)	**3.76** (2.86-5.06)	**4.25** (3.13-6.02)	**4.84** (3.30-7.00)	**5.74** (3.73-8.66)	**6.50** (4.11-10.0)
60-min	**0.869** (0.713-1.06)	**1.08** (0.884-1.31)	**1.42** (1.16-1.74)	**1.71** (1.38-2.10)	**2.10** (1.64-2.75)	**2.39** (1.82-3.22)	**2.70** (1.99-3.83)	**3.08** (2.10-4.45)	**3.65** (2.38-5.51)	**4.14** (2.62-6.40)
2-hr	**0.556** (0.460-0.672)	**0.700** (0.577-0.846)	**0.933** (0.766-1.13)	**1.13** (0.919-1.38)	**1.39** (1.09-1.81)	**1.59** (1.22-2.13)	**1.81** (1.34-2.55)	**2.07** (1.42-2.97)	**2.48** (1.62-3.71)	**2.83** (1.80-4.33)
3-hr	**0.431** (0.357-0.518)	**0.542** (0.449-0.653)	**0.724** (0.597-0.876)	**0.875** (0.717-1.07)	**1.08** (0.853-1.41)	**1.24** (0.951-1.65)	**1.40** (1.05-1.97)	**1.61** (1.11-2.30)	**1.94** (1.27-2.88)	**2.22** (1.41-3.37)
6-hr	**0.283** (0.236-0.338)	**0.353** (0.294-0.422)	**0.467** (0.387-0.561)	**0.562** (0.463-0.680)	**0.692** (0.548-0.890)	**0.788** (0.609-1.04)	**0.893** (0.668-1.24)	**1.02** (0.705-1.44)	**1.22** (0.803-1.80)	**1.40** (0.890-2.10)
12-hr	**0.182** (0.153-0.216)	**0.224** (0.188-0.267)	**0.293** (0.244-0.349)	**0.349** (0.290-0.420)	**0.428** (0.340-0.544)	**0.485** (0.377-0.635)	**0.548** (0.411-0.753)	**0.624** (0.432-0.872)	**0.741** (0.488-1.08)	**0.840** (0.538-1.25)
24-hr	**0.111** (0.094-0.131)	**0.137** (0.116-0.162)	**0.180** (0.152-0.214)	**0.216** (0.180-0.257)	**0.265** (0.212-0.335)	**0.301** (0.235-0.391)	**0.340** (0.257-0.465)	**0.389** (0.270-0.538)	**0.464** (0.307-0.669)	**0.530** (0.340-0.779)
2-day	**0.063** (0.054-0.074)	**0.080** (0.068-0.094)	**0.107** (0.091-0.126)	**0.130** (0.109-0.153)	**0.161** (0.130-0.202)	**0.183** (0.144-0.238)	**0.208** (0.159-0.284)	**0.241** (0.168-0.330)	**0.293** (0.194-0.417)	**0.339** (0.218-0.493)
3-day	**0.046** (0.040-0.054)	**0.058** (0.050-0.068)	**0.078** (0.066-0.091)	**0.094** (0.079-0.111)	**0.116** (0.094-0.146)	**0.133** (0.105-0.171)	**0.151** (0.116-0.205)	**0.174** (0.122-0.238)	**0.213** (0.141-0.301)	**0.247** (0.159-0.356)
4-day	**0.038** (0.032-0.044)	**0.047** (0.040-0.055)	**0.062** (0.053-0.072)	**0.074** (0.063-0.088)	**0.092** (0.075-0.115)	**0.104** (0.083-0.134)	**0.118** (0.091-0.160)	**0.137** (0.096-0.186)	**0.167** (0.111-0.235)	**0.193** (0.125-0.278)
7-day	**0.026** (0.022-0.030)	**0.032** (0.027-0.037)	**0.040** (0.035-0.047)	**0.048** (0.041-0.056)	**0.058** (0.047-0.072)	**0.065** (0.052-0.083)	**0.074** (0.057-0.099)	**0.085** (0.059-0.114)	**0.102** (0.068-0.143)	**0.118** (0.076-0.168)
10-day	**0.021** (0.018-0.024)	**0.025** (0.022-0.029)	**0.032** (0.027-0.037)	**0.037** (0.031-0.043)	**0.044** (0.036-0.054)	**0.049** (0.039-0.063)	**0.055** (0.043-0.073)	**0.063** (0.044-0.084)	**0.075** (0.050-0.104)	**0.086** (0.055-0.121)
20-day	**0.015** (0.013-0.017)	**0.017** (0.015-0.019)	**0.020** (0.018-0.024)	**0.023** (0.020-0.027)	**0.027** (0.022-0.033)	**0.030** (0.024-0.038)	**0.034** (0.026-0.043)	**0.037** (0.026-0.049)	**0.042** (0.029-0.058)	**0.047** (0.030-0.066)
30-day	**0.012** (0.011-0.014)	**0.014** (0.012-0.016)	**0.016** (0.014-0.019)	**0.018** (0.016-0.021)	**0.021** (0.017-0.025)	**0.023** (0.019-0.029)	**0.025** (0.019-0.032)	**0.028** (0.020-0.036)	**0.031** (0.021-0.042)	**0.033** (0.022-0.047)
45-day	**0.010** (0.009-0.011)	**0.011** (0.010-0.013)	**0.013** (0.011-0.015)	**0.014** (0.012-0.017)	**0.016** (0.014-0.020)	**0.018** (0.014-0.022)	**0.020** (0.015-0.024)	**0.021** (0.015-0.027)	**0.023** (0.016-0.031)	**0.024** (0.016-0.034)
60-day	**0.009** (0.008-0.010)	**0.010** (0.008-0.011)	**0.011** (0.010-0.013)	**0.012** (0.011-0.014)	**0.014** (0.011-0.016)	**0.015** (0.012-0.018)	**0.016** (0.012-0.020)	**0.017** (0.012-0.022)	**0.019** (0.013-0.025)	**0.019** (0.013-0.027)

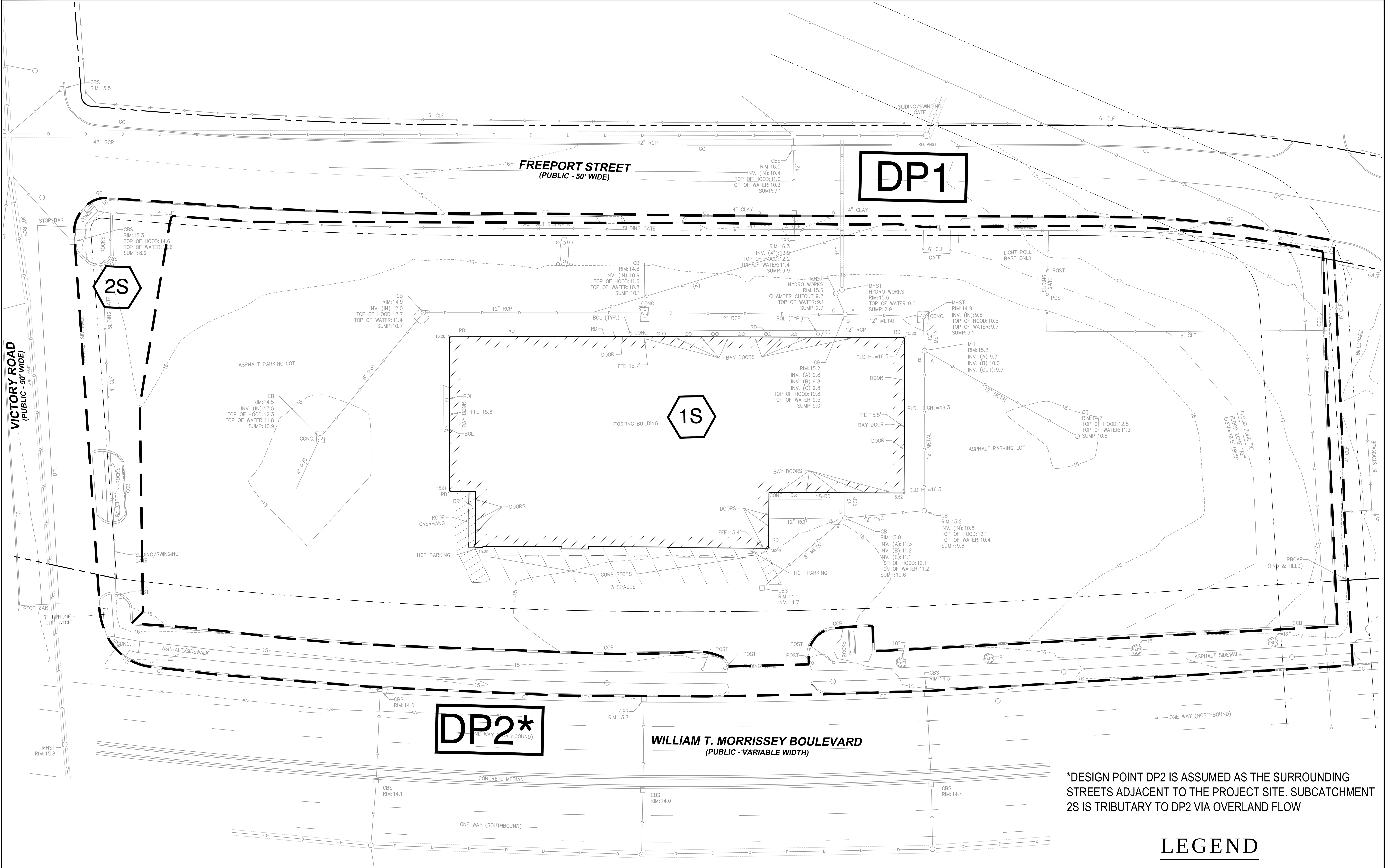
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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

PF graphical



*DESIGN POINT DP2 IS ASSUMED AS THE SURROUNDING STREETS ADJACENT TO THE PROJECT SITE. SUBCATCHMENT 2S IS TRIBUTARY TO DP2 VIA OVERLAND FLOW

LEGEND

1S — SUBCATCHMENT

DP1 — DESIGN POINT

CHA
141 Longwater Drive - Suite 104
Norwell, MA 02061
781.982.5400 • www.chacompanies.com

Scale in feet: 0 20 40

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

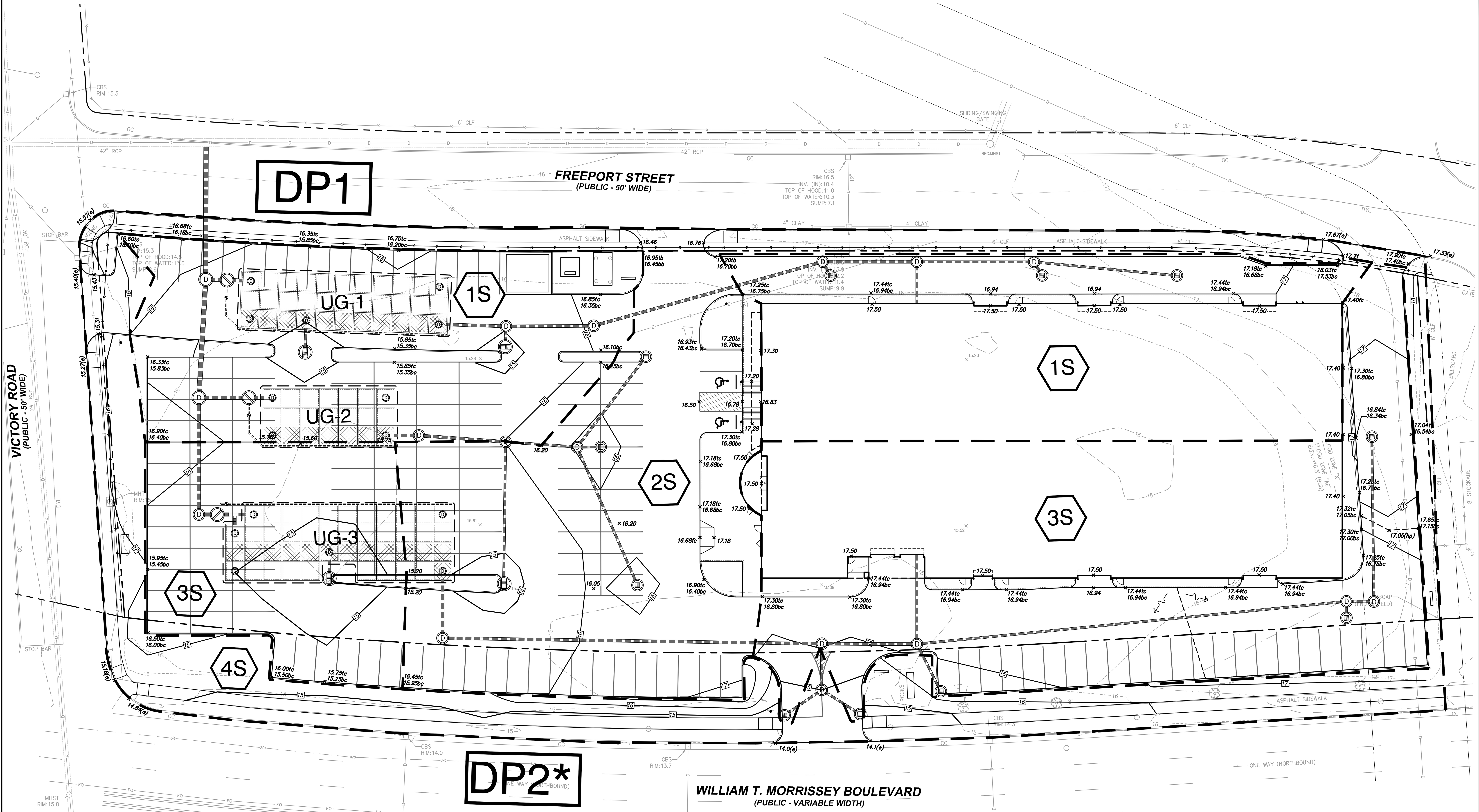
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

EXISTING CONDITIONS HYDROLOGY PLAN

Designed By:	Drawn By:	Checked By:
TK/JM	TK/JM	KK
Issue Date:	Project No:	Scale:
01/31/2020	059051	1"=20'

Drawing No.:
DR-EC



*DESIGN POINT DP2 IS ASSUMED AS THE SURROUNDING STREETS ADJACENT TO THE PROJECT SITE. SUBCATCHMENT 4S IS TRIBUTARY TO DP2 VIA OVERLAND FLOW

LEGEND

1S	SUBCATCHMENT
DP1	DESIGN POINT

CHA

1 Faneuil Hall Marketplace, South Market Building
Boston, MA 02109-6117
617.451.2717 . www.chacompanies.com

0 20 40
Scale in feet

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

PROPOSED CONDITIONS HYDROLOGY PLAN

Designed By:	Drawn By:	Checked By:
TK/JM	TK/JM	KK
Issue Date:	Project No:	Scale:
01/31/2020	059051	1"=20'

Drawing No.:
DR-PC

Section 4.0

Stormwater Management Calculations

Section 4.1

TSS Removal Calculations

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: CBs to UG1,2,3

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Subsurface Infiltration Galleys (w/ pretreatment row)	**0.80**	**0.75**	**0.60**	**0.15**

Total TSS Removal = 85%

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **Herb Chambers Honda**
Prepared By: **RM/AV**
Date: **1/21/2020**

*Equals remaining load from previous BMP (E) which enters the BMP

Section 4.2

Required Recharge Volume

RECHARGE

The calculation for the *Required Recharge Volume* is calculated using the equation in the 2008 Massachusetts Stormwater Handbook. The *Required Recharge Volume* equals a depth of runoff corresponding to the soil type multiplied by the new impervious areas covering that soil type at the post-development site. The *Required Recharge Volume* is based on the *Static* method.

The project is a redevelopment and subject to the Recharge Standard to the extent practicable. It should be noted that because the redevelopment will result in a decrease in impervious area, recharge is not required, but is still being provided.

The delineated soil boundaries from the Natural Resources Conservation Service (NRCS) soil survey show that the site consists of mainly of Urban Land which has no HSG designation. Based on the boring and test pit data, the in-situ soils were found to be sand to sandy loam and likely to promote infiltration. Additional soil information can be found in Appendix A. A designation of HSG "B" was utilized for the site, given the soil data.

The project has been designed to integrate recharge BMP's consisting of subsurface chamber systems with stone beds which collects all stormwater runoff through catch basins and roof drain connections.

Rv = F x impervious area (Equation 1) Volume 3, Ch 1, page 15
Rv = *Required Recharge Volume*, expressed in cubic feet, cubic yards, or acre-feet
F = Target Depth Factor associated with each Hydrologic Soil Group (HSG)
Impervious Area = new pavement and new rooftop area

F for A soils = 0.60 inches (Table 2.3.2) Volume 3, Ch 1, page 16
***F* for B soils = 0.35 inches**
F for C soils = 0.25 inches
F for D soils = 0.10 inches

Using the formula above, the following table shows the site's proposed impervious surface area overlying particular Hydrologic Soil Groups and the calculated *Required Recharge Volume*.

Existing Impervious	= 111,905 sq. ft.	= 2.569 ac.
Proposed Impervious	= 101,235 sq. ft	= 2.324 ac
Net New Impervious On-Site	= -10,670 sq. ft.	= -0.245 ac.

Required Recharge Volume

Rv = F x Imp
Rv = 0.35 in x (0 ac) x 1 ft/12 in
Rv = 0.0 ac-ft or 0.0 cu. ft.

Storage volume for Recharge calculated in HydroCAD below lowest orifice/weir

UG-1 = 3,933 cu. ft.
UG-2 = 2,391 cu. ft.
UG-3 = 4,278 cu. ft.

Total = 10,602 cu. ft.

As previously stated, groundwater recharge is not required due to the decrease in net impervious area. Therefore, the storage available in both UG-1,2, & 3 exceeds the Required Recharge Volume.

10,602 cu. ft. > 0 cu. ft.

Conclusion:

The recharge provided by the proposed subsurface chamber systems exceed the Required Recharge Volume required to compensate for the net increase in proposed impervious on the developed project site. The project's stormwater management system satisfies Standard 3 of the MassDEP Stormwater Regulations.

Section 4.3

Water Quality Calculations

WATER QUALITY

The stormwater runoff Water Quality Volume (WQV) is required by MassDEP at ½” or 1” depending on the site location. More stringent standards are required by the Boston Water and Sewer Commission. Projects are required to retain, on site, a volume of runoff equal to 1.25” of rainfall times the impervious areas. To be conservative, the below calculation assumes all onsite surfaces are impervious. The required WQVs has been calculated below.

Required WQVs:

Tributary Area to UG-1: 36,425 sq. ft.
WQV = 36,425 sq. ft. X (1.25/12) = **3,794 cu. ft**.

Tributary Area to UG-2: 21,205 sq. ft.
WQV = 21,205 sq. ft. X (1.25/12) ft = **2,209 cu. ft**.

Tributary Area to UG-3: 40,820 sq. ft.
WQV = 40,820 sq. ft. X (1.25/12) ft = **4,252 cu. ft.**

Total WQV: **10,255 cu. ft.** based on 98,450 sq.ft. onsite area.

Provided Volumes:

UG-1= 3,933 cu. ft.
UG-2= 2,391 cu. ft.
UG-3= 4,278 cu. ft.

TOTAL= **10,602 cu. ft.**

The provided storage volume of **10,602 cu. ft.** is greater than the required WQV of **10,255 cu. ft.**

The attached print out, from the HydroCAD program, shows the stage storage data for each of the three underground stormwater systems. Inside the outlet control structures, a weir has been set the corresponding stage height equal to or greater than the Water Quality Volume. This will ensure that there is adequate storage volume for the tributary stormwater runoff to each storage system.

Supplemental Calculations:
Off-site tributary area is described as portions of the project site that flow overland towards the surrounding streets and is not captured due to slopes of existing or proposed grading.

Existing Off-Site Tributary Area: 19,425 sq. ft. = 0.446 ac. (100% impervious)
Proposed Off-Site Tributary Area: 22,140 sq. ft. = 0.508 ac. (12.4% impervious)

The off-site tributary area was increased slightly by 2,715 sq. ft. = 0.062 ac. but the design greatly reduces the impervious surface area with perimeter landscaping. The HydroCAD model also shows the peak runoff rate leaving the site is significantly reduced.

Stage-Area-Storage for Pond 1P: UG-1 Retain It (2.5')

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
9.26	**2,340**	0
9.31	2,340	35
9.36	2,340	70
9.41	2,340	105
9.46	2,340	140
9.51	2,340	176
9.56	2,340	211
9.61	2,340	246
9.66	2,340	281
9.71	2,340	316
9.76	2,340	351
9.81	2,340	445
9.86	2,340	540
9.91	2,340	634
9.96	2,340	728
10.01	2,340	822
10.06	2,340	917
10.11	2,340	1,011
10.16	2,340	1,105
10.21	2,340	1,199
10.26	2,340	1,294
10.31	2,340	1,388
10.36	2,340	1,482
10.41	2,340	1,576
10.46	2,340	1,671
10.51	2,340	1,765
10.56	2,340	1,859
10.61	2,340	1,953
10.66	2,340	2,048
10.71	2,340	2,142
10.76	2,340	2,236
10.81	2,340	2,331
10.86	2,340	2,425
10.91	2,340	2,519
10.96	2,340	2,613
11.01	2,340	2,708
11.06	2,340	2,802
11.11	2,340	2,896
11.16	2,340	2,990
11.21	2,340	3,085
11.26	2,340	3,179
11.31	2,340	3,273
11.36	2,340	3,367
11.41	2,340	3,462
11.46	2,340	3,556
11.51	2,340	3,650
11.56	2,340	3,744
11.61	2,340	3,839
11.66	2,340	3,933
11.71	2,340	4,027
11.76	2,340	4,121
11.81	2,340	4,216
11.86	2,340	4,310
11.91	2,340	4,404
11.96	2,340	4,499
12.01	2,340	4,593
12.06	2,340	4,687
12.11	2,340	4,781
12.16	2,340	4,876
12.21	2,340	4,970
12.26	2,340	5,064
12.31	2,340	5,068
12.36	2,340	5,071
12.41	2,340	5,074
12.46	2,340	5,078
12.51	2,340	5,081
12.56	2,340	5,085
12.61	2,340	5,088
12.66	2,340	5,091
12.71	2,340	5,095
12.76	2,340	5,098
12.81	2,340	5,102
12.86	2,340	5,105
12.91	2,340	**5,109**

Stage-Area-Storage for Pond 2P: UG-2 Retain It (2.5'H)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
9.33	**1,508**	0	12.03	1,508	2,872
9.38	1,508	23	12.08	1,508	2,932
9.43	1,508	45	12.13	1,508	2,992
9.48	1,508	68	12.18	1,508	3,052
9.53	1,508	90	12.23	1,508	3,112
9.58	1,508	113	12.28	1,508	3,172
9.63	1,508	136	12.33	1,508	3,232
9.68	1,508	158	12.38	1,508	3,235
9.73	1,508	181	12.43	1,508	3,237
9.78	1,508	204	12.48	1,508	3,240
9.83	1,508	226	12.53	1,508	3,242
9.88	1,508	286	12.58	1,508	3,245
9.93	1,508	346	12.63	1,508	3,247
9.98	1,508	407	12.68	1,508	3,250
10.03	1,508	467	12.73	1,508	3,252
10.08	1,508	527	12.78	1,508	3,255
10.13	1,508	587	12.83	1,508	3,257
10.18	1,508	647	12.88	1,508	3,260
10.23	1,508	707	12.93	1,508	3,262
10.28	1,508	767	12.98	1,508	**3,264**
10.33	1,508	827			
10.38	1,508	888			
10.43	1,508	948			
10.48	1,508	1,008			
10.53	1,508	1,068			
10.58	1,508	1,128			
10.63	1,508	1,188			
10.68	1,508	1,248			
10.73	1,508	1,308			
10.78	1,508	1,369			
10.83	1,508	1,429			
10.88	1,508	1,489			
10.93	1,508	1,549			
10.98	1,508	1,609			
11.03	1,508	1,669			
11.08	1,508	1,729			
11.13	1,508	1,789			
11.18	1,508	1,850			
11.23	1,508	1,910			
11.28	1,508	1,970			
11.33	1,508	2,030			
11.38	1,508	2,090			
11.43	1,508	2,150			
11.48	1,508	2,210			
11.53	1,508	2,270			
11.58	1,508	2,331			
11.63	1,508	2,391			
11.68	1,508	2,451			
11.73	1,508	2,511			
11.78	1,508	2,571			
11.83	1,508	2,631			
11.88	1,508	2,691			
11.93	1,508	2,751			
11.98	1,508	2,812			

Stage-Area-Storage for Pond 3P: UG-3 Retain It (2.0'H)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
9.06	**3,172**	0
9.11	3,172	48
9.16	3,172	95
9.21	3,172	143
9.26	3,172	190
9.31	3,172	238
9.36	3,172	285
9.41	3,172	333
9.46	3,172	381
9.51	3,172	428
9.56	3,172	476
9.61	3,172	603
9.66	3,172	729
9.71	3,172	856
9.76	3,172	983
9.81	3,172	1,110
9.86	3,172	1,236
9.91	3,172	1,363
9.96	3,172	1,490
10.01	3,172	1,616
10.06	3,172	1,743
10.11	3,172	1,870
10.16	3,172	1,997
10.21	3,172	2,123
10.26	3,172	2,250
10.31	3,172	2,377
10.36	3,172	2,504
10.41	3,172	2,630
10.46	3,172	2,757
10.51	3,172	2,884
10.56	3,172	3,011
10.61	3,172	3,137
10.66	3,172	3,264
10.71	3,172	3,391
10.76	3,172	3,518
10.81	3,172	3,644
10.86	3,172	3,771
10.91	3,172	3,898
10.96	3,172	4,025
11.01	3,172	4,151
11.06	3,172	4,278
11.11	3,172	4,405
11.16	3,172	4,532
11.21	3,172	4,658
11.26	3,172	4,785
11.31	3,172	4,912
11.36	3,172	5,039
11.41	3,172	5,165
11.46	3,172	5,292
11.51	3,172	5,419
11.56	3,172	5,546
11.61	3,172	5,550
11.66	3,172	5,554
11.71	3,172	5,559
11.76	3,172	5,563
11.81	3,172	5,567
11.86	3,172	5,572
11.91	3,172	5,576
11.96	3,172	5,581
12.01	3,172	5,585
12.06	3,172	5,589
12.11	3,172	5,594
12.16	3,172	5,598
12.21	3,172	**5,602**

Section 4.4

Drawdown Time Calculations

DRAWDOWN TIME

Below are the drawdown time calculations for the recharge system proposed on the site. The calculation uses an estimated hydraulic conductivity value "*K*" of 1.02 inches per hour to be conservative. The predominate soil classification found on the site from the NRCS soil data is Urban Land with 0 to 3% slopes. Based on the borings & lab tests, the in-situ soils were found to be sand to sandy loam, likely to infiltrate water, and exhibited a groundwater elevation of 8'. Due to the available NRCS soil data and boring information, an HSG "B" designation was used in stormwater calculations and therefore a K value of 1.02 was utilized.

The formula below is the recommended method of calculating drawdown times from the Massachusetts Stormwater Management Handbook

DRAWDOWN TIME CALCULATION

$$Time_{drawdown} = \frac{Rv}{(K)(Bottom\ Area)}$$

Where:
Rv = Storage Volume
K = Saturated Hydraulic Conductivity, Rawls Rate
Bottom Area = Bottom Area of Recharge Structure

See the following Drawdown Calculation table for infiltration rates, bottom area, and drawdown times.

Drawdown Calculation

Recharge BMP	*Infiltration Rate (in/hr) k*	*Storage Volume (c.f.) Rv*	*Bottom Area (s.f.)*	*Draw Down Time (hrs.)*
UG-1	*1.02*	*3,933*	*2,340*	*19.8*
UG-2	*1.02*	*2,391*	*1,508*	*18.7*
UG-3	*1.02*	*4,278*	*3,172*	*15.9*

Conclusion:

The calculations show that the infiltration BMP draws down in less than 72 hours, as required.

Section 4.5

Illicit Discharge Statement

ILLICIT DISCHARGE COMPLIANCE STATEMENT

Standard 10: Massachusetts Stormwater Standards Handbook

Illicit discharges are defined as discharges into waters of the State or municipal separate stormwater system (MS4) that are not entirely comprised of stormwater. Exclusions for non-stormwater discharges into drainage systems include activities or facilities for firefighting, water line flushing, landscape irrigation, uncontaminated groundwater discharge, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, water used to clean residential buildings without detergents, water used for street washing, and flows from riparian habitats/wetlands. These exclusions are subject to change and are under the discretion of the local governing authority.

To the best of our knowledge and professional belief no illicit discharges to the stormwater system, surface waters, or wetland resource areas will remain on the site after construction. We will agree to implement a pollution prevention plan to prevent illicit discharges into the stormwater management system. The design of the site based on the plans prepared by CHA, 141 Longwater Drive, Suite 104, Norwell, Massachusetts show a separation and no direct connection between the stormwater management systems and the wastewater and/ or groundwater on the site. To the maximum extent practicable, the design prevents entry of illicit discharges into the stormwater management system.

Engineer's Name: Kelly Killeen, P. E
(please print)

Engineer's Signature: ______________ Date: 1.31.20

Company: CHA

Section 5.0

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.

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

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38991
REGISTERED PROFESSIONAL ENGINEER

Kelly Killeen 1.31.20

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:

- [x] No disturbance to any Wetland Resource Areas
- [ ] Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- [x] 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
- [x] Other (describe): Subsurface Drainage Systems

Standard 1: No New Untreated Discharges

- [x] 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 (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 (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 (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

Checklist (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 (continued)

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

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

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

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

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

Standard 9: Operation and Maintenance Plan

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

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

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

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

Standard 10: Prohibition of Illicit Discharges

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

☒ An Illicit Discharge Compliance Statement is attached;

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

Appendix A

Soils

United States Department of Agriculture

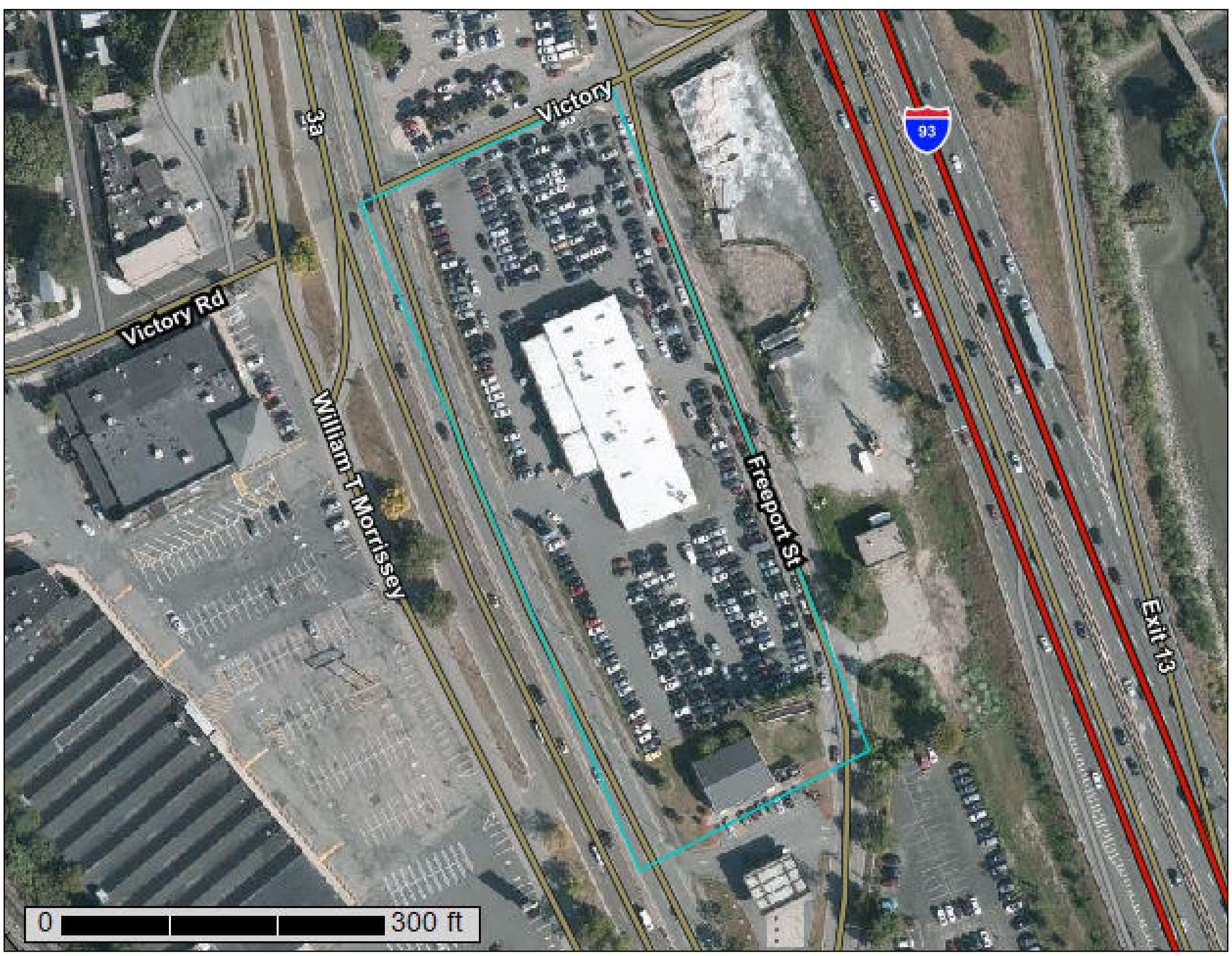
NRCS

Natural Resources Conservation Service

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

Custom Soil Resource Report for

Norfolk and Suffolk Counties, Massachusetts



December 11, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

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

Custom Soil Resource Report
Soil Map (Herb Chambers Honda in Boston)

N

Map Scale: 1:1,290 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 15, 30, 60, 90

Feet: 0, 50, 100, 200, 300

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 15, Sep 12, 2019

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

Date(s) aerial images were photographed: Sep 11, 2019—Oct 5, 2019

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 (Herb Chambers Honda in Boston)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
603	Urban land, wet substratum, 0 to 3 percent slopes	3.8	100.0%
Totals for Area of Interest		**3.8**	**100.0%**

Map Unit Descriptions (Herb Chambers Honda in Boston)

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

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

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

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

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

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

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

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

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

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

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

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

Norfolk and Suffolk Counties, Massachusetts

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

Map Unit Setting

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

Map Unit Composition

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

Description of Urban Land

Setting

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

Minor Components

Udorthents

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

Beaches

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

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REPORT ON

PROPOSED HERB CHAMBERS HONDA
720 MORRISSEY BOULEVARD
DORCHESTER, MASSACHUSETTS

by
Haley & Aldrich, Inc.
Boston, Massachusetts

for
The Herb Chambers Companies
Somerville, Massachusetts

File No. 134133-004
January 2020

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

29 January 2020
File No. 134133-004

The Herb Chambers Companies
259 McGrath Highway
Somerville, Massachusetts 02145

Attention: Mr. John Welch
Director of Construction & Facilities

Subject: Geotechnical Design Investigation and Recommendations
Proposed Herb Chambers Honda, 720 Morrissey Boulevard
Dorchester, Massachusetts

Dear Mr. Welch:

This report presents the results of subsurface investigations and provides geotechnical design and construction recommendations for the proposed Herb Chambers Honda dealership. The work summarized herein was conducted in accordance with our proposal dated 27 November 2019 and your subsequent authorization.

The site is underlain by thick undocumented Fill and compressible Organic Deposits, and building loads are recommended to be transmitted through these materials to underlying suitable bearing soils. The subsurface conditions are favorable for the proposed building to be supported on pressure injected footings (PIFs) bearing in naturally deposited, inorganic, granular soils. Suitable bearing soils were encountered at depths between 17 and 43 ft below existing site grades within the proposed building footprint. The lowest level floor should be constructed as a structural slab supported by the PIFs.

Thank you for the opportunity to continue to serve The Herb Chambers Companies during the design phase of this project. We look forward to assisting you in achieving an efficient and successful construction.

Sincerely yours,
HALEY & ALDRICH, INC.

Lucas P. Townsend, E.I.T.
Engineer

Brett R. Grunert, P.E. (MA)
Project Manager

Joel S. Mooney, P.E. (MA), LSP
Principal | Senior Vice President

Enclosures

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SIGNATURE PAGE FOR

REPORT ON
PROPOSED HERB CHAMBERS HONDA
720 MORRISSEY BOULEVARD
DORCHESTER, MASSACHUSETTS

PREPARED FOR
THE HERB CHAMBERS COMPANIES
SOMERVILLE, MASSACHUSETTS

PREPARED BY:

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1. Introduction

This report describes site and subsurface conditions and provides geotechnical design and construction recommendations for the proposed Honda dealership redevelopment project located at 720 Morrissey Boulevard, Dorchester, Massachusetts (MA). The general site location is shown on Figure 1, Project Locus.

1.1 PURPOSE AND SCOPE

The investigation reported herein was undertaken to obtain information on site subsurface soil conditions and groundwater levels, develop geotechnical design and construction recommendations for the proposed building, and to assist design of a planned stormwater management system(s). The scope of the investigation included the following activities:

- collect and review readily-available information on subsurface soil conditions and groundwater levels in the site vicinity, from Haley & Aldrich, Inc. (Haley & Aldrich) files, reports provided to Haley & Aldrich, and published geologic maps;
- plan and implement geotechnical subsurface exploration programs;
- perform laboratory grain-size analyses on selected soil samples recovered from explorations;
- support the stormwater infiltration design by the site Civil Engineer (CHA);
- perform geotechnical engineering evaluations, and develop geotechnical engineering recommendations; and,
- prepare this geotechnical engineering report.

1.2 ELEVATION AND DATUM

Elevations reported herein are in feet and reference Boston City Base datum (BCB).

1.3 EXISTING SITE CONDITIONS

The proposed development is located at 720 Morrissey Boulevard, Dorchester, Massachusetts. A single-story building with an approximate footprint of 28,400 square feet (sf), which is the site current Herb Chambers Honda dealership and formerly a J.D. Byrider dealership, is located in the approximate center of the site. We understand that the existing building has no below grade space. The type of foundation system of the building is unknown. The remaining portion of the site is an asphalt parking lot with top of pavement ranging from approximately El. 15 to El. 17.

According to EBI Consulting's Phase 1 Environmental Site Assessment dated August 2018, a portion of the Tenean Creek, a tributary to the Neponset River, historically ran through the southern portion of the site. The site was filled during the late 1950s and remained undeveloped until the existing automotive dealership and parking lot were built in 1967.

An approximately 12 ft by 12 ft sewer outfall conduit is present near the southern boundary of the site. Based on the plan entitled "12'x12' Culvert_E-2539C.pdf" provided to Haley & Aldrich on 9 December

HALEY ALDRICH

2019, we understand the conduit is supported by bents spaced 4 ft center to center, with 5 piles supporting each bent. The average pile is length is 31 ft.

The existing building is serviced from its eastern side by two water lines that tie in into Boston Water & Sewer Commission (BWSC) main in Freeport Street and a sewer line that ties into the BWSC main in Victory Road. The eastern side of the existing building also has an underground gas service, electric line, and two overhead utility lines that all are serviced from Freeport Street. The parking lot storm drain and building's roof drain tie into a drain line that surrounds the building. Multiple storm drain catch basins are present in the parking lot.

1.4 PROPOSED CONSTRUCTION

Our current understanding of the project is based on the Project Notification Form (PNF) for the project dated 24 September 2019 and discussions with project design team members. Herb Chambers Companies is planning to demolish the existing automobile dealership at 710 - 720 Morrissey Blvd and construct a new, four-story Honda dealership with a footprint of approximately 28,400 square feet. No below-grade space is planned. The new building will be positioned in the southern portion of the site, overlapping approximately half of the existing building's area, as shown in Figure 2. Future site grades may be raised on the order of one foot. Existing signs will be maintained such that new sign foundations are not required. A new stormwater management system will be installed below future pavement on the north portion of the site, and new utilites will generally be installed to the east, west, and north of the proposed building.

The proposed building ground floor will be finished at approximately El. 16.67 BCB. Based on 8 January 2020 correspondence with Flood Consulting (project structural engineer), column loads are anticipated to be on the order of 500 to 600 kips, while perimeter wall loads are anticipated to be around 1 kip per linear foot (klf).

2. Subsurface Exploration and Laboratory Testing

2.1 TEST BORINGS

Fifteen test borings (B-1 through B-16, omitting B-13) were conducted to depths of 31 to 66 ft by Haley & Aldrich at accessible site locations between 18 December 2019 and 8 January 2020. Standard Penetration Tests (ASTM D-1568) were typically performed continuously from ground surface until naturally deposited organic soils were encountered, and at 5-ft depth intervals thereafter.

Groundwater observation wells were installed in two of the completed boreholes (B-10 and B-14).

As-drilled locations and ground surface elevations at the test borings were taped or estimated by Haley & Aldrich relative to site features and topographic information shown on Figure 2. Test boring logs and observation well installation records are provided in Appendix A.

2.2 GEOTECHNICAL LABORATORY TESTING

Laboratory grain-size testing was conducted on soils samples obtained from the test borings to aid in soil classification, evaluate engineering properties, and assist stormwater design for the project. Results of the tests, conducted in general accordance with ASTM D6913 and/or ASTM D7928, are provided in Appendix B.

In general accordance with procedures in the Massachusetts Department of Environmental Protection Stormwater Handbook, the results of the laboratory testing were also plotted on a soil texture triangle to aid classification for estimating soil water infiltration rates, as shown on Figure 3.

3. Subsurface Conditions

3.1 SOIL CONDITIONS

The test borings conducted by Haley & Aldrich encountered undocumented Fill ranging in thickness from 8 ft to 19 ft overlying Organic Deposits with a thickness of up to 31.8 ft. A layer of inorganic Alluvial Deposits was encountered within the Organic Deposits in B-7 and may be present at other boring locations. Marine Deposits, with a thickness of up to 20 ft, were typically encountered below the Organic Deposits. The Marine Deposits were highly variable in composition and stiffness/density, ranging from a very soft to stiff lean Clay to a very loose to medium dense Sand. Naturally deposited Glaciofluvial Deposits consisting of Glaciofluvial Sand with gravel and silty Sand underlie Marine and/or Organic Deposits.

The Fill and Organic soils are considered unsuitable for building foundation and slab support. The naturally-deposited Marine Deposits are the uppermost suitable foundation bearing strata. The approximate elevations and depths to the top of each strata, and their thicknesses are summarized in Table 1. Refer to the boring logs in Appendix A for additional information on the soil classifications.

3.2 GROUNDWATER

Measured depths to water in the wells installed by Haley & Aldrich located in the north portion of the site ranged from 7.7 to 8.9 ft below ground surface, corresponding to about El. 7.1 to El. 7.3.

Water was observed in the boreholes during drilling at depths ranging from 7.0 to 12.1 ft below ground surface, which likely did not represent stabilized groundwater levels due to the methods of drilling and the limited time available for water level stabilization.

Groundwater levels should be anticipated to fluctuate with season, precipitation, leakage into or out of utilities, and nearby construction activity. Accordingly, water levels during construction could differ from those reported herein.

4. Geotechnical Design Recommendations

4.1 GENERAL

This section provides geotechnical design recommendations for the proposed development, based on the available subsurface information and the proposed building configuration. In general, building foundations should be designed and constructed in accordance with the current Massachusetts State Building Code and applicable requirements of the American Concrete Institute (ACI). The recommendations provided herein are intended to be consistent with the 9th Edition of the Building Code (the "Code"), as amended.

4.2 BUILDING FOUNDATIONS

Pavements, landscape materials, undocumented Fill, Organic Deposits, and loose and/or compressible inorganic soils are not suitable foundation bearing materials. Building loads are recommended to be transmitted through these materials to underlying suitable bearing soils, or these materials must be modified to provide adequate support and desired performance of the planned development. Selection of the appropriate building foundation system should consider foundation performance requirements, structure loads, subsurface soil and groundwater conditions, constructability issues, and adjacent structures.

Based on the above considerations, a number of foundation types were evaluated and considered for use. Ultimately, we recommend that the proposed building columns, walls and other load-bearing elements be supported on Pressure Injected Footings (PIFs), also referred to as Enlarged Based Piles in the Code. Alternative foundation types which could be considered include prestressed precast concrete piles, drilled micropiles, or other proprietary pile foundations.

PIFs should be designed in accordance with the following recommendations:

- Design compression PIFs (cased shaft type) for a 50-ton allowable (55-ton ultimate to include a 5-ton allowance for downdrag) capacity in compression. Compression PIFs should be constructed with a permanent steel casing (18-gauge minimum shell) from pile cut-off to the PIF base.
- Design tension and lateral PIFs (uncased compacted zero-slump concrete type or uncased high-slump concrete type) for a 50-ton allowable (55-ton ultimate to include a 5-ton allowance for downdrag) capacity in compression. Those PIFs that will be loaded in tension should be designed and installed to provide a tension capacity of 10 tons allowable (30-tons ultimate). Those PIFs that will be loaded laterally should be designed and installed to provide a lateral capacity of 5 tons at a maximum displacement of 0.75 in. (single PIF).
- PIF shafts should be 14-in. minimum diameter.
- The minimum center-to-center spacing of PIFs should be 42 in.
- PIFs should be designed to base out in suitable Marine Sands or the underlying Glacial Deposits, anticipated to typically be present at a depth of about 35 ft below ground surface or approximately El. -20. We note that the Marine Sands are typically overlain by Marine Clay and/or Silt, and the Contractor's attention is directed to the boring logs for additional

information. The specialty PIF contractor should review the subsurface information during preparation of its PIF submittals, and recommend base out elevations due to its interpretation of subsurface conditions for review by the Owner's Geotechnical Engineer. Other base out elevations (shallower or deeper) proposed by the specialty PIF contractor and accepted by the Geotechnical Engineer may be possible or required based on actual subsurface conditions observed during pre-drilling/pre-excavation at PIF caps, and drive tube resistance during driving.

- Install PIFs using a 21-in. diameter drive tube and a hammer imparting a minimum of 140 ft-kips of energy per blow unless otherwise proposed by the contractor and accepted by the Geotechnical Engineer. The blow count criteria following expulsion of the zero slump concrete (for each 5 cubic foot concrete batch volume) shall be as follows: 56 for Batch 1; 42 for Batch 2; 35 for Batch 3; and 30 for Batch 4 and beyond.
- Concrete mixes to construct PIF bases and shafts should be 4,500 psi (minimum) 28-day compressive strength concrete, and should conform to the requirements of the Building Code and ASTM C94-69. Concrete for PIF bases should be zero slump. Concrete for compression (cased) PIF shafts should have a slump between 4 and 7 in. Concrete for tension and lateral (uncased) PIF shafts should have either: zero slump for uncased compacted zero-slump concrete type PIFs; or 8 to 10 in. slump for uncased high-slump concrete type PIFs.
- PIFs should be reinforced for seismic, tension, and lateral loading in accordance with the Building Code. PIFs designed to resist tension and/or lateral loading should be sufficiently reinforced to maintain a connection between the shaft and base with an appropriate factor of safety.
- For PIFs subject to compression only: To prevent intrusion of soil and water into the PIF during concreting, we recommend PIF shafts be constructed with a permanent casing, consisting of corrugated metal pipe. The permanent metal casing should be fastened to the PIF base in such a manner that the two will not separate.
- We anticipate up to 1-in. total settlement for columns and walls supported on PIFs designed and constructed in accordance with the recommendations herein.
- The PIF design should be developed (to the extent possible) to allow for capacity modifications during PIF installation in the event that a PIF is not able to be installed at the design location or a reduced capacity PIF is required based on installation records.
- Prior to production PIF installation, a minimum of 10 indicator PIFs should be installed at production PIF locations proposed by the specialty PIF contractor and accepted by the Geotechnical Engineer to evaluate anticipated PIF lengths across the site and for selection of PIFs for static load testing. Indicator and production PIF installation and static load testing, if required by the Owner or building official, shall be observed in the field by the Geotechnical Engineer.
- If required, one successful static pile load test should be conducted at an indicator PIF location identified by the Geotechnical Engineer following completion of indicator PIF installation, and prior to production PIF installation. Load testing shall be conducted in general accordance with ASTM D1143 "Standard Test Method for Deep Foundations Under Static Axial Compressive Load", the Building Code, and the requirements of the Geotechnical Engineer (the more stringent shall apply).
- For frost protection, pile caps and grade beams should bear a minimum of 4 ft below the lowest adjacent ground surface exposed to freezing.

- In the event that an early site pre-clearing package is not conducted by the Demolition Contractor or General Contractor, the contractor is recommended to pre-clear obstructions in accordance with project specifications prior to PIF installation.
- A specialty PIF contractor retained by the General Contractor will be required to prepare PIF final design, installation, and load testing submittals (stamped by a MA Professional Engineer) for review and acceptance by the Geotechnical Engineer prior to PIF installation and load testing. Submittals will include (but not be limited to) installation means and methods, proposed final driving criteria, steel reinforcing requirements in the shaft and expanded base, and methods for static load testing.

4.3 LOWEST LEVEL FLOOR

The lowest level floor should be designed as a reinforced concrete structural slab supported on grade beams and pile caps supported by PIFs. Consideration should be given to the use of intermediate PIFs between column and wall caps to optimize slab design. The slab should be constructed on a 6-in. minimum thickness base course layer of free-draining Compacted Granular Fill placed over a stable, suitably proof-compacted subgrade consisting of existing site Fill soils. This base course layer will provide a capillary break from the underlying soils and serve as a working surface during subslab utility installation and slab construction.

As the finish floor slab elevation will be at or above the design groundwater level, permanent underslab or foundation drainage is not considered necessary. Waterproofing of the ground floor slab is also not considered necessary. However, we recommend a vapor barrier be installed beneath the new ground floor slabs for protection from potential subslab moisture as a prudent measure. We assume the type of vapor barrier, thickness, and other installation details will be provided by others on the design team.

From a geotechnical perspective, we recommend that a vapor retarder (e.g., minimum 10 mil HDPE) be provided below the slab-on-grade in occupied or conditioned spaces, to aid building humidity control, avoid potential problems if vapor-tight floor coverings are used, and avoid potential condensation on the floor surfaces. Detailed recommendations for vapor retarder design and installation are described in ACI 302.2R-06 "Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials". The slab concrete design and construction procedures should consider the impacts of the presence of a vapor retarder/barrier.

4.4 FLOOD POTENTIAL AND DESIGN GROUNDWATER LEVELS

Based on recent water level measurements in site observation wells, typical groundwater levels are anticipated to fluctuate between approximately El. 7 and El. 7.5 with occasional peaks above this range likely during storm events (i.e., non-flood events). It is our understanding that the FEMA flood elevation for this area is currently El. 16.5, which is above most of the existing site grades. Accordingly, we recommend a maximum groundwater level at El. 16.5 be assumed for design.

4.5 GROUNDWATER CONTROL, WATERPROOFING, AND DAMP-PROOFING

Given that the finished floor is located above the normal groundwater level and FEMA flood elevation, consideration could be given to the use of an underslab drain system as a conservative measure to manage and maintain these short duration high groundwater levels below the slab. The drainage system would consist of the following:

- A 12-in. minimum thickness drainage fill layer consisting of washed 3/4-in. crushed stone placed immediately beneath the slab.
- A network of 6-in. diameter perforated PVC or perforated corrugated polyethylene drain pipes positioned mid-height within the drainage fill layer leading to one or more collection/sump locations. Pipes should be positioned immediately adjacent to (inside of) the perimeter wall as well as in a grid pattern below the entire slab. The underslab drain pipes should be configured to provide redundant gravity flow paths to the ejection point(s) from all points within the system drainage piping.
- A layer of 6-oz per sq yd non-woven geotextile, placed directly beneath the crushed stone.
- One or more mechanical sump(s) to collect and eject the water collected by the drainage system, provided with emergency back-up power and redundant pumps. We recommend that the sump pit(s) and pumps be designed to accommodate a typical flow rate of 0 to 15 gallons per minute (gpm) and a peak flow rate of 50 gpm. We recommend that the sump pit(s) be located along the foundation walls closest to the stormwater infiltration systems.
- Effluent from the underslab drainage system should be pumped to the site storm water infiltration system. The system should be designed to assure reliable building drainage system operation, even if the municipal or site storm drainage systems are surcharged, and should include backflow preventers on the discharge pipes connecting the sump pits to the storm drain system.

The use of this underdrain system will not protect the lowest level floor from flooding during flood events. If the underdrain is not provided, consideration could be given to providing weep holes through the slab to preclude the buildup of hydrostatic pressures under the slab.

Surface runoff should be directed away from the building. In general, the ground surface within 8 ft immediately around the building should be sloped downward away from the structure to divert surface runoff in accordance with the Code. Stormwater runoff from roof drains should be directed in such a manner as to not surcharge the underslab drainage system. In general, the underslab drainage system should be isolated from the site stormwater management system to avoid compromising the underslab system during normal storm events (e.g.; there should not be a direct connection of the stormwater infiltration system to the crushed stone layer for the underslab drain system).

Waterproofing and joint waterstops should be applied to the foundation walls up to the higher of ground surface or El. 16.5.

Waterproofing of the ground floor slabs is not considered necessary, however, below-slab pits (e.g.; elevator pits) should be waterproofed and designed to resist hydrostatic uplift equivalent to the elevation of the adjacent floor level.

Other details of the subsurface drain systems should be established during final design, coordinating with foundation and underslab utility configurations, site stormwater infiltration design, and other aspects of the project design.

We note that the recommendations provided herein for subsurface drainage are not intended to be "fully" protective of the lowest building floor and other site improvements should the site or immediately surrounding area experience surficial flooding or water levels above about El. 15.

We recommend that the final design and configuration of the geotechnical aspects of the systems described above be reviewed by Haley & Aldrich prior to implementation.

4.6 SEISMIC DESIGN

Based on the test boring data, and in accordance with the criteria in the Code (Article 1806.4), the site soils are not considered susceptible to liquefaction. Applicable seismic design criteria, in accordance with the Code (Article 1604), are as follows:

- Seismic Site Class = E
- S_S = 0.29
- S_1 = 0.068
- F_a = 2.5
- F_v = 3.5

4.7 LATERAL EARTH PRESSURES ON BELOW-GRADE FOUNDATION WALLS

Building foundation walls serving as retaining walls should be designed in accordance with the lateral pressures listed below for the permanent condition. These recommendations assume that the ground surface behind the wall is inclined no steeper than 4H:1V. The height of the wall (H) is defined as the height of the retained earth behind the wall. However, elevator pits and other slab depressions in the building should be waterproofed and designed (as applicable) for hydrostatic pressures under the design flood level.

For seismic loading conditions, walls should be designed to resist static plus seismic earth pressures. Surcharge loading does not need to be considered for seismic design unless the surcharge will be applied over an extended time.

- <u>Static Earth</u>: Calculate pressures using an equivalent fluid unit weight equal to 95 pounds per cubic foot (pcf) per foot for restrained walls (braced at the top and bottom), and 85 pcf for unrestrained walls (unbraced at the top).
- <u>Seismic Earth</u>: Calculate in accordance with the Code (Article 1610.2) using a total soil unit weight (γt) of 125 pcf.
- <u>Surcharge:</u> Uniform pressure applied from the elevation of the surcharge to the bottom of the foundation element with a magnitude of 0.5q where q is the vertical surcharge load, uniformly distributed over the height of the wall for restrained and unrestrained walls, respectively.

Foundation walls designed as retaining walls should be designed for a factor of safety of 1.5 against sliding and overturning under static loading conditions and 1.2 under seismic loading conditions. Passive soil pressure should not be included as a resisting force.

4.8 LATERAL LOAD RESISTANCE

Lateral loads on the structure can be resisted at the foundation level by passive soil pressures on the sides of pile caps and grade beams. The following recommendation considers the lateral load resistance due to passive soil pressure. The net (passive minus active) resistance provided by the fill surrounding the pile caps and grade beams can be estimated using an equivalent fluid weight of 150 pcf. This value assumes that granular backfill is systematically compacted in lifts within 5 ft laterally all-around the below grade element. The top of the assumed passive zone should be 6-in. below the top of the adjacent backfill or soil surface.

If the horizontal distance between nearby caps or between grade beams is less than twice the height of subject structural element, the passive pressure should be discounted proportionately to the distance (full pressure at twice the height away) to accommodate interaction of the elements.

4.9 OTHER SITE DEVELOPMENT CONSIDERATIONS

4.9.1 Utilities and Site Facilities

Due to the limited (less than one foot) change, subslab utilities may be soil-supported (with suitable bedding) bearing on existing inorganic Fill soils that are stable under proof-compaction or on Compacted Granular Fill placed following the removal of exposed unsuitable bearing materials, as applicable. If encountered, remnants of former buildings, debris, and other obstructions should be removed to at least 24-in. below utility invert elevations to limit “hard” spots and potential cracking of utilities. Utilities that penetrate through garage foundation walls should pass through over-sized holes or box-outs in the foundation wall.

Due to the thicknesses of undocumented Fill and Organic Deposits, differential settlement could occur between soil-supported utilities and the PIF-supported building, between utilities in areas where Fill soils are densified and adjacent “unimproved” ground, or at the points where they connect or transition. Utilities should be designed to accommodate differential settlements under such conditions. In particular, utilities that penetrate through foundation walls should pass through over-sized holes or box-outs. Provisions should be made so that utility connections to buildings are flexible and can accommodate potential differential settlement between the “rigid” structure and the soil-supported utility.

In certain applications, it may be technically feasible and cost-effective to mitigate potential future settlement of utilities by placing lightweight fill (LWF) in lieu of earthen backfill. An example of LWF is rotary kiln dried expanded shale aggregate manufactured by Norlite Corporation, Cohoes, NY, 3/8-in. aggregate size, having an in-place compacted dry unit weight between 45 pcf and 60 pcf. Use of LWF should be evaluated on a case-by-case basis, as it is typically much more expensive than soil or rock fill.

We recommend that potential differential settlement of utilities and its mitigation be on a case-by-case basis based on site location, final site grading and utility design, and planned mitigation and construction sequencing. Similarly, support requirements for large transformers, tanks, and similar heavy or settlement-sensitive structures should be reviewed on a case-by-case basis.

4.9.2 Building Egress Transitions

Due to the potential for differential settlements between the site and the PIF-supported buildings we recommend that slabs/sidewalks at building egress points and other settlement-sensitive locations be designed as reinforced concrete structural “approach” slabs having one end supported on the structure (e.g.; shelf cast into foundation wall) and the other end supported on the ground at a sufficient distance from the structure to provide a suitable transition (providing suitable slope, compliant with ADA requirements, etc.). The support point at the building should allow for rotation, but not translation, of the slab.

4.9.3 Stormwater Infiltration Systems

To assist stormwater design for the project, laboratory grain-size analyses were performed on soil samples obtained at elevation intervals intended to correspond with the bottom of proposed stormwater management systems. In accordance with procedures in the Massachusetts Department of Environmental Protection Stormwater Handbook, the laboratory results were plotted on a soil texture triangle to aid classification for correlation to water infiltration rates (see attached Figure 3). In accordance with U.S. Department of Agriculture (USDA) soil physical analyses, the soil fractions are classified as sand to sandy loam.

The presence of soil redoximorphic features or other indicators of seasonal high water were generally not detected in examinations of the test boring soil samples. Based on documented depths to groundwater in on-site observation wells, and our observations and experience, we recommend a seasonal high-water level of El. 8.0 be used for design of the proposed stormwater management system(s). These features should be expected to be inundated during a flood event.

From a support perspective, the infiltration systems may be soil-supported in the existing Fill. Any weak or unstable soils, if present at the excavation subgrade level, should be over excavated at least 12-in. below the design subgrade level and replaced with ¾ -in. crushed stone or compacted Granular Fill.

5. Construction Considerations

5.1 GENERAL

This section of the report includes comments on items related to excavation, dewatering, lateral support, foundation construction, earthwork, and related geotechnical engineering aspects of the proposed construction. This section is written primarily for engineers responsible for preparation of plans and specifications. Since this section identifies potential construction problems related to foundations and earthwork, it will also aid personnel who monitor the construction activity.

Prospective contractors for the project must evaluate potential construction issues on the basis of their own knowledge and experience and taking into account their own proposed construction methods and procedures.

In addition to the construction guidelines and recommendations made herein, construction activities should conform to the requirements of OSHA and applicable local, State, and Federal regulatory agencies.

5.2 EARTHWORK

Excavations to construct pile caps and for removal of existing building foundations will be required and are anticipated mostly in the near surface Fill and Organic Deposits. Significant excavation of Fill soils in the existing building area may be required to clear obstructions ahead of PIF installation. Some oversized materials and obstructions should be anticipated to be encountered in the Fill. It appears feasible to use conventional construction equipment for general excavation and for removal of existing building foundations. Segregation of excavated Fill will be necessary to enable on-site reuse of existing soils considered suitable as an alternative to Compacted Granular Fill.

Support and protection of existing of utilities, existing to remain in service or proposed, should be reviewed by the earthwork contractor based on its specific excavation plan and the general contractor/ construction manager relative to its construction staging and traffic control plan. The contractor may elect to install temporary excavation support systems, use trench boxes, or take other measures to provide access and protection of nearby facilities.

5.3 PROPERTY LINE CONSTRUCTION AND EXISTING FOUNDATIONS

Existing building foundations and other below-grade structures and utilities will need to be removed (in their entirety or partially) when in direct conflict with new foundations or other construction.

Obstructions to PIF design locations, such as from the foundations of former structures or the existing building, may require removal. If difficult driving is encountered as a result of obstructions buried in the Fill and Organic Deposits, local excavations (up to depths of about 10 to 15 ft) to identify and remove the obstructions may be required; alternatively, it may be possible to reconfigure/relocate the PIF. Pre-drilling is not anticipated to be needed.

In general, where encountered and determined in conflict with new foundations (e.g.; pile caps, grade beams, and floor slabs), existing foundations and other structures should be removed to no less than 2 ft below the bottoms of new pile caps, grade beams, and underside of new slabs. Removal at other locations should be decided on a case-by-case basis.

5.4 PIF INSTALLATION

The schedule and sequence of PIF installation should be established in a manner that can accommodate adjustments that maybe necessary during PIF installation such as PIF relocation or additional PIFs should the contractor's installation not achieve the specified capacity. Additionally, PIF installations should be sequenced to start with those PIFs furthest from vibration and/or settlement sensitive structures to enable observation of such structures as PIF installations advance closer.

PIF installations will cause noise and vibrations that disturb people, computers, and other sensitive receptors and may become a nuisance to the adjacent businesses. It is recommended that neighboring businesses be informed of the PIF installation schedule prior to construction. Mitigation measures (e.g.; designated hours for PIF driving activities, relocations, vibration isolation tables), if any, should be planned prior to construction to reduce possible delays during construction.

Installation of PIFs will cause vibrations that can impact freshly placed concrete. It is recommended that vibration monitoring be conducted during construction to develop a correlation between vibrations and distance. Initially (until that correlation is formed) it is recommended that PIF vibration generating activities (e.g.; PIF driving) should not be conducted within 100 ft of fresh concrete (for PIF shafts or pile caps) that is less than 24 hours old. In addition, PIF vibration generating activities shall not be conducted within 50 ft of fresh concrete that is less than 48 hours old.

Concrete for cased shaft PIFs should not be placed until all PIFs within a radius of 20 ft have been accepted by the Geotechnical Engineer and should only be placed in shafts that are free of water and solid matter. PIFs located less than 9 ft from a completed uncased high-slump shaft should not be installed until at least 12 hours after shaft pour.

5.5 EFFECTS ON SURROUNDING BUILDINGS AND ENVIRONMENTAL CONSIDERATIONS

The construction activities include traffic, staging work, and operation of heavy equipment. Typically, construction activities generate noise, dust, vibrations, and odors.

Installation of PIFs for the building foundations generate vibrations that will be noticed 100 ft or greater from the source. We recommend that a monitoring program should be performed prior to and during construction on utilities and structures of concern. Performance criteria should be incorporated into the Contract Documents, and monitoring should be undertaken during construction to document conformance with the criteria and off-site impacts. The Contractor should coordinate with the Owner's Representative to allow access to monitoring points and instrumentation devices and to establish power for the vibration monitoring devices.

It is recommended that the program include:

- Pre-construction condition surveys (video/photo documentation) of utilities and structures of concern, streets, and sidewalks adjacent to the Site;
- Vibration monitoring (with engineering seismographs) at the Site perimeter; and

- Survey reference points to measure vertical movements of adjacent utilities, structures, and streets within 100 ft of planned PIF installation.

5.6 TEMPORARY CONSTRUCTION DEWATERING

Final excavation, subgrade preparation, filling, foundation construction, and utility construction should be conducted "in the dry". Much of the earthwork and excavations for the project are anticipated to be above the groundwater level. As such, temporary construction dewatering activities in these shallow local excavation areas are anticipated to be minor, and largely related to control of precipitation that falls on excavations and surface water runoff into excavations. We anticipate that dewatering in these areas can be accomplished by open pumping from sumps, temporary ditches, and trenches within and around excavations. Dewatering should be performed in a manner that avoids pumping of fine-grained soils.

Dewatering effluent must be discharged in accordance with all regulatory requirements. We anticipate that most or all dewatering effluent can likely be recharged into the ground on-site, which could be a more economical approach than off-site discharge.

If on-site recharge is not logistically feasible, or not desirable for environmental reasons, the project will need to obtain a temporary construction dewatering permit to facilitate discharge of effluent to an approved municipal system and/or water body. Effluent discharged directly to municipal systems is subject to regulatory requirements including discharge permitting. Typically, sedimentation and pH control will be required prior to off-site discharge of construction dewatering effluent in addition to possible treatment for other constituents if indicated by groundwater quality test data.

5.7 PREPARATION AND PROTECTION OF BEARING SURFACES

5.7.1 Pile Caps, Grade Beams, and Slabs

Excavation for Pile caps, grade beams, and slabs should be conducted in a manner that minimizes disturbance to the subgrade surfaces. Final excavations should be made with equipment having a smooth-edged bucket. Subgrades should be observed in the field by a representative of the Owner's Geotechnical Engineer to confirm their suitability prior to placement of reinforcement or concrete.

Subgrades in the materials anticipated will readily soften and be susceptible to disturbance from construction activities, particularly during cold and wet weather. To avoid this disturbance, the contractor should form and pour concrete as soon as practical after excavation.

Subgrades should be proof-compacted with a minimum of six passes of suitably sized vibratory compaction equipment until observed to be firm and stable by a representative of the Owner's Geotechnical Engineer. Compaction should be discontinued if disturbance occurs due to the presence of water as evidenced by subgrade weaving or "pumping" of water up through the subgrade soil, and judgments about further subgrade preparation should be made by the Geotechnical Engineer on a case-by-case basis.

Care should be taken to prevent surface water from accumulating on exposed subgrades. Worker and equipment traffic over subgrades should be minimized. Subgrades below completed pile caps and grade beams must be protected against freezing, before and after foundation construction.

5.7.2 Pavements

Pavement sections will largely be constructed over new fills placed as part of the site grade raise. These new fills will be placed over existing Fill soils. In these areas, the existing Fill should be proof compacted with at least six passes of a heavy drum vibratory roller (25,000 lbs dynamic force) prior to placement of fill. Common Fill or Compacted Granular Fill should then be placed and compacted in lifts to reach the proposed pavement subbase subgrade. This subgrade should then be proof-rolled with at least six passes of a fully loaded 10-wheel dump truck under the observation of a representative of the Owner's Geotechnical Engineer.

In areas where cuts are required to reach the subbase subgrade, the exposed subgrade should be proof-compacted with at least six passes of a heavy drum vibratory roller (25,000 lbs dynamic force) followed by at least six passes of a fully loaded 10-wheel dump truck under the observation of a representative of the Owner's Geotechnical Engineer.

Soft or weaving areas observed during proof-compaction and/or proof-rolling should be excavated to firm material or to a maximum depth of 18-in. below the pavement subbase subgrade and replaced with compacted lifts of Common Fill. If encountered, obstructions (e.g.; former building foundations, debris, cobbles, boulders) should be removed to at least 2 ft below pavement subbase elevations to limit "hard" spots and potential reflective cracking in the finished pavement surface.

5.7.3 Utilities

Existing Fill soils will be encountered at utility subgrade elevations. Utility trench subgrades should be proof-compacted with at least four coverages of hand-guided vibratory compaction equipment delivering a minimum 5,000 ft-lb dynamic force. Soft or weaving material observed during proof-compaction should be removed and replaced with Compacted Granular Fill or approved Common Fill. Utilities may be soil-supported with bedding materials as recommended by pipe manufacturers or regulatory agencies having jurisdiction over such installations. Crushed Stone should be separated from surrounding soils with Filter Fabric.

If encountered, obstructions (e.g.; former building foundations, debris, cobbles, boulders) should be removed to at least 2 ft below utility inverts to limit "hard" spots and potential misalignment or cracking of utilities.

5.8 FILLING AND BACKFILLING

For reinforced concrete structural slabs supported on the PIF foundations, fill or backfill should consist of a minimum 6-in thickness of Granular Fill or Common Fill that creates a subgrade suitable for placement of the structural slab. Within the zone of influence for pile caps and grade beams, excavations should be backfilled with compacted Granular Fill.

On-site materials meeting geotechnical and environmental requirements (determined by others) should be re-used for backfilling to the extent possible. The Contractor should be aware that the on-site soils may be very difficult to work with, particularly in periods of precipitation and in cold weather. Care should be taken to protect materials stockpiled for on-site reuse from moisture and other adverse conditions. Existing Fill may also have an intermittent, high percentage of debris and/or organic soils. Organic Soils and debris should not be used as backfill material.

Compacted fills should be placed in lift thicknesses not exceeding 12-in. in loose measure when compacted using self-propelled vibratory rollers imparting a dynamic force of at least 25,000 lbs. In confined areas, hand-guided equipment such as a large vibratory plate compactor imparting a dynamic force of at least 5,000 lbs should be used and the loose lift thickness should not exceed 6 in. A minimum of four systematic passes of the compaction equipment should be used to compact each lift. Cobbles or boulders having a size exceeding 2/3 of the loose lift thickness should be removed prior to compaction.

Moisture conditioning (i.e.; drying, watering, mixing, etc.) may be necessary to achieve proper compaction. Recommended compaction requirements are as follows:

Location	Minimum Compaction Requirements
Around pile caps, under slabs, against grade beams, and below grade walls	95%
Below pile-supported slabs and pile caps	92% or as necessary for a stable subgrade
Sidewalks, pavements	92% up to 3 ft below finished grade 95% in the upper 3 ft
Landscaped areas	Per the Landscape Architect

Minimum compaction requirements refer to percentages of the maximum dry density determined in accordance with ASTM D1557.

5.9 BACKFILL MATERIALS

5.9.1 Compacted Granular Fill

Compacted Granular Fill should consist of uncontaminated natural bank-run or processed sand and gravel, free of organic material, snow, ice, debris, recycled materials or other unsuitable materials and should be well-graded within the following limits:

U.S. Standard Sieve Size	Percent Finer by Weight
6 in. (1)	100
No. 4	30-80
No. 40	10-50
No. 200	0-8

(1) Maximum 3-in. size for fill placed within 6 in. of concrete slabs or pile caps, and within 3 ft of foundation walls.

5.9.2 Common Fill

Common Fill should consist of uncontaminated mineral sandy or gravelly soil, predominantly free from clay, organic matter, plastic, metal, wood, ice, snow, debris, or other deleterious material and should have the characteristic that it can be readily placed and compacted. Common Fill imported to the site should have a maximum of 80 percent passing the No. 4 sieve and a maximum of 30 percent finer than the No. 200 sieve. The maximum particle size should be the smaller of 2/3 the lift thickness or 6 in. Silty Common Fill soils will require moisture control during placement and compaction.

5.9.3 Reuse of Excavated Materials

Excavated materials will predominantly consist of existing site Fill containing variable amounts of concrete, brick, wood, glass, coal/slag/cinders fragments/particles, and organic matter. We anticipate that the majority of the Fill would be suitable for reuse as Common Fill from a geotechnical standpoint.

Given the sometimes-elevated silt content, Fill can be difficult to impossible to compact when wet. Careful moisture control will be required to achieve satisfactory compaction, and wet materials will need to be dried prior to placement and compaction, which can result in delays particularly during relatively cold or wet weather. Silty site soils may not be able to be compacted properly during cold or wet weather. Screening and removal of oversized materials and deleterious debris (i.e.; foundations, metal, organics, refuse, etc.) will be necessary as well. Rainfall or melting snow can readily saturate stockpiled silty soils. Providing drainage from or covering a stockpile can help limit this potential problem. These silty soils will require considerable drying time if left in an unprotected stockpile.

Final determination of suitability for reuse of on-site materials will be made when the materials are exposed during excavation. Reuse of on-site materials within the building or below pavements should be observed and documented in the field by the Geotechnical Engineer's representative.

5.10 TEMPORARY CONSTRUCTION SLOPES

Where space permits, temporary cut slopes up to about 10 ft high (and above groundwater) in the Fill soils should be stable if excavated no steeper than about 1.5H:1V; and protected from erosion due to surface water runoff, precipitation, seepage breakout, and freeze/ thaw. Some sloughing, raveling and wash-out should be anticipated in temporary earth slopes, especially during periods of wet weather. Temporary excavation slopes should be constructed to comply with OSHA and other applicable regulations.

Localized means of earth retention (e.g., timber shoring, trench boxes) may need to be considered in areas of deep utility trenches and adjacent/close to existing streets and utilities to avoid possible undermining.

5.11 EARTHWORK DURING FREEZING WEATHER

Precautions should be taken if work takes place while temperatures are below freezing. Frozen soil or soil containing snow or ice should not be used as compacted fill. Placement of compacted fills should not be conducted when air temperatures are low enough (approximately 30°F, or below) to cause freezing of the moisture in the fill during or before placement.

Fill materials should not be placed on water, snow, ice, or frozen soil. No fill should be allowed to freeze prior to compaction. At the end of each day's operations, the last lift of fill, after compaction, should be rolled by a smooth-wheeled roller to eliminate ridges of uncompacted soil. Silty soils are susceptible to disturbance by freezing, especially in the presence of water and traffic.

Soil bearing surfaces below completed pile caps, grade beams, and slabs must be protected against freezing before and after foundation construction. If construction is performed during freezing weather, pile caps and grade beams should be backfilled to a sufficient depth (up to 4 ft) as soon as possible after they are constructed. Alternatively, insulating blankets, heating or other means may be used for protection against freezing, consistent with weather conditions.

5.12 EXCAVATED SOIL MANAGEMENT

Excavation for construction of the proposed development may generate excess soils that will require handling and off-site disposal by the contractor. Off-site disposal of soil is anticipated to require chemical testing to characterize soils in accordance with applicable State and Local Regulations and disposal facility acceptance criteria. Characterization of soils for off-site disposal was not part of our scope of services. However, we would be pleased to assist with this aspect of the project if desired.

5.13 CONSTRUCTION OBSERVATION

The recommendations contained in this report are based on known and reasonably predictable behavior of properly engineered and constructed foundations and other facilities. We recommend that an engineer or technician, qualified by training and experience, perform full-time field observations and testing (where applicable) of the geotechnical aspects of construction summarized herein in accordance with Building Code requirements, including:

- excavation and removal of unsuitable materials beneath foundations, slabs, and pavements;
- installation of PIFs and lightweight fill (as applicable);
- load testing of PIFs (if required);
- preparation of slab, pile cap, pavement, and fill subgrades;
- on-site reuse of excavated materials;
- confirmation that backfill materials conform to project plans and specifications; and
- placement and compaction of structural fills (including field compaction control testing).

Monitoring of construction activities that could impact foundation performance is required by the Building Code. It is recommended that technical or engineering personnel from Haley & Aldrich be present to provide the recommended observation and geotechnical engineering services during the site development and foundation construction phases of the work based on our familiarity with the subsurface conditions, design concepts, and specifications. Haley & Aldrich would observe compliance with the design concepts, specifications and recommendations and assist in developing design of construction changes in the event that subsurface conditions differ from those anticipated prior to construction. The recommendations contained in this report are contingent on Haley & Aldrich providing the above-noted monitoring.

6. Other Recommendations

6.1 PLANS AND SPECIFICATIONS

We recommend that be provided the opportunity to review geotechnical aspects of the final plans and specifications prepared by others in order to confirm that our recommendations were interpreted and implemented as intended.

6.2 SUBMITTAL, SPECIFICATION, AND PLAN REVIEW

It is recommended that Haley & Aldrich be provided the opportunity to review submittals and design documents prepared by the earthwork and specialty geotechnical contractors, for general compliance with industry procedures and the project construction requirements, and in order to confirm that the recommendations made in this report were interpreted and implemented as intended.

7. Limitations

This report has been prepared for specific application to the proposed development at 720 Morrissey Boulevard, Dorchester, Massachusetts. This report is intended for the exclusive use of the project team in connection with the geotechnical aspects of the project as described herein. In the event that changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by Haley & Aldrich.

Various procedures are described herein for installing Pressure Injected Footings, preparation of subgrades, and on-site reuse of excavated soils. The recommendations should not be considered valid unless Haley & Aldrich is providing full-time field monitoring of these activities.

The analyses and recommendations submitted in this report are based in part upon data obtained from the referenced subsurface explorations. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report. The applicability of the recommendations in this report should be confirmed after structural and site grading designs are finalized.

The planned construction will be supported on or in the soil at the site. Recommendations presented in this report for foundation, subsurface drainage, moisture protection, and waterproofing address only the conventional geotechnical engineering related aspects of design and construction and are not intended to provide an environment that would prohibit infestation of mold or other biological pollutants. Our work scope did not include environmental investigations or the development of criteria or procedures to minimize the risk of vapors, radon, mold or biological pollutant infestations in or near any structure.

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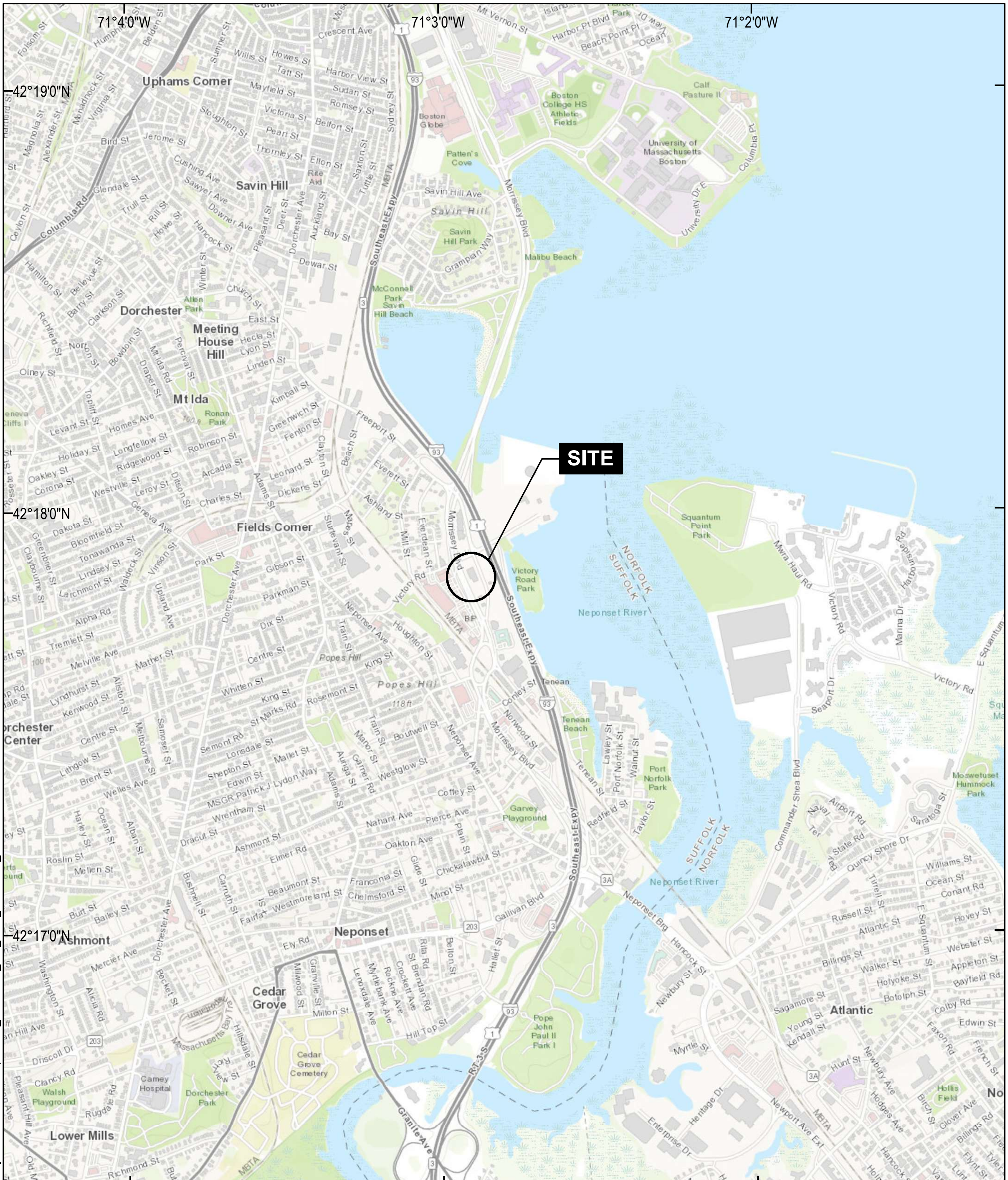
TABLES

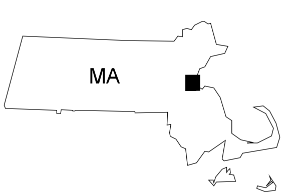
TABLE I - SUMMARY OF SUBSURFACE DATA
PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
720 MORRISSEY BOULEVARD
DORCHESTER, MASSACHUSETTS
134133-004

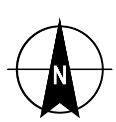
Exploration ID	Approx. Ground Surface Elevation[1,2]	Total Exploration Depth	El. Bottom of Exploration	Fill			Organic Deposits[3]			Marine Deposits[4]			Glacial Deposits		Groundwater	
				Depth to Top	El. Of Top	Thickness	Depth to Top	El. Of Top	Thickness	Depth to Top	El. Of Top	Thickness	Depth to Top	El. Of Top	Depth	El.
	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]	[ft]
B-1	15.5	38.0	-22.5	0.0	15.5	8.0	8.0	7.5	9.0	NE	NE	NE	17.0	-1.5	8.4	7.1
B-2	16.0	53.0	-37.0	0.0	16.0	16.0	16.0	0.0	18.0	34.0	-18.0	13.0	47.0	-31.0	12.1	3.9
B-3	17.0	41.0	-24.0	0.0	17.0	18.0	18.0	-1.0	16.0	34.0	-17.0	3.0	37.0	-20.0	8.0	9.0
B-4	15.5	38.0	-22.5	0.0	15.5	12.0	12.0	3.5	7.0	NE	NE	NE	19.0	-3.5	NM	NM
B-5	15.0	48.0	-33.0	0.0	15.0	14.0	14.0	1.0	19.5	33.5	-18.5	9.0	42.5	-27.5	11.5	3.5
B-6	15.0	50.0	-35.0	0.0	15.0	19.0	19.0	-4.0	14.0	33.0	-18.0	10.0	43.0	-28.0	9.6	5.4
B-7	15.5	38.0	-22.5	0.0	15.5	8.0	8.0	7.5	16.0	24.0	-8.5	10.0	34.0	-18.5	NM	NM
B-8	16.5	46.0	-29.5	0.0	16.5	9.0	9.0	7.5	30.0	39.0	-22.5	2.0	41.0	-24.5	11.4	5.1
B-9	15.0	36.0	-21.0	0.0	15.0	16.0	16.0	-1.0	15.5	NE	NE	NE	31.5	-16.5	NM	NM
B-10(OW)	15.5	38.0	-22.5	0.0	15.5	16.0	16.0	-0.5	19.0	35.0	-19.5	> 3.0	NE	NE	8.2	7.3
B-11	15.0	43.0	-28.0	0.0	15.0	14.0	14.0	1.0	25.0	39.0	-24.0	> 4.0	NE	NE	8.0	7.0
B-12	15.0	38.0	-23.0	0.0	15.0	14.0	14.0	1.0	18.9	32.9	-17.9	> 5.1	NE	NE	8.5	6.5
B-14(OW)	16.5	31.0	-14.5	0.0	16.5	16.0	16.0	0.5	7.0	NE	NE	NE	23.0	-6.5	8.9	7.6
B-15	16.0	36.0	-20.0	0.0	16.0	16.0	NE	NE	NE	16.0	0.0	12.0	28.0	-12.0	7.0	9.0
B-16	15.5	66.0	-50.5	0.0	15.5	12.2	12.2	3.3	31.8	44.0	-28.5	20.0	64.0	-48.5	NM	NM

NOTES:
1. Elevations refer to Boston City Base (BCB).
2. Ground surface elevations were estimated based on available topographic information and should be considered approximate. Top of stratum elevations were estimated based on ground surface elevations indicated.
3. Inorganic Alluvial Deposits were encountered as an interbedded layer within the Organic Deposits in B-7. Although not identified, this layer may be present at other boring locations.
4. Marine Deposits vary in density and composition and may include clay, sand, silt, and/or gravel. Refer to the boring logs for additional information.
5. Stratum thicknesses shown are total, cumulative thicknesses. Strata may be interbedded.
6. Strata shown in typical order of depth below ground surface. At some locations strata may be missing or in a different sequence.
7. "NE" indicates stratum not encountered.
8. "NM" indicates depth to groundwater not measured.
9. ">" indicates that the stated unit thickness or depth to the top of the unit is greater than the value indicated.

FIGURES







MAP SOURCE: ESRI
SITE COORDINATES: 42°17'50"N, 71°2'54"W

HALEY ALDRICH

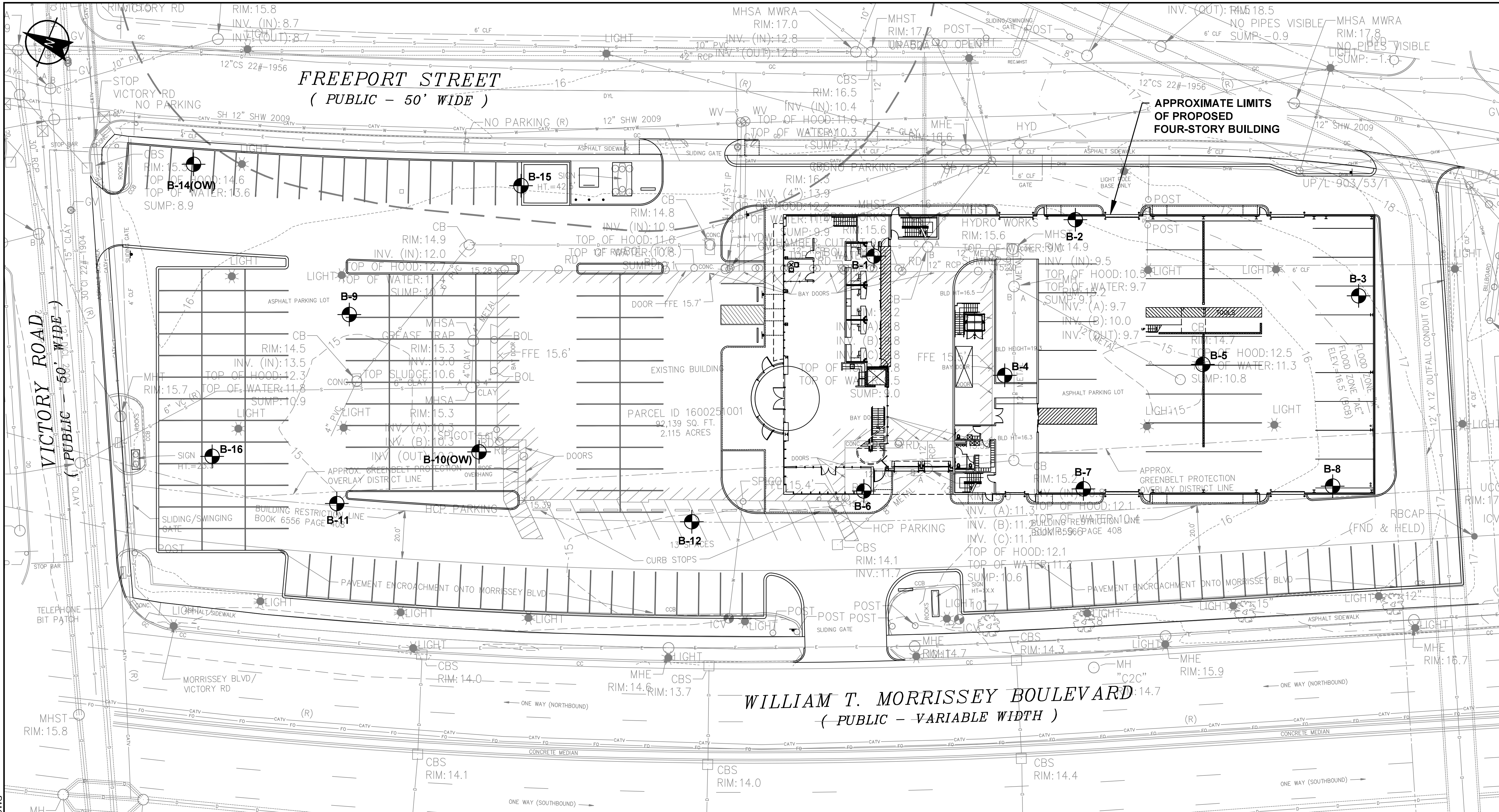
THE HERB CHAMBERS COMPANIES
259 MCGRATH HIGHWAY
SOMERVILLE, MASSACHUSETTS

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
JANUARY 2020

FIGURE 1

GIS FILE PATH: \\haleyaldrich.com\share\CF\Projects\134133\GIS\Maps\2019_12\134133_004_0001_PROJECT_LOCUS.mxd — USER: hwachholz — LAST SAVED: 12/17/2019 2:50:33 PM



LEGEND

B-1 APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING PERFORMED BY NORTHERN DRILL SERVICE, INC., MONITORED BY HALEY & ALDRICH, INC. DURING THE PERIOD 18 DECEMBER 2019 TO 8 JANUARY 2020

(OW) INDICATED OBSERVATION WELL INSTALLED IN COMPLETED BOREHOLE

NOTE

1. BASE PLAN TAKEN FROM AN ELECTRONIC FILE TITLED "59051_CAD to H&A.dwg", PROVIDED BY CHA CONSULTING, INC. ON 9 JANUARY 2019.

0 40 80
SCALE IN FEET

HALEY ALDRICH

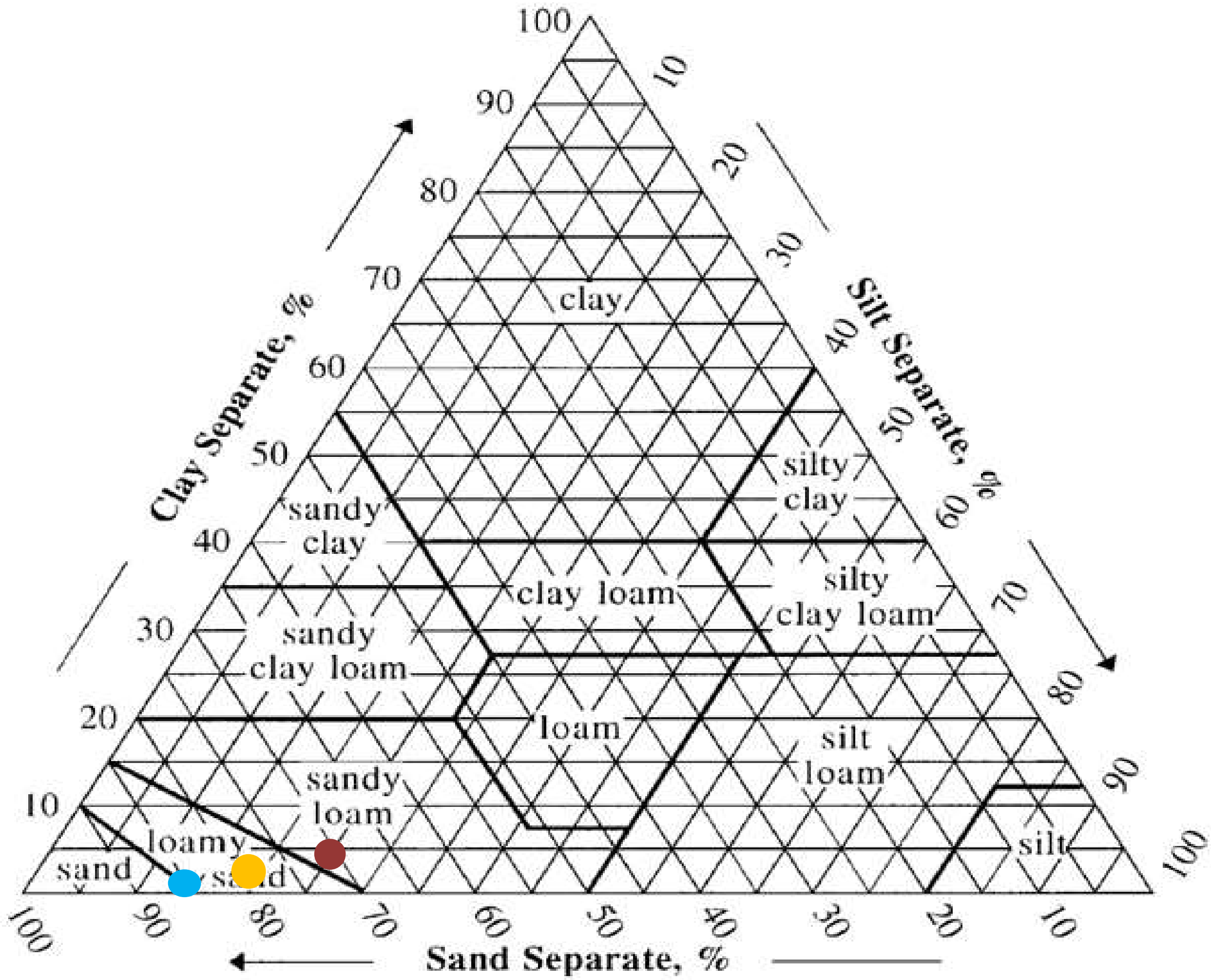
PROPOSED HERB CHAMBERS HONDA
720 MORRISSEY BOULEVARD
DORCHESTER, MASSACHUSETTS

SITE AND SUBSURFACE
EXPLORATION LOCATION PLAN

SCALE: AS SHOWN
JANUARY 2020

FIGURE 2

Saved by: DTE Printed: 1/16/2020 12:05 PM Sheet: B001
J:\GRAPHICS\134133\134133-004-B001.DWG



LEGEND:

● (blue)	**B-9**	**Approximately El. 7.0 - 11.0 (Fill)**
● (yellow)	**B-14**	**Approximately El. 8.5 - 12.5 (Fill)**
● (brown)	**B-16**	**Approximately El. 7.5 - 11.5 (Fill)**

Notes:
1. Guidance Document: USDA, 2016, National Soil Survey Handbook, Section 618.87 (Texture Class, Texture Modifier, and Terms Used in Lieu of Texture.)
2. Approximate elevations are in feet and reference Boston City Base (BCB).

F:\134133\Deliverables\Geotech_Rpt\Stormwater\[2020-0114-HAI-HC_Honda-NRCS_Soil_Texture_Triangle.xls]NRCS Soil Texture Triangles

HALEY ALDRICH

UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS

Proposed Herb Chambers Honda
720 Morrissey Boulevard
Dorchester, Massachusetts

FIGURE 3
NRCS SOIL TEXTURE TRIANGLE

FILE NO. 134133-004 January 2020

APPENDIX A

Logs of Test Borings

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-1

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA	File No.	134133-004
Client	THE HERB CHAMBERS COMPANIES	Sheet No.	1 of 2
Contractor	NORTHERN DRILL SERVICE, INC.	Start	January 6, 2020
		Finish	January 6, 2020
		Driller	C. Bierholm
		H&A Rep.	A. Fleming
		Elevation	15.5 (est.)
		Datum	Boston City Base
		Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	--	Rig Make & Model: Mobile Drill B-57, Truck
Inside Diameter (in.)	4.0	1 3/8	--	Bit Type: Roller Bit; Drill Mud: None
Hammer Weight (lb)	300	140	-	Casing: HW Drive to 34.0 ft
Hammer Fall (in.)	24	30	-	Hoist/Hammer: Winch Automatic Hammer; PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
0						15.2 0.3	-BITUMINOUS CONCRETE-										
	8 10 10	S1 8	0.5 2.0	ND	SP		Medium dense gray brown to light brown poorly graded SAND (SP), mps 0.4 in., no structure, no odor, moist		5	5	20	65	5				
	10 12 13 9	S2 10	2.0 4.0	ND	SP		Medium dense tan to light brown poorly graded SAND (SP), mps 0.3 in., no structure, no odor, moist			5	20	70	5				
5	8 12 11 8	S3 7	4.0 6.0	ND	SM		Medium dense gray brown to gray silty SAND with gravel (SM), mps 0.5 in., no structure, no odor, moist	5	10	15	35	20	15				
	5 6 2 2	S4 0	6.0 8.0				No Recovery, 3 in. spoon also no recovery -FILL-										
	1 1 1 2	S5 6	8.0 10.0	0.6	OL/ OH	7.5 8.0	Very soft gray to black ORGANIC SOIL (OL/OH), mps 0.6 in., no structure, no odor, wet, trace copper wire, trace pockets of silty sand						100				
10	WOR/12" - 1 4	S6 11	10.0 12.0	4.1	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.2 in., no structure, faint organic odor, wet, trace coarse gravel, trace pockets of silty sand, trace shells						100				
	8 4 2 3	S7 15	12.0 14.0	2.0	OL/ OH		Medium stiff gray to dark gray ORGANIC SOIL (OL/OH), mps 0.8 in., no structure, faint organic odor, wet, trace coarse gravel, trace pockets of silty sand, trace shells						100				
15	1 1 1 1	S8 23	14.0 16.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers -ORGANIC DEPOSITS-						100				
						-1.5 17.0	Note: Drill action indicates increase in gravel at 17.0 ft. -GLACIOFLUVIAL DEPOSITS-										
20	5 7	S9 7	19.0 21.0	ND	SM		Medium dense light brown to gray silty SAND with gravel (SM), mps 1.0 in., no structure, no odor, wet	10	15	20	25	15	15				

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
1/6/2020	1250	~0.5	34.0	38.0	8.43

Sample ID
- O - Open End Rod
- T - Thin Wall Tube
- U - Undisturbed Sample
- S - Splitspoon Sample
- G - Geoprobe

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

Summary
- Overburden (ft) 38.0
- Rock Cored (ft) -
- Samples S13

Boring No. B-1

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.

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-1
File No. 134133-004
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	5 13																
25	5 10 7 7	S10 6	24.0 26.0	ND	SW		Medium dense light brown to brown well graded SAND with gravel (SW), mps 1.0 in., no structure, no odor, wet	10	20	20	30	15	5				
30	5 9 6 4	S11 5	29.0 31.0	ND	GW		Medium dense light brown to gray brown well graded GRAVEL with sand (SW), mps 1.0 in. no structure, no odor, wet	25	35	25	10	5					
							-GLACIOFLUVIAL DEPOSITS-										
35	7 25 10 18	S12 3	34.0 36.0	ND	SW		Dense light brown well graded SAND with gravel (SW), mps 1.0 in., no structure, no odor, wet	10	20	30	25	10	5				
	17 48 24 22	S13 7	36.0 38.0	ND	SW		Very dense light brown well graded SAND with gravel (SW), mps 1.0 in., no structure, no odor, wet	15	25	30	20	10					
						-22.5 38.0	BOTTOM OF EXPLORATION 38.0 FT Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

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

Boring No. B-1

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-2

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA
Client	THE HERB CHAMBERS COMPANIES
Contractor	NORTHERN DRILL SERVICE, INC.

File No.	134133-004
Sheet No.	1 of 3
Start	January 2, 2020
Finish	January 3, 2020
Driller	J. Bierhom
H&A Rep.	A. Fleming
Elevation	16.0 (est.)
Datum	Boston City Base
Location	See Plan

	Casing	Sampler	Barrel
Type	HW	S	--
Inside Diameter (in.)	4.0	1 3/8	--
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

- Rig Make & Model: Mobile Drill B-57, Truck
- Bit Type: Roller Bit
- Drill Mud: None
- Casing: HW Drive to 19.0 ft
- Hoist/Hammer: Winch Automatic Hammer
- PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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 0.3	-BITUMINOUS CONCRETE-										
	13 9 8	S1 11	0.5 2.0	ND	SM		Medium dense tan to gray brown silty SAND (SM), mps 0.6 in., no structure, no odor, moist PP 15 tsf	5	5	15	25	30	20				
	3 2 2 2	S2 12	2.0 4.0	ND	OL/ OH		Soft gray to black ORGANIC SOIL (OL/OH), mps 0.3 in., no structure, faint organic odor, moist, 15-20% pockets of silty sand					5	95				
5	1 2 2 2	S3 17	4.0 6.0	ND	PT		Very soft brown to gray PEAT (PT), mps 0.5 in., no structure, faint organic odor, moist, trace pockets of silty sand						100				
	4 4 6 6	S4 13	6.0 8.0	2.4	SM		Loose black to gray silty SAND (SM), mps 0.6 in., no structure, no odor, moist, 20-25% pockets of ash and cinders, trace brick	5	5	5	30	30	25				
	4 5 8	S5 16	8.0 10.0	0.8	SM		Medium dense black silty SAND (SM), mps 0.5 in., no structure, no odor, wet, 10-15% pockets of ash and cinders, trace wood, coal and brick		10	5	25	35	25				
10	6 4 11 29	S6 8	10.0 12.0	ND	SM		Medium dense black silty SAND (SM), mps 0.7 in., no structure, no odor, wet, wood lodged in sampler tip	5	5	15	30	25	20				
							Note: Drill action and drill wash indicate wood obstruction from 12.0-13.5 ft. -FILL-										
15	5 2 1 2	S7 3	14.0 16.0	ND	SM/ OL/ OH	0.0 16.0	Very loose black to gray silty SAND (SM) intermixed with ORGANIC SOIL (OL/OH), mps 0.7 in., no structure, no odor, wet, trace wood and shells		5	10	35	30	20				
	2 1 1 1	S8 8	16.0 18.0	ND	OL/ OH		Very soft gray to dark gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells -ORGANIC DEPOSITS-						100				
20	1 1	S9 11	19.0 21.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
1/3/2020	945		19.0	53.0	12.08

Sample ID

- O - Open End Rod
- T - Thin Wall Tube
- U - Undisturbed Sample
- S - Splitspoon Sample
- G - Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (ft)	53.0
Rock Cored (ft)	-
Samples	S16

Boring No. B-2

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

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-2
File No. 134133-004
Sheet No. 2 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	1 1																
25	1 1 1 1	S10 24	24.0 26.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers						100				
30	1 2 3 3	S11 23	29.0 31.0	ND	OL/ OH		Medium stiff gray to gray brown ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, 10-15% peat fibers						100				
							-ORGANIC DEPOSITS-										
35	3 3 4 5	S12 12	34.0 36.0	ND	ML	-18.0 34.0	Medium stiff gray SILT (ML), mps 0.1 in., no structure, no odor, wet, trace lean clay in occassional layer						100				
							-MARINE DEPOSITS-										
40	4 6 10 17	S13 20	39.0 41.0	ND	SP/CL		Medium dense gray poorly graded SAND (SP), mps 0.3 in., no structure, no odor, wet, trace silt layers interbedded with lean CLAY (CL) layers				60	35	5				
45	6 10 10 15	S14 17	44.0 46.0	ND	SP		Medium dense tan to light brown poorly graded SAND (SP), mps 0.4 in., no structure, no odor, wet, 5-10% silt layers, occasional clay layers				30	65	5				
						-31.0 47.0	Note: Drill action indicates increase in gravel content starting at 47.0 ft.										
							-GLACIOFLUVIAL DEPOSITS-										
	13	S15	49.0	ND	SW-		Medium dense gray well-graded SAND with silt and gravel (SW-	10	20	20	25	15	10				

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

Boring No. B-2

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-2
File No. 134133-004
Sheet No. 3 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	12 14 10	11	51.0		SM		SM), mps 0.9 in., no structure, no odor, wet										
	11 10 12 12	S16 10	51.0 53.0	ND	SW-SM	-37.0 53.0	Medium dense gray well-graded SAND with silt and gravel (SW-SM), mps 1.0 in., no structure, no odor, wet	10	20	20	25	15	10				
							BOTTOM OF EXPLORATION 53.0 FT Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

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

Boring No. B-2

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-3

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA
Client	THE HERB CHAMBERS COMPANIES
Contractor	NORTHERN DRILL SERVICE, INC.

File No.	134133-004
Sheet No.	1 of 2
Start	January 7, 2020
Finish	January 7, 2020
Driller	C. Bierholm
H&A Rep.	A. Fleming
Elevation	17.0 (est.)
Datum	Boston City Base
Location	See Plan

	Casing	Sampler	Barrel
Type	HW	S	--
Inside Diameter (in.)	4.0	1 3/8	--
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

- Rig Make & Model: Mobile Drill B-57, Truck
- Bit Type: Roller Bit
- Drill Mud: None
- Casing: HW Drive to 39.0 ft
- Hoist/Hammer: Winch Automatic Hammer
- PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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						16.7 0.3	-BITUMINOUS CONCRETE-										
	11 10 11	S1 13	0.5 2.0	ND	SP		Medium dense light brown to gray brown poorly graded SAND (SP), mps 0.5 in., no structure, no odor, moist		5	5	20	65	5				
	3 37 21 15	S2 18	2.0 4.0	ND	SM		Very dense brown to gray brown silty SAND (SM), mps 0.8 in., no structure, no odor, moist, 15-20% pockets of fine sand	5	5	5	40	30	15				
5	9 6 4 5	S3 8	4.0 6.0	ND	SM		Loose dark gray to black silty SAND (SM), mps 0.6 in., no structure, no odor, moist, trace brick, trace pockets of organic soil	5	5	10	35	25	20				
	3 2 3 8	S4 2	6.0 8.0	ND	OL/ OH		Soft gray to black ORGANIC SOIL (OL/OH), mps 0.5 in., no structure, no odor, moist, trace pockets of silty sand, trace brick						100				
	1 2 1 1	S5 9	8.0 10.0	0.4	SM		Very loose black to gray silty SAND (SM), mps 0.6 in., no structure, no odor, wet, 5-10% pockets of organic soil, trace brick and ash		5	10	35	30	20				
10	1 1 1 2	S6 1	10.0 12.0	ND	SM		Very loose dark gray silty SAND (SM), mps 0.3 in., no odor, wet, trace brick, ash, and glass -FILL-		5	10	35	30	20				
	5 1 1 2	S7 14	12.0 14.0	2.1	SM/ OL/ OH		Very loose dark gray to gray silty SAND (SM) intermixed with ORGANIC SOIL (OL/OH), mps 0.5 in., no structure, no odor, wet, trace ash, brick, and wood		5	5	35	30	25				
15	1 3 2 1	S8 8	14.0 16.0	ND	OL/ OH		Medium stiff gray to dark gray ORGANIC SOIL (OL/OH), mps 0.7 in., no structure, faint organic odor, wet, trace pockets of silty sand, trace wood						100				
	1 2 2 3	S9 17	16.0 18.0	ND	OL/ OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.3 in., no structure, faint organic odor, wet, trace wood, trace pockets of fine sand					5	95				
	1 1 1 1	S10 20	18.0 20.0	ND	OL/ OH	-1.0 18.0	Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells -ORGANIC DEPOSITS-						100				
20																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
1/7/2020			34.0	41.0	8.0

Sample ID

- O - Open End Rod
- T - Thin Wall Tube
- U - Undisturbed Sample
- S - Splitspoon Sample
- G - Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (ft)	41.0
Rock Cored (ft)	-
Samples	S14

Boring No. B-3

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

HALEY ALDRICH

TEST BORING REPORT

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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																	
25	1 1 1 1	S11 23	24.0 26.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
30	1 1 1 1	S12 16	29.0 31.0	ND	OL/ OH		Very soft gray ORGANIC SOIL with sand (OL/OH), mps 0.2 in., no structure, organic odor, wet, trace shells				10	10	80				
							-ORGANIC DEPOSITS-										
35	3 3 3 7	S13 9	34.0 36.0	ND	SM	-17.0 34.0	Loose gray to gray brown silty SAND with gravel (SM), mps 0.8 in., no structure, no odor, wet Note: Soil description based on labratory test results. -MARINE DEPOSITS-	11	7	2	16	39	25				
						-20.0 37.0	Note: Drill action indicates increase in gravel starting at 37.0 ft.										
							-GLACIOFLUVIAL DEPOSITS-										
40	6 13 14 19	S14 8	39.0 41.0	ND	SW-SM		Medium dense gray well-graded SAND with silt and gravel (SW-SM), mps 0.8 in., no structure, no odor, wet Note: Soil description based on labratory test results.	10	24	14	32	10	10				
						-24.0 41.0	BOTTOM OF EXPLORATION 41.0 FT										
							Note: Casing spun off when advancing to 44.0 ft. Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

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

HALEY ALDRICH — TEST BORING REPORT

Boring No. B-4

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA
Client	THE HERB CHAMBERS COMPANIES
Contractor	NORTHERN DRILL SERVICE, INC.

File No.	134133-004
Sheet No.	1 of 2
Start	January 3, 2020
Finish	January 3, 2020
Driller	J. Bierholm
H&A Rep.	A. Fleming
Elevation	15.5 (est.)
Datum	Boston City Base
Location	See Plan

	Casing	Sampler	Barrel
Type	HW	S	--
Inside Diameter (in.)	4.0	1 3/8	--
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

- Rig Make & Model: Mobile Drill B-57, Truck
- Bit Type: Roller Bit
- Drill Mud: None
- Casing: HW Drive to 34.0 ft
- Hoist/Hammer: Winch Automatic Hammer
- PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
0						15.3 0.2	-BITUMINOUS CONCRETE-										
	10 11 4	S1 9	0.5 2.0	ND	SM		Medium dense tan to gray brown silty SAND (SM), mps 0.6 in., no structure, no odor, moist, trace pockets of organic soil		10	10	40	25	15				
	1 1 2 2	S2 12	2.0 4.0	ND	OL/OH		Soft gray to dark gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, faint organic odor, moist, trace roots						100				
5	1 1 1 1	S3 19	4.0 6.0	ND	OL/OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, moist, trace shells						100				
	1 1 1 1	S4 7	6.0 8.0	ND	OL/OH		Similar to S3 -FILL-						100				
	2 2 2 2	S5 18	8.0 10.0	ND	OL/OH		Soft gray to black ORGANIC SOIL with sand (OL/OH), mps 0.8 in., no structure, faint organic odor, wet, trace brick specks and clinkers		5	5	10	10	70				
10	2 2 1 2	S6 18	10.0 12.0	ND	OL/OH		Soft gray to black ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, faint organic odor, wet, trace pockets of fine sand					10	90				
	2 1 2 1	S7 20	12.0 14.0	ND	OL/OH	3.5 12.0	Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure , organic odor, wet, trace peat fibers						100				
15	1 1 1 1	S8 14	14.0 16.0	ND	OL/OH		Similar to S7, except very soft -ORGANIC DEPOSITS-						100				
20	2 4	S9 9	19.0 21.0	ND	SW-SM	-3.5 19.0	Loose gray to gray brown well-graded SAND with silt and gravel (SW-SM), mps 0.8 in., no structure, no odor, wet	10	15	15	30	20	10				

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
		Not Measured			

Sample ID

- O - Open End Rod
- T - Thin Wall Tube
- U - Undisturbed Sample
- S - Splitspoon Sample
- G - Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (ft)	38.0
Rock Cored (ft)	-
Samples	S13

Boring No. B-4

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

TEST BORING REPORT

Boring No. B-4
File No. 134133-004
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	5 9																
25	11 6 1 1	S10 5	24.0 26.0	ND	SM		Loose light brown to yellow brown silty SAND with gravel (SM), mps 0.4 in., no structure, no odor, wet	5	10	10	30	30	15				
							-GLACIOFLUVIAL DEPOSITS-										
30	6 7 6 9	S11 4	29.0 31.0	ND	SW-SM		Medium dense light brown to yellow brown well-graded SAND with gravel (SW-SM), mps 0.8 in., no structure, no odor, wet	10	20	20	30	20					
35	37 18 19 33	S12 8	34.0 36.0		SW-SM		Dense light brown to yellow brown well-graded SAND with silt and gravel (SW-SM), mps 0.8 in., no structure, no odor, wet	5	15	15	35	20	10				
	11 9 8 6	S13 8	36.0 38.0		SW-SM		Medium dense light brown to yellow brown well graded SAND with silt and gravel (SW-SM), mps 0.9 in., no structure, no odor, wet	10	10	20	35	15	10				
						-22.5 38.0	BOTTOM OF EXPLORATION 38.0 FT										
							Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

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

HALEY ALDRICH — TEST BORING REPORT

Boring No. B-5

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA	File No.	134133-004
Client	THE HERB CHAMBERS COMPANIES	Sheet No.	1 of 2
Contractor	NORTHERN DRILL SERVICE, INC.	Start	January 8, 2020
		Finish	January 8, 2020
		Driller	C. Bierholm
		H&A Rep.	A. Fleming
		Elevation	15.0 (est.)
		Datum	Boston City Base
		Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	--	Rig Make & Model: Mobile Drill B-57, Truck
Inside Diameter (in.)	4.0	1 3/8	--	Bit Type: Roller Bit; Drill Mud: None
Hammer Weight (lb)	300	140	-	Casing: HW Drive to 19.0 ft
Hammer Fall (in.)	24	30	-	Hoist/Hammer: Winch Automatic Hammer; PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
0						14.7 / 0.3	-BITUMINOUS CONCRETE-										
						14.3 / 0.7	Note: Drill action indicates concrete from 0.3-0.7 ft. -CONCRETE-										
	6 5	S1 0	1.0 2.0	ND			S1: No Recovery										
	6 2 3 4	S2 5	2.0 4.0	ND	SM		Loose gray to dark gray silty SAND (SM), mps 0.6 in., no structure, no odor, moist, trace rubber		5	10	30	35	20				
5	3 1 1 1	S3 8	4.0 6.0	0.6	OL/OH		Very soft gray to dark gray ORGANIC SOIL with sand (OL/OH), mps 0.4 in., no structure, faint organic odor, moist, trace wood, trace pockets of wood peat, trace pockets of silty sand			5	5	10	80				
	1 1 2 1	S4 19	6.0 8.0	ND	OL/OH		Soft gray to black ORGANIC SOIL with sand (OL/OH), mps 0.8 in., no structure, no odor, moist, trace wood and glass, trace pockets of poorly graded sand				10	10	80				
	2 1 2 4	S5 4	8.0 10.0	ND	OL/OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.4 in., no odor, wet, trace wood					10	90				
10	3 2 2 3	S6 7	10.0 12.0	ND	SM		Very loose gray silty sand (SM), mps 0.6 in., no structure, no odor, wet, 25-30% pockets of organic soil, trace wood			10	35	25	30				
	5 4 3 2	S7 10	12.0 14.0	ND	SM		Similar to S6 -FILL-			10	35	25	30				
15	3 1 2 2	S8 3	14.0 16.0	ND	OL/OH	1.0 / 14.0	Soft gray ORGANIC SOIL with sand (OL/OH), mps 0.3 in., no structure, no odor, wet, trace wood and porcelain				5	10	85				
	2 2 2 2	S9 4	16.0 18.0	ND	OL/OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.2 in., no structure, faint organic odor, wet, trace pockets of silty sand, trace wood					5	95				
	1 1 1 1	S10 23	18.0 20.0	ND	OL/OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
20																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
1/8/2020	1320		19.0	48.0	11.52

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Splitspoon Sample
G - Geoprobe

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

Summary
Overburden (ft) 48.0
Rock Cored (ft) -
Samples S16
Boring No. B-5

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

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-5
File No. 134133-004
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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
25	1 1 1 1	S11 24	24.0 26.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers					5	95				
							-ORGANIC DEPOSITS-										
30	1/12" 1 1	S12 17	29.0 31.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
						-18.5 33.5	Note: Drill action indicates increase in density at 33.5 ft.										
35	3 2 4 9	S13 14	34.0 36.0	ND	ML		Medium stiff gray SILT with sand (ML), mps 0.1 in., no structure, no odor, wet, trace lean clay					25	75				
							-MARINE DEPOSITS-										
40	5 8 8 11	S14 18	39.0 41.0	ND	ML		Medium dense gray to tan SILT with sand (ML), mps 0.3 in., no structure, no odor, wet, silt content varies throughout sample Note: Soil description based on labratory test results.		1	1	5	15	78				
						-27.5 42.5	-GLACIOFLUVIAL DEPOSITS-										
45	29 18 22 18	S15 8	44.0 46.0	ND	SP- SM		Dense tan to olive gray poorly graded SAND with silt and gravel (SP-SM), mps 0.9 in., no structure, no odor, wet Note: Soil description based on labratory results.	15	23	18	21	11	12				
	22 18 26 16	S16 9	46.0 48.0	ND	SM		Dense tan to olive gray silty SAND with gravel (SM), mps 0.9 in., no structure, no odor, wet	10	15	20	25	15	15				
						-33.0 48.0	BOTTOM OF EXPLORATION 48.0 FT Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

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

Boring No. B-5

HALEY ALDRICH	TEST BORING REPORT	Boring No. B-6

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA	File No.	134133-004
Client	THE HERB CHAMBERS COMPANIES	Sheet No.	1 of 2
Contractor	NORTHERN DRILL SERVICE, INC.	Start	December 19, 2019
		Finish	December 20, 2019
		Driller	C. Bierhom
		H&A Rep.	A. Fleming
		Elevation	15.0 (est.)
		Datum	Boston City Base
		Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	--	Rig Make & Model: Mobile Drill B-57, Truck
Inside Diameter (in.)	4.0	1 3/8	--	Bit Type: Roller Bit Drill Mud: None
Hammer Weight (lb)	300	140	-	Casing: HW Drive to 24.0 ft
Hammer Fall (in.)	24	30	-	Hoist/Hammer: Winch Automatic Hammer PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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						14.8 0.2	-BITUMINOUS CONCRETE-										
	14 17 14	S1 9	0.5 2.0	ND	SM		Dense brown to dark gray silty SAND with gravel (SM), mps 0.6 in., no structure, no odor, moist	5	10	15	25	25	20				
	13 15 16 17	S2 11	2.0 4.0	ND	SM		Dense tan to light gray brown silty SAND with gravel (SM), mps 0.5 in., no structure, no odor, moist -FILL-	5	10	5	20	40	20				
5	7 2 2 3	S3 13	4.0 6.0	ND	SM/ OL/ OH		Loose gray to black silty SAND (SM) intermixed with sandy ORGANIC SOIL (OL/OH), mps 0.9 in., no structure, no odor, wet		5	5	30	40	20				
						9.0 6.0											
	4 5 2 3	S4 3	6.0 8.0	ND	OL/ OH		Medium stiff gray to dark gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, faint organic organic odor, wet, trace shells, trace pockets of poorly graded sand					10	90				
	2 2 3 3	S5 10	8.0 10.0	ND	OL/ OH		Medium stiff gray to olive gray sandy ORGANIC SOIL (OL/OH), mps 0.3 in., no structure, faint organic odor, wet		5	5	15	10	65				
10	1 3 1 2	S6 12	10.0 12.0	3.6	SM		Loose olive to olive gray silty SAND (SM), mps 0.1 in., no structure, no odor, wet		5	5	15	10	65				
				ND	OL/ OH		Soft black ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, no odor, wet, trace roots						100				
	2 2 1 2	S7 1	12.0 14.0	ND	OL/ OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, faint organic odor, wet						100				
15	1 2 1 1	S8 0	14.0 16.0				No Recovery										
	1 1 1 2	S9 18	16.0 18.0	4.7	OL/ OH		Very soft black to gray ORGANIC SOIL (OL/OH), mps 0.4 in., no structure, organic odor, wet, 10-20% pockets of sand with trace scrap metal -FILL-						100				
						-4.0 19.0											
20	WOH/6" 1 1 1	S10 24	19.0 21.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
	1 1	S11 17	21.0 23.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/20/2019	1040		24.0	50.0	9.60

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Splitspoon Sample
G - Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	50.0
Rock Cored (ft)	-
Samples	S22
Boring No.	**B-6**

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

TEST BORING REPORT

HALEY ALDRICH

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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
	1 1																
	WOH/6" 1 1 1	S12 24	23.0 25.0	ND	OL/ OH		Similar to S11						100				
25	WOH/6" 1 1 1	S13 21	25.0 27.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet trace shells						100				
	1 1 1 1	S14 22	27.0 29.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers						100				
30	1 2 2 3	S15 23	29.0 31.0	ND	PT		Soft brown PEAT (PT), mps 0.1 in., no structure, stong organic odor, wet -ORGANIC DEPOSITS-						100				
	2 2 2 3	S16 10	31.0 33.0	ND	PT	-18.0 33.0	Soft brown to gray PEAT (PT), mps 0.1 in., no structure, organic odor, wet, 10-15% sandy organic soil						100				
	4 2 1 3	S17 10	33.0 35.0	ND	CL		Soft gray sandy lean CLAY (CL), mps 0.1 in., no structure, no odor, wet					40	60				
35	7 4 3 5	S18 12	35.0 37.0	ND	CL		Medium stiff gray sandy lean CLAY (CL), mps 0.6 in., no structure, no odor, wet -MARINE DEPOSITS-	5	5	5	10	25	50				
	6 9 9 12	S19 14	37.0 39.0	ND	CL		Medium stiff gray to olive gray sandy lean CLAY (CL), mps 0.6 in., no structure, no odor, wet	5	5	5	10	25	50				
40	8 12 12 12	S20 13	39.0 41.0	ND	ML		Medium dense gray to olive gray sandy SILT (ML), mps 0.2 in., no structure, no odor, wet, trace lean clay, trace sand seams		5			35	60				
						-28.0 43.0	Note: Drill action indicates change in material at 43.0 ft.										
45	21 62 50 44	S21 9	44.0 46.0	ND	SM		Very dense gray to gray brown silty SAND with gravel (SM), mps 0.9 in., no structure, no odor, wet Note: Drill action indicates boulder from 45.8-47.3 ft. -GLACIOFLUVIAL DEPOSITS-	15	20	10	20	15	20				
	15 19 34 30	S22 9	48.0 50.0	ND	SM	-35.0 50.0	Very dense gray silty SAND with gravel (SM), mps 0.9 in., no structure, no odor, wet	10	20	10	25	15	20				
50							BOTTOM OF EXPLORATION 50.0 FT Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-7

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA	File No.	134133-004
Client	THE HERB CHAMBERS COMPANIES	Sheet No.	1 of 2
Contractor	NORTHERN DRILL SERVICE, INC.	Start	December 18, 2019
		Finish	December 18, 2019
		Driller	C. Bierhom
		H&A Rep.	A. Fleming
		Elevation	15.5 (est.)
		Datum	Boston City Base
		Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	--	Rig Make & Model: Mobile Drill B-57, Truck
Inside Diameter (in.)	4.0	1 3/8	--	Bit Type: Roller Bit Drill Mud: None
Hammer Weight (lb)	300	140	-	Casing: HW Drive to 34.0 ft
Hammer Fall (in.)	24	30	-	Hoist/Hammer: Winch Automatic Hammer PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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							-BITUMINOUS CONCRETE-										
	10 12 12	S1 12	0.5 2.0	ND	SP	15.0 0.5	Medium dense tan to brown poorly graded SAND (SP), mps 0.3 in., no structure, no odor, moist		5	10	65	15	5				
	4 3 3 5	S2 10	2.0 4.0	ND	SM		Loose brown to gray brown silty SAND with gravel (SM), mps 0.7 in., no structure, no odor, moist, trace pockets of peat										
5	5 4 8 7	S3 8	4.0 6.0	ND	SM		Medium dense gray brown to gray silty SAND with gravel (SM), mps 0.8 in., no structure, no odor, moist -FILL-	5	10	5	20	35	25				
	2 5 5 4	S4 7	6.0 8.0	ND	SM		Loose gray brown to gray silty SAND with gravel (SM), mps 0.7 in., no structure, no odor, moist	5	10	15	20	25	25				
	1 1 1 2	S5 1	8.0 10.0	ND	OL/ OH	7.5 8.0	Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure,faint organic odor, wet -ORGANIC DEPOSITS-						100				
10	2 2 2 2	S6 3	10.0 12.0	ND	OL/ OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, faint organic odor, wet, trace shells						100				
	4 6 3 4	S7 8	12.0 14.0	2.6	SM	3.5 12.0	Loose gray silty SAND with gravel (SM), mps 0.7 in., no structure, faint organic odor, wet ALLUVIAL DEPOSITS-	5	10	15	35	20	15				
15	1 1 1 2	S8 1	14.0 16.0	ND	OL/ OH	1.5 14.0	Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, faint organic odor, wet -ORGANIC DEPOSITS-						100				
	1 2 1 2	S9 21	16.0 18.0	ND	OL/ OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
	WOH/6" 1 1 1	S10 22	18.0 20.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
20																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Depth (ft) to: Bottom of Hole	Depth (ft) to: Water
		Not Measured			

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Splitspoon Sample
G - Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	38.0
Rock Cored (ft)	-
Samples	S17

Boring No. B-7

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

TEST BORING REPORT

HALEY ALDRICH

Boring No. B-7
File No. 134133-004
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	1 1 1 1	S11 23	20.0 22.0	ND	OL/ OH		Similar to S10 -ORGANIC DEPOSITS-						100				
	1 1 1 1	S12 3	22.0 24.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
25	5 10 17 15	S13 3	24.0 26.0	ND	SW	-8.5 24.0	Medium dense gray brown well-graded SAND with gravel (SW), mps 0.9 in., no structure, no odor, wet	10	20	10	35	20	5				
	11 14 13 13	S14 6	26.0 28.0	ND	SW		Medium dense gray to tan well graded SAND with gravel (SW), mps 0.9 in., no structure, no odor, wet	10	20	15	35	20					
30	9 11 15 11	S15 8	29.0 31.0	ND	GW		Medium dense gray well-graded GRAVEL with sand (GW), mps 1.0 in., no structure, no odor, wet -GLACIOFLUVIAL DEPOSITS-	25	35	20	10	5	5				
35	14 10 15 37	S16 9	34.0 36.0	ND	SM	-18.5 34.0	Medium dense tan to light brown silty SAND with gravel (SM), mps 0.9 in., no structure, no odor, wet	10	15	10	25	25	15				
	21 20 15 9	S17 11	36.0 38.0	ND	SM		Dense tan to light brown silty SAND with gravel (SM), mps 0.9 in., no structure, no odor, wet -GLACIOFLUVIAL DEPOSITS-	10	15	10	25	25	15				
						-22.5 38.0	BOTTOM OF EXPLORATION 38.0 FT Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

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

Boring No. B-7

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-8

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA
Client	THE HERB CHAMBERS COMPANIES
Contractor	NORTHERN DRILL SERVICE, INC.

File No.	134133-004
Sheet No.	1 of 2
Start	December 17, 2019
Finish	December 17, 2019
Driller	C. Bierhom
H&A Rep.	A. Fleming
Elevation	16.5 (est.)
Datum	Boston City Base
Location	See Plan

	Casing	Sampler	Barrel
Type	HW	S	--
Inside Diameter (in.)	4.0	1 3/8	--
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

- Rig Make & Model: Mobile Drill B-57, Truck
- Bit Type: Roller Bit
- Drill Mud: None
- Casing: HW Drive to 14.0 ft
- Hoist/Hammer: Winch Automatic Hammer
- PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Color, GROUP NAME, max. particle size[†], structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
0							-BITUMINOUS CONCRETE-										
	11 16 11	S1 11	0.5 2.0	ND	SW-SM	16.0 0.5	Medium dense brown to olive brown well graded SAND with silt and gravel (SW-SM), mps 0.8 in., no structure, no odor, moist	5	10	15	35	25	10				
	16 19 21 15	S2 14	2.0 4.0	ND	SM		Dense tan to brown silty SAND (SM), mps 0.6 in., no structure, no odor, moist, trace pockets of black sandy organic soil	5	5	10	25	40	15				
5	12 7 5 7	S3 18	4.0 6.0	ND	SM		Medium dense dark brown to olive brown silty SAND (SM), mps 0.4 in., no structure, no odor, moist, trace pockets of sandy lean clay -FILL-		10	10	25	40	15				
	7 6 7 51	S4 20	6.0 8.0	ND	SM		Medium dense dark brown silty SAND (SM), mps 0.5 in., no structure, no odor, moist, trace shells, ash, and wire, trace granite in spoon tip		5	10	25	40	20				
						7.5	Note: Drill action indicates rock from 8.0-8.9 ft. Granite in drill cuttings.										
10	2 2 2 2	S5 2	9.0 11.0	ND	OL/OH	9.0	Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, no odor, wet						100				
	2 1 1 2	S6 21	11.0 13.0	ND	OL/OH		Very soft gray ORGANIC SOIL with sand (OL/OH), mps 0.1 in., no structure, faint organic odor, wet, trace shells and peat fibers				5	10	85				
	3 3 4 2	S7 5	13.0 15.0	ND	OL/OH		Medium stiff black ORGANIC SOIL (OL/OH), mps 0. in., no structure, faint organic odor, wet, trace shells, trace single sand layer					5	95				
15	2 1 1 3	S8 10	15.0 17.0	ND	OL/OH		Very soft gray to black ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, faint organic odor, wet, trace shells -ORGANIC DEPOSITS-					15	85				
	3 2 2 2	S9 13	17.0 19.0	ND	OL/OH		Soft gray to black ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, no odor, wet, trace shells					25	75				
20	1 1	S10 17	19.0 21.0	ND	OL/OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in.m no structure, organic odor, wet, trace shells					5	95				

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/17/2019	1445	~0.5	14.0	46.0	11.4

Sample ID

- O - Open End Rod
- T - Thin Wall Tube
- U - Undisturbed Sample
- S - Splitspoon Sample
- G - Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (ft)	46.0
Rock Cored (ft)	-
Samples	S23

Boring No. B-8

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.

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-8
File No. 134133-004
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	1 1																
	2 2 2 1	S11 19	21.0 23.0	ND	OL/ OH		Similar to S10, except soft					5	95				
	1 1 1 1	S12 23	23.0 25.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
25	WOH/6" 1 1 1	S13 3	25.0 27.0	ND	OL/ OH		Similar to S12						100				
	1 1 2 1	S14 14	27.0 29.0	ND	OL/ OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers						100				
30	1 1 1 1	S15 24	29.0 31.0	ND	OL/ OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
	WOH/6" 2 1 1	S16 16	31.0 33.0	ND	OL/ OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells -ORGANIC DEPOSITS-						100				
	WOH/12" - 1 1	S17 24	33.0 35.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
35	WOH/6" WOH/6" 1 1	S18 24	35.0 37.0	ND	OL/ OH		Similar to S18						100				
	1 3 6 3	S19 13	37.0 39.0	ND	OL/ OH		Stiff gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat, trace layers of sandy organic soil						100				
40	4 5 1 2	S20 14	39.0 41.0	ND	SM	-22.5 39.0	Loose gray silty SAND (SM), mps 0.1 in., no structure, organic odor, wet Note: Soil description based on labratory results. -MARINE DEPOSITS-				1	68	31				
	3 16 17 19	S21 6	41.0 43.0	ND	SM	-24.5 41.0	Dense tan to gray silty SAND with gravel (SM), mps 0.1 in., no structure, no odor, wet Note: Soil description based on labratory results. -GLACIOFLUVIAL DEPOSITS-	21	17	7	16	16	23				
	13 29 24 66	S22 11	43.0 45.0	ND	SM		Very dense tan to gray silty SAND with gravel (SM), mps 1.0 in., no structure, no odor, wet	15	15	10	10	30	20				
45	89 100/2"	S23 4	45.0 45.7	MD	SM	-29.2 45.7	Very dense tan to gray silty SAND with gravel (SM), mps 0.9 in., no structure, no odor, wet	15	15	10	10	25	25				
							BOTTOM OF EXPLORATION 45.7 FT Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

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

Boring No. B-8

TEST BORING REPORT

HALEY ALDRICH

Boring No. B-9

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA	File No.	134133-004
Client	THE HERB CHAMBERS COMPANIES	Sheet No.	1 of 2
Contractor	NORTHERN DRILL SERVICE, INC.	Start	December 30, 2019
		Finish	December 30, 2019
		Driller	J. Bierholm
		H&A Rep.	A. Fleming
		Elevation	15.0 (est.)
		Datum	Boston City Base
		Location	See Plan

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	--	Rig Make & Model: Mobile Drill B-57, Truck
Inside Diameter (in.)	4.0	1 3/8	--	Bit Type: Roller Bit; Drill Mud: None
Hammer Weight (lb)	300	140	-	Casing: HW Drive to 19.0 ft; Hoist/Hammer: Winch Automatic Hammer
Hammer Fall (in.)	24	30	-	PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (Color, GROUP NAME, max. particle size†, structure, odor, moisture, optional descriptions GEOLOGIC INTERPRETATION)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Dilatancy	Toughness	Plasticity	Strength
0							-BITUMINOUS CONCRETE-										
	10 6 6	S1 10	0.5 2.0		SM	14.5 0.5	Medium dense gray brown silty SAND with gravel (SM), mps 0.8 in., no structure, no odor, moist	5	10	10	30	25	20				
	8 6 3 6	S2 8	2.0 4.0		SM		Loose gray brown to gray silty SAND with gravel (SM), mps 0.7 in., no structure, no odor, moist, trace coal	5	10	10	35	20	20				
5	13 8 5 14	S3 12	4.0 6.0		SM		Medium dense gray brown to gray silty SAND with gravel (SM), mps 1.2 in., no structure, faint petroleum odor, moist, trace brick	5	10	10	30	25	20				
	6 7 10 12	S4 7	6.0 8.0		SM		Similar to S3 -FILL-	5	10	10	30	25	20				
	4 3 4 5	S5 5	8.0 10.0		SM		Loose black to gray silty SAND with gravel (SM), mps 0.7 in., no structure, faint petroleum odor, wet, trace brick	5	15	10	35	20	15				
10	10 4 9 3	S6 7	10.0 12.0				Medium dense black to gray concrete rubble, mps 1.0 in., no structure, no odor, wet, trace pockets of silty sand										
	5 3 5 7	S7 4	12.0 14.0				Loose black to gray concrete rubble, mps 0.9 in., no structure, no odor, wet, trace pockets of silty sand										
15	8 2 22	S8 6	14.0 16.0		SM/ OL/ OH		Loose black to gray silty SAND (SM) intermixed with ORGANIC SOIL (OL/OH), mps 0.6 in., no structure, faint organic odor, wet, trace concrete										
	2 1 1 2	S9 19	16.0 18.0		OL/ OH	-1.0 16.0	Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells -ORGANIC DEPOSITS-						100				
	2 1	S10 22	19.0 21.0		OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells										
20																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
		Not Measured			

Sample ID
- O - Open End Rod
- T - Thin Wall Tube
- U - Undisturbed Sample
- S - Splitspoon Sample
- G - Geoprobe

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

Summary
- Overburden (ft) 36.0
- Rock Cored (ft) -
- Samples S14

Boring No. B-9

Field Tests: **Dilatancy**: R - Rapid S - Slow N - None **Plasticity**: N - Nonplastic L - Low M - Medium H - High
Toughness: 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 WITH PERM PID COLUMN HA-LIB09-BOS - COPY.GLB HA-TB+CORE+WELL-09 W FENCE.GDT \\HALEYALDRICH.COM\SHARE\CF\PROJECTS\134133\GINT\134133-003-TBOW.GPJ Jan 24, 20

TEST BORING REPORT

HALEY ALDRICH

Boring No. B-9

File No. 134133-004

Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	1 2																
25	1 1 1 2	S11 24	24.0 26.0		OL/ OH		Similar to S10						100				
							-ORGANIC DEPOSITS-										
30	3 2 3 2	S12 6	29.0 31.0		OL/ OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers						100				
						-16.5 31.5											
	6 11 12 12	S13 0	32.0 34.0				No Recovery										
							-GLACIOFLUVIAL DEPOSITS-										
35	5 8 10 100/5"	S14 8	34.0 35.9		SM		Medium dense gray silty SAND with gravel (SM), mps 0.9 in., no structure, no odor, wet	5	15	15	25	20	20				
						-20.9 35.9	BOTTOM OF EXPLORATION 35.9 FT Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

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

Boring No. B-9

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-10 (OW)

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA
Client	THE HERB CHAMBERS COMPANIES
Contractor	NORTHERN DRILL SERVICE, INC.

File No.	134133-004
Sheet No.	1 of 2
Start	December 23, 2019
Finish	December 26, 2019
Driller	C. Bierholm
H&A Rep.	A. Fleming
Elevation	15.5 (est.)
Datum	Boston City Base
Location	See Plan

	Casing	Sampler	Barrel
Type	HW	S	--
Inside Diameter (in.)	4.0	1 3/8	--
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

Rig Make & Model: Mobile Drill B-57, Truck
Bit Type: Roller Bit
Drill Mud: None
Casing: HW Drive to 19.0 ft
Hoist/Hammer: Winch Automatic Hammer
PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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							15.2 0.3	-BITUMINOUS CONCRETE-										
	11 12 10	S1 8	0.5 2.0	ND	SM			Medium dense gray to brown silty SAND (SM), mps 0.7 in., no structure, no odor, moist, trace pockets of fine sand		5	5	10	65	15				
	11 14 7 4	S2 8	2.0 4.0	ND	SM			Medium dense gray to dark brown silty SAND (SM), mps 0.5 in., no structure, no odor, moist, trace brick specks		5	10	15	50	20				
5	2 2 1 1	S3 1	4.0 6.0	ND	OL/ OH			Soft gray ORGANIC SOIL (OL/OH), mps 0.2 in., no structure, faint organic odor, wet, trace pockets of fine sand						100				
	2 2 9 10	S4 11	6.0 8.0	ND	OL/ OH			Stiff gray to black ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, faint organic odor, wet, 15-20% pockets of fine sand						100				
	4 1 2 4	S5 4	8.0 10.0	ND	SM			Very loose black to dark gray silty SAND (SM), mps 0.6 in., no structure, no odor, wet, trace pockets of organic soil, trace wood		5	10	45	25	15				
10	3 6 7 11	S6 3	10.0 12.0	ND	SM			Medium dense dark gray to black silty SAND (SM), mps 0.8 in., no structure, no odor, wet	5	5	10	45	20	15				
	8 6 6 9	S7 2	12.0 14.0	3.3	SM			Similar to S6	5	5	10	45	20	15				
15	11 3 2 2	S8 3	14.0 16.0	4.6	SW- SM/OL- OH			Loose black to dark gray well graded SAND with silt and gravel (SW-SM) intermixed with ORGANIC SOIL (OL/OH), mps 0.8 in., no structure, faint organic odor, wet, trace brick and wood	5	10	10	40	20	15				
	2 2 1 1	S9 7	16.0 34.0	ND	OL/ OH		-0.5 16.0	Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells -ORGANIC DEPOSITS-						100				
	WOH/6" 1 2 1	S10 9	18.0 20.0	ND	OL/ OH			Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet trace shells and peat fibers						100				
20																		

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/26/2019	0715				8.21

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Splitspoon Sample
G - Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	38.0
Rock Cored (ft)	-
Samples	S14

Boring No. B-10 (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.

TEST BORING REPORT

HALEY ALDRICH

Boring No. B-10 (OW)
File No. 134133-004
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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																		
25	1 1 1 1	S11 16	24.0 26.0	ND	OL/ OH			Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers						100				
30	WOH/6" 1 1 1	S12 24	29.0 31.0	ND	OL/ OH			Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers						100				
	1 2	S13 18	34.0 36.0	ND	OL/ OH			Similar to S12						100				
35	4 6			ND	ML		-19.5 35.0	Stiff gray SILT (ML), mps 0.1 in., no structure, no odor, wet, trace lean clay					5	95				
	10 10 12 13	S14 19	36.0 38.0	ND	ML			Very stiff gray SILT (ML), mps 0.1 in., no structure, no odor, wet, trace lean clay -MARINE DEPOSITS-					5	95				
							-22.5 38.0	BOTTOM OF EXPLORATION 38.0 FT Note: Observation well installed. Refer to installation report for details.										

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

Boring No. B-10 (OW)

TEST BORING REPORT

HALEY ALDRICH

Boring No. B-11

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA
Client	THE HERB CHAMBERS COMPANIES
Contractor	NORTHERN DRILL SERVICE, INC.

File No.	134133-004
Sheet No.	1 of 2
Start	September 26, 2019
Finish	September 27, 2019
Driller	J. Bierholm
H&A Rep.	A. Fleming
Elevation	15.0 (est.)
Datum	Boston City Base
Location	See Plan

	Casing	Sampler	Barrel
Type	HW	S	--
Inside Diameter (in.)	4.0	1 3/8	--
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

Rig Make & Model: Mobile Drill B-57, Truck
Bit Type: Roller Bit
Drill Mud: None
Casing: HW Drive to 19.0 ft
Hoist/Hammer: Winch Automatic Hammer
PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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						14.7 0.3	-BITUMINOUS CONCRETE-										
	19 12 10	S1 10	0.5 2.0	0.3	SP		Medium dense yellow brown to gray poorly graded SAND (SP), mps 0.5 in., no structure, no odor, moist, trace pockets of silty sand		5	5	55	30	5				
	14 11 15 12	S2 12	2.0 4.0	ND	SM		Medium dense black to dark gray silty SAND (SM), mps 0.6 in., no structure, no odor, moist, trace brick		10	10	25	35	20				
5	7 3 2 3	S3 6	4.0 6.0	6.4	SM		Loose black to gray silty SAND (SM), mps 0.6 in., no structure, no odor, moist		10	10	20	40	20				
	1 5 15 14	S4 1	6.0 8.0	ND	SM		Similar to S3, except medium dense -FILL-		10	10	20	40	20				
	23 15 7 2	S5 8	8.0 10.0	ND	SM		Medium dense gray to dark gray silty SAND (SM), mps 0.7 in., no structure, no odor, wet, trace wood and glass		10	15	35	25	15				
10	7 4 2 2	S6 1	10.0 12.0	1.4	SM		Loose black to dark gray silty SAND with gravel (SM), mps 0.8 in., no structure, no odor, wet, trace ash, cinders, coal, and glass, trace pockets of organic soil	5	10	15	25	25	20				
	2 2 1 2	S7 4	12.0 14.0	ND	SM	1.0 14.0	Similar to S6	5	10	15	25	25	20				
15	2 1 1 1	S8 2	14.0 16.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace peat fibers						100				
	2 1 2 2	S9 17	16.0 18.0	ND	OL/ OH		Similar to S8 -ORGANIC DEPOSITS-						100				
20	1 1	S10 20	19.0 21.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace peat fibers						100				

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
9/26/2019					~8.0

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Splitspoon Sample
G - Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	43.0
Rock Cored (ft)	-
Samples	S15

Boring No. B-11

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

HALEY ALDRICH	TEST BORING REPORT	Boring No. B-11 File No. 134133-004 Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	1 1																
25	WOH/6" 1 1 1	S11 19	24.0 26.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace peat fibers and shells						100				
30	WOH/6" 1 1 1	S12 20	29.0 31.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers						100				
							-ORGANIC DEPOSITS-										
35	WOH/6" 1/12" 1	S13 24	34.0 36.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
40	3 4 4 3	S14 16	39.0 41.0	ND	ML	-24.0 39.0	Medium stiff gray SILT (ML), mps 0.1 in., no structure, organic odor, wet -MARINE DEPOSITS-						100				
	2 4 3 3	S15 14	41.0 43.0	ND	CL		Medium stiff gray lean CLAY (CL), mps 0.1 in., no structure, no odor, wet						100	S	M	H	
						-28.0 43.0	BOTTOM OF EXPLORATION 43.0 FT Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

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

Boring No. B-11

HALEY ALDRICH — TEST BORING REPORT

Boring No. B-12

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA
Client	THE HERB CHAMBERS COMPANIES
Contractor	NORTHERN DRILL SERVICE, INC.

File No.	134133-004
Sheet No.	1 of 2
Start	December 20, 2019
Finish	December 23, 2019
Driller	C. Bierholm
H&A Rep.	A. Fleming
Elevation	15.0 (est.)
Datum	Boston City Base
Location	See Plan

	Casing	Sampler	Barrel
Type	HW	S	--
Inside Diameter (in.)	4.0	1 3/8	--
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

- Rig Make & Model: Mobile Drill B-57, Truck
- Bit Type: Roller Bit
- Drill Mud: None
- Casing: HW Drive to 19.0 ft
- Hoist/Hammer: Winch Automatic Hammer
- PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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						14.5	-BITUMINOUS CONCRETE-										
	9 13 11	S1 12	0.5 2.0	ND	SM	0.5	Medium dense tan to light brown silty SAND (SM), mps 0.3 in., no structure, no odor, moist			5	20	60	15				
	9 5 4 3	S2 10	2.0 4.0	ND	SM		Loose tan to light brown silty SAND (SM), mps 0.5 in., no structure, no odor, moist, trace pockets of peat		5	5	20	55	15				
5	4 4 2 2	S3 3	4.0 6.0	ND	SP		Loose tan to brown poorly graded SAND (SP), mps 0.2 in., no structure, no odor, moist, trace pockets of gray silty sand			5	20	70	5				
	2 1 1 2	S4 1	6.0 8.0	ND	SP		Very loose tan to light brown poorly graded SAND (SP), mps 0.2 in., no structure, no odor, moist -FILL-			5	20	70	5				
	WOH/6" 1 1 1	S5 2	8.0 10.0	6.4	OL/ OH		Very soft gray ORGANIC SOIL with sand (OL/OH), mps 0.1 in., no structure, no odor, wet			5	5	5	85				
10	5 2 2 2	S6 8	10.0 12.0	3.1	OL/ OH/ SM		Loose dark gray to black silty SAND (SM) intermixed with ORGANIC SOIL (OL/OH), mps 0.7 in., no structure, no odor, wet, trace wood and brick		5	5	20	45	25				
	1 1 1 1	S7 5	12.0 14.0	0.8	OL/ OH/ SM	1.0 14.0	Similar to S6		5	5	20	45	25				
15	2 1 1 2	S8 18	14.0 16.0	1.3	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers -ORGANIC DEPOSITS-						100				
	1 1 1 1	S9 10	16.0 18.0	ND	OL/ OH		Similar to S8						100				
	1 1 1 2	S10 16	18.0 20.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers						100				
20																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/23/2019	901		19.0	38.0	8.51

Sample ID

- O - Open End Rod
- T - Thin Wall Tube
- U - Undisturbed Sample
- S - Splitspoon Sample
- G - Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (ft)	38.0
Rock Cored (ft)	-
Samples	S16

Boring No. B-12

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.

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	1 1 1 1	S11 24	20.0 22.0	ND	OL/OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
	1 1 1 1	S12 24	22.0 24.0	ND	OL/OH		Similar to S11						100				
25	WOH/6" 1 1 1	S13 14	24.0 26.0	ND	OL/OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				
30	WOH/6" 1 2 2	S14 16	29.0 31.0	ND	OL/OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, 30-40% peat						100				
							-ORGANIC DEPOSITS-										
						-17.9 32.9	Note: Drill action indicates change in density at 32.9.										
							-MARINE DEPOSITS-										
35	4 6 10 13	S15 9	34.0 36.0	ND	ML		Very stiff gray SILT with sand (ML), mps 0.2 in., no structure, no odor, wet, trace lean clay					15	85				
	8 15 15 17	S16 13	36.0 38.0	ND	ML		Very stiff gray SILT (ML), mps 0.1 in., no structure, no odor, wet, 10-15% lean clay					5	95				
						-23.0 38.0	BOTTOM OF EXPLORATION 38.0 FT										
							Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

TEST BORING REPORT

HALEY ALDRICH

Boring No. B-14 (OW)

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA
Client	THE HERB CHAMBERS COMPANIES
Contractor	NORTHERN DRILL SERVICE, INC.

File No.	134133-004
Sheet No.	1 of 2
Start	December 27, 2019
Finish	December 27, 2019
Driller	J. Bierholm
H&A Rep.	A. Fleming
Elevation	16.5 (est.)
Datum	Boston City Base
Location	See Plan

	Casing	Sampler	Barrel
Type	HW	S	--
Inside Diameter (in.)	4.0	1 3/8	--
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

Rig Make & Model: Mobile Drill B-57, Truck
Bit Type: Roller Bit
Drill Mud: None
Casing: HW Drive to 24.0 ft
Hoist/Hammer: Winch Automatic Hammer
PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	Toughness	Plasticity	Strength
0							16.2 0.3	-BITUMINOUS CONCRETE-										
	13 10 7	S1 7	0.5 1.0	ND	SM			Medium dense black to dark gray silty SAND (SM), mps 0.6 in., no structure, no odor, moist, trace pockets of tan poorly graded sand	5	5	10	25	35	20				
	7 6 13 24	S2 3	2.0 4.0	0.6	SM			Medium dense dark gray to black silty SAND (SM), mps 0.5 in., no structure, no odor, moist	5	5	10	25	35	20				
5	22 35 18 32	S3 13	4.0 6.0	ND	SM			Very dense brown to gray brown silty SAND with gravel (SM), mps 1.2 in., no structure, no odor, moist, 25-30% brick and concrete	5	10	15	25	25	20				
	14 22 16 16	S4 12	6.0 8.0	ND	SM			Dense brown to light brown silty SAND with gravel (SM), mps 1.0 in., no structure, no odor, moist, 10-15% brick and concrete	5	10	10	30	25	20				
	6 5 6 6	S5 5	8.0 10.0	ND	SW-SM			Medium dense brown to red brown well graded SAND with silt and gravel (SW-SM), mps 0.9 in., no structure, no odor, wet -FILL-	10	10	20	30	20	10				
10	8 5 4 6	S6 3	10.0 12.0	ND	SW-SM			Loose brown to light brown well graded SAND with silt and gravel (SW-SM), mps 0.9 in., no structure, no odor, wet, trace brick specks	10	10	20	30	20	10				
	6 6 4 5	S7 5	12.0 14.0	0.4	SM			Loose tan to black silty SAND with gravel (SM), mps 0.7 in., no structure, no odor, wet, trace pockets of black organic soil	5	10	10	30	25	20				
15	8 6 6 3	S8 4	14.0 16.0	ND	SM		0.5 16.0	Medium dense black silty SAND with gravel (SM), mps 0.6 in., no structure, no odor, wet	5	10	10	30	25	20				
	1 1 1 1	S9 14	16.0 18.0	ND	OL/OH			Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, no odor, wet, trace fine sand seams -ORGANIC DEPOSITS-						100				
	1 1	S10 15	19.0 21.0	ND	OL/OH			Soft gray ORGANIC SOIL with sand (OL/OH), mps 0.1 in., no structure, no odor, wet, trace shells					15	85				
20																		

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
12/27/2019	1506		19.0	21.0	10.0
12/30/2019	0710		19.0	21.0	8.91

Sample ID
O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Splitspoon Sample
G - Geoprobe

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

Summary
Overburden (ft) 31.0
Rock Cored (ft) -
Samples S12

Boring No. B-14 (OW)

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

TEST BORING REPORT

HALEY ALDRICH

Boring No. B-14 (OW)
File No. 134133-004
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Well Diagram	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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 2																	
							-6.5 23.0	Note: Drill action indicates a change in material at 23.0 ft.										
25	10 8 7 8	S11 6	24.0 26.0	ND	SW			Medium dense gray well graded SAND with gravel (SM), mps 0.9 in., no structure, no odor, wet	10	15	20	35	20					
								-GLACIOFLUVIAL DEPOSITS-										
30	8 8 5 6	S12 7	29.0 31.0	ND	SW			Medium dense gray to tan well graded SAND with gravel (SM), mps 1.0 in., no structure, no odor, wet	10	15	20	30	20	5				
							-14.5 31.0	BOTTOM OF EXPLORATION 31.0 FT										
								Note: Observation well installed. Refer to installation report for details.										

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

Boring No. B-14 (OW)

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-15

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA
Client	THE HERB CHAMBERS COMPANIES
Contractor	NORTHERN DRILL SERVICE, INC.

File No.	134133-004
Sheet No.	1 of 2
Start	January 2, 2020
Finish	January 2, 2020
Driller	J. Bierholm
H&A Rep.	A. Fleming
Elevation	16.0 (est.)
Datum	Boston City Base
Location	See Plan

	Casing	Sampler	Barrel
Type	HW	S	--
Inside Diameter (in.)	4.0	1 3/8	--
Hammer Weight (lb)	300	140	-
Hammer Fall (in.)	24	30	-

Drilling Equipment and Procedures

- Rig Make & Model: Mobile Drill B-57, Truck
- Bit Type: Roller Bit
- Drill Mud: None
- Casing: HW Drive to 34.0 ft
- Hoist/Hammer: Winch Automatic Hammer
- PID Make & Model: MiniRAE 3000 10.6 eV

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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						15.8 0.2	-BITUMINOUS CONCRETE-										
	15 26 7	S1 6	0.5 2.0	ND	SM		Dense gray brown to tan silty SAND with gravel (SM), mps 0.4 in., no structure, no odor, moist, trace pockets of fine sand	5	10	10	30	25	20				
	8 6 5 8	S2 9	2.0 4.0	ND	SM		Medium dense brown to light gray silty SAND (SM), mps 0.4 in., no structure, no odor, moist, 10-15% pockets of organic soil	5	5	10	25	40	15				
5	22 28 32 27	S3 5	4.0 6.0	ND	SM		Similar to S2	5	5	10	25	40	15				
	38 23 16 11	S4 2	6.0 8.0	ND	SM		Dense gray brown to gray silty SAND with gravel (SM), mps 0.6 in., no structure, no odor, wet, trace brick, trace pockets of organic soil	5	10	15	30	25	15				
	5 5 2 2	S5 6	8.0 10.0	ND	SM		Similar to S4, except loose -FILL-	5	10	15	30	25	15				
10	10 3 3 1	S6 3	10.0 12.0	ND	SM		Loose gray brown to brown silty SAND (SM), mps 0.6 in., no structure, no odor, wet	5	5	10	30	35	15				
	3 3 3 5	S7 6	12.0 14.0	ND	SP		Loose gray poorly graded SAND (SP), mps 0.3 in., no structure, no odor, wet		5	5	15	70	5				
15	6 10 10 7	S8 12	14.0 16.0	ND	SP		Medium dense gray poorly graded SAND (SP), mps 0.5 in., no structure, no odor, wet, trace brick specks	5	5	10	20	55	5				
	8 8 10 7	S9 16	16.0 18.0	ND	SP	0.0 16.0	Medium dense gray poorly graded SAND (SP), mps 0.4 in., no structure, no odor, wet -MARINE DEPOSITS-		5	5	20	65	5				
	7 5 4 3	S10 6	18.0 20.0	ND	SP		Loose gray poorly graded SAND (SP), mps 0.3 in., no structure, no odor, wet, trace wood/stick		5	5	20	65	5				
20																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
1/2/2020					~7.0

Sample ID

- O - Open End Rod
- T - Thin Wall Tube
- U - Undisturbed Sample
- S - Splitspoon Sample
- G - Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (ft)	36.0
Rock Cored (ft)	-
Samples	S17

Boring No. B-15

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.

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-15
File No. 134133-004
Sheet No. 2 of 2

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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 2 1 1	S11 5	20.0 22.0	ND	SP		Very loose gray poorly graded SAND (SP), mps 0.5 in., no structure, no odor, wet		5	5	20	65	5				
	4 3 1 3	S12 10	22.0 24.0	ND	SP		Similar to S11		5	5	20	65	5				
25	9 5 4 3	S13 5	24.0 26.0	ND	SP		Loose gray poorly graded SAND (SP), mps 0.9 in., no structure, no odor, wet	5	5	5	20	60	5				
	6 4 4 3	S14 5	26.0 28.0	ND	SP		Similar to S13	5	5	5	20	60	5				
	5 4 3 2	S15 5	28.0 30.0	ND	SM	-12.0 28.0	Loose gray silty SAND with gravel (SM), mps 0.9 in., no structure, no odor, wet	10	15	15	25	15	20				
30	2 3 3 2	S16 6	30.0 32.0	ND	SM		Loose gray silty SAND with gravel (SM), mps 1.0 in., no structure, no odor, wet	10	15	15	25	15	20				
							-GLACIOFLUVIAL DEPOSITS-										
35	12 8 9 10	S17 5	34.0 36.0	ND	SM		Medium dense gray to olive brown silty SAND with gravel (SM), mps 1.0 in., no structure, no odor, wet	10	15	15	30	15	15				
						-20.0 36.0	BOTTOM OF EXPLORATION 36.0 FT										
							Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

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

Boring No. B-15

HALEY ALDRICH

TEST BORING REPORT

Boring No. B-16

Project	HERB CHAMBERS HONDA, 720 MORRISSEY BOULEVARD, DORCHESTER, MA	File No.	134133-004
Client	THE HERB CHAMBERS COMPANIES	Sheet No.	1 of 3
Contractor	NORTHERN DRILL SERVICE, INC.	Start	December 30, 2019
		Finish	December 30, 2019
		Driller	J. Bierholm
		H&A Rep.	A. Fleming

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	HW	S	--	Rig Make & Model: Mobile Drill B-57, Truck
Inside Diameter (in.)	4.0	1 3/8	--	Bit Type: Roller Bit; Drill Mud: None
Hammer Weight (lb)	300	140	-	Casing: HW Drive to 19.0 ft; Hoist/Hammer: Winch Automatic Hammer
Hammer Fall (in.)	24	30	-	PID Make & Model: MiniRAE 3000 10.6 eV

Elevation	15.5 (est.)
Datum	Boston City Base
Location	See Plan

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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						15.2 0.3	-BITUMINOUS CONCRETE-										
	14 10 9	S1 9	0.5 2.0		SM		Medium dense brown to gray brown silty SAND with gravel (SM), mps 0.7 in., no structure, no odor, moist, trace pockets of fine sand	5	10	10	35	20	20				
	14 14 17 9	S2 8	2.0 4.0		SM		Dense gray brown silty SAND with gravel (SM), mps 0.5 in., no structure, no odor, moist	5	10	10	35	20	20				
5	8 6 6 4	S3 7	4.0 6.0		SM		Medium dense dark brown to gray brown silty SAND with gravel (SM), mps 1.3 in., no structure, no odor, moist	5	10	10	30	25	20				
	5 5 3 2	S4 4	6.0 8.0		SM		Loose dark brown to gray brown silty SAND with gravel (SM), mps 1.0 in., no structure, no odor, moist -FILL-	10	10	15	30	15	20				
	3 1 1 1	S5 8	8.0 10.0	ND	SM		Very loose gray to black silty SAND (SM) intermixed with ash and cinders, mps 0.8 in., no structure, no odor, wet, trace glass		10	10	30	30	20				
10	1 1 1 2	S6 6	10.0 12.0	8.6	SM		Very loose gray to black silty SAND (SM) intermixed with ash and cinders, mps 0.8 in., no structure, faint petroleum odor, wet, slight sheen, trace wood		10	15	35	20	20				
	3 1 1 1	S7 10	12.0 14.0	0.4	PT	3.3 12.2	Similar to S6 Very soft gray brown to brown PEAT (PT), mps 0.1 in., no structure, strong organic odor, wet						100				
15	2 1 1 1	S8 12	14.0 16.0	ND	OL/ OH		Very soft gray to gray brown ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, peat fibers throughout						100				
	2 2 1 2	S9 11	16.0 34.0	ND	OL/ OH		Soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace peat fibers -ORGANIC DEPOSITS-						100				
20	WOH/6" 1	S10 2	19.0 21.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells						100				

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth (ft) to: Bottom of Casing	Bottom of Hole	Water
		Not Measured			

Sample ID

O - Open End Rod
T - Thin Wall Tube
U - Undisturbed Sample
S - Splitspoon Sample
G - Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (ft)	66.0
Rock Cored (ft)	-
Samples	S20

Boring No. B-16

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.

TEST BORING REPORT

HALEY ALDRICH

Boring No. B-16
File No. 134133-004
Sheet No. 2 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	1 1																
25	1 1 1 1	S11 13	24.0 26.0	ND	OL/ OH		Similar to S10						100				
30	WOH/6" 1 1	S12 24	29.0 31.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells and peat fibers						100				
35	WOH/6" WOH/6" 1/12"	S13 21	34.0 36.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells -ORGANIC DEPOSITS-						100				
40	1 1 1 1	S14 20	39.0 41.0	ND	OL/ OH		Very soft gray ORGANIC SOIL (OL/OH), mps 0.1 in., no structure, organic odor, wet, trace shells					5	95				
45	1 1 1 3	S15 9	44.0 46.0	ND	CL	-28.5 44.0	Very soft gray lean CLAY (CL), mps 0.1 in., no structure, no odor, wet, trace silt						100	S	M	H	
	3 3 3 3	S16 22	46.0 48.0	ND	CL		Medium stiff gray LEAN CLAY (CL), mps 0.1 in., no structure, no odor, wet, trace silt -MARINE DEPOSITS-						100	S	M	H	
	WOH/6"	S17	49.0	ND	CL		Very soft gray lean CLAY (CL), mps 0.1 in., no structure, no odor,						100	S	M	H	

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

Boring No. B-16

HALEY ALDRICH

TEST BORING REPORT

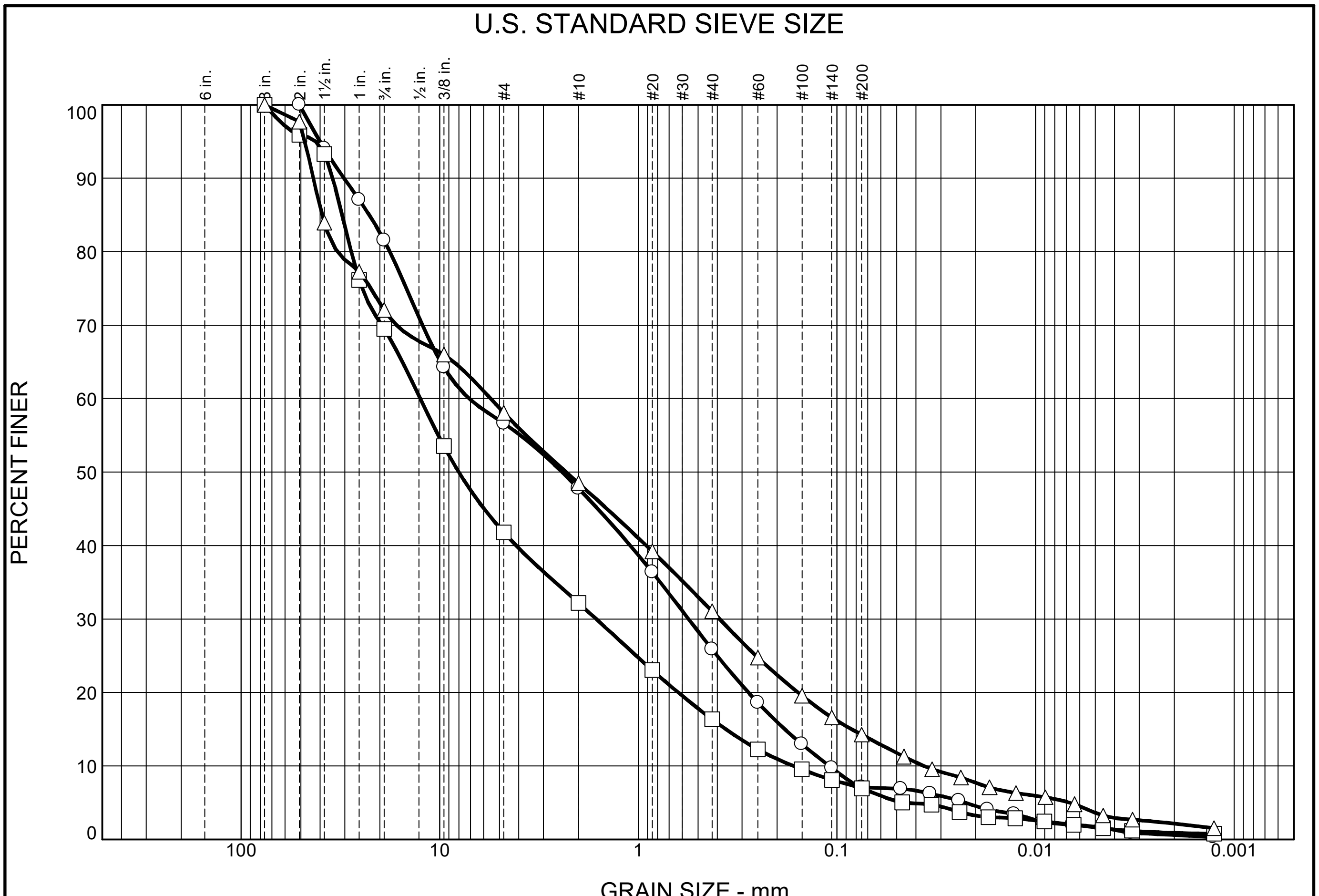
Boring No. B-16
File No. 134133-004
Sheet No. 3 of 3

Depth (ft)	Sampler Blows per 6 in.	Sample No. & Rec. (in.)	Sample Depth (ft)	PID Readings (ppm)	USCS Symbol	Stratum Change Elev/Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION (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	1 1 2	24	51.0				wet, trace silt										
55	WOH/6" 2 2 2	S18 22	54.0 56.0	ND	CL		Soft gray lean CLAY (CL), mps 0.1 in., no structure, no odor, wet, trace fine sand seams						100	S	M	H	
							-MARINE DEPOSITS-										
60	3 5 6 11	S19 23	59.0 61.0	ND	CL		Stiff gray lean CLAY (CL), mps 0.1 in., no structure, no odor, wet, 15-20% silt, trace fine sand layers						100	S	M	H	
65	8 12 14 13	S20 6	64.0 66.0	ND	SM	-48.5 64.0	Medium dense gray silty SAND with gravel (SM), mps 0.8 in., no structure, no odor, wet -GLACIOFLUVIAL DEPOSITS-	10	10	15	30	20	15				
						-50.5 66.0	BOTTOM OF EXPLORATION 66.0 FT Note: Backfilled with cuttings to approximately 10 ft below ground surface, and backfilled with pea gravel to ground surface. Patched borehole with cold patch.										

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

APPENDIX B

Grain Size Test Results



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	18.5	24.9	8.8	21.9	18.8	6.5	0.6
□	0.0	30.5	27.7	9.6	15.8	9.5	6.0	0.9
△	0.0	27.9	14.0	9.6	17.4	16.8	12.2	2.1

	Expl. No.	Sample No.	Depth (ft)	Atterberg Limits % W_L	W_P	I_P	Water Content (%)	C_u	C_c	USCS
○	B-9		4.0-8.0				27.1	64.82	0.40	SP-SM
□	B-14		4.0-8.0				12.8	75.39	1.28	GW-GM
△	B-16		4.0-8.0				19.0	150.96	0.75	SM

	Sample Description
○	Dark gray poorly graded sand with silt and gravel
□	Brown well-graded gravel with silt and sand
△	Brown silty sand with gravel

Remarks:

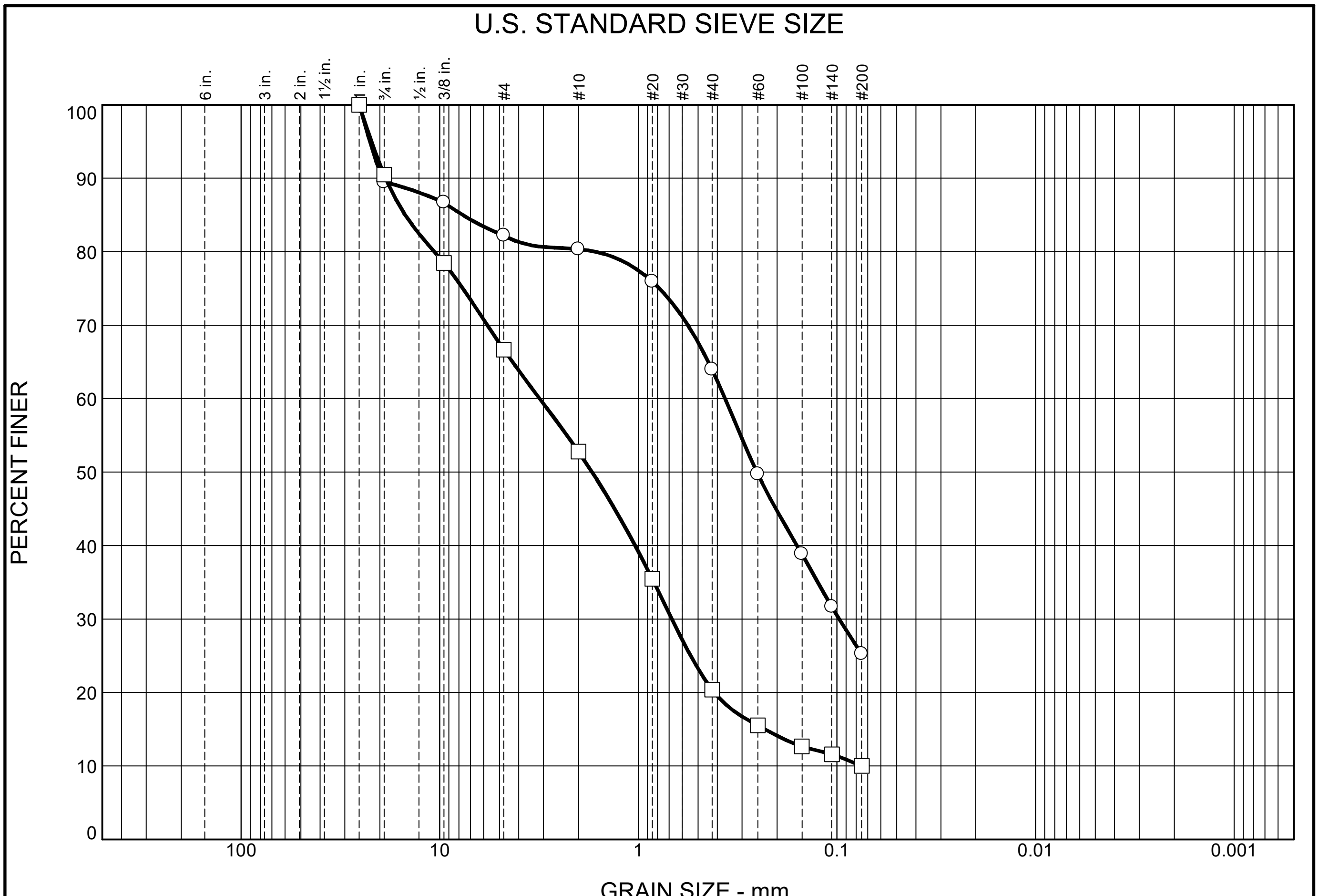
HALEY ALDRICH

Herb Chambers Honda
720 Morrissey Boulevard
Dorchester, Massachusetts

GRAIN SIZE DISTRIBUTION

DATE: 1/14/2020

FILE NO: 134133-004



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	10.5	7.3	1.9	16.3	38.7	25.3	
□	0.0	9.5	23.8	13.9	32.4	10.4	10.0	

	Expl. No.	Sample No.	Depth (ft)	Atterberg Limits % W_L	W_P	I_P	Water Content (%)	C_u	C_c	USCS
○	B-3	S13	34.0-36.0				20.6			SM
□	B-3	S14	39.0-41.0				11.2	41.60	1.94	SW-SM

Sample Description

○ Gray silty sand with gravel

□ Gray well-graded sand with silt and gravel

Remarks:

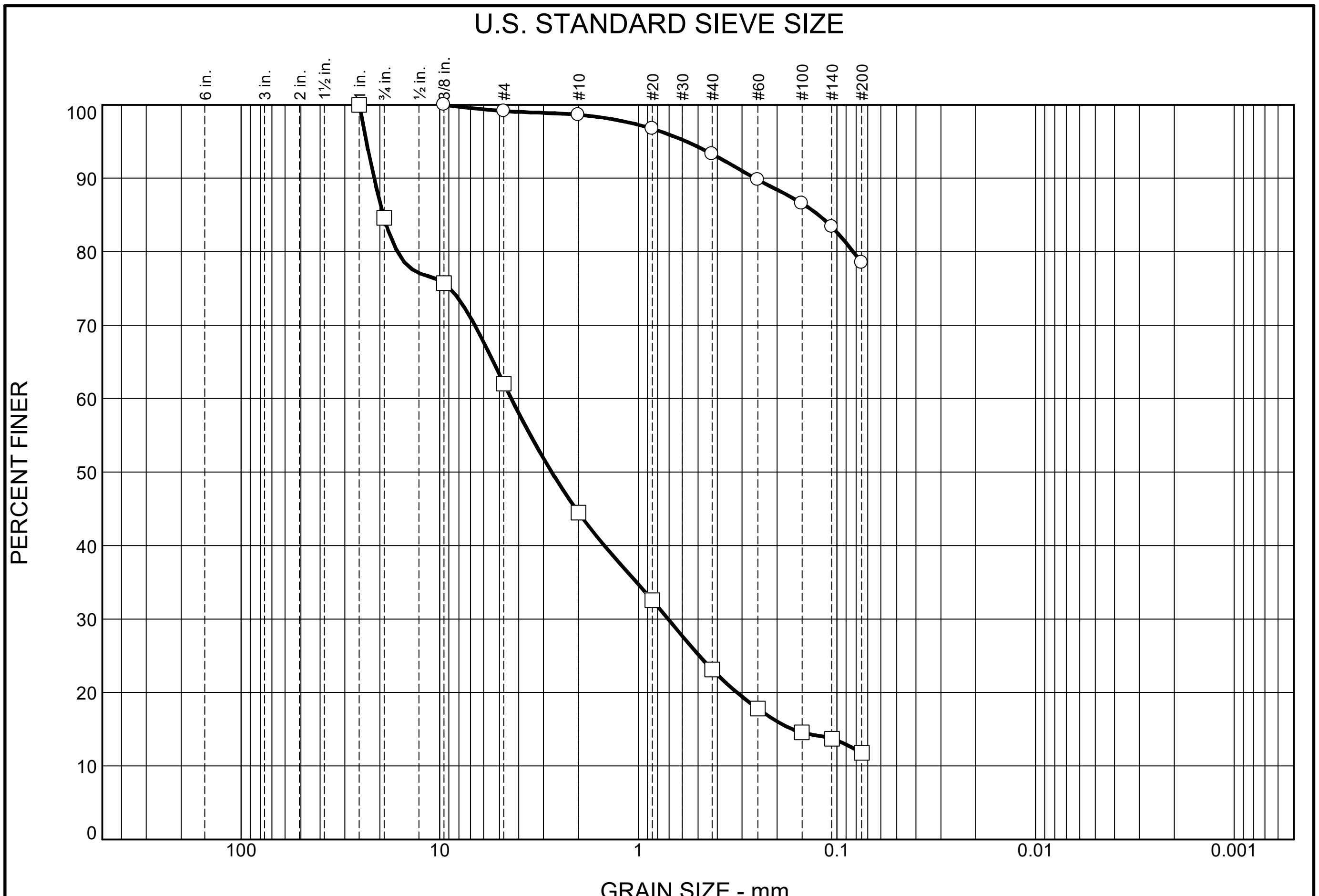
Herb Chambers Honda
720 Morrissey Boulevard
Dorchester, Massachusetts

HALEY ALDRICH

GRAIN SIZE DISTRIBUTION

DATE: 1/21/2020

FILE NO: 134133-004



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.8	0.6	5.3	14.8	78.5	
□	0.0	15.4	22.6	17.5	21.4	11.3	11.8	

	Expl. No.	Sample No.	Depth (ft)	Atterberg Limits % W_L	W_P	I_P	Water Content (%)	C_u	C_c	USCS
○	B-5	S14	39.0-41.0				20.6			ML
□	B-5	S15	44.0-46.0				10.7			SP-SM

	Sample Description
○	Olive gray silt with sand
□	Olive gray poorly graded sand with silt and gravel

Remarks:

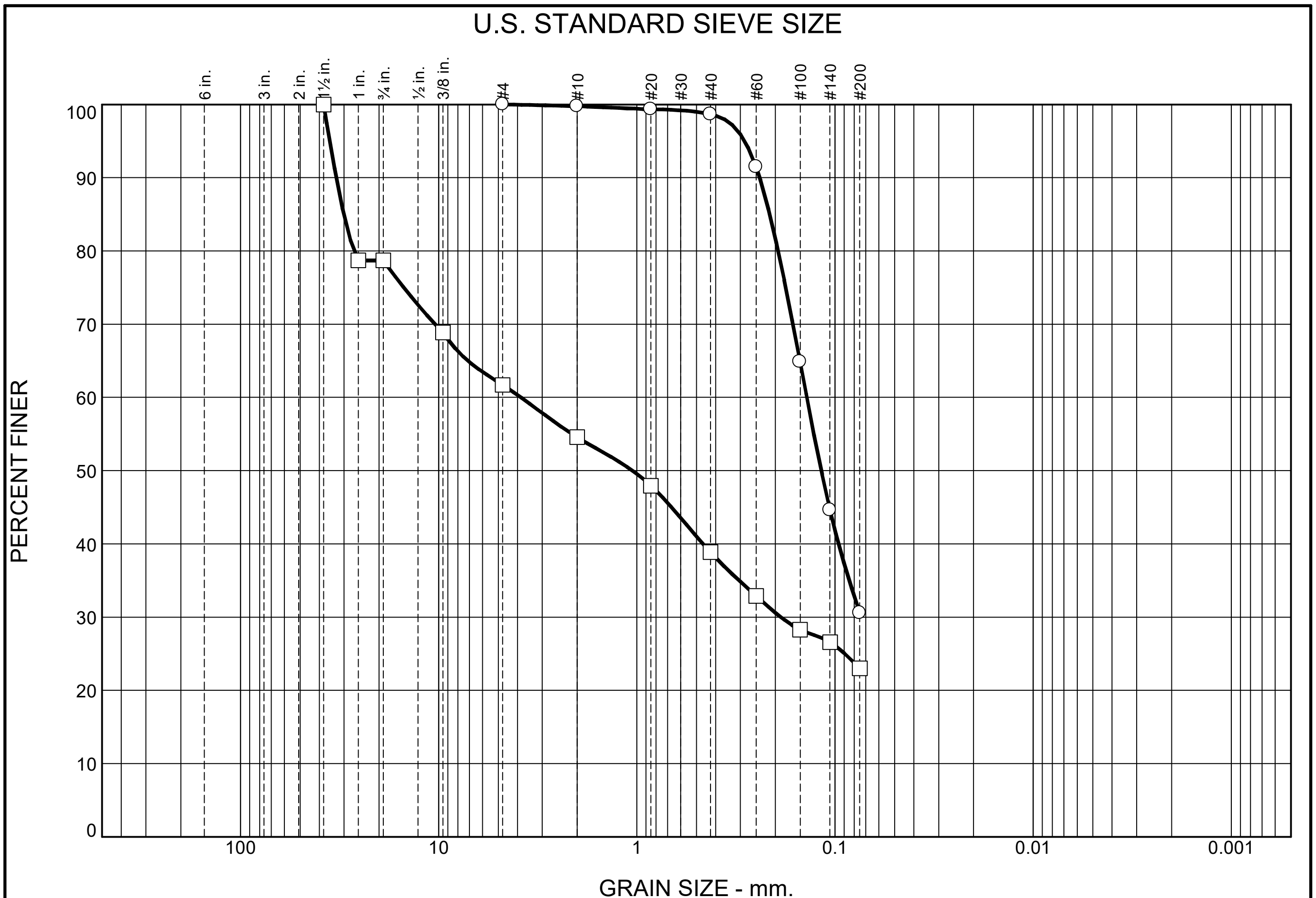
HALEY ALDRICH

Herb Chambers Honda
720 Morrissey Boulevard
Dorchester, Massachusetts

GRAIN SIZE DISTRIBUTION

DATE: 1/21/2020

FILE NO: 134133-004



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	1.1	68.1	30.6	
□	0.0	21.3	17.0	7.1	15.7	15.9	23.0	

	Expl. No.	Sample No.	Depth (ft)	Atterberg Limits %			Water Content (%)	C_u	C_c	USCS
				W_L	W_P	I_P				
○	B-8	S20	39.0-41.0				20.0			SM
□	B-8	S21	41.0-43.0				15.7			SM

	Sample Description
○	Gray silty sand
□	Gray silty sand with gravel

Remarks:

HALEY ALDRICH

Herb Chambers Honda
720 Morrissey Boulevard
Dorchester, Massachusetts

GRAIN SIZE DISTRIBUTION

DATE: 1/21/2020

FILE NO: 134133-004

CHA

Site Development Plans

for

Herb Chambers Honda of Boston

#710-720 Morrissey Blvd., Boston (Dorchester), MA

HONDA

APPLICANT:
HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BOULEVARD
GLASTONBURY, CT 06033

CHA

CIVIL ENGINEER:
CHA CONSULTING, INC.
1 FANEUIL HALL MARKETPLACE
SOUTH MARKET BUILDING
BOSTON, MA 02109

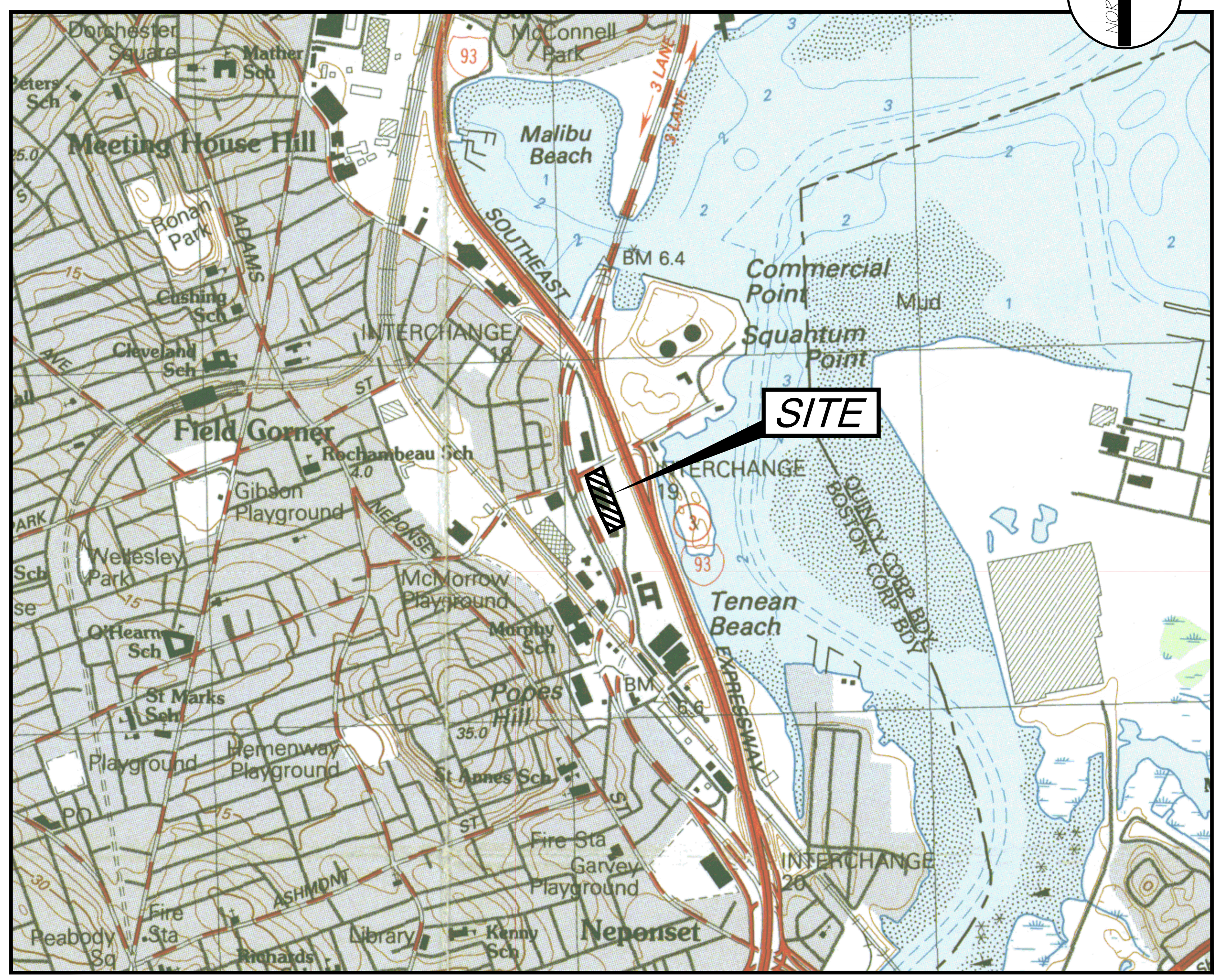
ARCHITECT:
THE CURTIS ARCHITECTURAL GROUP
36 BURRAGE ROAD
NEWTON, MA 02459

MEP ENGINEER:
CBC ENGINEERING
536 GRANITE STREET
BRAINTREE, MA 02184

LOCUS MAP

SCALE: 1" = 1000'

NORTH



DRAWING INDEX

Sheet Number	Sheet Title
C-001	TITLE SHEET
C-002	NOTES & LEGEND (SHEET 1)
C-003	NOTES & LEGEND (SHEET 2)
C-004	DEMOLITION & PHASING PLAN (PHASE 1) 20059
C-005	DEMOLITION & PHASING PLAN (PHASE 2) 20252
C-006	DEMOLITION & PHASING PLAN (PHASE 3) 20253
C-101	SITE PLAN (PHASE 1) 20059
C-102	SITE PLAN (PHASE 2) 20252
C-103	SITE PLAN (PHASE 3) 20253
C-104	OVERALL SITE PLAN
C-201	GRADING & DRAINAGE PLAN (PHASE 1) 20059
C-202	GRADING & DRAINAGE PLAN (PHASE 2) 20252
C-203	GRADING & DRAINAGE PLAN (PHASE 3) 20253
C-204	OVERALL GRADING & DRAINAGE PLAN
C-301	UTILITY PLAN (PHASE 1) 20059
C-302	UTILITY PLAN (PHASE 2) 20252
C-303	UTILITY PLAN (PHASE 3) 20253
C-304	OVERALL UTILITY PLAN
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C-602	DETAILS-2
C-603	DETAILS-3
C-604	DETAILS-4
C-605	DETAILS-5
C-606	DETAILS-6
C-607	DETAILS-7

FOR BWSC USE ONLY

BOSTON WATER & SEWER DEMOLITION INSPECTION LIST

TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
DP1-1	CATCH BASIN (STA 1+36, 118' R)		
DP1-2	CATCH BASIN (STA 1+79, 60' R)		
DP2-1	CATCH BASIN (STA 2+79, 60' R)		
DP2-2	CATCH BASIN (STA 3+32, 185' R)		
DP2-3	DRAIN MANHOLE (STA 3+65, 51'R)		
DP2-4	DRAIN MANHOLE (STA 3+68, 50'R)		
DP2-5	CATCH BASIN (STA 3+69, 61'R)		
DP2-6	CATCH BASIN (STA 3+69, 153'R)		
DP2-7	DRAIN MANHOLE (STA 4+05, 62'R)		
DP2-8	DRAIN MANHOLE (STA 4+05, 77'R)		
DP2-9	CATCH BASIN (STA 4+05, 150'R)		
DP2-10	CATCH BASIN (STA 4+75, 116'R)		
DP2-11	DRAIN SERVICE CUT & CAP (STA 3+68, 20' L)		
DP2-12	IRRIGATION WATER (STA 2+92, 167'R)		
DP3-1	OIL/GAS SEPARATOR (STA 1+82, 100' R)		
DP3-2	SEWER MANHOLE (STA 1+81, 119' R)		
DP3-3	DOMESTIC WATER CUT & CAP (STA 2+93, 71' R)		
DP3-4	FIRE SERVICE CUT & CAP (STA 2+91, 71' R)		
DP3-5	SEWER SERVICE CUT & CAP (STA 0+31, 159' R)		
DP3-6	WATER SERVICE FOR TRAILERS (STA 2+81, 71' R)		
DP3-7	SEWER SERVICE FOR TRAILER (STA 0+59, 140' R)		
DP3-8	SEWER SERVICE FOR TRAILER (STA 0+85, 128' R)		

BOSTON WATER & SEWER DRAINAGE INSPECTION LIST

TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
GD1-1	UG-1		
GD1-2	UG-2		
GD1-3	UG-3		
GD1-4	DCB-1 (2+01: 66'R)		
GD1-5	DCB-2 (1+19: 70'R)		
GD1-6	DCB-3 (1+31: 166'R)		
GD1-7	DMH-1 (2+38: 57'R)		
GD1-8	DMH-2 (2+01: 57'R)		
GD1-9	DMH-3 (1+67: 104'R)		
GD1-10	DMH-5 (1+77: 189'R)		
GD1-11	DMH-6 (0+80: 141'R)		
GD1-12	DMH-7 (0+77: 92'R)		
GD1-13	DMH-8 (0+77: 42'R)		
GD1-14	OCS-1 (0+85: 41'R)		
GD1-15	OCS-2 (0+97: 91'R)		
GD1-16	OCS-3 (0+87: 141'R)		
GD1-17	DRAIN CONNECTION (0+73: 14'L)		
GD2-1	CB-4 (4+86: 35'R)		
GD2-2	CB-5 (4+28: 35'R)		
GD2-3	CB-6 (3+39: 35'R)		
GD2-4	CB-7A (5+85: 96'R)		
GD2-5	CB-7B (5+89: 173'R)		
GD2-6	CB-8 (3+85: 212'R)		

BOSTON WATER & SEWER DRAINAGE INSPECTION LIST

TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
GD2-7	CB-9 (2+99: 213'R)		
GD2-8	CB-10A (2+82: 222'R)		
GD2-9	CB-10B (2+56: 222'R)		
GD2-10	DMH-10 (4+25: 30'R)		
GD2-11	DMH-11 (3+75: 30'R)		
GD2-12	DMH-12 (3+35: 30'R)		
GD2-13	DMH-13A (6+01: 149'R)		
GD2-14	DMH-13B (5+84: 167'R)		
GD2-15	DMH-13C (3+75: 192'R)		
GD2-16	DMH-14 (2+69: 190'R)		
GD2-17	DMH-15 (2+76: 210'R)		
GD3-1	CB-11 (2+57: 167'R)		
GD3-2	CB-12 (2+41: 108'R)		
GD3-3	CB-13 (2+60: 70'R)		
GD3-4	DCB-14 (1+99: 166'R)		
GD3-5	DMH-4 (2+01: 106'R)		
GD3-6	DMH-9 (2+31: 108'R)		
PL2-1	"DON'T DUMP" PLAQUES (9ea in PH2)		
PL3-1	"DON'T DUMP" PLAQUES (7ea in PH3)		
DT1-1	DYE TEST AT DMH-249 (3+46: 15'L)		
DT2-1	DYE TEST AT DMH-2 (2+01: 57'R)		
DT2-2	DYE TEST AT DMH-5 (1+77: 189'R)		
DT3-1	DYE TEST AT DMH-3 (1+67: 104'R)		

BOSTON WATER & SEWER UTILITIES INSPECTION LIST

TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
UT1-1	SMH-1 (1+93: 178'R)		
UT1-2	SMH-2 (0+59: 174'R)		
UT1-3	WATER TO PH2 TRAILERS (2+81, 71'R)		
UT1-4	SEWER TO PH2 TRAILER (0+59, 140'R)		
UT1-5	SEWER TO PH2 TRAILER (0+84, 125'R)		
UT2-1	SMH-3 (4+01: 179'R)		
UT2-2	OIL/GAS SEPARATOR (4+37: 179'R)		
UT2-3	FIRE CONNECTION (5+42: 4'R)		
UT2-4	WATER CONNECTION (5+40: 4'R)		
UT2-5	SMH-1 STUB CONNECTION (1+98: 178'R)		
UT3-1	SEWER CONNECTION (0+34: 178'R)		
UT3-2	SMH-2 STUB CONNECTION (0+56: 174'R)		
DT3-2	DYE TEST AT SMH-87 (0+62: 342'R)		

TASK ID LEGEND:

DP3-6
SHEET TITLE — PHASE # — SPECIFIC ID # FOR PHASE & SHEET

DP – DEMO & PHASING PLAN
GD – GRADING & DRAINAGE PLAN
UT – UTILITY PLAN
PL* – PLAQUES ("DON'T DUMP")
DT* – DYE TEST

* PLAQUES & DYE TESTS ARE LISTED IN THE TASK ID LEGEND AS "SHEET TITLES", HOWEVER, THERE IS NO SPECIFIC PLAQUE OR DYE TEST SHEET. THESE ITEMS CAN BE FOUND ON THEIR RESPECTIVE GD OR UT SHEETS.

WARD: 16
PARCEL ID: 1600251001

EXISTING BWSC ACCOUNT: #1299270
SITE PLAN NUMBERS: #20059; #20252; #20253

CHA
1 Faneuil Hall Marketplace, South Market Building
Boston, MA 02109-6117
617.451.2717 . www.chacompanies.com

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT
06033

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38991
REGISTERED PROFESSIONAL ENGINEER
6.9.21

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

TITLE SHEET

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: AS SHOWN

Drawing No.:
C-001

File: \\CHA-LLP.COM\PROJ\PROJECTS\ANY\K5\059051.000\CADD_ACAD\59051_C-001 TITLE SHEET.DWG Saved: 6/9/2021 8:52:21 AM Plotted: 6/9/2021 1:14:10 PM Current User: Taylor, Megan LastSavedBy: 6431

SURVEY NOTES:

GENERAL NOTES:

1. THE EXISTING CONDITIONS INFORMATION SHOWN HEREON IS THE RESULT OF AN ON-THE-GROUND SURVEY PERFORMED BY CHA CONSULTING, INC. IN OCTOBER OF 2018.

2. ALL DEED REFERENCES ARE TO SUFFOLK COUNTY REGISTRY OF DEEDS UNLESS OTHERWISE NOTED.

3. LOCUS OWNER OF RECORD:

   BLOOMRICH REALTY 1990 TRUST (HENRY BLOOM & MARK J LEVINSON TRUSTEES)
   DEED BOOK 16376 PAGE 102
   PARCEL ID 1600251001

4. TOPOGRAPHY, CONTOURS AND BENCHMARKS ARE BASED ON THE BOSTON CITY VERTICAL DATUM (BCB). TEMPORARY BENCHMARKS, REFERENCED TO THE DATUM ARE INDICATED ON THE SURVEY.

   IN THE EVENT THAT BENCHMARKS (TBM'S), ESTABLISHED FOR THIS PROJECT AND PUBLISHED ON THIS SURVEY ARE DESTROYED, NOT RECOVERABLE OR A DISCREPANCY IS FOUND, THE USER SHOULD NOTIFY THIS FIRM IN WRITING PRIOR TO COMMENCING OR CONTINUING ANY WORK.

5. THE PROJECT AREA IS PARTIALLY LOCATED IN FLOOD ZONE "AE" (EL. 16.5'), BASE FLOOD ELEVATIONS DETERMINED, AND PARTIALLY LOCATED IN FLOOD ZONE "X", AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS SHOWN ON FLOOD INSURANCE RATE MAP FOR THE CITY OF BOSTON, COMMUNITY PANEL NUMBER 25025C0091J, EFFECTIVE DATE MARCH 16, 2016.

6. THE LOCUS PARCEL IS LOCATED IN THE CITY OF BOSTON, DORCHESTER NEIGHBORHOOD DISTRICT AND COMMUNITY COMMERCIAL SUBDISTRICT AND IS PARTIALLY LOCATED IN THE FLOOD HAZARD OVERLAY DISTRICT & GREENBELT PROTECTION OVERLAY DISTRICT AS DEFINED BY THE CITY OF BOSTON ZONING MAP #5C.
   MINIMUM SETBACK REQUIREMENTS ARE:

   FRONT SETBACK:.................N/A
   SIDE SETBACK:....................N/A
   REAR SETBACK:.....................20'

7. LOCATION OF SUBSURFACE UTILITIES SHOWN HEREON ARE APPROXIMATE AND ADDITIONAL UTILITIES MAY EXIST THAT ARE NOT SHOWN ON THIS PLAN. LOCATIONS ARE COMPILED FROM UTILITY PLANS OF RECORD AND DIG-SAFE FIELD MARKINGS. RIM AND INVERT INFORMATION HAS BEEN COMPILED AND FIELD VERIFIED WHERE POSSIBLE. THIS INFORMATION IS NOT TO BE USED FOR CONSTRUCTION. PRIOR TO ANY CONSTRUCTION, CONTACT DIG-SAFE (1-800-344-7233) TO FIELD VERIFY LOCATION OF ALL UTILITIES.

8. PLAN REFERENCES:

   - PLAN BOOK 7975, PAGE 580
   - PLAN BOOK 7219, PAGE 369
   - MA STATE HIGHWAY LAYOUT 4309
   - MASSACHUSETTS WATER RESOURCES AUTHORITY: CSO TREATMENT FACILITIES UPGRADES, COMMERCIAL POINT CHEMICAL BUILDING EXISTING CONDITIONS PLAN, DRAWING NO. CP C-2, PAGE 14 OF 127, PREPARED BY JUDITH NITSCH ENGINEERING INC., DATED JULY 1999, RECEIVED FROM THE MASSACHUSETTS WATER RESOURCES AUTHORITY.
   - COMMONWEALTH OF MASSACHUSETTS METROPOLITAN DISTRICT COMMISSION "EXISTING RIGHT OF WAY PLAN" PREPARED BY VANASSE HANGEN BRUSTLIN, INC. DATED OCTOBER 4, 1994 (UNRECORDED).

LEGEND - EXISTING

	BUILDING LINE
	PARCEL BOUNDARY LINE
	EASEMENT LINE
	ADJOINING PARCEL LINE
	INTERIOR PARCEL LINE
	EDGE OF ASPHALT
	EDGE OF CONCRETE
	MAJOR CONTOUR LINE
	MINOR CONTOUR LINE
X	FENCE LINE
S	SEWER LINE
D	DRAIN LINE
W	WATER LINE
G	GAS LINE
	TREE LINE
	TRAFFIC FLOW ARROW
DRAIN	FLOOR DRAIN
CB	ROUND CATCH BASIN
CB	SQUARE CATCH BASIN
MHST	STORM MANHOLE
TREE	DECIDUOUS TREE
MH	MANHOLE
MHE	ELECTRIC MANHOLE
EHH	ELECTRIC HAND HOLE
EB	ELECTRIC BOX
	SINGLE POST SIGN
BOL	BOLLARD
MW	MONITORING WELL
POST	POST
IP	IRON PIPE
ICV	IRRIGATION CONTROL VALVE
WSO	WATER SHUT OFF
WV	WATER VALVE
HYD	HYDRANT
GSO	GAS SHUT OFF
GV	GAS VALVE
GAS MTR	GAS METER
MHSA	SEWER MANHOLE
CO	CLEAN OUT
VENT	VENT
	UTILITY POLE
GUY POLE	GUY POLE
	LIGHT POLE
	GUY WIRE
FP	FLAG POLE
PM	PARKING METER

FOR BWSC USE ONLY

SWPPP NOTES

1. CONTRACTOR TO ABIDE BY PROVISIONS OF THE LONG TERM POLLUTION PREVENTION AND OPERATION & MAINTENANCE DOCUMENTS PREPARED FOR THE PROJECT SITE. CONTRACTOR TO USE EPA NPDES CONSTRUCTION PHASE NOTICE REQUIREMENTS AS A MINIMUM STANDARD FOR EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES.
2. EROSION CONTROL MEASURES SHALL BE INCORPORATED IN THE SEQUENCE OF CONSTRUCTION TO PREVENT SEDIMENT-LADEN WATER FROM LEAVING THE SITE. THESE MEASURES MAY INCLUDE STAKED STRAW BALES, FILTER SOCK, POLYPROPYLENE SILT FENCING AND VARIOUS COMBINATIONS OF THE THREE. THE LOCATION FOR THE INSTALLATION OF THESE MATERIALS ON THE PROJECT SITE ARE INDICATED ON THE PROJECT PLANS AND APPROPRIATE CONSTRUCTION DETAILS ARE INCLUDED ON THE PROJECT DETAIL SHEETS.
3. NATURAL VEGETATION SHALL BE RETAINED WHENEVER FEASIBLE UP TO THE SCHEDULED START OF CONSTRUCTION ACTIVITY.
4. AREAS SUBJECT TO EROSION SHALL BE MINIMIZED IN TERMS OF TIME AND AREA.
5. IN GENERAL, WORK REQUIRING EROSION CONTROL INCLUDES EXCAVATIONS, FILLS, DRAINAGE SWALES, ROUGH AND FINISHED GRADING, AND STOCKPILING OF EARTH.
6. ALL TEMPORARY STOCKPILE AREAS SHALL HAVE EROSION CONTROLS (STRAW AND SILT FENCE) AROUND THE PERIMETER.
7. DO NOT DISTURB VEGETATION AND TOPSOIL BEYOND THE PROPOSED LIMIT OF GRADING.
8. ALL SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE IN PLACE AND OBSERVED PRIOR TO ANY WORK STARTING ON THE PROJECT.
9. SITE ENTRY AND EXIT LOCATIONS SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAYS. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ON A PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY. WHEN WASHING IS REQUIRED TO REMOVE SEDIMENT PRIOR TO ENTRANCE TO A PUBLIC ROADWAY, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN. ALL FINES IMPOSED FOR TRACKING ONTO PUBLIC ROADS SHALL BE PAID BY THE CONTRACTOR.
10. TEMPORARY SEEDING OR OTHER METHOD OF STABILIZATION SHALL BE INITIATED WITHIN 14 DAYS OF THE LAST DISTURBANCE ON ANY AREA OF THE SITE, UNLESS ADDITIONAL CONSTRUCTION OF THE AREAS IS EXPECTED WITHIN 14 DAYS OF THE LAST DISTURBANCE.
11. INSTALL AND MAINTAIN CATCH BASIN INSERTS IN ALL EXISTING CATCH BASINS WITHIN WORK ZONE (NOT REMOVED).
12. STRAWBALES OR INSERTS (SILT SACKS OR SIMILAR) WILL BE PLACED AT EACH CATCH BASIN PROPOSED TO REMAIN TO PREVENT SEDIMENTATION FROM ENTERING THE CATCH BASIN.
13. UPON COMPLETION OF DEMOLITION, ALL AREAS NOT OTHERWISE PERMANENTLY STABILIZED SHALL BE SEEDED AND MAINTAINED UNTIL A UNIFORM COVERAGE OF 75%± MINIMUM DENSITY, AS DETERMINED BY THE OWNER'S REPRESENTATIVE, IS ACHIEVED.
14. MAINTENANCE - EROSION AND SEDIMENT CONTROLS SHALL BE REPAIRED OR REPLACED AS INSPECTION DEEMS NECESSARY OR AS DIRECTED BY THE ENGINEER OR ARCHITECT. ACCUMULATED SILT AT ANY EROSION AND SEDIMENT CONTROL DEVICE SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6", AND SHALL BE DISTRIBUTED ON-SITE IN A MANNER NOT CONTRIBUTING TO ADDITIONAL SILTATION.
15. CONTRACTOR IS RESPONSIBLE FOR REESTABLISHING ANY EROSION CONTROL DEVICE WHICH HE DISTURBS. EACH CONTRACTOR SHALL NOTIFY THE ENGINEER/ARCHITECT OF ANY DEFICIENCIES IN THE ESTABLISHED EROSION CONTROL MEASURES WHICH MAY LEAD TO UNAUTHORIZED DISCHARGE OR STORM WATER POLLUTION, SEDIMENTATION OR OTHER POLLUTANTS. UNAUTHORIZED POLLUTANTS INCLUDE, BUT ARE NOT LIMITED TO, EXCESS CONCRETE DUMPING OR CONCRETE RESIDUE, PAINTS, SOLVENTS, GREASE, FUEL, AND LUBE OIL, PESTICIDES, ANY SOLID WASTE MATERIALS.
16. ALL SIDE SLOPES SHALL BE SEEDED WITH GRASS OR INSTALL JUTE NETTING TO PREVENT EROSION. SIDE SLOPES ALONG THE PERIMETER OF THE DEVELOPED AREA SHALL BE STABILIZED IMMEDIATELY FOLLOWING CONSTRUCTION.
17. INSPECTIONS: INSPECTIONS ARE TO BE PERFORMED BY QUALIFIED PERSONNEL. DISTURBED AREAS THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR STORAGE, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE, MUST BE INSPECTED ONCE EVERY 7 DAYS OR WITHIN 24 HOURS OF A STORM EVENT OF 0.25 INCHES OR GREATER. STABILIZED AREAS ARE TO BE INSPECTED ONCE PER MONTH DISTURBED AREAS AND STORAGE AREAS EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF OR POTENTIAL FOR POLLUTANTS ENTERING THE DRAINAGE SYSTEM. CONTROL MEASURES SHALL BE OBSERVED TO ENSURE THEY ARE WORKING PROPERLY. DISCHARGE LOCATIONS AND POINTS SHALL BE INSPECTED TO ASCERTAIN WHETHER CONTROLS ARE PREVENTING SIGNIFICANT IMPACT. BASED ON THE RESULTS OF THE ABOVE INSPECTIONS, ANY NECESSARY CHANGES TO THE PLAN WILL BE MADE WITHIN 7 DAYS OF THE INSPECTION. THE CHANGES MUST BE IMPLEMENTED IN THE FIELD BEFORE THE NEXT STORM EVEN IF PRACTICABLE, OTHERWISE WITHIN 7 DAYS PER GENERAL CONSTRUCTION PERMIT.
18. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL REMOVE ALL ACCUMULATED SILT FROM BEHIND SILTATION BARRIERS, PAVEMENT AREAS, AND CATCH BASIN SUMPS. DISPOSE OF SILT IN ACCORDANCE WITH THE SWPPP DOCUMENTS.
19. PROVIDE TEMPORARY SEDIMENTATION BASINS, BALES, ETC. AS NECESSARY.
20. STOCKPILES ARE TO BE AT LEAST 100 FEET FROM WETLAND AREAS. STOCKPILES NOT TO BE REUSED WITHIN 14 DAYS ARE TO BE STABILIZED WITH SEED OR MULCH.
21. THE CONTRACTOR SHALL HAVE A WATER TRUCK ON-SITE AT ALL TIMES AND SHALL PROVIDE TEMPORARY PLANTINGS OR OTHER COVERINGS SUCH AS WOOD CHIPS TO MINIMIZE THE AMOUNT OF DUST LEAVING THE PREMISES.
22. CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY STORMWATER MANAGEMENT MEASURES FOR THE DURATION OF CONSTRUCTION.
23. CONTRACTOR TO PROVIDE AND MAINTAIN TEMPORARY DEWATERING MEASURES TO ALLOW FOR EXCAVATION AND INSTALLATION OF UNDERGROUND UTILITIES AND STRUCTURES. CONVEY WATER TO TEMPORARY SEDIMENT CONTROL/DEWATERING AREAS. NO UNTREATED WATER SHALL BE DISCHARGED DIRECTLY TO THE STORMWATER DRAINAGE SYSTEM OR TOWARDS RESOURCE AREAS.
24. CONTRACTOR IS REQUIRED TO PROVIDE STREET SWEEPING TO CONTINUALLY MAINTAIN PAVEMENT AREAS FREE OF DIRT, DEBRIS, TRASH, ETC.

SITE WORK

1. CAUTION - NOTICE TO CONTRACTOR

   THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON DESIGN PLANS AND LIMITED AS-BUILT INFORMATION. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS (EXCLUSIVE OF SATURDAYS, SUNDAYS, AND LEGAL HOLIDAYS) PRIOR TO ANY EXCAVATION, DEMOLITION, BORING, OR OTHER EARTH MOVING OPERATIONS TO REQUEST EXACT FIELD LOCATIONS OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS AT NO ADDITIONAL EXPENSE TO OWNER.

2. FILL MATERIAL

A. ENSURE THAT AREAS TO BE FILLED ARE FREE OF STANDING WATER, FROST, FROZEN MATERIAL, TRASH, AND DEBRIS PRIOR TO FILL PLACEMENT.

B. PLACE APPROPRIATE FILL MATERIAL AS DESIGNATED BY THE GEOTECHNICAL ENGINEER IN HORIZONTAL LAYERS NOT EXCEEDING EIGHT INCHES (8") IN LOOSE DEPTH AND COMPACT EACH LAYER AT OPTIMUM MOISTURE CONTENT TO THE GREATER OF:

B.1. ADJACENT UNDISTURBED SOIL, OR

B.2. 95% OF THE MAXIMUM DRY DENSITY OF THE EMBANKMENT MATERIAL AS DETERMINED BY AASHTO STANDARD METHOD T99, METHOD C.

3. FINISH GRADING

A. GRADE ALL AREAS WHERE FINISH GRADE ELEVATIONS ARE INDICATED ON DRAWINGS, OTHER THAN PAVED AREAS AND BUILDINGS, INCLUDING EXCAVATED AREAS, FILLED AND TRANSITION AREAS, AND LANDSCAPED AREAS. GRADED AREAS SHALL BE UNIFORM AND SMOOTH, FREE FROM DEBRIS, OR IRREGULAR SURFACE CHANGES. FINISHED SUBGRADE SURFACE SHALL NOT BE MORE THAN 0.10 FEET ABOVE OR BELOW ESTABLISHED SUBGRADE ELEVATIONS, AND ALL GROUND SURFACES SHALL VARY UNIFORMLY BETWEEN INDICATED ELEVATIONS. FINISH DITCHES SHALL BE GRADED TO ALLOW FOR PROPER DRAINAGE WITHOUT PONDING AND IN A MANNER THAT WILL MINIMIZE EROSION POTENTIAL

B. GRADE SURFACE TO MATCH ADJACENT GRADES AND TO PROVIDE FLOW TO SURFACE DRAINAGE STRUCTURES, OR GRADE AS DESIGNATED ON THE PLANS AFTER FILL PLACEMENT AND COMPACTION.

4. THE CONTRACTOR IS RESPONSIBLE FOR GENERAL CLEANUP OF THE PROJECT ON A DAILY BASIS AND AT THE COMPLETION OF THE PROJECT. OPEN TRENCHES, DITCHES, EXCAVATIONS, ETC. SHALL NOT BE PERMITTED TO BE LEFT OPEN OVERNIGHT. CONTRACTOR WILL BACKFILL OR UTILIZE SUITABLE STEEL PLATES FOR THE SECURING OF THE PROJECT SITE PRIOR TO CEASING WORK EACH DAY.

5. APPROPRIATE TRAFFIC CONTROL, I.E. SIGNAGE, BARRICADES, AND OTHER MEANS, WILL BE SUPPLIED BY THE CONTRACTOR IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL AGENCIES.

6. UNDER NO CIRCUMSTANCES MAY ANY UTILITY, STRUCTURE, AND/OR REPAIR BE BACKFILLED UNLESS INSPECTED AND APPROVED BY THE CITY OFFICIALS AND/OR REPRESENTATIVE. RECEIPT OF APPROVAL TO BACKFILL WILL NOT RELEASE THE CONTRACTOR FROM ANY RESPONSIBILITY OR LIABILITY FOR PERFORMANCE TESTS REQUIRED AS PART OF THIS PROJECT.

7. PROPER SHORING AND TRENCH BOXES SHALL BE UTILIZED AS REQUIRED BY LOCAL, STATE, AND FEDERAL REGULATORY AGENCIES TO PROVIDE A SAFE WORKING ENVIRONMENT. SHORING SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MASSACHUSETTS WITH EXPERIENCE IN SHORING DESIGN.

8. ALL UTILITIES DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

9. WATER

A. ALL WATER PIPING, VALVES, HYDRANTS, AND FITTINGS ETC. TO CONFORM TO LOCAL GUIDELINES OR AS DIRECTED BY THE BOSTON WATER AND SEWER COMMISSION. CONSTRUCTION OF WATER LINE TO CONFORM TO ALL LOCAL AND STATE AGENCIES HAVING JURISDICTION.

B. ALL WATER PIPE SHALL BE THICKNESS CLASS 56 DUCTILE IRON. ALL PIPES AND FITTINGS SHALL HAVE A CEMENT LINING TWICE THE THICKNESS SPECIFIED IN AWWA C104 AND SHALL HAVE A BITUMINOUS SEAL COAT APPLIES INSIDE AND OUTSIDE CONFORMING TO AWWA C104, "TYTON" OR MECHANICAL JOINTS ARE PERMITTED UNLESS OTHERWISE DIRECTED.

C. REFER TO PLUMBING PLANS FOR WATER SERVICE, FIRE PROTECTION, AND SANITARY SEWER CONNECTIONS UNLESS OTHERWISE NOTED.

10. CONTRACTOR SHALL OBTAIN APPROVAL FOR ALL TRANSFORMER LOCATIONS FROM THE FIRE DEPARTMENT AND BUILDING INSPECTOR PRIOR TO CONSTRUCTION.

GENERAL

1. PROTECTIONS

A. PROVIDE PROTECTION NECESSARY TO PREVENT DAMAGE TO EXISTING IMPROVEMENTS, TREES OR VEGETATION.

B. PROTECT IMPROVEMENTS ON ADJOINING PROPERTIES AND ON OWNER'S PROPERTY.

C. RESTORE DAMAGED IMPROVEMENTS TO ORIGINAL CONDITION AS ACCEPTABLE TO PARTIES HAVING JURISDICTION.

D. CONDUCT OPERATIONS TO ENSURE MINIMUM INTERFERENCE WITH OPERATIONS, STREETS, WALKS, AND OTHER ADJACENT FACILITIES. DO NOT CLOSE OR OBSTRUCT STREETS, WALKS, OR OTHER OCCUPIED OR USED FACILITIES WITHOUT PERMISSION FROM AUTHORITIES HAVING JURISDICTION. STREETS AND ROADWAYS SHALL BE THOROUGHLY CLEANED AND/OR SWEPT ON A DAILY BASIS OR MORE FREQUENTLY AS REQUIRED BY THE GOVERNING AUTHORITY.

2. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE BOSTON WATER AND SEWER COMMISSION SPECIFICATIONS & MASSACHUSETTS DOT SPECIFICATIONS FOR HIGHWAYS AND BRIDGES AND/OR THE APPROPRIATE LOCAL AUTHORITIES.

3. ALL SLOPES, UNLESS OTHERWISE SPECIFIED, SHALL BE LOAMED AND SEEDED FOR STABILIZATION AS SOON AS POSSIBLE TO PREVENT EROSION TOWARD RESOURCE AREAS AND BUFFERS, ABUTTING PROPERTIES, OR PUBLIC WAYS. EROSION CONTROL BLANKETS ARE REQUIRED FOR ALL 2H:1V SLOPES. SLOPES MAY NOT EXCEED 2H:1V.

4. ANY DEVIATIONS, I.E. "FIELD CHANGES" FROM THE DESIGN PLAN(S) MUST BE APPROVED BY THE DESIGN ENGINEER IN WRITING. CONTRACTOR SHOULD BE AWARE THAT LOCAL AND STATE AUTHORITIES HAVE JURISDICTION AND APPROVALS MUST BE OBTAINED FROM THE APPROPRIATE AUTHORITY PRIOR TO THE IMPLEMENTATION OF THE "FIELD CHANGE." CHA INC. ASSUMES NO LIABILITY OR RESPONSIBILITY FOR WORK ASSOCIATED WITH FIELD CHANGES COMPLETED WITHOUT REGARD TO THE "FIELD CHANGE" PROCEDURE.

5. RELOCATION OF ANY UTILITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE PROVISIONS OF THE APPROPRIATE UTILITY COMPANY AND/OR REGULATORY AGENCY.

6. * * * DIG SAFE NOTE * * * IN ACCORDANCE WITH MGL. CH. 82, SEC. 40 INCLUDING AMENDMENTS, ALL CONTRACTORS SHALL NOTIFY UTILITY COMPANIES AND GOVERNMENT AGENCIES, IN WRITING, OF THE INTENT TO EXCAVATE, BLAST, DEMOLISH, BORE, OR PERFORM OTHER EARTH MOVING OPERATIONS NO LESS THAN 72 HOURS AND NO MORE THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF SUCH WORK (EXCLUSIVE OF SATURDAYS, SUNDAYS, AND LEGAL HOLIDAYS) OR CALL "DIG SAFE" AT 1-888-DIG-SAFE.

7. ADDITIONAL BENCHMARKS TO BE SET BY CONTRACTOR PRIOR TO CONSTRUCTION TO ENSURE QUALITY WORKMANSHIP.

8. ANY STILLING AND/OR DETENTION BASINS SHOULD RECEIVE PERIODIC MAINTENANCE DURING CONSTRUCTION TO REMOVE DEPOSITED SILTS AND DEBRIS TO ENSURE PROPERTY DRAINAGE AND SETTLING OF PARTICULATE MATTER.

9. ALL MANHOLE COVERS FOR CROSS-COUNTRY LOCATIONS OR IN PUBLIC GATHERING LOCATIONS SHALL BE FITTED WITH BOLT LOCKS OR EQUIVALENT.

10. UNLESS OTHERWISE LABELED, ALL REINFORCED CONCRETE PIPE, RCP, SHALL BE CLASS III; ALL DUCTILE IRON PIPE SHALL BE CEMENT LINED CLASS 56; ALL PVC SEWER SHALL BE SDR 35; ALL HDPE PIPE TO BE HP-STORM WATER TIGHT JOINT OR APPROVED EQUAL.

CONCRETE AND REINFORCING STEEL NOTES

1. GENERAL

   - ALL STRUCTURAL DRAWINGS ARE TO BE USED WITH THE ENTIRE SET OF DRAWINGS.
   - ALL SAFETY REGULATIONS ARE TO BE STRICTLY FOLLOWED. METHODS OF CONSTRUCTION AND ERECTION OF STRUCTURAL MATERIALS IS THE CONTRACTOR'S RESPONSIBILITY.
   - THE CONTRACTOR IS RESPONSIBLE FOR DISSEMINATION OF ALL REVISIONS AND REQUIREMENTS TO THE SUBCONTRACTORS.
   - REASONABLE CARE HAS BEEN TAKEN IN THE PREPARATION OF ALL DRAWINGS AND SPECIFICATIONS. HOWEVER THE ENGINEER DOES NOT GUARANTEE AGAINST HUMAN ERROR AND FOR THAT REASON IT IS IMPERATIVE THAT THE CONTRACTOR SHALL CHECK ALL DIMENSIONS AND DETAILS AND MUST VERIFY ALL CONDITIONS AND DIMENSIONS AT THE SITE. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING.
   - PRESUMED ALLOWABLE SOIL BEARING CAPACITY IS 4000 PSF. VERIFY IN THE FIELD PRIOR TO THE START OF CONSTRUCTION.

2. CODE CONFORMANCE TO COMPLY WITH THE LATEST RECOMMENDATIONS OF THESE STANDARDS.

   - ACI 301- "STRUCTURAL CONCRETE FOR BUILDINGS"
   - ACI 315- "DETAILING CONCRETE WORK"
   - ACI 318- "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"
   - ACI 322- "BUILDING CODE REQUIREMENTS FOR STRUCTURAL PLAIN CONCRETE"
   - ACI 347- "FORM WORK"

3. MATERIALS :

   a. CONCRETE:
   - APPROVED, READY MIXED CONCRETE HAVING AN MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3,500 PSI AT 28 DAYS WITH 3/4" AGGREGATE MIX., SLUMP 3-5 INCHES UNLESS OTHERWISE NOTED.
   - PROVIDE AIR-ENTRAINMENT ADMIXTURE TO AID THE FREEZE/THAW RESISTANCE OF ALL EXPOSED CONCRETE.

   b. REINFORCING STEEL:
   - ASTM A615 GRADE 60 DEFORMED BARS. ASTM A185 WELDED WIRE FABRIC

   c. FORM WORK:
   - SMOOTH PLYWOOD FORMS FOR EXPOSED SLABS OR VERTICAL SURFACES. BOARD FORMS FOR FOOTINGS OR UNEXPOSED CONCRETE SURFACES. NO EARTH FORMS PERMITTED.

   d. GROUT:
   - NONMETALLIC, NON-SHRINK GROUT UNDER BASE PLATES OR BEARING PLATES

4. EXECUTION :

   a. CONCRETE:
   - PLACE CONCRETE ACCORDING TO THE APPROVED METHODS OF ACI 301.89. STRENGTH (f'c) OF 3500 PSI AT 28 DAYS, SLUMP 3-5 INCHES UNLESS OTHERWISE NOTED WITH MAXIMUM 3/4 INCH AGGREGATE AND MAXIMUM 6% AIR ENTERTAINMENT FOR EXTERIOR CONCRETE EXPOSED TO MOISTURE.

   b. REINFORCING STEEL:
   - PLACE REINFORCING USING STANDARD BAR SUPPORTS TO PROVIDE PROPER CLEARANCE AND PREVENT DISPLACEMENT DURING CONCRETE OPERATIONS. LAP CONTINUOUS BARS 40 DIAMETERS. PROVIDE THE FOLLOWING MINIMUM CONCRETE COVERAGE:
   - 3" CONCRETE PLACED AGAINST EARTH
   - 2" FORMED CONCRETE EXPOSED TO EARTH, WEATHER, OR WATER
   - 2" SLABS ON GRADE (MINIMUM FROM TOP)
   - 2" FRAMED SLABS (NOT EXPOSED TO WEATHER)
   - 2" FRAMED SLABS (EXPOSED TO WEATHER)
   - PLACE DEFORMED BARS IN ACCORDANCE WITH THE LATEST EDITION OF CRSI "RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS." ALL WELDED WIRE MESH SHALL CONFORM TO ASTM A185. LAP TWO SQUARES AT ALL JOINTS AND AND TIE AT 3'-0" ON CENTER. PROVIDE (2) #5 BARS EACH SIDE OF ALL OPENINGS IN WALLS AND SLABS. BARS TO EXTEND 24" BEYOND EDGE OF OPENINGS. (FOR SIZE AND LOCATION OF OPENINGS REFER TO ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS).
   - NO HORIZONTAL CONSTRUCTION JOINTS ARE ALLOWED UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS OR ALLOWED IN WRITING BY THE ENGINEER.
   - ALL GROUT FOR BASE PLATES SHALL BE NON-SHRINK AND NON-METALLIC WITH A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI.

REINFORCING BAR	EMBEDMENT LENGTH	STANDARD HOOK
#4	12"	12"
#5	12"	12"
#6	12"	12"
#7	16"	16"
#8	20"	20"

   c. FORM WORK :
   - PROPERLY BRACE AND SHORE FORM WORK TO MAINTAIN ALIGNMENT AND TOLERANCES IN ACCORDANCE TO ACI 347.
   - DETAILS NOT SHOWN IN DRAWINGS SHALL BE IN ACCORDANCE WITH ACI DETAILING MANUAL (ACI 315).

5. QUALITY CONTROL:

   - CONTRACTOR SHALL MAKE PROVISIONS TO HAVE FOUR CYLINDERS CAST FOR EACH (50) CUBIC FEET OF CONCRETE POURED OR FOR ANY ONE DAY OPERATION.
   - TESTING LABORATORY SHALL BE RESPONSIBLE FOR MAKING AND CURING SPECIMENS IN CONFORMANCE TO ASTM C31 AND TESTING SPECIMENS IN ACCORDANCE TO ASTM C39.

6. EXCAVATION & COMPACTED FILL :

   - COMPACTED FILL SHALL BE PLACED IN LEVEL, UNIFORM LIFTS NOT EXCEEDING 8 INCHES IN UNCOMPACTED THICKNESS AND BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557.
   - FILL TO CONFORM TO THE PROJECT SPECIFICATIONS FOR STRUCTURAL FILL OR AS DIRECTED BY THE ENGINEER. BACKFILL AND EXCAVATION TO BE COMPLETED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER AND STRUCTURAL ENGINEER.

7. EXPANSION, CONTRACTION, AND CONSTRUCTION JOINTS :

   - CONTRACTOR SHALL PROVIDE CONTRACTION JOINTS IN WALLS AND SLABS NOT TO EXCEED 20' (OR EQUALLY SPACED) AND EXPANSION JOINTS NOT TO EXCEED 90' (IF APPLICABLE)
   - ALL CONSTRUCTION JOINTS SHALL HAVE ROUGHENED, KEYED, AND/OR BONDING AGENT APPLIED TO THE CONCRETE LAYING SURFACES AS DIRECTED BY THE ENGINEER OR TO THE MOST STRINGENT AC1 318 STANDARDS

8. CONCRETE FINISHING:

   - ALL EXPOSED CONCRETE SHALL BE FINISHED TO PROJECT ARCHITECTURAL STANDARDS OR AS DIRECTED BY THE ENGINEER. ALL EXPOSED CORNERS SHALL BE CHAMFERED.
   - ALL VOIDS, POCKETS, AND DEFORMATIONS IN THE EXPOSED FACE OF WALL SHALL BE CORRECTED TO A SMOOTH, UNIFORM FINISH OR AS DIRECTED BY THE ENGINEER.

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OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38991
REGISTERED PROFESSIONAL ENGINEER
6-9-21

PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

NOTES & LEGEND
(SHEET 1)

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date:	Project No:	Scale:
01/31/2020	059051	NONE

Drawing No.:

C-002

GRADING NOTES

1. THE CONTRACTOR SHALL VERIFY EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE OWNER OR HIS REPRESENTATIVE.
2. EXCAVATION REQUIRED WITHIN THE PROXIMITY OF EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER.
3. PITCH EVENLY BETWEEN SPOT GRADES. GRADE ALL AREAS TO DRAIN. ALL PAVED AREAS MUST PITCH TO DRAIN AT A MINIMUM OF 1/8" PER FOOT UNLESS OTHERWISE SPECIFIED. ANY DISCREPANCIES NOT ALLOWING THIS MINIMUM PITCH SHALL BE REPORTED TO THE OWNER OR HIS REPRESENTATIVE PRIOR TO CONTINUING WORK.
4. ALL SITEWORK SHALL CONFORM TO THE CONTRACT DOCUMENTS AND SHALL COMPLY WITH APPLICABLE CODES AND REGULATIONS, AND THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARED FOR THE PROJECT.
5. DURING THE PROGRESS OF THE WORK, THE CONTRACTOR MAY BE REQUIRED TO EXCAVATE ADDITIONAL TEST PITS FOR THE PURPOSE OF LOCATING UNDERGROUND UTILITIES OR STRUCTURES AS AN AID IN ESTABLISHING THE PRECISE LOCATION OF NEW WORK. THIS WORK IS TO BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER. TEST PITS SHALL BE BACKFILLED, AS SOON AS THE DESIRED INFORMATION HAS BEEN OBTAINED.
6. PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS AND OTHER FACILITIES FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT AND OTHER HAZARDS CREATED BY CONTRACTOR OPERATIONS.
7. UNLESS DIRECTED OTHERWISE, ALL EXISTING TURF OR VEGETATED AREAS WITHIN THE PROPOSED LIMITS OF WORK FOR EXCAVATION, GRADING, OR IMPROVEMENT SHALL BE CLEARED AND GRUBBED. WITHIN THE CLEARING AND GRUBBING AREA, REMOVE ALL TREES, SHRUBS AND ROOTS UNLESS DESIGNATED OTHERWISE. CLEARING SHALL INCLUDE THE FELLING, CUTTING AND OFF-SITE DISPOSAL OF ALL TREES, SHRUBS, STUMPS AND VEGETATIVE DEBRIS PRODUCED THROUGH THE CLEARING OPERATIONS.
8. FILL DEPRESSIONS CAUSED BY TEST PITS AND CLEARING AND GRUBBING OPERATIONS WITH SATISFACTORY SOIL MATERIAL UNLESS FURTHER EXCAVATION OR EARTHWORK IS INDICATED.
9. THE CONTRACTOR SHALL PREVENT SURFACE WATER AND SUBSURFACE OR GROUNDWATER FROM FLOWING INTO EXCAVATIONS OR EARTHWORK AREAS WHICH WOULD CAUSE FLOODING OF THE PROJECT SITE AND SURROUNDING AREA, OR SOFTENING OR LOOSENING OF THE SOIL AT EXCAVATION OR EARTHWORK SUB-GRADES.
10. THE CONTRACTOR SHALL PROVIDE, INSTALL, OPERATE, MAINTAIN AND REMOVE ADEQUATE AND SATISFACTORY DEWATERING SYSTEMS AND DRAINAGE OF EXCAVATIONS TO PERMIT CONSTRUCTION TO PROCEED "IN THE DRY". THE CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR THE ADEQUACY OF THE METHODS, MATERIALS AND EQUIPMENT EMPLOYED. THE CONTRACTOR SHALL BEAR THE FULL COST OF PROVIDING ALL NECESSARY DEWATERING.
11. THE CONTRACTOR SHALL PROHIBIT SEEPAGE, GROUNDWATER FLOW OR SURFACE INFILTRATION AND RUNOFF FROM UNDERMINING OR OTHERWISE DAMAGING ADJACENT STRUCTURES AND UTILITIES.
12. ANY WATER PUMPED FROM EXCAVATIONS WILL BE CONVEYED BY HOSE TO AN UPLAND AREA AND DISCHARGED INTO TEMPORARY SEDIMENT BASINS WITH CONTROLLED DISCHARGE. DEFER TO THE "SITE WORK & PREPERATION PLAN" AND "EROSION & SEDIMENTATION CONTROL PLAN" HEREIN.
13. PAVING, CONCRETE WORK AND BASE COURSE PREPARATION SHALL BE DONE ONLY AFTER EXCAVATION AND CONSTRUCTION WORK WHICH MIGHT INJURE THEM HAS BEEN COMPLETED. DAMAGE CAUSED DURING CONSTRUCTION SHALL BE REPAIRED BEFORE ACCEPTANCE.
14. PAVEMENT OR BASE MATERIALS SHALL NOT BE PLACED ON A MUDDY OR FROZEN SUBGRADE.
15. ESTABLISHMENT OF GRADES, GRADE CONTROL, AND CONFORMANCE TO REQUIRED GRADE TOLERANCES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
16. PROTECT GRADED, FINISHED OR PAVED AREAS FROM DAMAGE AND KEEP THEM FREE OF TRASH AND DEBRIS RESULTING FROM CONSTRUCTION OPERATIONS. REPAIR AND RE-ESTABLISH GRADES IN SETTLED, ERODED AND RUTTED AREAS.
17. PAVEMENT EXCAVATED DURING UTILITY CONSTRUCTION, WHETHER ON THE SITE OR ADJACENT PROPERTIES, SHALL BE RESTORED AND MATCHED WITH EXACTLY THE SAME MATERIALS AND TOLERANCES AS PRIOR TO DISRUPTION, AT NO ADDITIONAL COST TO THE OWNER, OR ADJACENT PROPERTY OWNERS.
18. STONE USED FOR MACHINE PLACED RIP-RAP SHALL BE REASONABLY WELL GRADED, HARD, DURABLE, ANGULAR IN SHAPE, RESISTANT TO WEATHERING AND FREE FROM ORGANIC MATERIAL. ROUNDED STONES OR BOULDERS ARE NOT ACCEPTABLE. THE MINIMUM WEIGHT OF THE STONE SHALL BE 155 POUNDS PER CUBIC FOOT. STONE SHALL BE PLACED IN CONFORMANCE WITH THE LINES, GRADES AND THICKNESSES SHOWN ON THE DRAWINGS.
19. AT ALL LOCATIONS WHERE EXISTING CURBING OR PAVEMENT ABUTS NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAW CUT TO A CLEAN, SMOOTH EDGE. BLEND NEW PAVEMENT, CURBS AND EARTHWORK SMOOTHLY INTO EXISTING BY MATCHING LINES, GRADES AND JOINTS.
20. ALL RIP RAP STONE SHALL BE HAND CHINKED AND SHALL CONFORM TO MASSACHUSETTS HIGHWAY DEPARTMENT STANDARDS.

LEGEND - PROPOSED

585	MAJOR CONTOUR	(S)	SANITARY MANHOLE
586	MINOR CONTOUR	(O)	OIL/WATER SEPARATOR
W	DOMESTIC WATER		CAST IN PLACE RETAINING WALL
FP	FIRE PROTECTION		LIGHT FIXTURE
UE	UNDERGROUND ELECTRIC	TC: 45.50	TOP OF CURB ELEVATION
S	SANITARY SEWER	BC: 45.00	BOTTOM OF CURB ELEVATION
	STORM SEWER	TW: 45.50	TOP OF WALL ELEVATION
GAS	NATURAL GAS	BW: 45.00	BOTTOM OF WALL ELEVATION
x	FENCE	45.00(HP)	HIGH POINT ELEVATION
	TRENCH DRAIN	45.00(e)	EXISTING ELEVATION
IRR	IRRIGATION SLEEVE	45.00(f)	FLUSH CURB ELEVATION
	CATCH BASIN	VGC	VERTICAL GRANITE CURB
	DOUBLE CATCH BASIN	MCC	MONOLITHIC CONCRETE CURB
(D)	DRAIN MANHOLE	ECC	EXTRUDED CONCRETE CURB
	LINE VALVE	PCC	PRECAST CONCRETE CURB
	SIGN POST		

FOR BWSC USE ONLY

SEWER

ALL TESTING SHALL BE PER CITY OF BOSTON WATER AND SEWER COMMISSION SPECIFICATIONS.

1. THESE NOTES ARE INTENDED TO SUPPLEMENT THE LOCAL REQUIREMENTS FOR MATERIALS AND WORKMANSHIP.
2. WATER AND SEWER MAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST LOCAL AND STATE CODES INCLUDING THE RECOMMENDATIONS OF THE AMERICAN WATER WORKS ASSOCIATION AND THE NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION TECHNICAL REPORT 16. CONSTRUCTION SHALL PROCEED IN A WORKMANLIKE MANNER WITH STATE-OF-THE-ART CONSTRUCTION TECHNIQUES.
3. THE CONTRACTOR SHALL INSULATE WATER AND SEWER MAINS AS INDICATED ON THE PLANS OR WHEN DESIGN OR CONSTRUCTION ENCUMBRANCES DICTATE ALIGNMENT TO OCCUR ABOVE THE FROST LINE. PROCUREMENT AND INSTALLATION OF PIPE INSULATION SHALL CONFORM TO THE REQUIREMENTS LISTED IN THE LATEST MASS. DOT STANDARD SPECIFICATIONS FOR SECTION 301.60P AND MATERIAL SPECIFICATION M9.11.1. THE PIPE INSULATION SHALL BE PRE-MOLDED TYPE CELLULAR GLASS INSULATION WITH ALUMINUM JACKET CONFORMING TO THE LATEST REQUIREMENTS OF ASTM-522 OR APPROVED EQUAL.
4. THE CONTRACTOR SHALL FOLLOW ALTERNATE CONSTRUCTION PROCEDURES WHEN DESIGN OR CONSTRUCTION ENCUMBRANCES PREVENT HORIZONTAL SEPARATION OF 10 FEET OR THE ALTERNATE OF 18 INCHES OF VERTICAL SEPARATION BETWEEN WATER AND SEWER MAINS. IN AREAS WHERE THE ABOVE OFFSETS CANNOT BE MAINTAINED, THE WATER MAIN SHALL BE CONSTRUCTED WITH MEGA-LUG MECHANICAL TYPE FITTINGS OR APPROVED EQUAL FOR A DISTANCE OF 10-FEET ON EITHER SIDE OF THE CROSSING OR LATERAL ENCROACHMENT AND SHALL STRADDLE A FULL LENGTH OF CLASS 56 CEMENTED LINED DUCTILE IRON WATER PIPE.
5. THE DEFLECTION IN ALL GRAVITY SEWER PIPE SHALL BE TESTED USING A GO, NO-GO MANDREL TEST TO ENSURE THAT PROPER INSTALLATION HAS OCCURED. TEST SHALL CONFORM WITH PIPE MANUFACTURER'S RECOMMENDATIONS AND SHALL NOT INDICATE MORE THAN 7.5% DEFLECTION, U.O.N.
6. EACH SEGMENT OF THE SEWER MAIN INCLUDING MANHOLES SHALL BE LEAK TESTED AND OBSERVED BY A REPRESENTATIVE OF THE CITY AND/OR ENGINEER IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:

<u>EXFILTRATION TEST FOR NEW SEWER MAIN :</u>

1. PREPARATION OF TEST. AFTER THE MANHOLE HAD BEEN ASSEMBLED IN PLACE, ALL LIFTING HOLES AND THOSE EXTERIOR JOINTS WITHIN SIX FEET OF THE GROUND SURFACE SHALL BE FILLED AND POINTED WITH AN APPROVED NON-SHRINKING MORTAR. THE TEST SHALL BE MADE PRIOR TO PLACING THE SHELF AND INVERT AND BEFORE FILLING AND POINTING THE HORIZONTAL JOINTS BELOW THE 6- FOOT DEPTH LINE. IF THE GROUNDWATER TABLE HAS BEEN ALLOWED TO RISE ABOVE THE BOTTOM OF THE MANHOLE, IT SHALL BE LOWERED FOR THE DURATION OF THE TEST. ALL PIPES AND OTHER OPENINGS INTO THE MANHOLE SHALL BE SUITABLE PLUGGED AND PLUGS BRACED TO PREVENT BLOW OUT.
2. TEST PROCEDURE. THE MANHOLE SHALL THEN BE FILLED WITH WATER TO THE TOP OF THE CONE SECTION. IF THE EXCAVATION HAS NOT BEEN BACKFILLED AND OBSERVATION INDICATED NO VISIBLE LEAKAGE, THAT IS, NO WATER VISIBLY MOVING DOWN THE SURFACE OF THE MANHOLE, THE MANHOLE MAY BE CONSIDERED TO BE SATISFACTORILY WATERTIGHT. IF THE TEST AS DESCRIBED ABOVE IS UNSATISFACTORY AS DETERMINED BY THE ENGINEER OR IF THE MANHOLE EXCAVATION HAS BEEN BACKFILLED THE TEST SHALL BE CONTINUED. A PERIOD OF TIME MAY BE PERMITTED, IF THE CONTRACTOR WISHES, TO ALLOW FOR ABSORPTION.
3. AT THE END OF THIS PERIOD, THE MANHOLE SHALL BE REFILLED TO THE TOP OF THE CONE, IF NECESSARY, AND THE MEASURING TIME OF AT LEAST EIGHT HOURS BEGUN. AT THE END OF THE TEST PERIOD, THE MANHOLE SHALL BE REFILLED TO THE TOP OF THE CONE, MEASURING THE VOLUME OF WATER ADDED. THIS AMOUNT SHALL BE EXTRAPOLATED TO A 24-HOUR RATE AND THE LEAKAGE DETERMINED ON THE BASIS OF DEPTH. THE LEAKAGE FOR EACH MANHOLE SHALL NOT EXCEED ONE GALLON PER VERTICAL FOOT FOR A 24-HOUR PERIOD. IF THE TEST FAILS THIS REQUIREMENTS, BY THE LEAKAGE DOES NOT EXCEED THREE GALLONS PER VERTICAL FOOT PER DAY, REPAIRS BY APPROVED METHODS MAY BE MADE AS DIRECTED BY THE ENGINEER TO BRING THE LEAKAGE WITHIN THE ALLOWABLE RATE ON ONE GALLON PER VERTICAL FOOT PER DAY. LEAKAGE DUE TO A DEFECTIVE SECTION OR JOINT OF EXCEEDING THE THREE-GALLON PER VERTICAL FOOT PER DAY RATE, SHALL BE CAUSE FOR THE REJECTION OF THE MANHOLE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UNCOVER, DISASSEMBLE, RECONSTRUCT OR REPLACE THE MANHOLE AS DIRECTED BY THE ENGINEER. THE MANHOLE SHALL THEN BE RE-TESTED AND, IF SATISFACTORY, INTERIOR JOINTS SHALL BE FILLED AND POINTED.
4. BACKFILLING. THE TEST MAY BE CONDUCTED EITHER BEFORE OR AFTER BACKFILLING AROUND THE MANHOLE. HOWEVER, IF THE CONTRACTOR ELECTS TO BACKFILL PRIOR TO TESTING, IT SHALL BE AT HIS OWN RISK AND IT SHALL BE INCUMBENT UPON THE CONTRACTOR TO DETERMINE THE REASON FOR ANY FAILURE OF THE TEST. NO ADJUSTMENT IN THE LEAKAGE ALLOWANCE WILL BE MADE FOR UNKNOWN CAUSES SUCH AS LEAKING PLUGS, ABSORPTION, ETC., I.E., IT WILL BE ASSUMED THAT ALL LOSS OF WATER DURING THE TEST IS A RESULT OF LEAKS THROUGH THE JOINTS OF THROUGH THE CONCRETE. FURTHERMORE, THE CONTRACTOR SHALL TAKE ANY STEPS NECESSARY TO ASSURE THE ENGINEER THAT THE WATER TABLE IS BELOW THE BOTTOM OF THE MANHOLE THROUGHOUT THE TEST.

<u>VACUUM TEST FOR NEW SEWER MAIN :</u>

1. THE VACUUM TESTING SYSTEM SHALL BE SUPPLIED BY NPC SYSTEMS, INC. OR EQUIVALENT AS APPROVED BY THE ENGINEER. THE TESTING SHALL BE DONE IMMEDIATELY AFTER ASSEMBLY OF THE MANHOLE AND BEFORE BACKFILLING. A 60 LB-FT. TORQUE WRENCH SHALL BE USED TO TIGHTEN EXTERNAL CLAMPS THAT SECURE THE TEST COVER TO THE TOP OF THE MANHOLE. ALL LIFT HOLES SHALL BE PLUGGED WITH A NON-SHRINKING MORTAR. THE CONTRACTOR SHALL PLUG THE PIPE OPENINGS, TAKING CARE TO SECURELY BRACE THE PLUGS AND THE PIPE TO PREVENT THE PLUGS FROM BEING DRAWN INTO THE MANHOLE.
2. A VACUUM OF 10 INCHES OF MERCURY, HG (4.9 PSI), SHALL BE DRAWN AND THE VACUUM PUMP SHUT OFF. THE MANHOLE PASSES THE TEST IF THE VACUUM REMAINS GREATER THAN OR EQUAL TO 9 INCHES HG (4.4 PSI) FOR A PERIOD GREATER THAN ONE MINUTE FOR MANHOLES UP TO 10 FEET DEEP; ONE MINUTE FIFTEEN SECONDS FOR MANHOLES 10-15 FEET DEEP; AND ONE MINUTE THIRTY SECONDS FOR MANHOLES 15-25 FEET DEEP.
3. IF THE MANHOLE FAILS THE INITIAL TEST, THE CONTRACTOR SHALL LOCATE THE LEAKS AND MAKE PROPER REPAIRS. LEAKS MAY BE FILLED WITH A WET SLURRY OF ACCEPTED QUICK SETTING MATERIAL. IF THE MANHOLE FAILS THE VACUUM TEST AGAIN, ADDITIONAL REPAIRS MUST BE MADE, AND THE MANHOLE MUST BE TESTED BY EXFILTRATION AS OUTLINED IN PARAGRAPH 3.03 (A). FIELD QUALITY CONTROL

<u>LEAKAGE TEST :</u>

1. THE PIPELINES SHALL BE MADE AS NEARLY WATERTIGHT AS PRACTICABLE, AND LEAKAGE TESTS AND MEASUREMENTS SHALL BE MADE AFTER THE PIPELINE HAS BEEN BACKFILLED
2. WHERE THE GROUNDWATER LEVEL IS MORE THAN 1 FT ABOVE THE TOP OF THE PIPE AT ITS UPPER END, THE CONTRACTOR SHALL CONDUCT EITHER INFILTRATION TESTS OR LOW PRESSURE AIR TESTS.
3. WHERE THE GROUNDWATER LEVEL IS LESS THAN 1 FT. ABOVE THE TOP OF THE PIPE AT ITS UPPER END, THE CONTRACTOR SHALL CONDUCT EITHER EXFILTRATION TESTS OR LOW PRESSURE AIR TESTS.
4. AT THE TIME OF THE TEST, THE CONTRACTOR SHALL DETERMINE THE GROUNDWATER ELEVATION FROM OBSERVATION WELLS, EXCAVATIONS OR OTHER MEANS, ALL SUBJECT TO REVIEW BY THE ENGINEER.
5. FOR MAKING THE LOW PRESSURE AIR TESTS, THE CONTRACTOR SHALL USE EQUIPMENT SPECIFICALLY DESIGNED AND MANUFACTURED FOR THE PURPOSE OF TESTING SEWER PIPELINES USING LOW PRESSURE AIR. THE EQUIPMENT SHALL BE PROVIDED WITH AN AIR REGULATORY VALVE OR AIR SAFETY SO SET THAT THE INTERNAL AIR PRESSURE IN THE PIPELINE CANNOT EXCEED 8 PSIG.
6. THE LEAKAGE TEST USING LOW PRESSURE AIR SHALL BE MADE ON EACH MANHOLE-TO-MANHOLE SECTION OF PIPELINE AFTER PLACEMENT OF THE BACKFILL.
7. PNEUMATIC PLUGS SHALL HAVE A SEALING LENGTH EQUAL TO OR GREATER THAN THE DIAMETER OF THE PIPE TO BE TESTED. PNEUMATIC PLUGS SHALL RESIST INTERNAL TEST PRESSURES WITHOUT REQUIRING EXTERNAL BRACING OR BLOCKING.
8. ALL AIR USED SHALL PASS THROUGH A SINGLE CONTROL PANEL.
9. LOW PRESSURE AIR SHALL BE INTRODUCED INTO THE SEALED LINE UNTIL THE INTERNAL AIR PRESSURE REACHES 4 PSIG. GREATER THAN THE MAXIMUM PRESSURE EXERTED BY THE GROUNDWATER THAT MAY BE ABOVE THE INVERT OF THE PIPE AT THE TIME OF THE TEST. HOWEVER, THE INTERNAL AIR PRESSURE IN THE SEALED LINE SHALL NOT BE ALLOWED TO EXCEED 8 PSIG. WHEN THE MAXIMUM PRESSURE EXERTED BY THE GROUNDWATER IS GREATER THAN 4 PSIG., THE CONTRACTOR SHALL CONDUCT ONLY AN INFILTRATION TEST.
10. AT LEAST TWO MINUTES SHALL BE ALLOWED FOR THE AIR PRESSURE TO STABILIZE IN THE SECTION UNDER TEST. AFTER THE STABILIZATION PERIOD, THE LOW PRESSURE AIR SUPPLY HOSE SHALL BE QUICKLY DISCONNECTED FROM THE CONTROL PANEL. THE TIME REQUIRED IN MINUTES FOR THE PRESSURE IN THE SECTION UNDER TEST TO DECREASE FROM 3.5 TO 2.5 PSIG (GREATER THAN THE MAXIMUM PRESSURE EXERTED BY GROUNDWATER THAT MAY BE ABOVE THE INVERT OF THE PIPE) SHALL NOT BE LESS THAN THAT SHOWN IN THE FOLLOWING TABLE:

PIPE DIAMETER IN INCHES VS. MINUTES

6"	5.0 MIN. 40 SEC.
8"	7.0 MIN. 34 SEC.
10"	9.0 MIN. 26 SEC.
12"	11.0 MIN. 20 SEC.
15"	14.0 MIN. 10 SEC.
18"	17.0 MIN. 0 SEC.
21"	19.0 MIN. 50 SEC.
24"	22.0 MIN. 40 SEC.
27"	25.0 MIN. 30 SEC.

11. FOR MAKING THE INFILTRATION AND EXFILTRATION TESTS, THE CONTRACTOR SHALL FURNISH SUITABLE TEST PLUGS, WATER PUMPS, AND APPURTENANCES, AND ALL LABOR REQUIRED TO PROPERLY CONDUCT THE TESTS ON SECTIONS OF ACCEPTABLE LENGTH.
12. FOR MAKING THE INFILTRATION TESTS, UNDERDRAINS, IF USED, SHALL BE PLUGGED AND OTHER GROUNDWATER DRAINAGE SHALL BE STOPPED TO PERMIT THE GROUNDWATER TO RETURN TO ITS NORMAL LEVEL INSOFAR AS PRACTICABLE
13. UPON COMPLETION OF A SECTION OF THE SEWER, THE CONTRACTOR SHALL DEWATER IT AND CONDUCT AN EXFILTRATION TEST TO MEASURE THE INFILTRATION FOR AT LEAST 24 HOURS. THE AMOUNT OF INFILTRATION, INCLUDING MANHOLES, TEES, AND CONNECTIONS, SHALL NOT EXCEED 200 GAL. PER INCH DIAMETER PER MILE OF SEWER PER 24 HOURS.
14. FOR MAKING THE EXFILTRATION TESTS, THE SEWERS SHALL BE SUBJECTED TO AN INTERNAL PRESSURE BY PLUGGING THE PIPE AT THE LOWER END AND THEN FILLING THE PIPELINES AND MANHOLES WITH CLEAN WATER TO A HEIGHT OF 2 FT. ABOVE THE TOP OF THE SEWER AT ITS UPPER END. WHERE CONDITIONS BETWEEN MANHOLES, MAY RESULT IN TEST PRESSURES WHICH WOULD CAUSE LEAKAGE AT THE STOPPERS IN BRANCHES, PROVISIONS SHALL BE MADE BY SUITABLE TIES, BRACES, AND WEDGES TO SECURE THE STOPPERS AGAINST LEAKAGE RESULTING FROM THE TEST PRESSURE.
15. THE RATE OF LEAKAGE FROM THE SEWERS SHALL BE DETERMINED BY MEASURING THE AMOUNT OF WATER REQUIRED TO MAINTAIN THE LEVEL 2 FT. ABOVE THE TOP OF THE PIPE.
16. LEAKAGE FROM THE SEWERS UNDER TEST SHALL NOT EXCEED THE REQUIREMENTS FOR LEAKAGE INTO SEWERS AS HEREIN BEFORE SPECIFIED.
17. THE SEWERS SHALL BE TESTED BEFORE ANY CONNECTIONS ARE MADE TO BUILDINGS.
18. THE CONTRACTOR SHALL CONSTRUCT WEIRS OR OTHER MEANS OF MEASUREMENTS AS MAY BE REQUIRED.
19. SUITABLE BULKHEADS SHALL BE INSTALLED, AS REQUIRED, TO PERMIT THE TEST OF THE SEWER.
20. SHOULD THE SECTIONS UNDER TEST FAIL TO MEET THE REQUIREMENTS, THE CONTRACTOR SHALL DO ALL WORK OF LOCATING AND REPAIRING LEAKS AND RETESTING AS THE ENGINEER MAY REQUIRE WITHOUT ADDITIONAL COMPENSATION.
21. IF, IN THE JUDGMENT OF THE ENGINEER, IT IS IMPRACTICABLE TO FOLLOW THE FOREGOING PROCEDURES FOR ANY REASON, ACCEPTABLE MODIFICATIONS IN THE PROCEDURES SHALL BE MADE AS REQUIRED, BUT IN ANY EVENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ULTIMATE TIGHTNESS OF THE LINE WITHIN THE ABOVE TEST REQUIREMENTS.

WATER TESTING

ALL TESTING SHALL CONFORM TO CITY OF BOSTON WATER AND SEWER SPECIFICATIONS.

1. REQUIRED TESTS FOR WATERLINES AND FORCE MAINS:
   A. PERFORM THE FOLLOWING AFTER THE PIPE HAS BEEN INSTALLED AND PRIOR TO FINAL ACCEPTANCE:
   A.1. PRESSURE TEST. / A.2. LEAKAGE TEST.
2. PRESUMPTIVE HYDROSTATIC TESTS MAY BE PERFORMED WHEN THE SYSTEM IS PARTIALLY BACKFILLED TO “CHECK” THE WORK, BUT FINAL ACCEPTANCE SHALL BE BASED ON HYDROSTATIC TESTS PERFORMED ON THE FINISHED SYSTEM AFTER IT IS COMPLETELY BACKFILLED.
3. <u>PRESSURE TEST:</u>
   A. TEST PIPING TO 1.5 TIMES THE PIPE WORKING PRESSURE, OR 150 PSI, WHICHEVER IS GREATER. MEASURE TEST PRESSURES AT THE LOWEST POINT IN THE PIPE SECTION AND CORRECT TO THE ELEVATION OF THE GAUGE.
   B. RELIEVE TRAPPED AIR AT THE SECTION HIGH POINTS THROUGH HYDRANTS, OR TAPS INSTALLED FOR THIS PURPOSE, PROVIDED TEMPORARY INSTALLATIONS ARE REMOVED AND PLUGGED AFTER ACCEPTANCE.
   C. MAINTAIN THE TEST PRESSURE FOR A PERIOD OF TWO (2) HOURS. AT THE END OF THE TEST PERIOD, IF THE TEST PRESSURE REMAINS CONSTANT, THE PIPE SECTION SHALL HAVE PASSED THE TEST. IF THE PRESSURE HAS DROPPED, IT SHALL BE BROUGHT BACK TO THE TEST PRESSURE BY PUMPING A KNOWN VOLUME OF WATER (BY PUMPING FROM A GRADUATED CONTAINER OR BY METERING) BACK INTO THE PIPE. THE VOLUME OF WATER THUS USED, REPRESENTING LEAKAGE FROM THE PIPE, SHALL BE RECORDED. IF THE LEAKAGE IS LESS THAN THE ALLOWABLE LEAKAGE SPECIFIED BELOW, THE PIPE SHALL HAVE PASSED THE TEST. IF THE LEAKAGE EXCEEDS THE ALLOWABLE LEAKAGE SPECIFIED, THE CONTRACTOR SHALL LOCATE THE LEAK, PERMANENTLY REPAIR THE SECTION OF PIPE WHERE THE LEAK IS OCCURRING TO THE SATISFACTION OF THE ENGINEER, AND RETEST THE PIPE AS SPECIFIED ABOVE.
4. <u>LEAKAGE TEST:</u>
   A. CONDUCT THE LEAKAGE TEST CONCURRENTLY WITH THE PRESSURE TEST.
   B. THE MAXIMUM ALLOWED LEAKAGE IS DETERMINED BY THE FOLLOWING FORMULA:

$$L = \frac{N \times D \times P^{1/2}}{7400}$$

WHERE L = ALLOWABLE LEAKAGE, IN GPH ; WHERE N = NO. OF JOINTS IN TEST SECTION
WHERE D = NOMINAL PIPE DIAMETER, IN INCHES ; WHERE P = AVERAGE TEST PRESSURE, IN PSIG

5. ACCEPTANCE SHALL BE DETERMINED ON THE BASIS OF ALLOWABLE LEAKAGE. IF ANY PIPE SECTION DISCLOSES LEAKAGE GREATER THAN THAT SPECIFIED, LOCATE, REPAIR AND RETEST UNTIL THE LEAKAGE IS WITHIN THE LIMITS SPECIFIED.
6. MAKE ALL VISIBLE LEAKS TIGHT REGARDLESS OF THE AMOUNT OF LEAKAGE, AND IF THE LINES DO NOT MEET THE ABOVE LEAKAGE TEST, REPAIR AND RETEST AS NECESSARY UNTIL THE LEAKAGE REQUIREMENT IS MET. REPAIR OR REPLACE ALL DEFECTIVE WORK.

<u>DISINFECTION OF POTABLE WATER MAINS</u>

1. DISINFECT ALL POTABLE WATER MAINS IN ACCORDANCE WITH THE LATEST VERSION OF AWWA C651, EXCEPT THAT THE PLACEMENT OF CHLORINE POWDER OR TABLETS INSIDE THE PIPE DURING INSTALLATION SHALL NOT BE ALLOWED. DISINFECT WATER MAINS AFTER THE PIPING HAS PASSED THE PRESSURE AND LEAKAGE TESTING.
2. FLUSH THE PIPE WITH WATER AT A MINIMUM VELOCITY OF 2.5 FEET PER SECOND (FPS) TO CLEAR ALL FOREIGN MATERIAL FROM THE PIPE.
3. APPLY A CHLORINE SOLUTION WITH A CONCENTRATION BETWEEN 50 PARTS PER MILLION (PPM) AND 100 PPM. THE CHLORINE SOLUTION SHALL REMAIN IN THE PIPING FOR A MINIMUM OF 24 HOURS. THE CONCENTRATION AT THE END OF THIS PERIOD SHALL BE AT LEAST 25 PPM IN ALL SECTIONS OF THE MAIN. REPEAT THE ENTIRE PROCEDURE IF THE RESIDUAL IS LESS THAN 25 PPM.
   A. WHILE THE CHLORINATED WATER IS BEING ADDED, ALL APPURTENANCES (VALVES, HYDRANTS, ETC.) SHALL BE OPERATED SO AS TO COMPLETELY DISINFECT THE NEW WORK.
   B. POSITION VALVES SO THAT THE CHLORINE SOLUTION IN THE SECTION BEING DISINFECTED WILL NOT FLOW INTO WATER MAINS IN ACTIVE SERVICE.
   C. CHLORINE RESIDUAL SAMPLES SHALL BE TAKEN AS DIRECTED BY THE ENGINEER.
4. AFTER THE TWENTY FOUR (24) HOUR RETENTION PERIOD, FLUSH THE MAIN UNTIL RESIDUAL TESTING INDICATES THAT THE CHLORINE CONCENTRATION IS APPROXIMATELY THAT OF THE NEIGHBORING SERVICE AREA.
   A. DISPOSE OF HEAVILY CHLORINATED WATER INTO SANITARY SEWER OR TANK TRUCK.
   B. THE OWNER AND THE OWNER OF THE SANITARY SEWER SYSTEM SHALL BE NOTIFIED A MINIMUM OF TWENTY-FOUR (24) HOURS PRIOR TO THE DISCHARGE OF ANY WATER TO THE SANITARY SEWER. CONTRACTOR SHALL SUBMIT TO THE ENGINEER WRITTEN CONFIRMATION THAT THE OWNER OF SANITARY SEWER SYSTEM (THE CITY), HAS APPROVED THE DISCHARGE OF WATER TO ITS SANITARY SEWER.
   C. UNDER NO CIRCUMSTANCES WILL THE EMPTYING OF WATER ONTO ROADWAYS, OR INTO DITCHES, CULVERTS, STREAMS OR WETLANDS BE ALLOWED.
5. AFTER DISINFECTION AND FINAL FLUSHING, AND PRIOR TO PLACING THE LINES IN SERVICE, THE CONTRACTOR SHALL COLLECT BACTERIOLOGICAL SAMPLES (BOTH COLIFORM AND HETEROTROPHIC PLATE COUNT) AND SUBMIT SAMPLES TO AN APPROVED TESTING LABORATORY. TWO CONSECUTIVE SETS OF SAMPLES SHALL BE TAKEN AT LEAST 24 HOURS APART IN ACCORDANCE WITH AWWA C651. THE COLLECTION POINTS SHALL BE AS DIRECTED BY THE ENGINEER AND LOCAL AUTHORITY HAVING JURISDICTION.
   A. THE TESTING LABORATORY PERFORMING THE BACTERIOLOGICAL ANALYSIS SHALL BE ACCEPTABLE TO THE ENGINEER.
   B. SUBMIT THREE (3) COPIES OF THE LABORATORY ANALYSIS TO THE ENGINEER.
   C. SHOULD SAFE RESULTS NOT OCCUR AFTER LABORATORY TESTS, THE CONTRACTOR SHALL, AT HIS EXPENSE, REPEAT THE DISINFECTION PROCEDURE UNTIL SAFE RESULTS ARE OBTAINED. THIS INCLUDES A POSITIVE RESULT FOR COLIFORM OR A MEASURED HETEROTROPHIC PLATE COUNT OF GREATER THAN 500 COLONY-FORMING UNITS PER ML.
   D. CONTRACTOR SHALL PAY FOR ALL TESTING REQUIRED.
6. ALL PRECAUTION SHALL BE TAKEN TO MAINTAIN DRY AND SANITARY CONDITIONS AND PREVENT CONTAMINATION OF ANY PIPING. IF, IN THE OPINION OF THE ENGINEER, CONTAMINATION HAS OCCURRED, THE CONTRACTOR SHALL REPEAT THE DISINFECTION PROCEDURE AND TESTING AT HIS COST AND EXPENSE.

CHA
1 Faneuil Hall Marketplace, South Market Building
Boston, MA 02109-6117
617.451.2717 . www.chacompanies.com

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

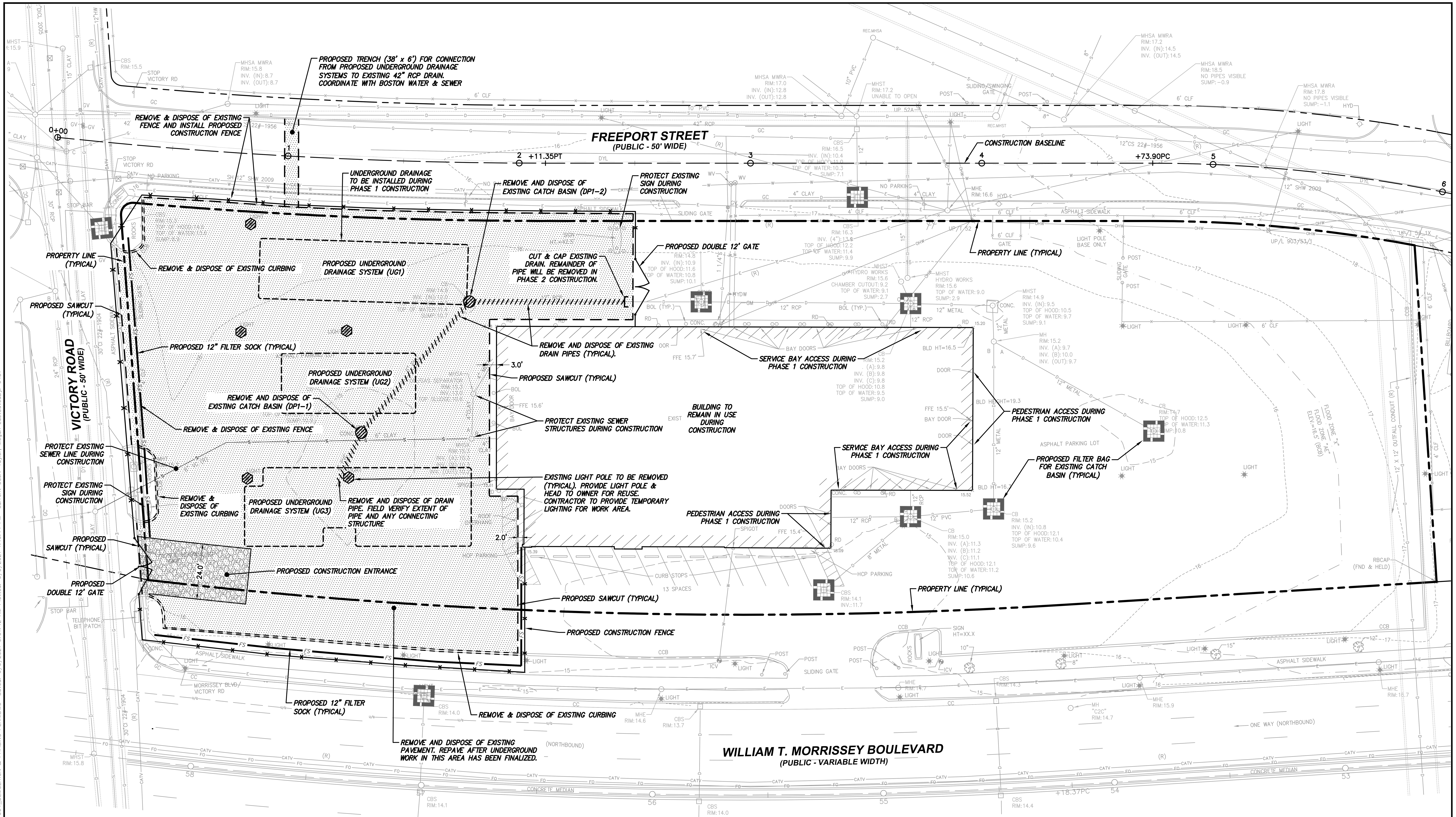
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

NOTES & LEGEND (SHEET 2)

Designed By: TK	Drawn By: TK/MT	Checked By: KK
Issue Date: 01/31/2020	Project No: 059051	Scale: NONE

Drawing No.: C-003



FOR BWSC USE ONLY

BOSTON WATER & SEWER DEMOLITION INSPECTION LIST

TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
DP1-1	CATCH BASIN (STA 1+36, 118' R)		
DP1-2	CATCH BASIN (STA 1+79, 60' R)		

EXISTING BWSC ACCOUNT: #1299270
BWSC SITE PLAN NUMBER: #20059

NOTE:
THE CONTRACTOR SHALL REFER TO SHEET C-002 THROUGH C-006 AND THE DETAIL SHEETS FOR STORMWATER POLLUTION PREVENTION PLAN (SWPPP) RELATED NOTES AND DETAILS. A SWPPP WILL BE ISSUED TO THE CONTRACTOR DURING THE BID PROCESS. AFTER THE JOB IS AWARDED, BUT PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL FILE A NOTICE OF INTENT WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THE SWPPP TRACKING NUMBER SHALL BE PROVIDED TO THE BOSTON WATER AND SEWER COMMISSION (BWSC) PRIOR TO CONSTRUCTION.

KEY

- DRAIN INLET PROTECTION
- PROPOSED CONSTRUCTION ENTRANCE
- AREA OF ASPHALT REMOVAL & DISPOSAL
- MANHOLE / CATCH BASIN TO BE REMOVED & DISPOSED
- EXISTING LIGHT POLE TO BE REMOVED. (PROVIDE LIGHT POLE AND HEAD TO OWNER FOR REUSE)
- DRAIN PIPE TO BE REMOVED & DISPOSED
- EXISTING CURBING TO BE REMOVED & DISPOSED
- PROPOSED CONSTRUCTION FENCE
- PROPOSED SAWCUT
- PROPOSED 12" FILTER SOCK

CHA
1 Faneuil Hall Marketplace, South Market Building
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617.451.2717 . www.chacompanies.com

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

KELLY KILLEEN CIVIL No. 38691
6-9-21

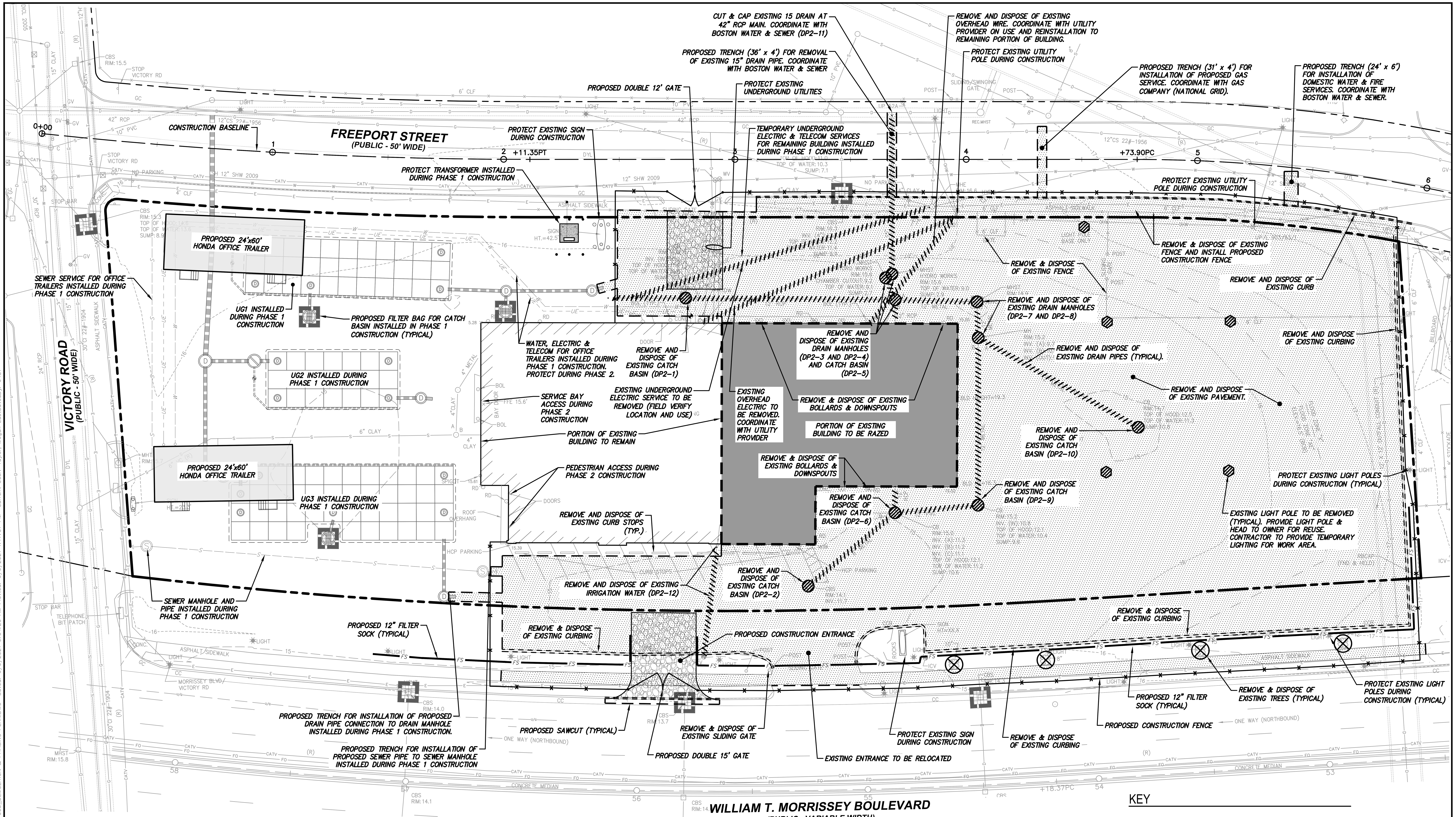
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

DEMOLITION & PHASING PLAN (PHASE 1)
SP # 20059

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: 1"=20'

Drawing No.:
C-004



FOR BWSC USE ONLY

BOSTON WATER & SEWER DEMOLITION INSPECTION LIST			
TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
DP2-1	CATCH BASIN (STA 2+79, 60' R)		
DP2-2	CATCH BASIN (STA 3+32, 185' R)		
DP2-3	DRAIN MANHOLE (STA 3+65, 51'R)		
DP2-4	DRAIN MANHOLE (STA 3+68, 50'R)		
DP2-5	CATCH BASIN (STA 3+69, 61'R)		
DP2-6	CATCH BASIN (STA 3+69, 153'R)		
DP2-7	DRAIN MANHOLE (STA 4+05, 62'R)		
DP2-8	DRAIN MANHOLE (STA 4+05, 77'R)		
DP2-9	CATCH BASIN (STA 4+05, 150'R)		
DP2-10	CATCH BASIN (STA 4+75, 116'R)		
DP2-11	DRAIN SERVICE CUT & CAP (STA 3+68, 20' L)		
DP2-12	IRRIGATION WATER (STA 2+92, 167'R)		

EXISTING BWSC ACCOUNT: #1299270
BWSC SITE PLAN NUMBER: #20252

NOTE:
THE CONTRACTOR SHALL REFER TO SHEET C-002 THROUGH C-006 AND THE DETAIL SHEETS FOR STORMWATER POLLUTION PREVENTION PLAN (SWPPP) RELATED NOTES AND DETAILS. A SWPPP WILL BE ISSUED TO THE CONTRACTOR DURING THE BID PROCESS. AFTER THE JOB IS AWARDED, BUT PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL FILE A NOTICE OF INTENT WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THE SWPPP TRACKING NUMBER SHALL BE PROVIDED TO THE BOSTON WATER AND SEWER COMMISSION (BWSC) PRIOR TO CONSTRUCTION.

KEY

- DRAIN INLET PROTECTION
- PROPOSED CONSTRUCTION ENTRANCE
- AREA OF ASPHALT REMOVAL & DISPOSAL
- MANHOLE / CATCH BASIN TO BE REMOVED & DISPOSED
- EXISTING LIGHT POLE TO BE REMOVED. (PROVIDE LIGHT POLE AND HEAD TO OWNER FOR REUSE)
- EXISTING TREE TO BE REMOVED & DISPOSED
- UTILITY SERVICE TO BE REMOVED & DISPOSED
- EXISTING CURBING TO BE REMOVED & DISPOSED
- PROPOSED CONSTRUCTION FENCE
- PROPOSED SAWCUT
- PROPOSED 12" FILTER SOCK

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OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

KELLY KILLEEN CIVIL No. 38607
6.9.21

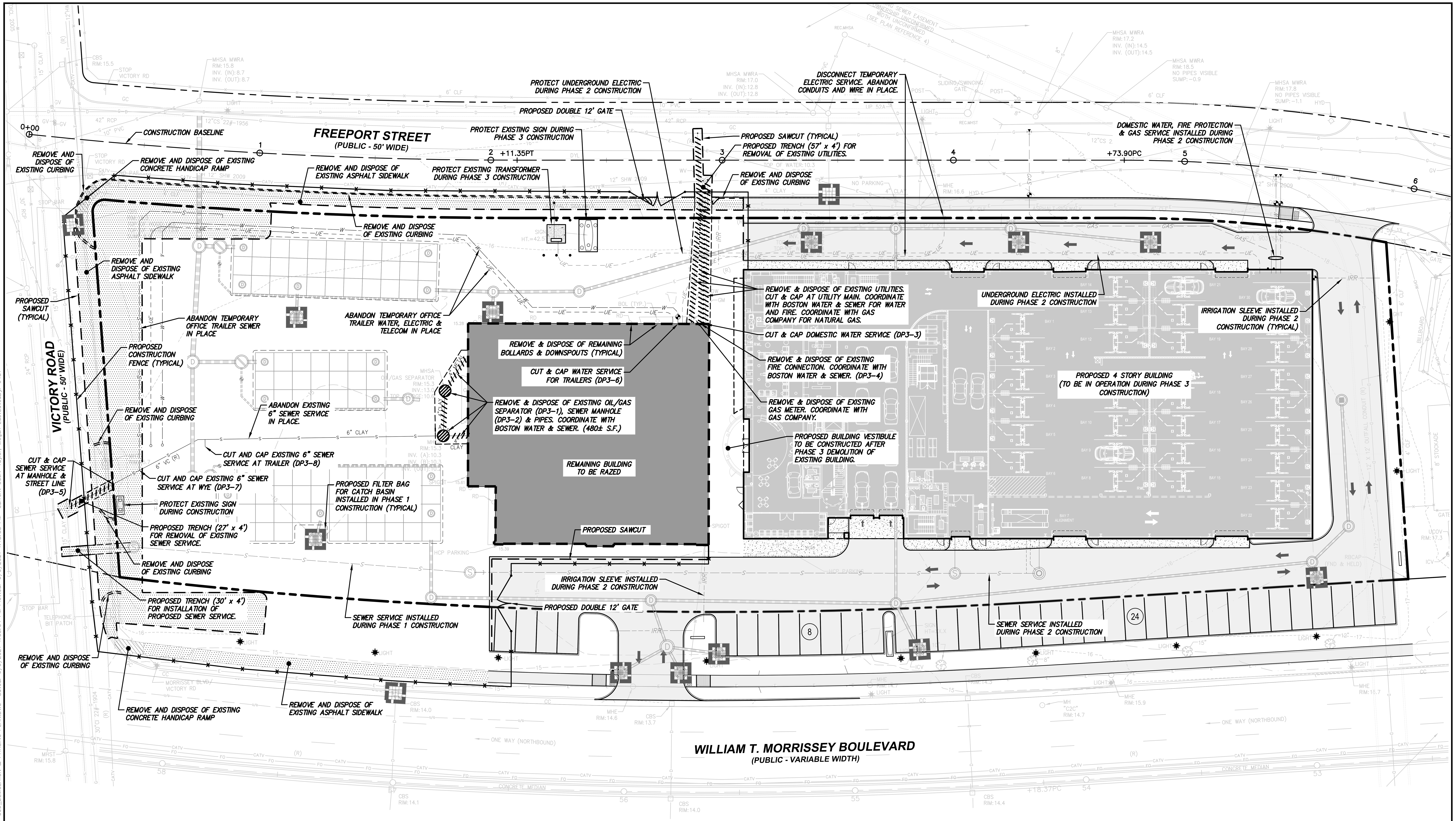
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

DEMOLITION & PHASING PLAN (PHASE 2)
SP # 20252

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: 1"=20'

Drawing No.:
C-005



FOR BWSC USE ONLY

BOSTON WATER & SEWER DEMOLITION INSPECTION LIST

TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
DP3-1	OIL/GAS SEPARATOR (STA 1+82, 100' R)		
DP3-2	SEWER MANHOLE (STA 1+81, 119' R)		
DP3-3	DOMESTIC WATER CUT & CAP (STA 2+93, 71' R)		
DP3-4	FIRE SERVICE CUT & CAP (STA 2+91, 71' R)		
DP3-5	SEWER SERVICE CUT & CAP (STA 0+31, 159' R)		
DP3-6	WATER SERVICE FOR TRAILERS (STA 2+81, 71' R)		
DP3-7	SEWER SERVICE FOR TRAILER (STA 0+59, 140' R)		
DP3-8	SEWER SERVICE FOR TRAILER (STA 0+85, 128' R)		

EXISTING BWSC ACCOUNT: #1299270
BWSC SITE PLAN NUMBER: #20253

KEY

- PORTION OF BUILDING TO BE RAZED
- DRAIN INLET PROTECTION
- AREA OF ASPHALT REMOVAL & DISPOSAL
- AREA OF CONCRETE REMOVAL & DISPOSAL
- SEWER MANHOLE TO BE REMOVED & DISPOSED
- UTILITY SERVICE TO BE REMOVED & DISPOSED
- PROPOSED CONSTRUCTION FENCE
- PROPOSED SAWCUT
- PROPOSED 12" FILTER SOCK

NOTES:

1. THE CONTRACTOR SHALL REFER TO SHEET C–002 THROUGH C–006 AND THE DETAIL SHEETS FOR STORMWATER POLLUTION PREVENTION PLAN (SWPPP) RELATED NOTES AND DETAILS. A SWPPP WILL BE ISSUED TO THE CONTRACTOR DURING THE BID PROCESS. AFTER THE JOB IS AWARDED, BUT PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL FILE A NOTICE OF INTENT WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THE SWPPP TRACKING NUMBER SHALL BE PROVIDED TO THE BOSTON WATER AND SEWER COMMISSION (BWSC) PRIOR TO CONSTRUCTION.
2. EXISTING WATER SERVICE SHALL BE CUT AND CAPPED AT THE MAIN, AND THE EXISTING METER REMOVED FROM THE EXISTING BUILDING PRIOR TO INSTALLATION OF THE NEW WATER METER (COORDINATE WITH BWSC)

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0 20 40
Scale in feet

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38991
REGISTERED PROFESSIONAL ENGINEER
6-9-21

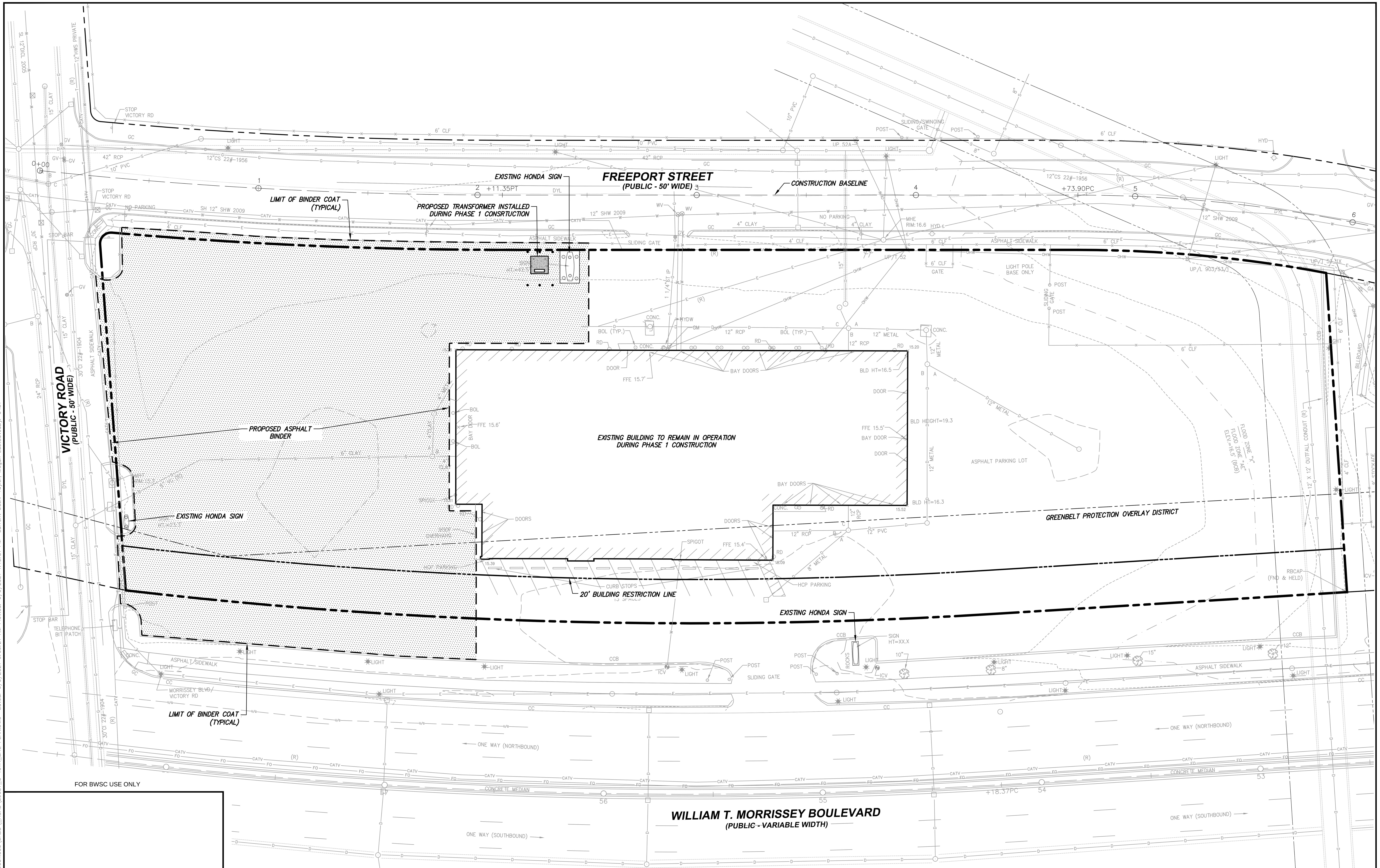
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

DEMOLITION & PHASING PLAN (PHASE 3)
SP # 20253

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: 1"=20'

Drawing No.:
C-006



FOR BWSC USE ONLY

BWSC SITE PLAN NUMBER: #20059

KEY

ASPHALT BINDER

LIMIT OF ASPHALT BINDER

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OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

6.9.21

PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

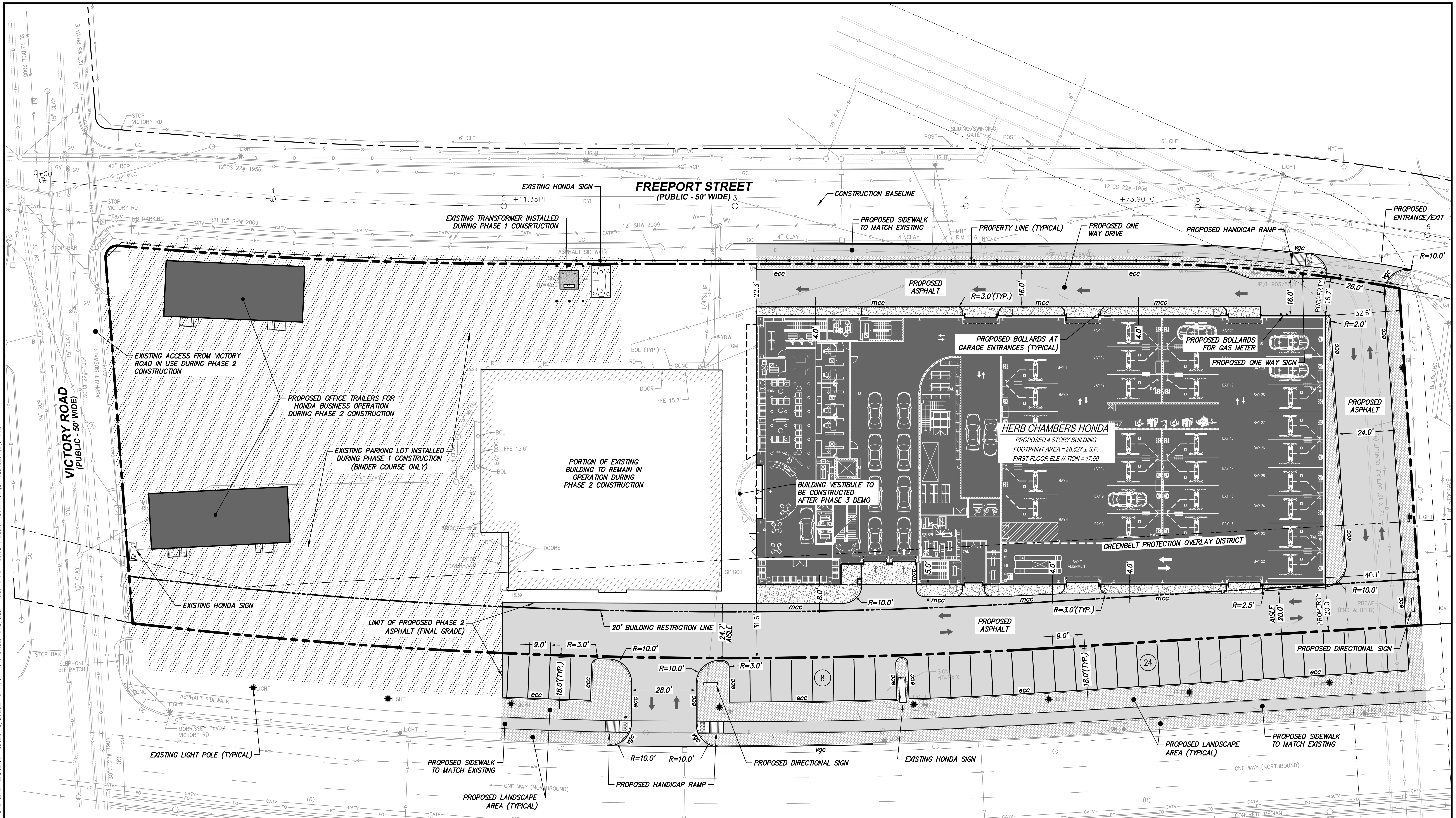
No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

SITE PLAN
(PHASE 1)
SP # 20059

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date:	Project No:	Scale:
01/31/2020	059051	1"=20'

Drawing No.:

C-101



BWSC SITE PLAN NUMBER: #20252

KEY

- PROPOSED ASPHALT SURFACE
- PROPOSED CONCRETE SIDEWALK
- PROPOSED LANDSCAPE AREA
- TEMPORARY ASPHALT BINDER
- ecc — INDICATES EXTRUDED CONCRETE CURB
- mcc — INDICATES MONOLITHIC CONCRETE CURB
- vgc — INDICATES VERTICAL GRANITE CURB

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Scale in feet

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38606
REGISTERED PROFESSIONAL ENGINEER
6-9-21

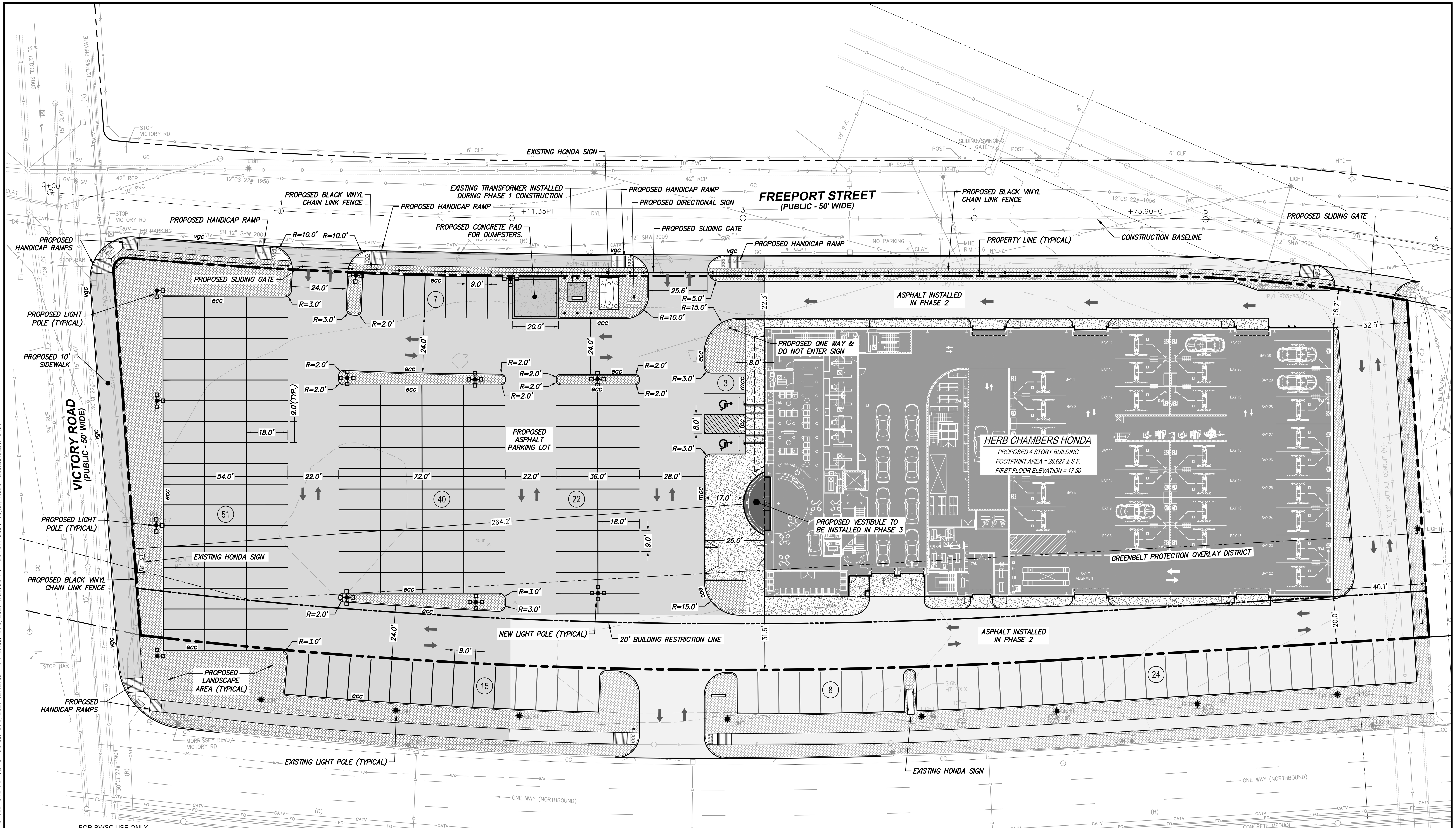
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

SITE PLAN
(PHASE 2)
SP # 20252

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date:	Project No:	Scale:
01/31/2020	059051	1"=20'

Drawing No.:
C-102



FOR BWSC USE ONLY

BWSC SITE PLAN NUMBER: #20253

KEY

- PROPOSED ASPHALT SURFACE
- PROPOSED CONCRETE SIDEWALK
- PROPOSED LANDSCAPE AREA
- ecc — INDICATES EXTRUDED CONCRETE CURB
- fcc — INDICATES FLUSH MONOLITHIC CONCRETE CURB
- mcc — INDICATES MONOLITHIC CONCRETE CURB
- vgc — INDICATES VERTICAL GRANITE CURB

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OWNER / APPLICANT:

HONDA

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47 EASTERN BLVD.
GLASTONBURY, CT 06033

KELLY KILLEEN CIVIL No. 38891

6-9-21

PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

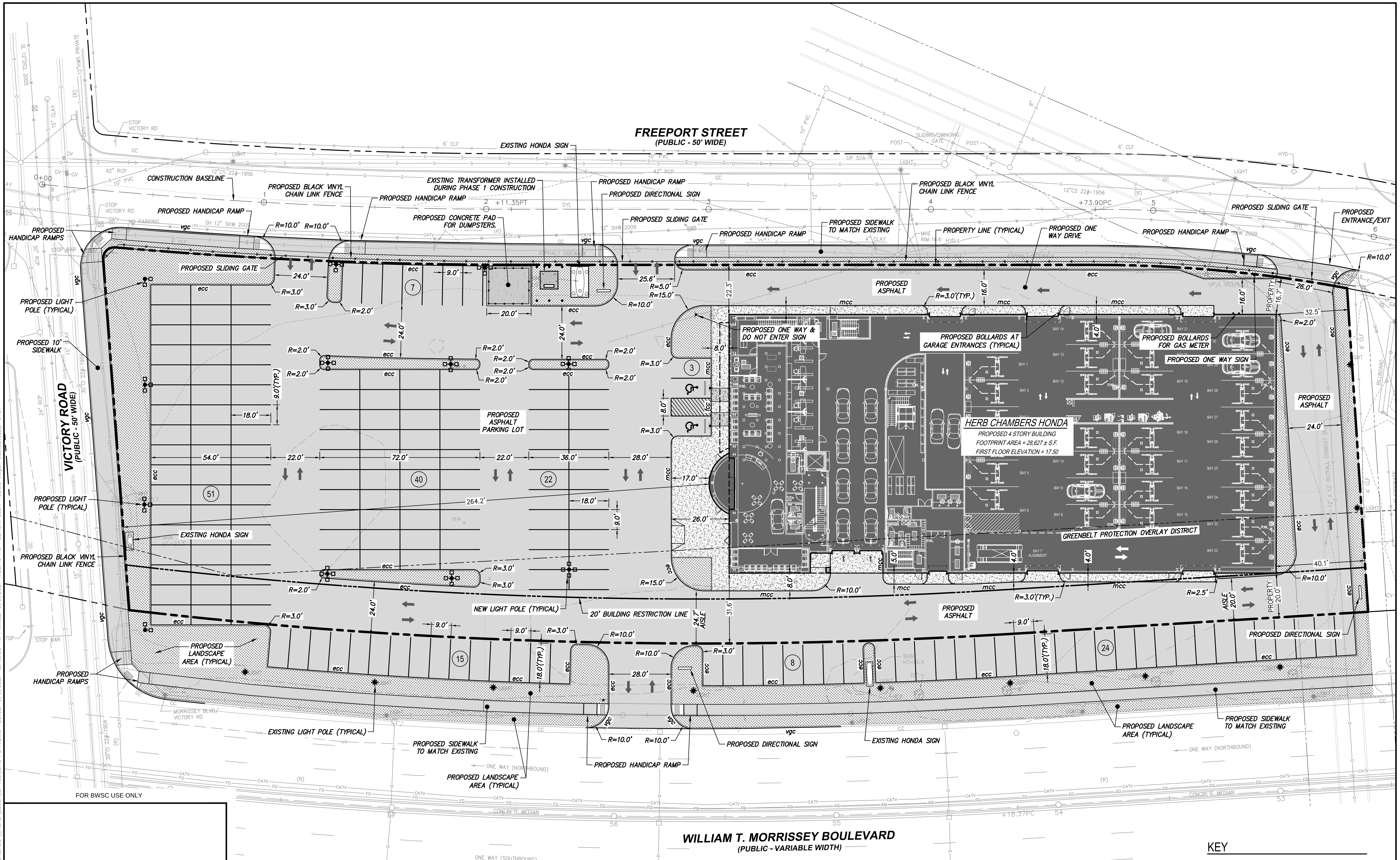
No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

SITE PLAN
(PHASE 3)
SP # 20253

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: 1"=20'

Drawing No.:

C-103



FOR BWSC USE ONLY

BWSC SITE PLAN NUMBER: #20253

KEY

- PROPOSED ASPHALT SURFACE
- PROPOSED CONCRETE SIDEWALK
- PROPOSED LANDSCAPE AREA
- ecc INDICATES EXTRUDED CONCRETE CURB
- fcc INDICATES FLUSH CONCRETE CURB
- mcc INDICATES MONOLITHIC CONCRETE CURB
- vgc INDICATES VERTICAL GRANITE CURB

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Scale in feet: 0 20 40

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

KELLY KILLEEN CIVIL No. 38091 PROFESSIONAL ENGINEER
6.9.21

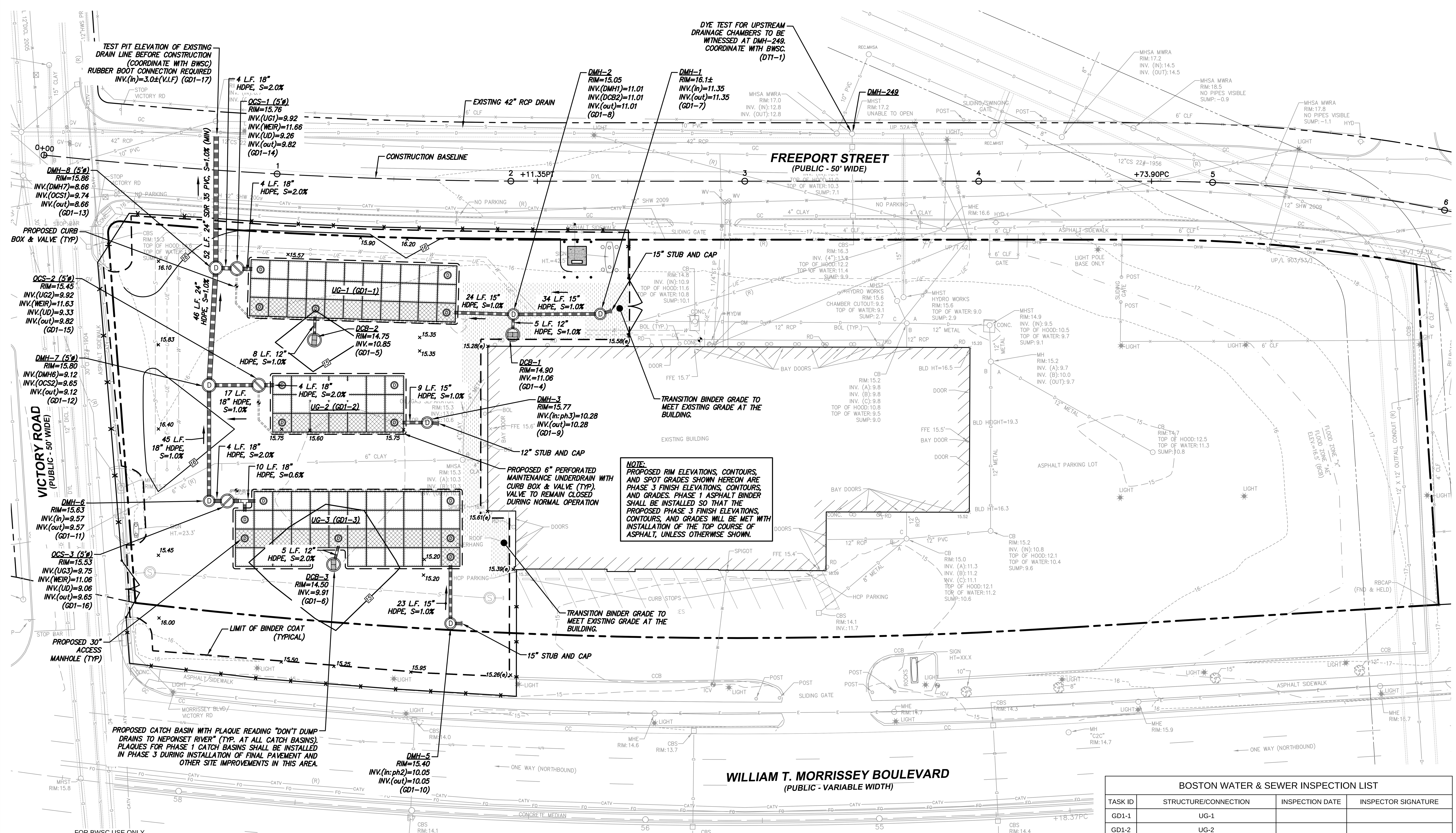
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

OVERALL SITE PLAN

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: 1"=20'

Drawing No.: C-104



FOR BWSC USE ONLY

BWSC SITE PLAN NUMBER: #20059

UG-1
90.0' L x 26.0' W
(33) 2.5' RETAIN-IT CHAMBERS
TOP OF CHAMBER = 12.93
BOT. OF CHAMBER = 9.76
BOT. OF STONE = 9.26
UNDERDRAIN = 9.26
INV.(in) = 10.77
INV.(out) = 10.00

UG-2
58.0' L x 26.0' W
(21) 2.5' RETAIN-IT CHAMBERS
TOP OF CHAMBER = 13.00
BOT. OF CHAMBER = 9.83
BOT. OF STONE = 9.33
UNDERDRAIN = 9.33
INV.(in) = 10.19
INV.(out) = 10.00

UG-3
98.0' L x 34.0' W
(45) 2' RETAIN-IT CHAMBERS
TOP OF CHAMBER = 12.23
BOT. OF CHAMBER = 9.56
BOT. OF STONE = 9.06
UNDERDRAIN = 9.06
INV.(in) = 9.81
INV.(out) = 9.81

STORMWATER STORAGE CAPACITY BREAKDOWN

SYSTEM	IMPERVIOUS TRIBUTARY AREA (S.F.)	RUNOFF DEPTH (FT)	RUNOFF VOLUME (C.F.)	AVAILABLE STORAGE IN UST (C.F.)
UG-1	36,425	0.104	3,794	3,933
UG-2	21,205	0.104	2,209	2,391
UG-3	40,820	0.104	4,252	4,278
TOTAL	98,450	-	10,255	10,602

NOTE:
AVAILABLE STORAGE WITHIN EACH SYSTEM IS BASED OFF OF A 30% VOID RATIO IN THE SURROUNDING STONE

BOSTON WATER & SEWER INSPECTION LIST

TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
GD1-1	UG-1		
GD1-2	UG-2		
GD1-3	UG-3		
GD1-4	DCB-1 (2+01: 66'R)		
GD1-5	DCB-2 (1+19: 70'R)		
GD1-6	DCB-3 (1+31: 166'R)		
GD1-7	DMH-1 (2+38: 57'R)		
GD1-8	DMH-2 (2+01: 57'R)		
GD1-9	DMH-3 (1+67: 104'R)		
GD1-10	DMH-5 (1+77: 189'R)		
GD1-11	DMH-6 (0+80: 141'R)		
GD1-12	DMH-7 (0+77: 92'R)		
GD1-13	DMH-8 (0+77: 42'R)		
GD1-14	OCS-1 (0+85: 41'R)		
GD1-15	OCS-2 (0+97: 91'R)		
GD1-16	OCS-3 (0+87: 141'R)		
GD1-17	DRAIN CONNECTION (0+73: 14'L)		
DT1-1	DYE TEST AT DMH-249 (3+46: 15'L)		

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Scale in feet: 0 20 40

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN CIVIL No. 58691 REGISTERED PROFESSIONAL ENGINEER
6.9.21

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PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

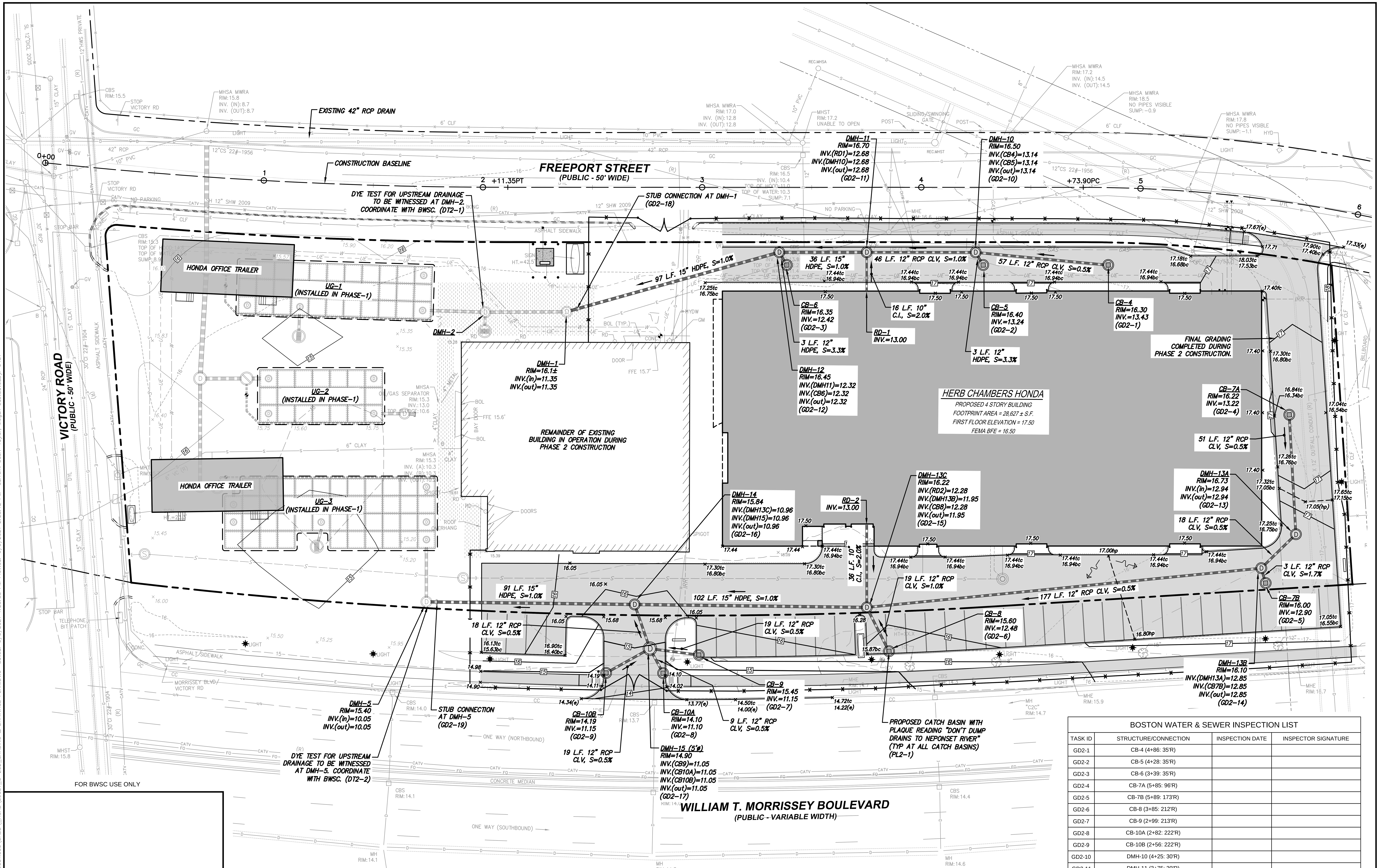
No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

GRADING & DRAINAGE PLAN (PHASE 1)
SP # 20059

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: 1"=20'

Drawing No.:
C-201

File: \\CHA-LLP.COM\PROJ\PROJECTS\ANY\K5\059051.000\CADD_ACAD\59051_C-201_GRADING & DRAINAGE PLAN.DWG Saved: 6/9/2021 1:24:39 PM Plotted: 6/9/2021 2:26:43 PM Current User: Taylor, Megan LastSavedBy: 6431



BWSC SITE PLAN NUMBER: #20252

BOSTON WATER & SEWER INSPECTION LIST			
TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
GD2-1	CB-4 (4+86: 35'R)		
GD2-2	CB-5 (4+28: 35'R)		
GD2-3	CB-6 (3+39: 35'R)		
GD2-4	CB-7A (5+85: 96'R)		
GD2-5	CB-7B (5+89: 173'R)		
GD2-6	CB-8 (3+85: 212'R)		
GD2-7	CB-9 (2+99: 213'R)		
GD2-8	CB-10A (2+82: 222'R)		
GD2-9	CB-10B (2+56: 222'R)		
GD2-10	DMH-10 (4+25: 30'R)		
GD2-11	DMH-11 (3+75: 30'R)		
GD2-12	DMH-12 (3+35: 30'R)		
GD2-13	DMH-13A (6+01: 149'R)		
GD2-14	DMH-13B (5+84: 167'R)		
GD2-15	DMH-13C (3+75: 192'R)		
GD2-16	DMH-14 (2+69: 190'R)		
GD2-17	DMH-15 (2+76: 210'R)		
GD2-18	DMH-1 STUB CONNECTION (2+43: 55'R)		
GD2-19	DMH-5 STUB CONNECTION (1+82: 189'R)		
PL2-1	"DON'T DUMP" PLAQUES (9ea in PH2)		
DT2-1	DYE TEST AT DMH-2 (2+01: 57'R)		
DT2-2	DYE TEST AT DMH-5 (1+77: 189'R)		

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OWNER / APPLICANT:

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47 EASTERN BLVD.
GLASTONBURY, CT 06033

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38091
REGISTERED PROFESSIONAL ENGINEER
6.9.21

PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

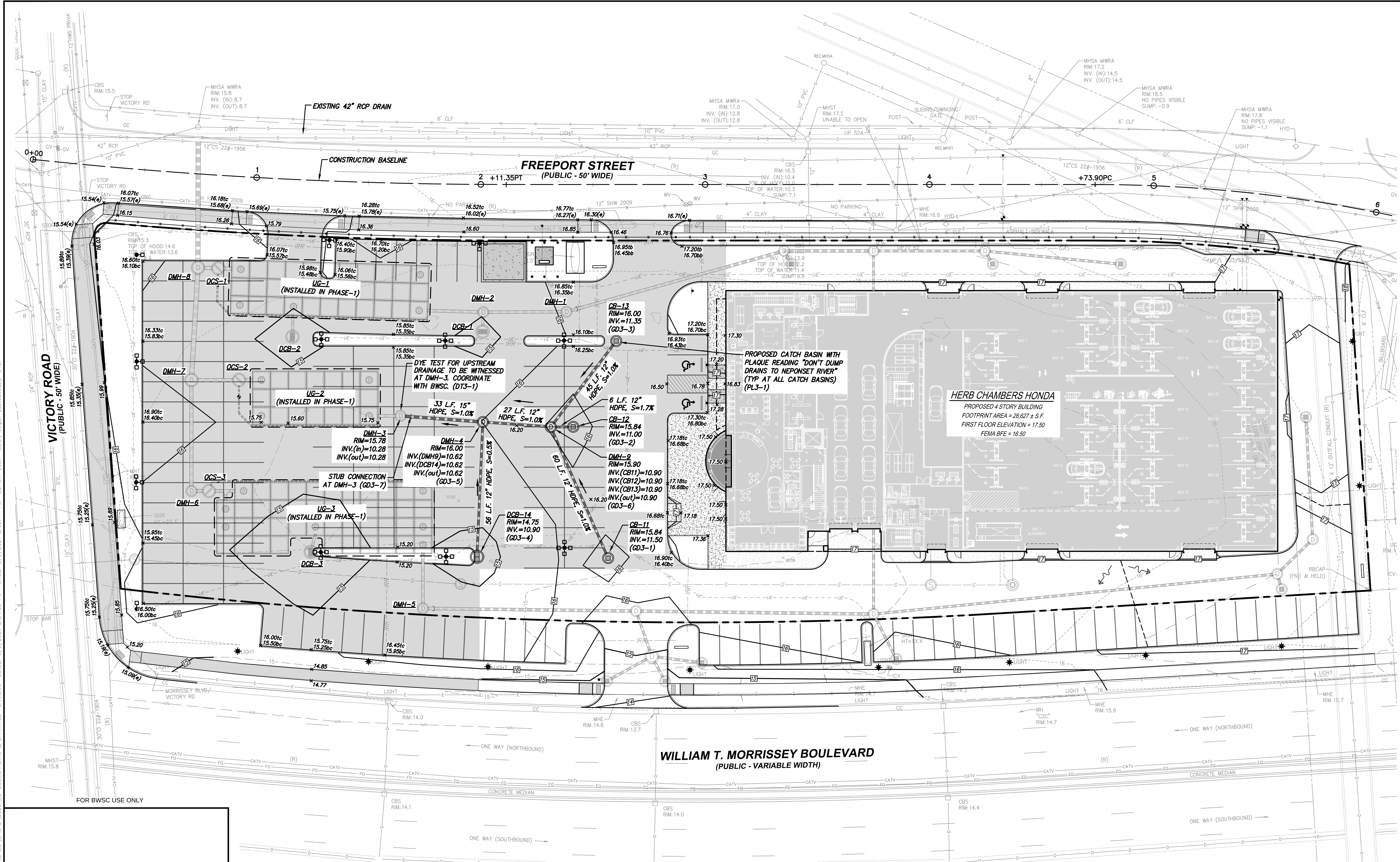
No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

GRADING & DRAINAGE PLAN (PHASE 2) SP # 20252

Designed By: TK	Drawn By: TK/MT	Checked By: KK
Issue Date: 01/31/2020	Project No: 059051	Scale: 1"=20'

Drawing No.:

C-202



BWSC SITE PLAN NUMBER: #20253

BOSTON WATER & SEWER INSPECTION LIST			
TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
GD3-1	CB-11 (2+57: 167'R)		
GD3-2	CB-12 (2+41: 108'R)		
GD3-3	CB-13 (2+60: 70'R)		
GD3-4	DCB-14 (1+99: 166'R)		
GD3-5	DMH-4 (2+01: 106'R)		
GD3-6	DMH-9 (2+31: 108'R)		
GD3-7	DMH-3 STUB CONNECTION (1+71: 104'R)		
PL3-1	"DON'T DUMP" PLAQUES (7ea in PH3)		
DT3-1	DYE TEST AT DMH-3 (1+67: 104'R)		

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0 20 40
Scale in feet

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38991
REGISTERED PROFESSIONAL ENGINEER
6.9.21

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PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

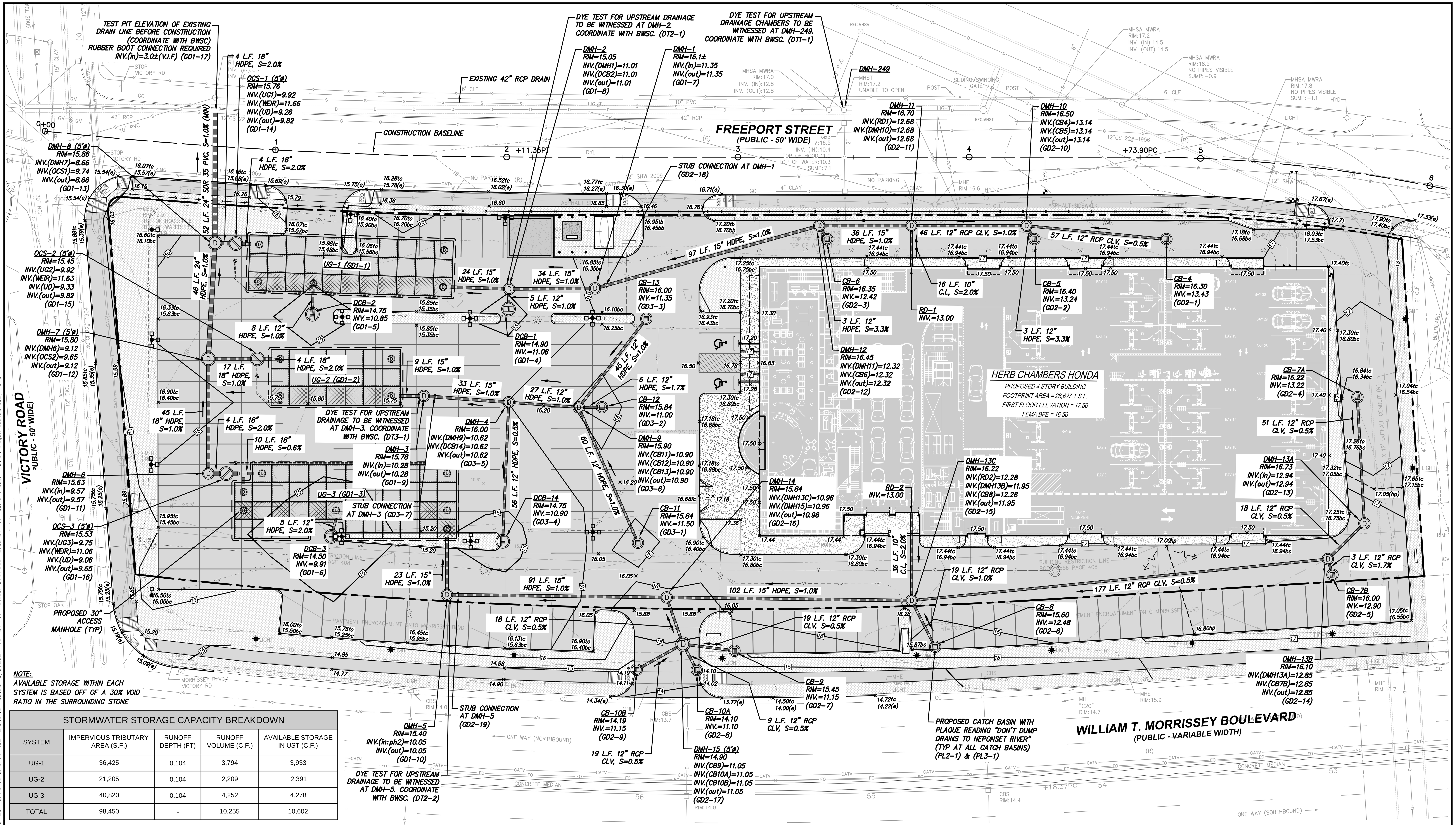
No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

GRADING & DRAINAGE PLAN (PHASE 3) SP # 20253

Designed By: TK	Drawn By: TK/MT	Checked By: KK
Issue Date: 01/31/2020	Project No: 059051	Scale: 1"=20'

Drawing No.:

C-203



NOTE:
AVAILABLE STORAGE WITHIN EACH SYSTEM IS BASED OFF OF A 30% VOID RATIO IN THE SURROUNDING STONE

STORMWATER STORAGE CAPACITY BREAKDOWN				
SYSTEM	IMPERVIOUS TRIBUTARY AREA (S.F.)	RUNOFF DEPTH (FT)	RUNOFF VOLUME (C.F.)	AVAILABLE STORAGE IN UST (C.F.)
UG-1	36,425	0.104	3,794	3,933
UG-2	21,205	0.104	2,209	2,391
UG-3	40,820	0.104	4,252	4,278
TOTAL	98,450	-	10,255	10,602

FOR BWSC USE ONLY

BWSC SITE PLAN NUMBER: #20253

UG-1
90.0' L x 26.0' W
(33) 2.5' RETAIN-IT CHAMBERS
TOP OF CHAMBER = 12.93
BOT. OF CHAMBER = 9.76
BOT. OF STONE = 9.26
UNDERDRAIN = 9.26
INV.(in) = 10.77
INV.(out) = 10.00

UG-2
58.0' L x 26.0' W
(21) 2.5' RETAIN-IT CHAMBERS
TOP OF CHAMBER = 13.00
BOT. OF CHAMBER = 9.83
BOT. OF STONE = 9.33
UNDERDRAIN = 9.33
INV.(in) = 10.19
INV.(out) = 10.00

UG-3
98.0' L x 34.0' W
(45) 2' RETAIN-IT CHAMBERS
TOP OF CHAMBER = 12.23
BOT. OF CHAMBER = 9.56
BOT. OF STONE = 9.06
UNDERDRAIN = 9.06
INV.(in) = 9.81
INV.(out) = 9.81

BOSTON WATER & SEWER INSPECTION LIST			
TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
GD1-1	UG-1		
GD1-2	UG-2		
GD1-3	UG-3		
GD1-4	DCB-1 (2+01: 66'R)		
GD1-5	DCB-2 (1+19: 70'R)		
GD1-6	DCB-3 (1+31: 166'R)		
GD1-7	DMH-1 (2+38: 57'R)		
GD1-8	DMH-2 (2+01: 57'R)		
GD1-9	DMH-3 (1+67: 104'R)		
GD1-10	DMH-5 (1+77: 189'R)		
GD1-11	DMH-6 (0+80: 141'R)		
GD1-12	DMH-7 (0+77: 92'R)		
GD1-13	DMH-8 (0+77: 42'R)		
GD1-14	OCS-1 (0+85: 41'R)		
GD1-15	OCS-2 (0+97: 91'R)		
GD1-16	OCS-3 (0+87: 141'R)		

BOSTON WATER & SEWER INSPECTION LIST			
TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
GD1-17	DRAIN CONNECTION (0+73: 14'L)		
GD2-1	CB-4 (4+86: 35'R)		
GD2-2	CB-5 (4+28: 35'R)		
GD2-3	CB-6 (3+39: 35'R)		
GD2-4	CB-7A (5+85: 96'R)		
GD2-5	CB-7B (5+89: 173'R		
GD2-6	CB-8 (3+85: 212'R)		
GD2-7	CB-9 (2+99: 213'R)		
GD2-8	CB-10A (2+82: 222'R)		
GD-2-9	CB-10B (2+56: 222'R)		
GD2-10	DMH-10 (4+25: 30'R)		
GD2-11	DMH-11 (3+75: 30'R)		
GD2-12	DMH-12 (3+35: 30'R)		
GD2-13	DMH-13A (6+01: 149'R)		
GD2-14	DMH-13B (5+84: 167'R)		
GD2-15	DMH-13C (3+75: 192'R)		
GD2-16	DMH-14 (2+69: 190'R)		

BOSTON WATER & SEWER INSPECTION LIST			
TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
GD2-17	DMH-15 (2+76: 210'R)		
GD2-18	DMH-1 STUB CONNECTION (2+43: 55'R)		
GD2-19	DMH-5 STUB CONNECTION (1+82: 189'R)		
GD3-1	CB-11 (2+57: 167'R)		
GD3-2	CB-12 (2+41: 108'R)		
GD3-3	CB-13 (2+60: 70'R)		
GD3-4	DCB-14 (1+99: 166'R)		
GD3-5	DMH-4 (2+01: 106'R)		
GD3-6	DMH-9 (2+31: 108'R)		
GD3-7	DMH-3 STUB CONNECTION (1+71: 104'R)		
PL2-1	"DON'T DUMP" PLAQUES (9ea in PH2)		
PL3-1	"DON'T DUMP" PLAQUES (7ea in PH3)		
DT1-1	DYE TEST AT DMH-249 (3+46: 15'L)		
DT2-1	DYE TEST AT DMH-2 (2+01: 57'R)		
DT2-2	DYE TEST AT DMH-5 (1+77: 189'R)		
DT3-1	DYE TEST AT DMH-3 (1+67: 104'R)		

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OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

6.9.21

PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

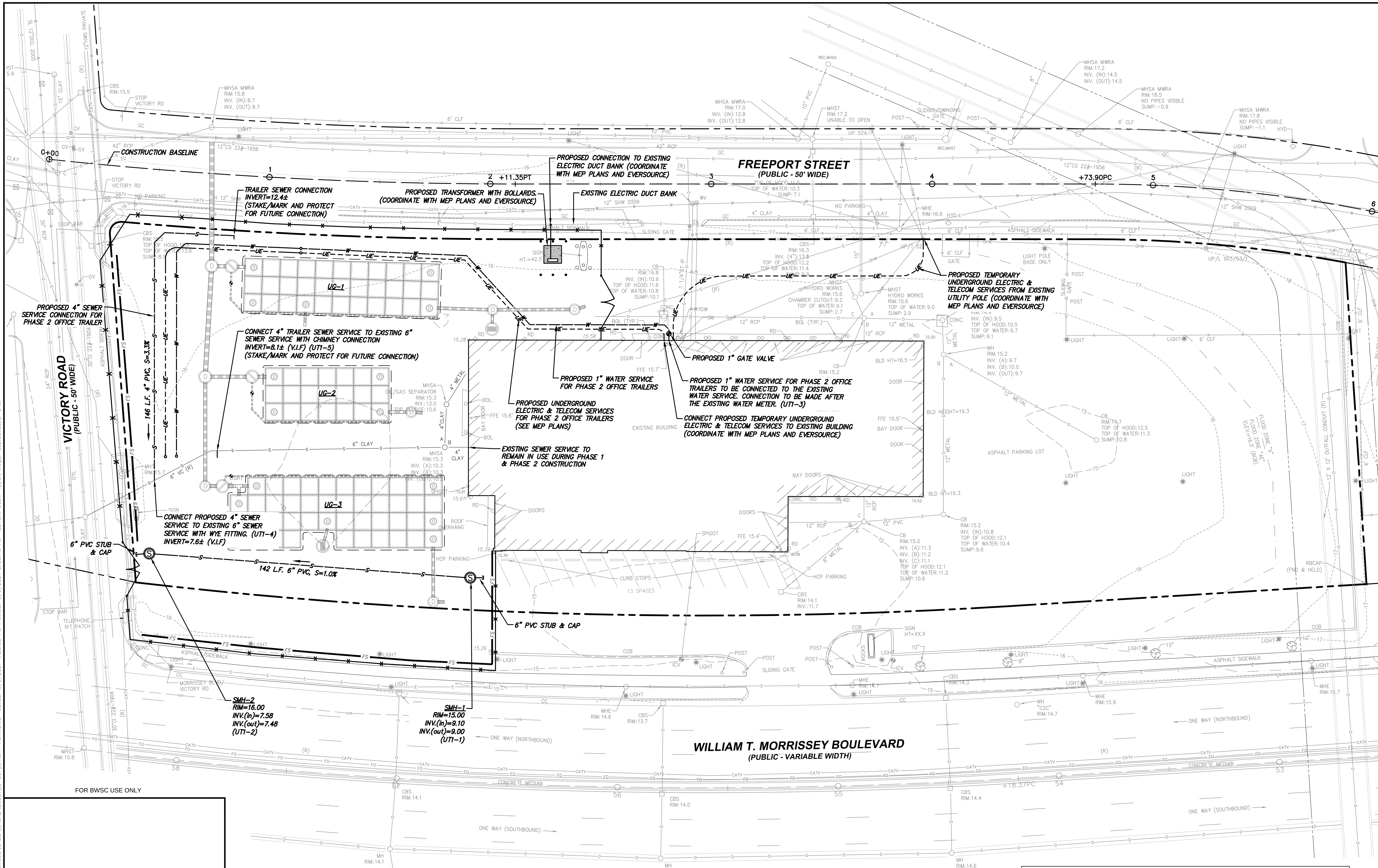
No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

OVERALL GRADING & DRAINAGE PLAN

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: 1"=20'

Drawing No.:

C-204



FOR BWSC USE ONLY

BWSC SITE PLAN NUMBER: #20059

BOSTON WATER & SEWER INSPECTION LIST

TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
UT1-1	SMH-1 (1+93: 178'R)		
UT1-2	SMH-2 (0+59: 174'R)		
UT1-3	WATER TO PH2 TRAILERS (2+81, 71'R)		
UT1-4	SEWER TO PH2 TRAILER (0+59, 140'R)		
UT1-5	SEWER TO PH2 TRAILER (0+84, 125'R)		

NOTES:
1. THE PROPOSED SEWER FLOW IS 1,359 GALLONS PER DAY.

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Scale in feet: 0 20 40

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

6-9-21

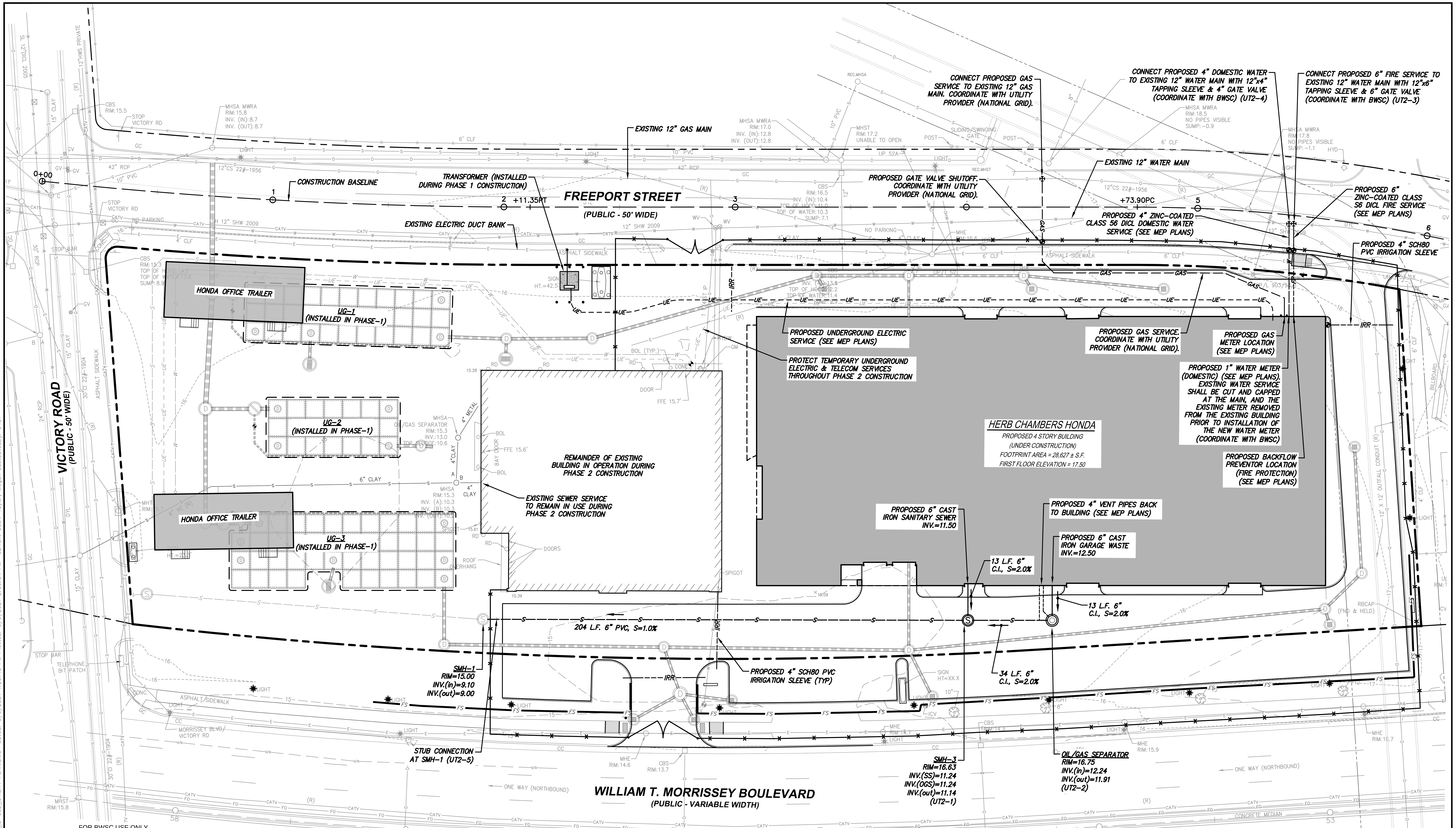
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

UTILITY PLAN
(PHASE 1)
SP # 20059

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date:	Project No:	Scale:
01/31/2020	059051	1"=20'

Drawing No.:
C-301



FOR BWSC USE ONLY

BWSC SITE PLAN NUMBER: #20252

BOSTON WATER & SEWER INSPECTION LIST			
TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
UT2-1	SMH-3 (4+01: 179'R)		
UT2-2	OIL/GAS SEPARATOR (4+37: 179'R)		
UT2-3	FIRE CONNECTION (5+42: 4'R)		
UT2-4	WATER CONNECTION (5+40: 4'R)		
UT2-5	SMH-1 STUB CONNECTION (1+98: 178'R)		

NOTES:
1. THE PROPOSED SEWER FLOW IS 1,359 GALLONS PER DAY.

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0 20 40
Scale in feet

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

KELLY KILLEEN CIVIL No. 58091
6.9.21

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

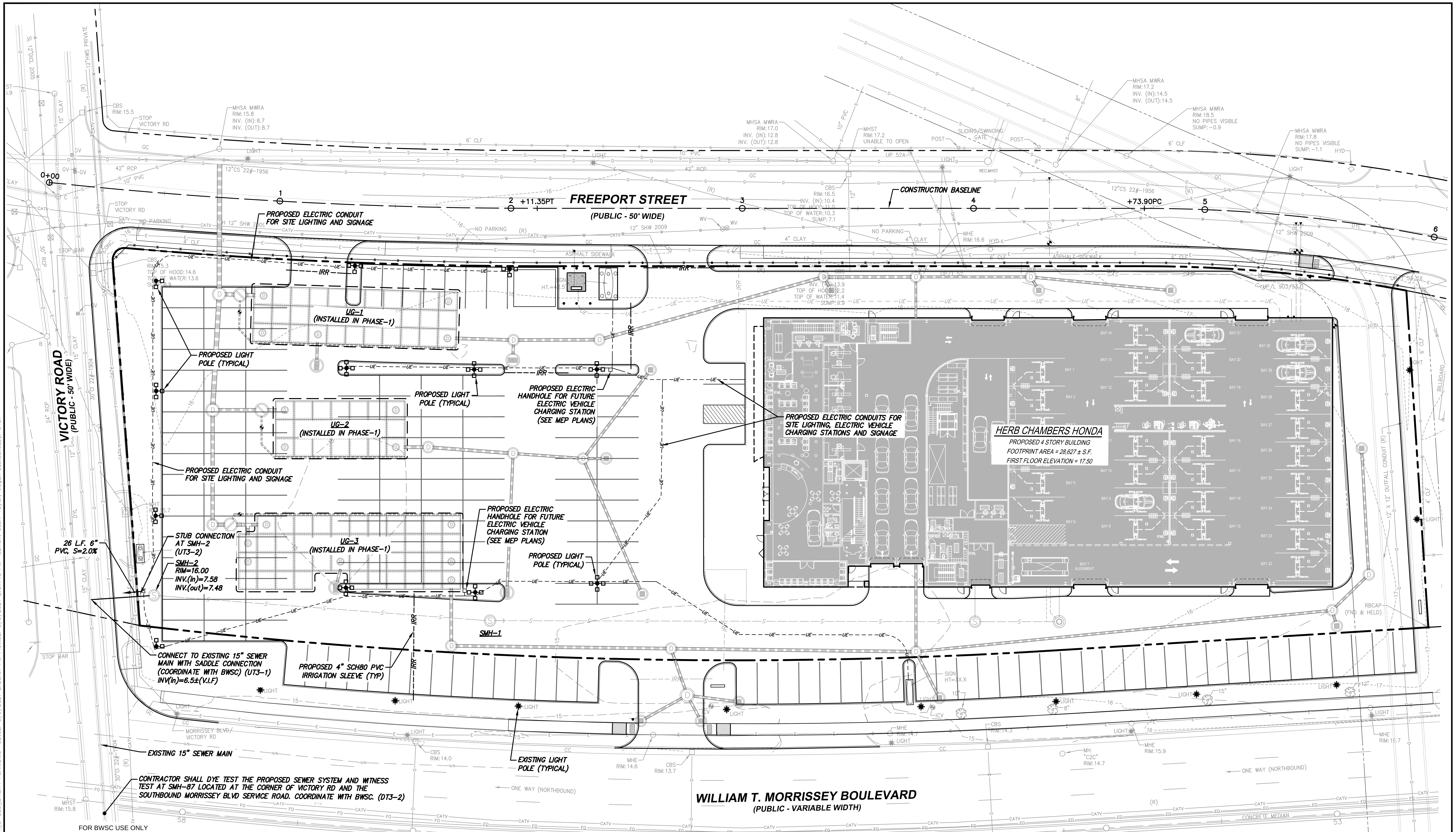
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

UTILITY PLAN
(PHASE 2)
SP # 20252

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date:	Project No:	Scale:
01/31/2020	059051	1"=20'

Drawing No.:
C-302



BWSC SITE PLAN NUMBER: #20253

BOSTON WATER & SEWER INSPECTION LIST			
TAKS ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
UT3-1	SEWER CONNECTION (0+34: 178'R)		
UT3-2	SMH-2 STUB CONNECTION (0+56: 174'R)		
DT3-2	DYE TEST AT SMH-87 (0+62: 342'R)		

NOTES:
1. THE PROPOSED SEWER FLOW IS 1,359 GALLONS PER DAY.

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0 20 40
Scale in feet

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38091
REGISTERED PROFESSIONAL ENGINEER
6.9.21

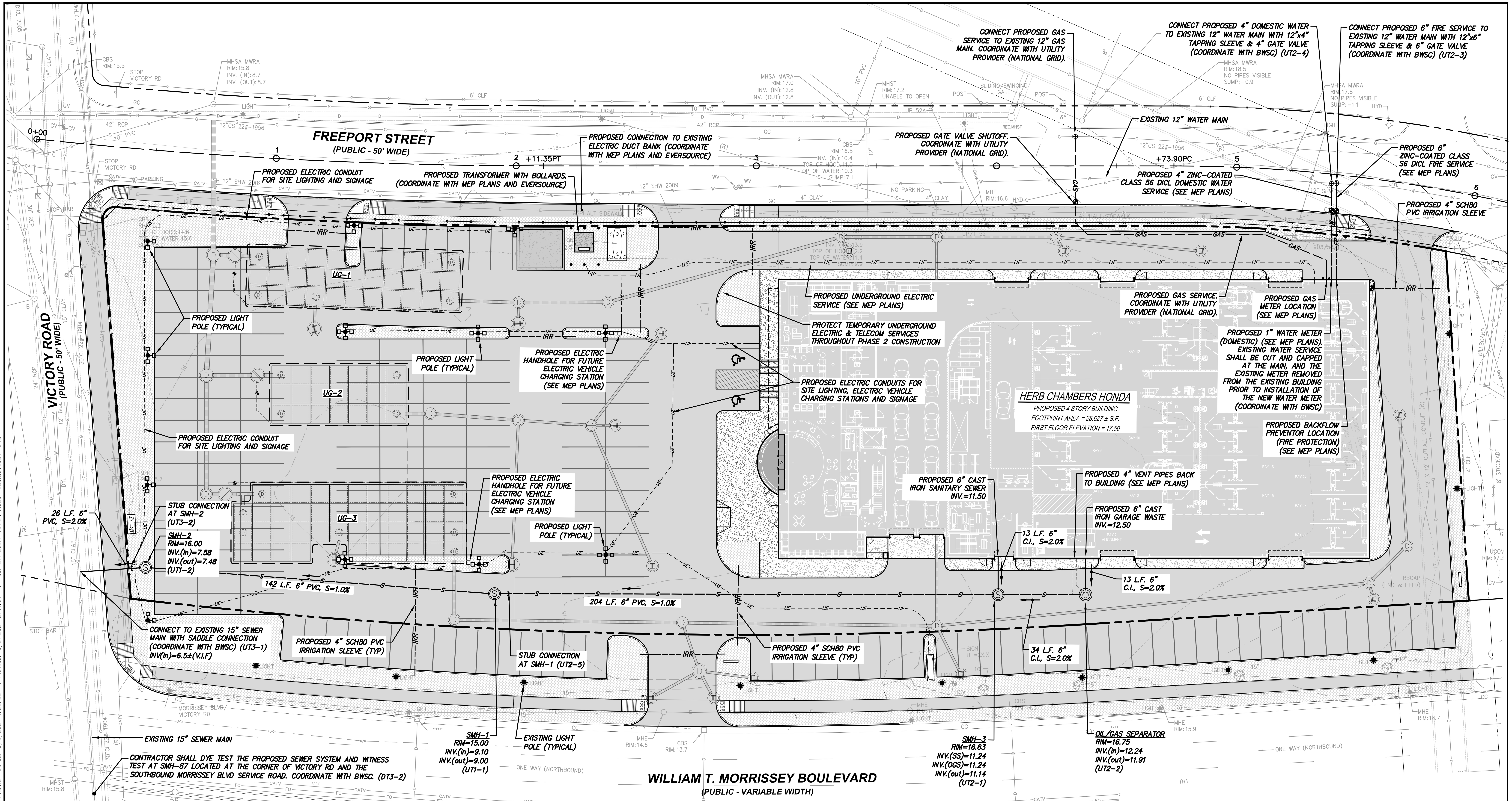
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

UTILITY PLAN
(PHASE 3)
SP # 20253

Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: 1"=20'

Drawing No.:
C-303



FOR BWSC USE ONLY

BWSC SITE PLAN NUMBER: #20253

BOSTON WATER & SEWER INSPECTION LIST

TASK ID	STRUCTURE/CONNECTION	INSPECTION DATE	INSPECTOR SIGNATURE
UT1-1	SMH-1 (1+93: 178'R)		
UT1-2	SMH-2 (0+59: 174'R)		
UT1-3	WATER TO PH2 TRAILERS (2+81, 71'R)		
UT1-4	SEWER TO PH2 TRAILER (0+59, 140'R)		
UT1-5	SEWER TO PH2 TRAILER (0+84, 125'R)		
UT2-1	SMH-3 (4+01: 179'R)		
UT2-2	OIL/GAS SEPARATOR (4+37: 179'R)		
UT2-3	FIRE CONNECTION (5+42: 4'R)		
UT2-4	WATER CONNECTION (5+40: 4'R)		
UT2-5	SMH-1 STUB CONNECTION (1+98: 178'R)		
UT3-1	SEWER CONNECTION (0+34: 178'R)		
UT3-2	SMH-2 STUB CONNECTION (0+56: 174'R)		
DT3-2	DYE TEST AT SMH-87 (0+62: 342'R)		

NOTES:
1. THE PROPOSED SEWER FLOW IS 1,359 GALLONS PER DAY.

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Scale in feet: 0 20 40

OWNER / APPLICANT:

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GLASTONBURY, CT 06033

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38691
REGISTERED PROFESSIONAL ENGINEER
6.9.21

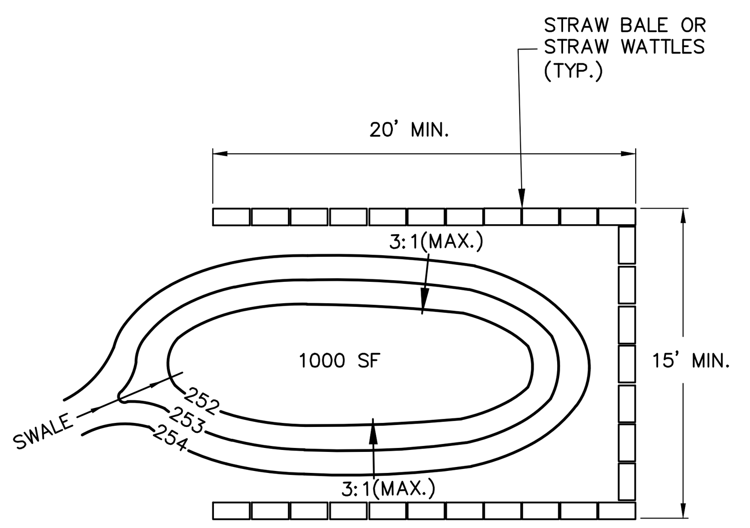
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

OVERALL UTILITY PLAN

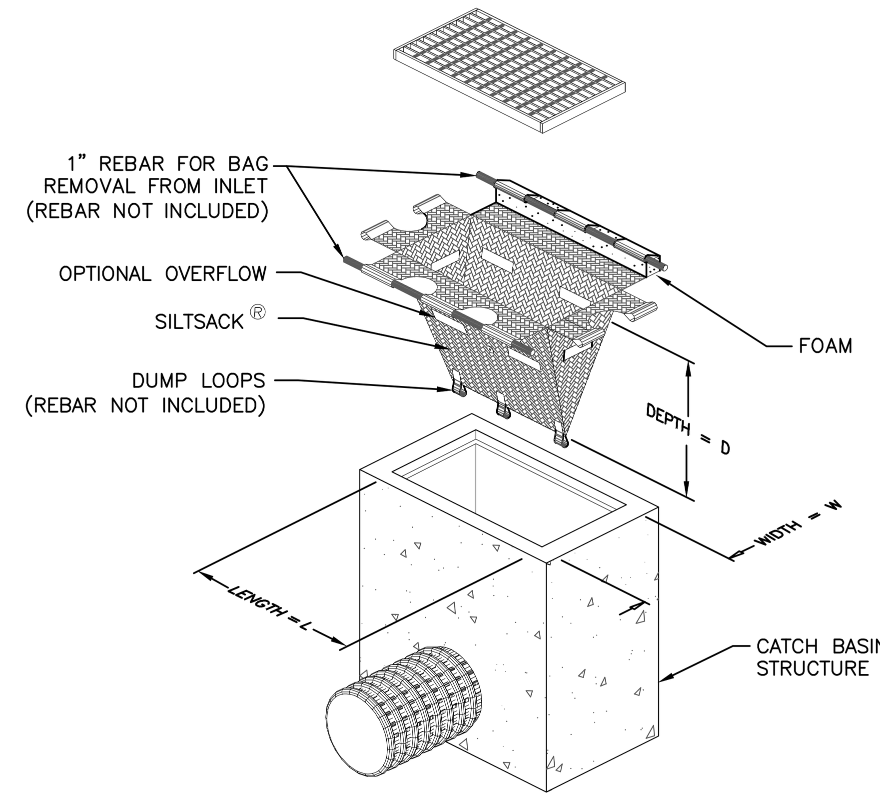
Designed By:	Drawn By:	Checked By:
TK	TK/MT	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: 1"=20'

Drawing No.:
C-304



1. SEDIMENT BASINS AND TRAPS SHALL BE SIZED IN ACCORDANCE WITH EPA NPDES GUIDELINES.
2. SEDIMENT TRAPS ARE UTILIZED FOR DRAINAGE AREAS SMALLER THAN 5 ACRES. THE SEDIMENT TRAP SHOULD HAVE A MINIMUM VOLUME BASED ON 1/2 INCH OF STORAGE FOR EACH ACRE OF DRAINAGE AREA. THIS VOLUME EQUATES TO 1800 CUBIC FEET OF STORAGE OR 67 CUBIC YARDS FOR EACH ACRE OF DRAINAGE AREA.
3. SEDIMENT BASIN ARE UTILIZED FOR DRAINAGE AREAS FROM 5 TO 100 ACRES. THE TEMPORARY SEDIMENT BASIN SHOULD HAVE A MINIMUM VOLUME OF 3,600 CUBIC FEET FOR EACH ACRE OF DRAINAGE AREA.
4. LOCATION DICTATED BY SEQUENCE OF CONSTRUCTION. CONTRACTOR TO PROVIDE WHERE NECESSARY TO FILTER RUNOFF FROM CONSTRUCTION AREAS PRIOR TO DISCHARGE.

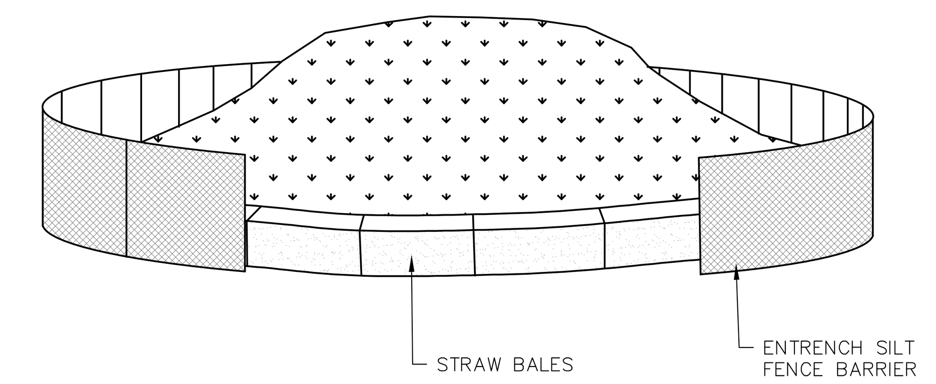
1 TEMPORARY SEDIMENT BASIN
SCALE: NO SCALE



ISOMETRIC VIEW

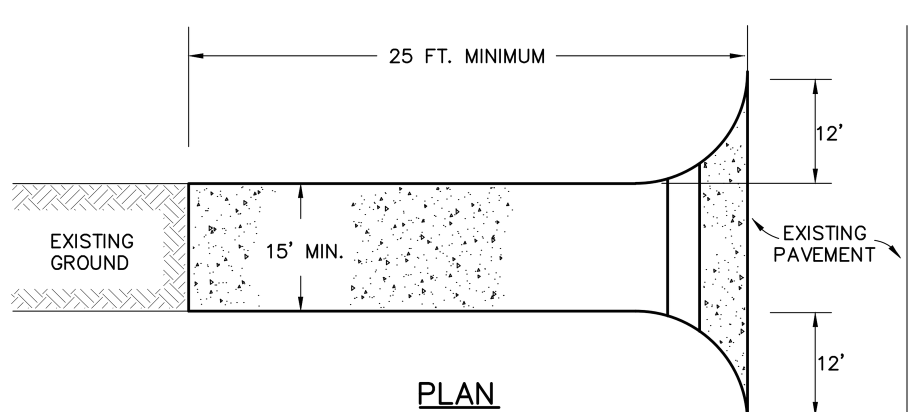
NOTES:
1. REMOVE ACCUMULATED SEDIMENT WHEN CAPACITY IS REDUCED BY HALF OR PER MANUFACTURER'S RECOMMENDATIONS.
2. CATCH BASIN INSERT TO BE SILTSACK® BY ACF ENVIRONMENTAL, PHONE: 1-800-448-3636, acfenvironmental.com OR EQUIVALENT.
3. INSTALL ON ALL EXISTING CATCH BASINS AS INDICATED ON THE SITE PLANS AND INSTALL ON ALL PROPOSED CATCH BASINS AFTER STRUCTURE INSTALLATION.

2 FILTER SACK CATCH BASIN INSERT DETAIL
SCALE: NO SCALE

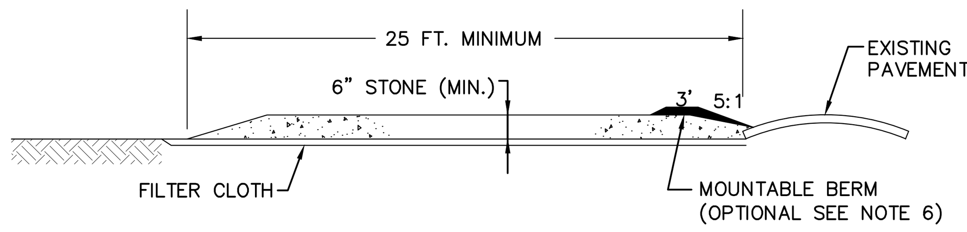


INSTALLATION NOTES:
1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2:1.
3. UPON COMPLETION OF STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH STRAW BALES, THEN STABILIZED WITH VEGETATION, OR COVERED.
4. SEE SPECIFICATIONS FOR INSTALLATION OF STRAW BALES.

3 SOIL STOCKPILE
SCALE: NO SCALE



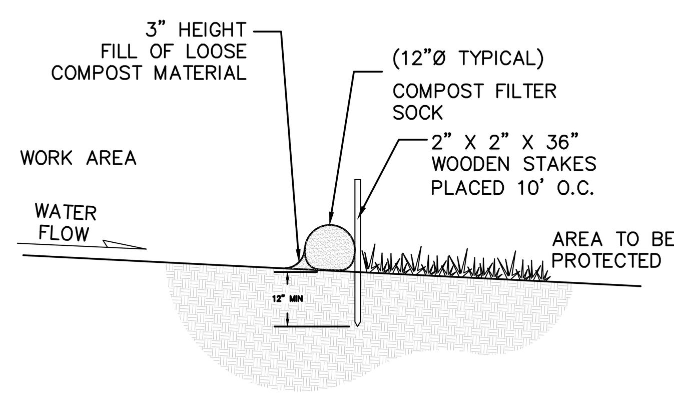
PLAN



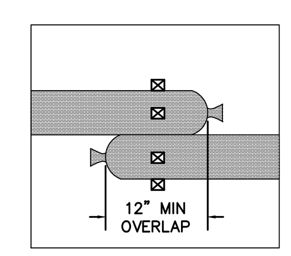
SECTION

CONSTRUCTION SPECIFICATIONS:
1. STONE SIZE: USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH: RECOMMEND GREATER THAN OR EQUAL TO 30 FEET WHERE SOILS ARE SANDS AND GRAVELS AND 100 FEET IN SILTS AND CLAYS.
3. THICKNESS: NOT LESS THAN SIX (6) INCHES.
4. WIDTH: FIFTEEN (15) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OF EGRESS OCCURS.
5. FILTER CLOTH: SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER: ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM SHALL BE INSTALLED.
7. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OF FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY AND ON AN ON GOING BASIS.
8. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED.

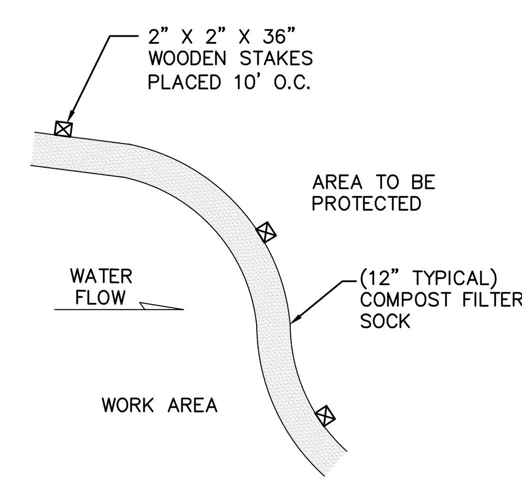
4 STABILIZED CONSTRUCTION ENTRANCE
SCALE: NO SCALE



SECTION VIEW



COMPOST SOCK CONNECTION ATTACHMENT DETAIL



PLAN VIEW

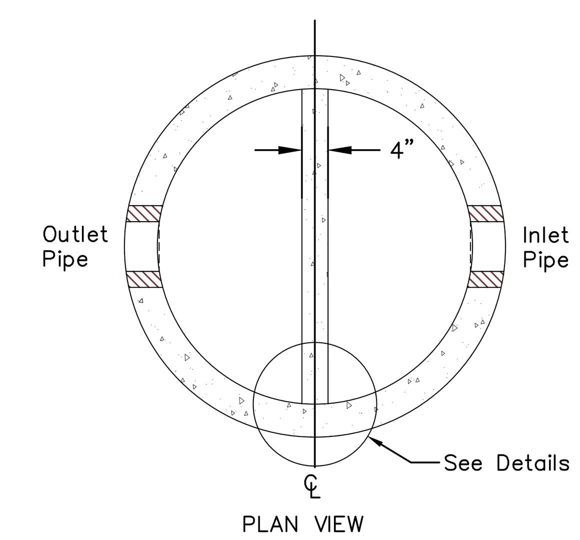
NOTES:
1. PREFABRICATED COMPOST SOCK SHALL BE FILTREXX SOXX OR APPROVED EQUAL.
2. MATERIAL FOR SOCKS SHALL CONSIST OF SANITIZED MATURE COMPOST, FREE OF VIABLE WEED SEEDS AND FOREIGN DEBRIS SUCH AS GLASS AND PLASTIC. COMPOST SHALL BE IN SHREDDED OR GRANULAR FORM AND FREE FROM HARD LUMPS. IN ADDITION, NO KILN-DRIED WOOD OR CONSTRUCTION DEBRIS SHALL BE ALLOWED. CONTRACTOR SHALL REFER TO MASSDOT SPECIFICATIONS M1.06.0 FOR MATERIAL SPECIFICATIONS.
3. SOCK SHALL CONSIST OF JUTE MESH OR OTHER APPROVED BIODEGRADABLE MATERIAL.

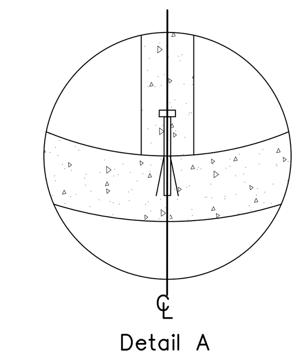
PRACTICE: COMPOST FILTER SOCK:
A COMPOST FILTER SOCK IS A TYPE OF CONTAINED COMPOST FILTER BERM CONSISTING OF A MESH TUBE FILLED WITH COMPOST MATERIAL THAT IS PLACED PERPENDICULAR TO SHEET FLOW RUNOFF TO RETAIN SEDIMENT FROM DISTURBED AREAS. THE COMPOST FILTER SOCK ACTS AS A FILTER TO RETAIN SEDIMENT AND OTHER POLLUTANTS (E.G., SUSPENDED SOLIDS, NUTRIENTS) WHILE ALLOWING THE WATER TO FLOW THROUGH IT. COMPOST QUALITY MUST MEET AASHTO 2010 SPECIFICATIONS.

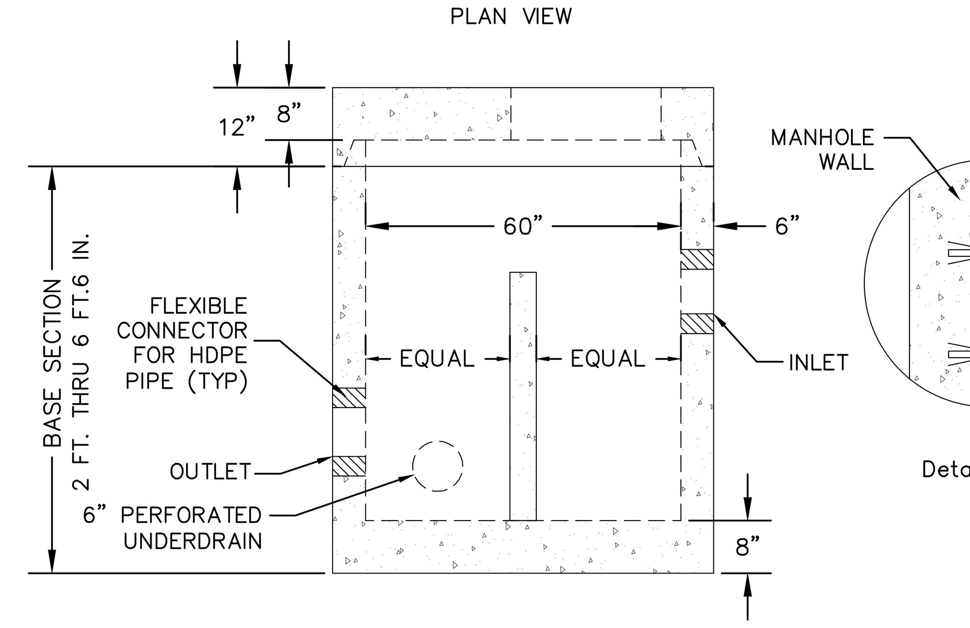
INSTALLATIONS REQUIREMENTS:
ONCE THE FILTER SOCK IS FILLED AND PUT IN PLACE, IT SHOULD BE ANCHORED TO THE SLOPE BY STAKES ALONG THE DOWNHILL SIDE OF THE SOCK AT 10' SPACING ON CENTER (O.C.)0 THE ENDS OF THE FILTER SOCK SHOULD BE DIRECTED UPSLOPE, TO PREVENT STORMWATER FROM RUNNING AROUND THE END OF THE TUBE.

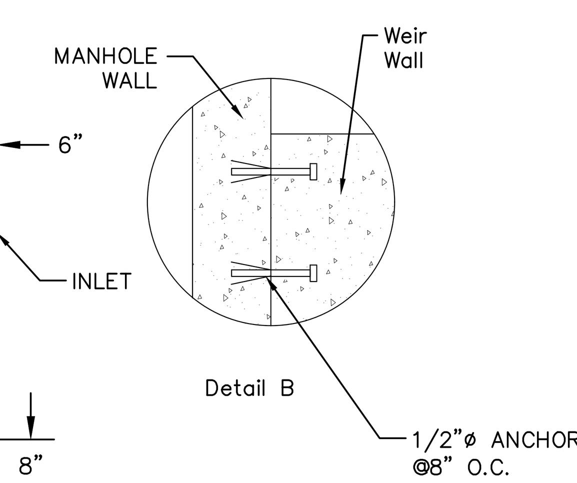
MAINTENANCE REQUIREMENTS:
SOCK MUST BE INSPECTED FOR SEDIMENT ACCUMULATION. IF THERE IS EXCESSIVE PONDING BEHIND THE FILTER SOCK OR ACCUMULATED SEDIMENT REACHES THE TOP OF THE SOCK, AN ADDITIONAL SOCK SHOULD BE ADDED ON TOP OR INFRONT OF THE EXISTING SOCK IN THESE AREAS. AN ADEQUATE RESERVE OF SOCKS MUST BE KEPT ON SITE AT ALL TIMES FOR EMERGENCY AND/OR ROUTINE REPLACEMENT. SOCKS SHALL BE REMOVED ONLY AFTER EXPOSED SOILS IN THE CONTRIBUTING DRAINAGE AREA ACHIEVE FINAL STABILIZATION. SEDIMENT ACCUMULATION MUST BE REMOVED ONCE IT HAS REACHED 1/2 OF THE EXPOSED HEIGHT OF THE SOCK.

5 12-INCH COMPOST FILTER SOCK
SCALE: NO SCALE









OUTLET CONTROL STRUCTURE INVERTS				
STRUCTURE	RIM	INLET	OUTLET	TOP OF WALL
OCS-1	15.76	18" @ 9.92 6" @ 9.26	18" @ 9.82	11.66
OCS-2	15.45	18" @ 9.92 6" @ 9.33	18" @ 9.82	11.63
OCS-3	15.53	18" @ 9.75 6" @ 9.06	18" @ 9.65	11.06

6 OUTLET CONTROL STRUCTURE
SCALE: NO SCALE

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OWNER / APPLICANT:

HONDA

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COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
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No. 38991
REGISTERED PROFESSIONAL ENGINEER
6-9-21

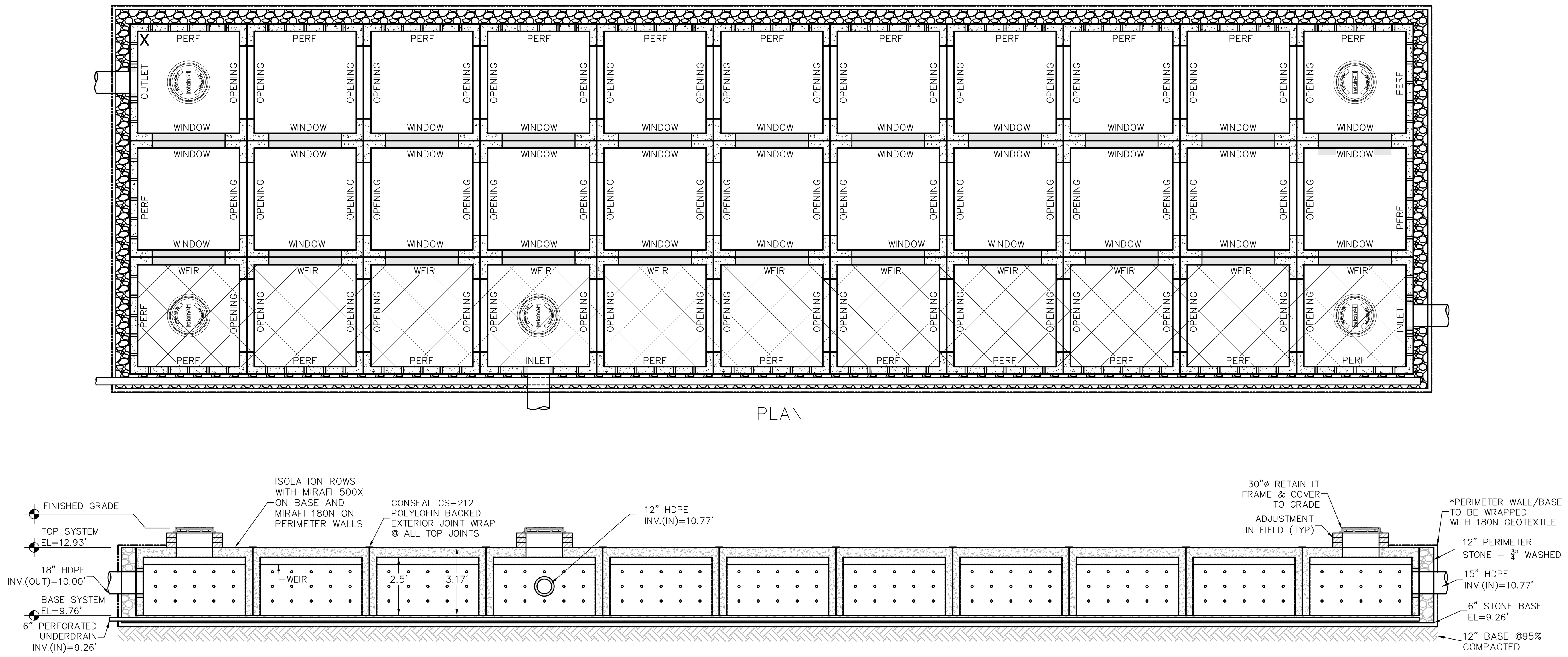
PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

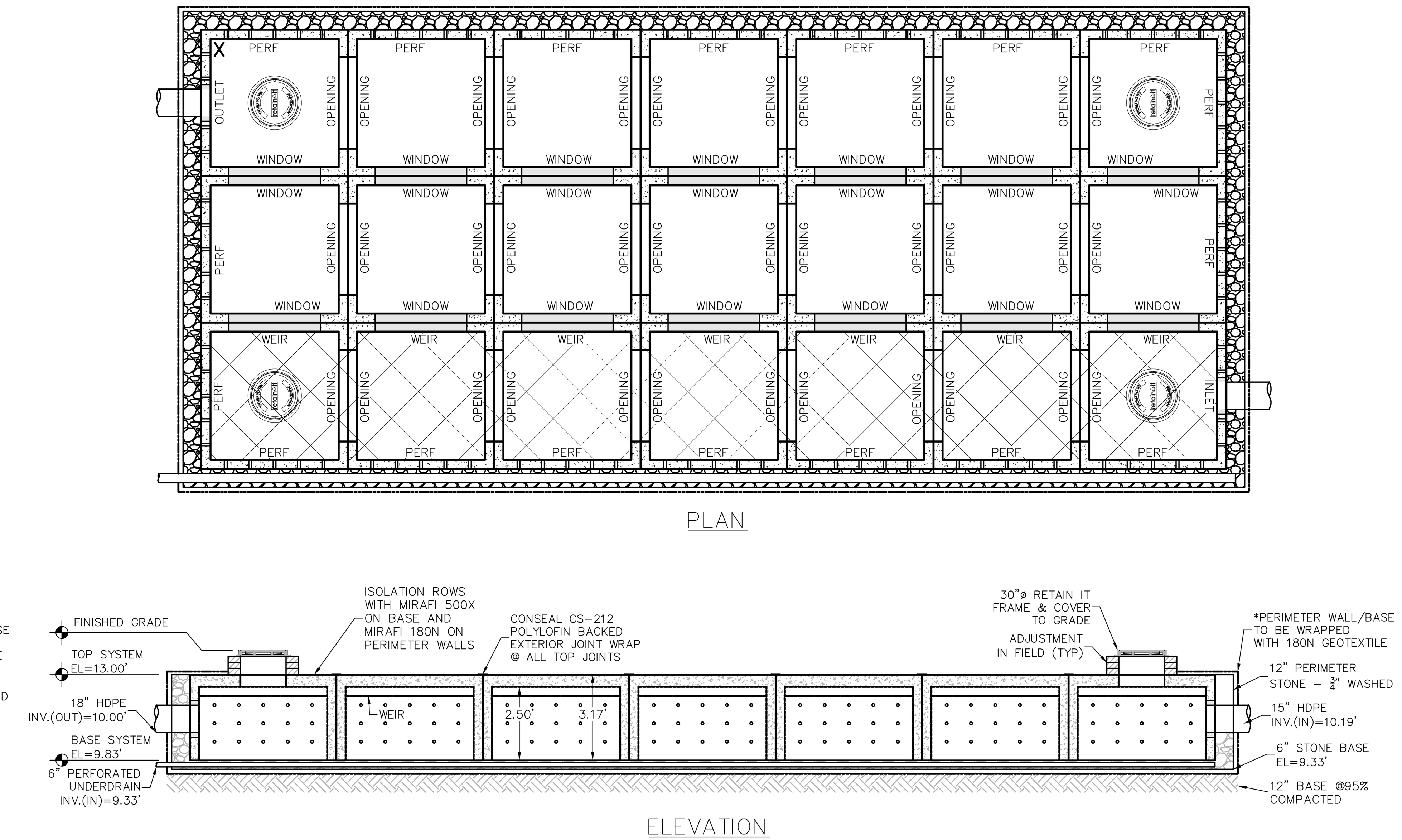
DETAILS-1

Designed By:	Drawn By:	Checked By:
TK/JM	TK/JM	KK
Issue Date:	Project No:	Scale:
01/31/2020	059051	NONE

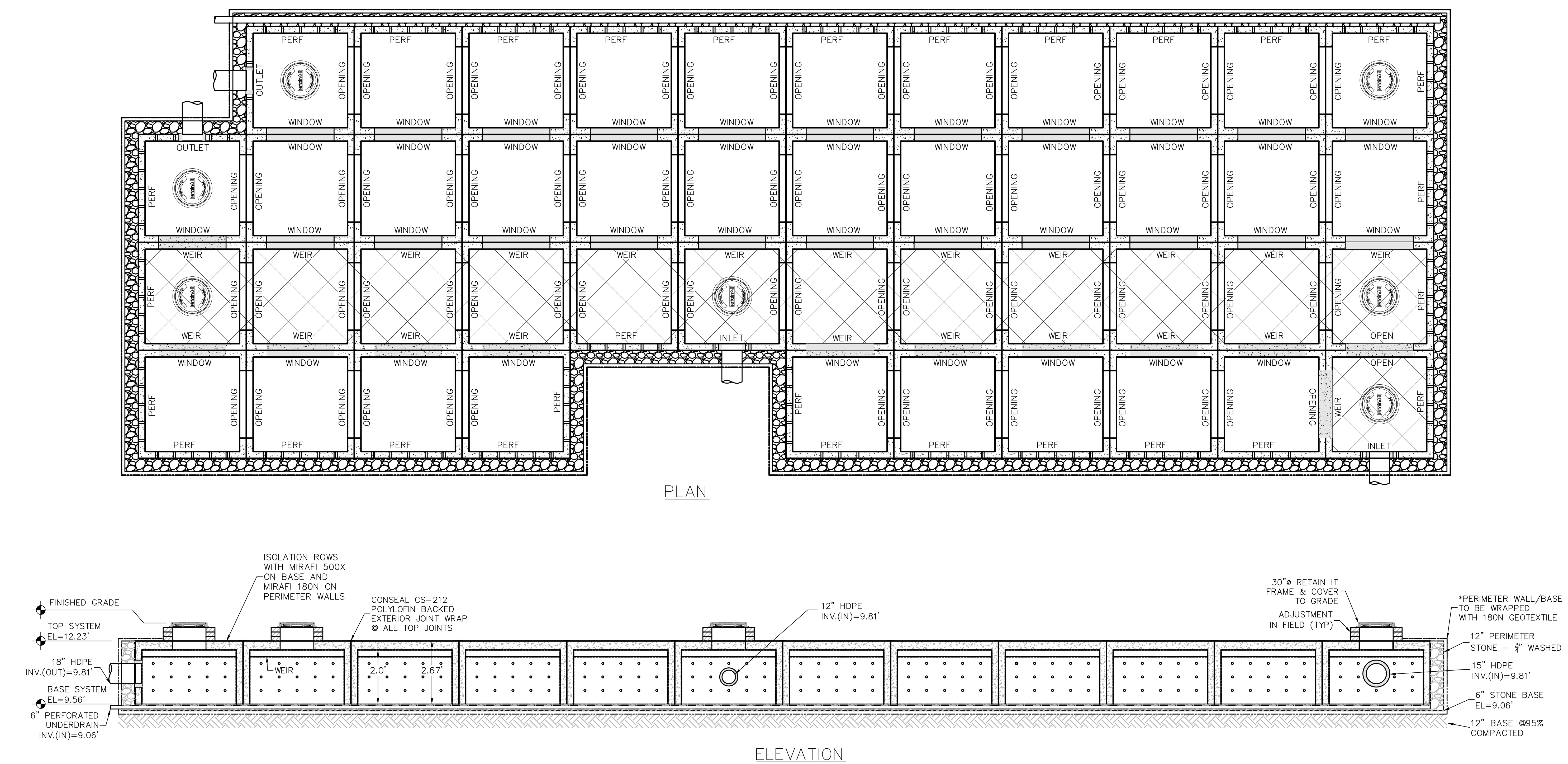
Drawing No.:
C-601



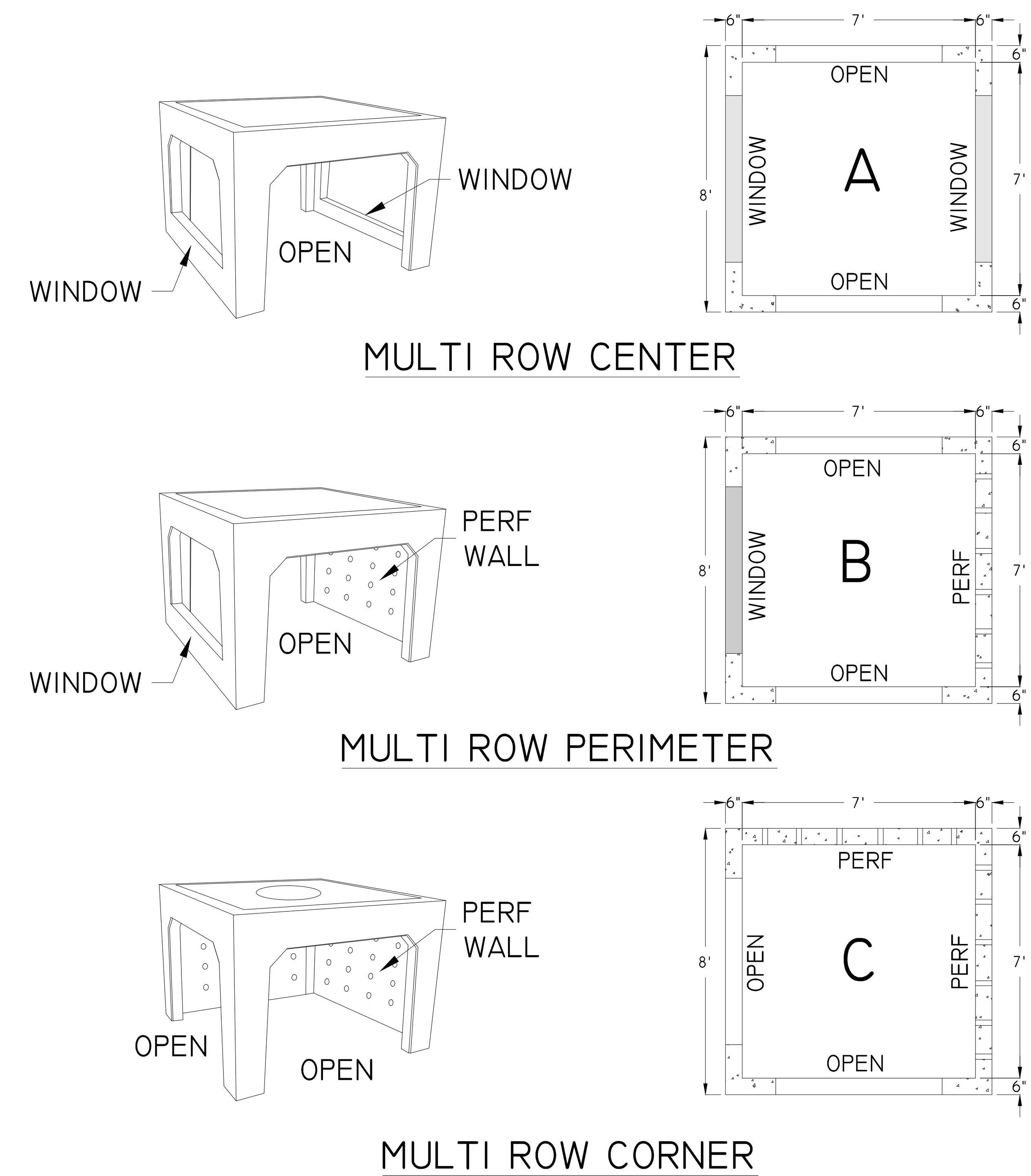
1 RETAIN IT STORMWATER INFILTRATION SYSTEM – UG-1
SCALE: NO SCALE



2 RETAIN IT STORMWATER INFILTRATION SYSTEM – UG-2
SCALE: NO SCALE



3 RETAIN IT STORMWATER INFILTRATION SYSTEM – UG-3
SCALE: NO SCALE



4 RETAIN IT STORMWATER INFILTRATION – STANDARD UNITS
SCALE: NO SCALE

CHA
1 Faneuil Hall Marketplace, South Market Building
Boston, MA 02109-6117
617.451.2717 . www.chacompanies.com

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

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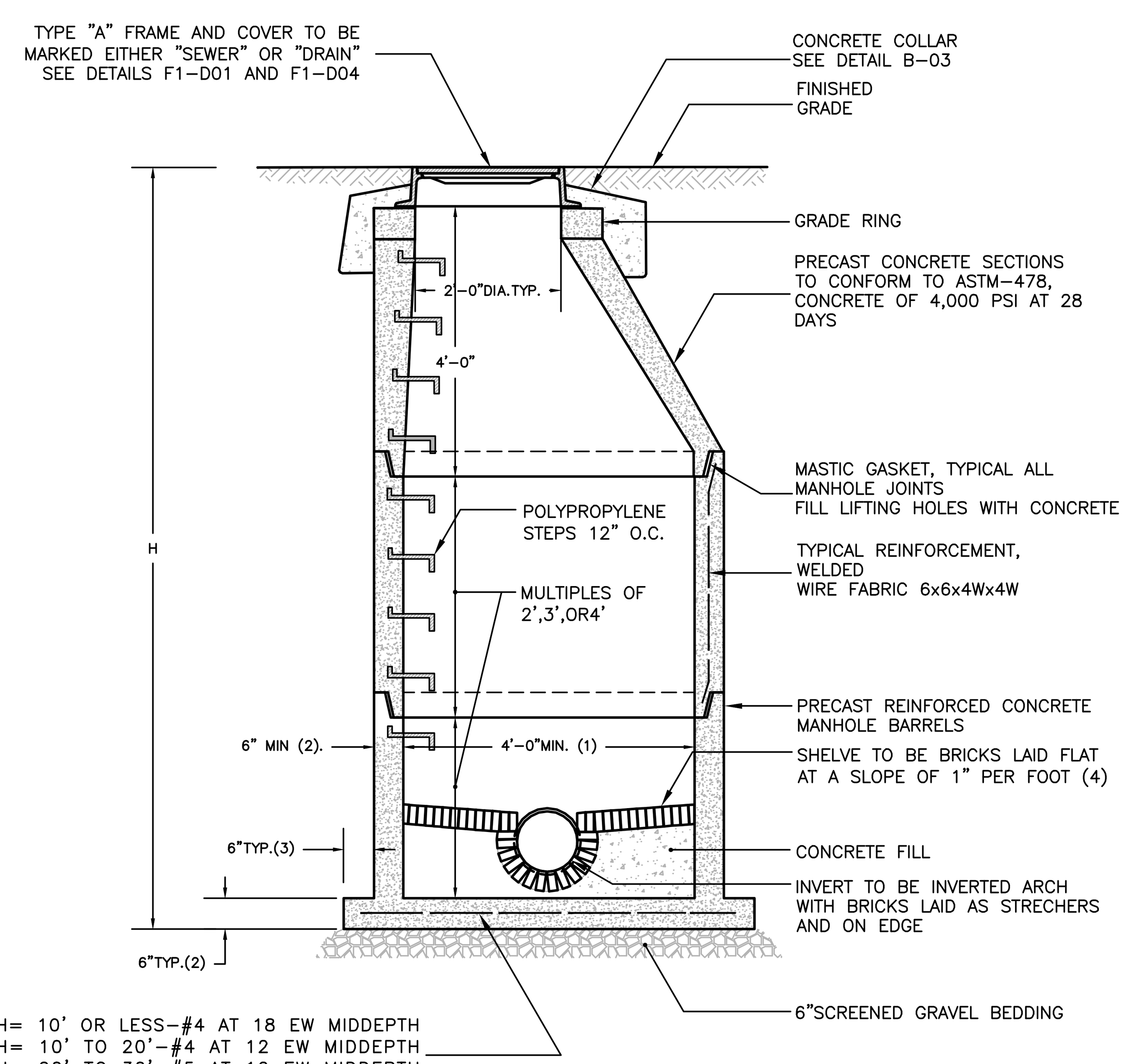
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

DETAILS-2

Designed By:	Drawn By:	Checked By:
TK/JM	TK/JM	KK
Issue Date:	Project No:	Scale:
01/31/2020	059051	NONE

Drawing No.:
C-602



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" MIN. WALL THICKNESS AND 7 INCH MIN. BASE THICKNESS WITH 5'-0" DIAMETER MANHOLES
3. 6 INCH LIP OPTIONAL UNLESS OTHERWISE NOTED
4. CONCRETE INVERT AND SHELF MAY BE SUBSTITUTED IN STORM DRAIN MANHOLES AS DIRECTED BY THE ENGINEER

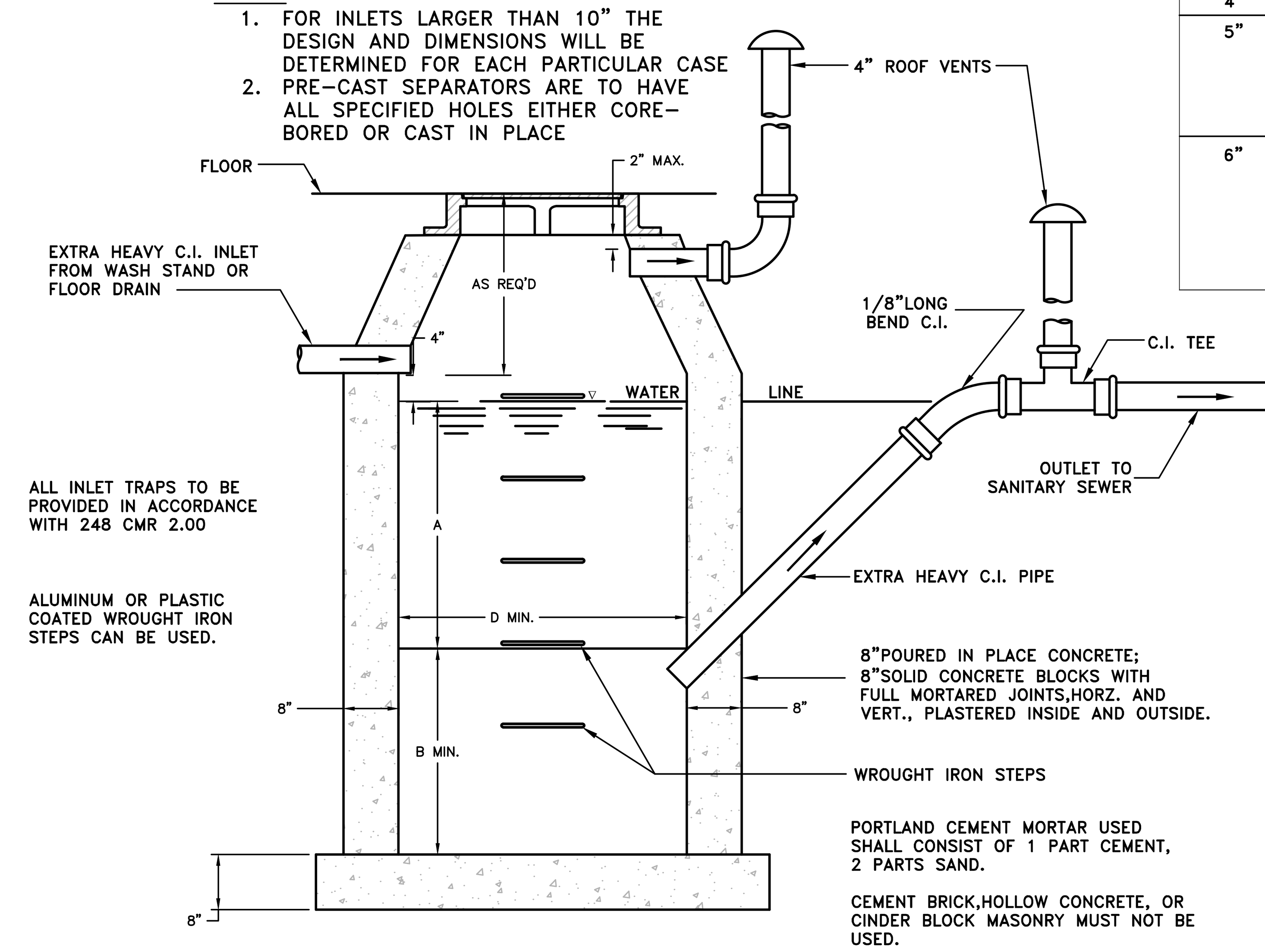
NOTES:

1. ALL CAST IN PLACE CONCRETE TO HAVE A MINIMUM 28 DAY STRENGTH OF 3000 LBS PER SQ. INCH, USING 3/4"MAXIMUM SIZE AGGREGATE
2. REINFORCING STEEL BARS ARE DEFORMED BARS OF BILLET STEEL ASTM A615 GRADE 60
3. WELDED WIRE FABRIC CONFORMS TO ASTM A185
4. CAST IRON FRAME, TYPE "A" AND COVER TYPE "A" FOR DETAILS SEE DETAILS NOS. F1-D01, F1-D04 AND F1-D05 COVERS TO BE MARKED EITHER "SEWER" OR "DRAIN".
5. DESIGN LIVE LOAD – HS 20 – 44
6. MINIMUM COVER FOR REINFORCING IN WALLS OR SLABS POURED AGAINST EARTH SHALL BE 3 INCHES. ALL OTHERS SHALL BE 2 INCHES UNLESS OTHERWISE NOTED
7. USE 2'-0" LENGTHS OF PIPE STUBS AT ALL MANHOLES FOR VC OR AC PIPE. USE 4'-0" MAX. LENGTHS OF PIPE STUBS AT ALL MANHOLES FOR RC, DI OR PVC.
8. THESE MANHOLE DETAILS TO BE USED FOR BOTH SANITARY SEWER AND STORM DRAIN MANHOLES
9. ALL MANHOLES SHALL BE CONSTRUCTED OF REINFORCED CONCRETE SHOP DRAWINGS SUBMITTALS SHALL SHOW ALL REINFORCING DETAILS
10. MWRA OIL AND GREASE SEPARATOR IS USED WITHIN BUILDINGS WHERE REQUIRED BY MWRA (MASSACHUSETTS WATER RESOURCES AUTHORITY) OR DEP (DEPARTMENT OF ENVIRONMENTAL PROTECTION) REGULATION. FOR DETAILS SEE DETAIL NO. B-04. FOR BWSC APPROVED GRIT AND OIL SEPARATORS, SEE DETAIL NOS. B-17 AND B-18.

1 TYPICAL PRECAST CONCRETE MANHOLE (B-02a) & MANHOLE GENERAL NOTES (B-02e)
SCALE: NO SCALE

NOTES:

1. FOR INLETS LARGER THAN 10" THE DESIGN AND DIMENSIONS WILL BE DETERMINED FOR EACH PARTICULAR CASE
2. PRE-CAST SEPARATORS ARE TO HAVE ALL SPECIFIED HOLES EITHER CORE-BORED OR CAST IN PLACE



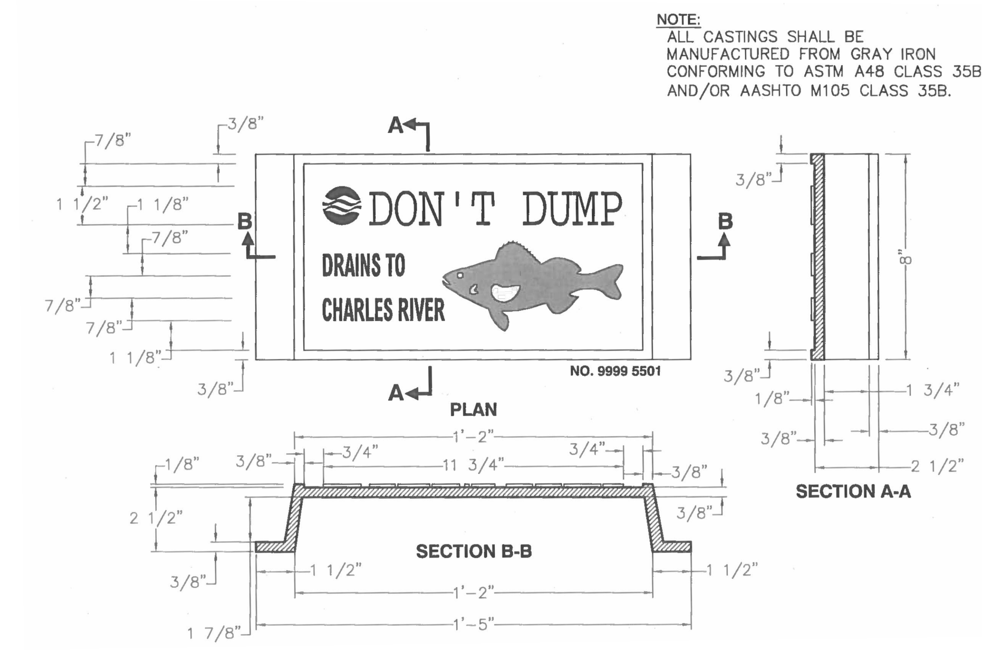
INLET	D	A	B	INLET	D	A	B
4"	3'-6"ø	3'-0"	2'-6"	8"	5'-0"ø	6'-0"	5'-0"
5"	3'-6"ø	5'-0"	4'-0"		5'-6"x 5'-6"	4'-6"	4'-0"
	3'-6"x 3'-6"	4'-0"	3'-0"		6'-0"ø	4'-0"	3'-6"
	4'-0"	3'-8"	3'-0"		6'-0"x 6'-0"	3'-0"	2'-6"
	4'-0"x 4'-0"	3'-0"	2'-6"		6'-6"ø	3'-6"	3'-0"
	4'-6"	3'-0"	2'-6"		6'-6"x 6'-6"	3'-0"	2'-6"
6"	4'-0"ø	5'-0"	4'-6"	10"	5'-6"ø	7'-6"	6'-6"
	4'-0"x 4'-0"	4'-0"	3'-6"		6'-0"x 6'-0"	5'-6"	4'-6"
	4'-6"ø	4'-0"	3'-6"		6'-0"ø	6'-6"	5'-6"
	4'-6"x 4'-6"	3'-6"	3'-0"		6'-6"x 6'-6"	5'-0"	4'-0"
	5'-0"ø	3'-6"	3'-0"				
	5'-0"x 5'-0"	3'-0"	2'-6"				

GENERAL CONSTRUCTION NOTES

1. BASIN TO BE LOCATED OUTSIDE OF BUILDING WHERE POSSIBLE,COVER TO HAVE A CENTER HOLE.
2. A TIGHT COVER MUST BE USED IF BASIN IS LOCATED INSIDE OF BUILDING.
3. OPENING SHALL BE NOT LESS THAN 24" DIA.
4. THE CATCH BASIN SHALL BE SO LOCATED AND CONSTRUCTED THAT SURFACE WATER SHALL BE EXCLUDED.
5. INLET PIPE SHALL BE AT LEAST FOUR INCHES ABOVE NORMAL WATER LINE.
6. WHERE SUBJECT TO FROST OR CRUSHING CONDITIONS, OUTLET SHALL BE AT LEAST THREE FEET BELOW THE SURFACE.
7. THE NEW CATCH BASIN MUST BE FILLED WITH CLEAN WATER BEFORE USING, AND AFTER BEING EMPTIED FOR PERIODIC CLEANING.
8. ALL OIL AND GASOLINE MUST BE REMOVED BEFORE CLEANING OUT THE BASIN, AND MUST NOT BE DISCHARGED INTO THE SEWER THROUGH OTHER FIXTURES.
9. SPECIFICATIONS FOR COVERING SPECIAL CASES OR CONDITIONS, SHALL BE APPROVED BY THE LOCAL AUTHORITIES, AND THE AUTHORITIES OF THE M.W.R.A.
10. WROUGHT IRON STEPS SHALL BE SPACED ABOUT 18" APART.
11. BOTH VENTS SHALL BE EXTENED INDEPENDENTLY 18" ABOVE THE ROOF, OR AS APPROVED BY THE LOCAL AUTHORITIES, AND THE AUTHORITIES OF THE M.W.R.A.
12. OUTLET PIPE TO BE 45 DEGREE ANGLE.

2 APPROVED OIL AND GREASE SEPARATOR (G-01)
SCALE: NO SCALE

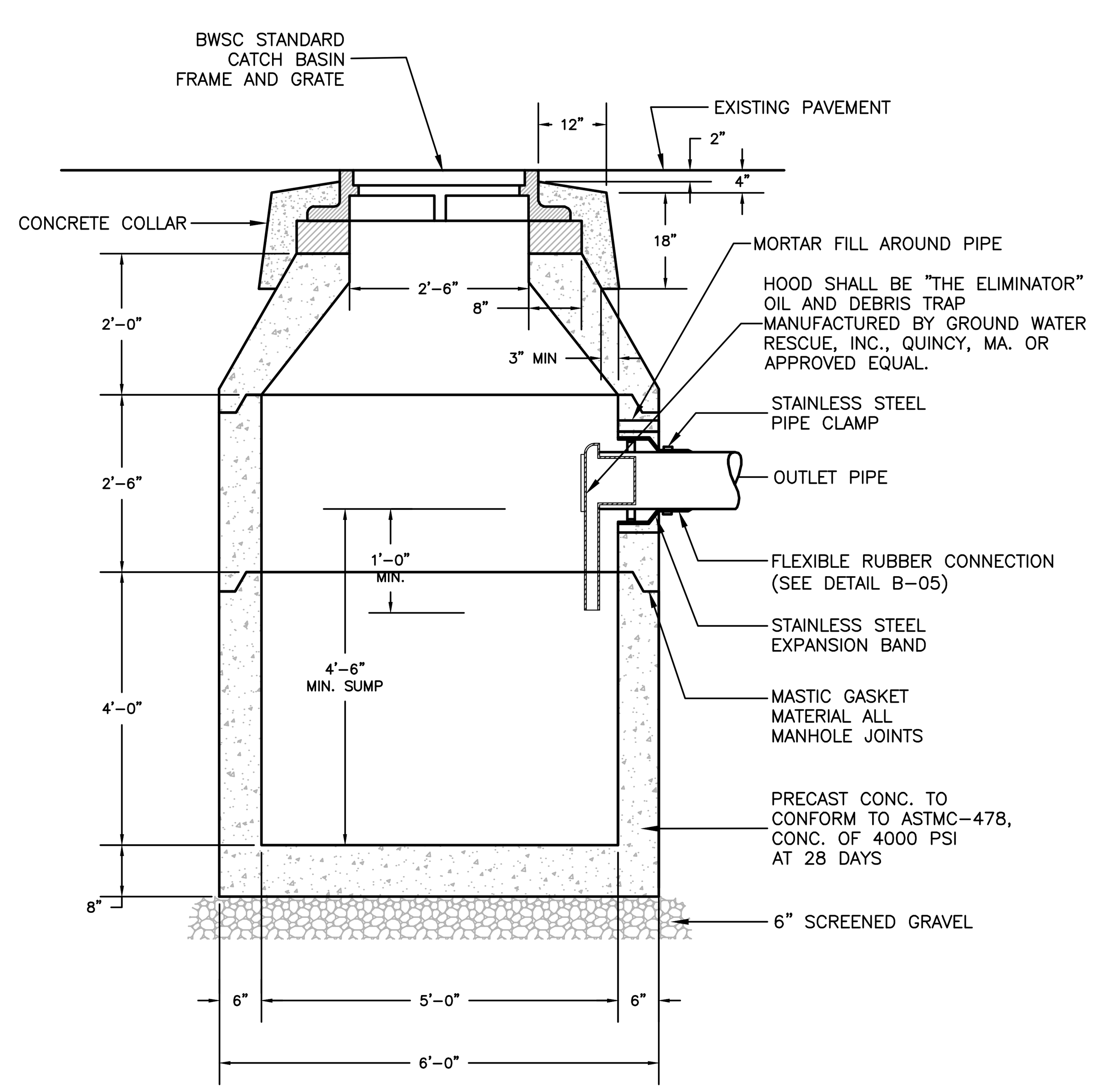
NOTE:
ALL CASTINGS SHALL BE MANUFACTURED FROM GRAY IRON CONFORMING TO ASTM A48 CLASS 35B AND/OR AASHTO M105 CLASS 35B.



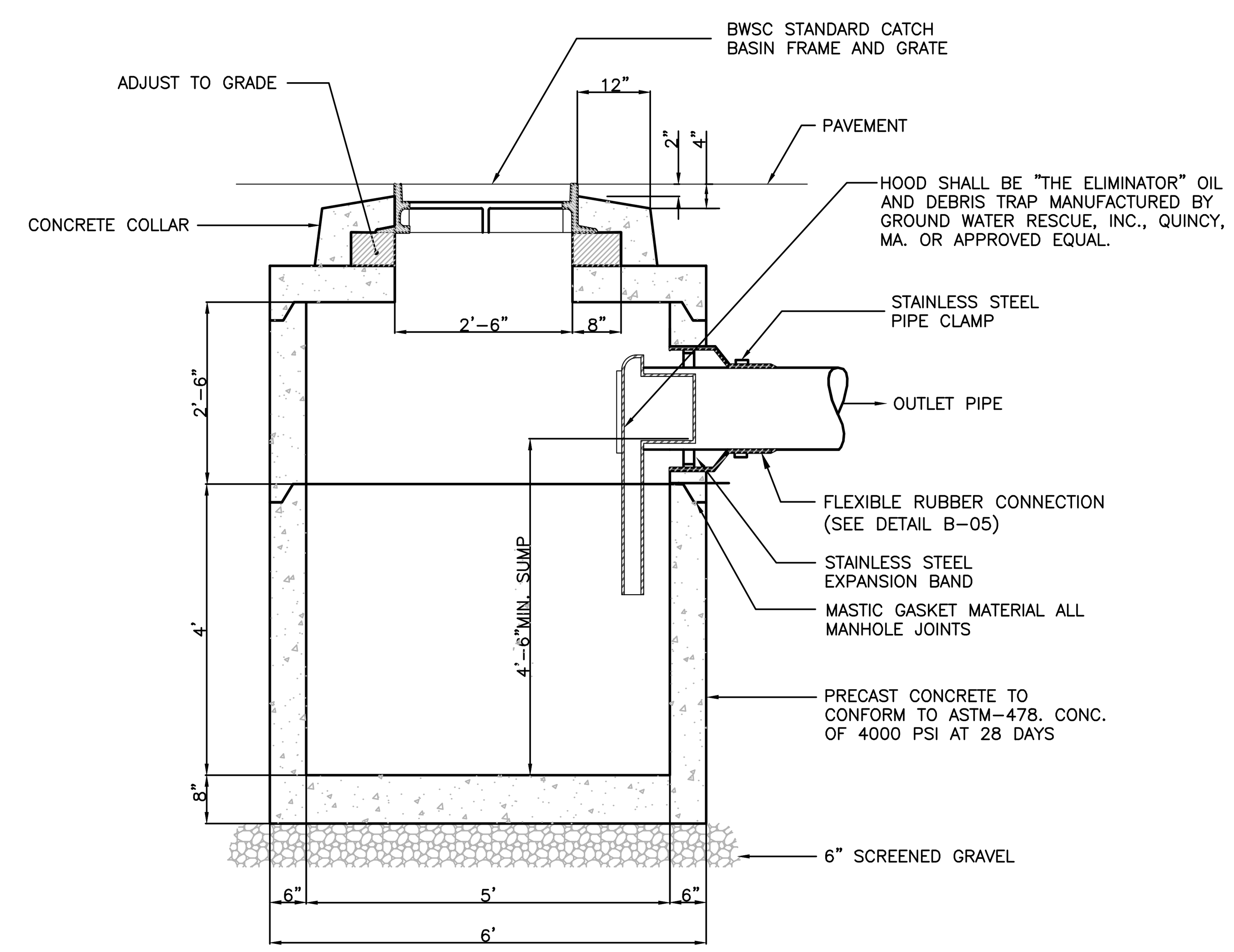
NOTE:

1. PLAQUE SHALL READ "DRAINS TO NEPONSET RIVER". PRODUCT NO. 99995502

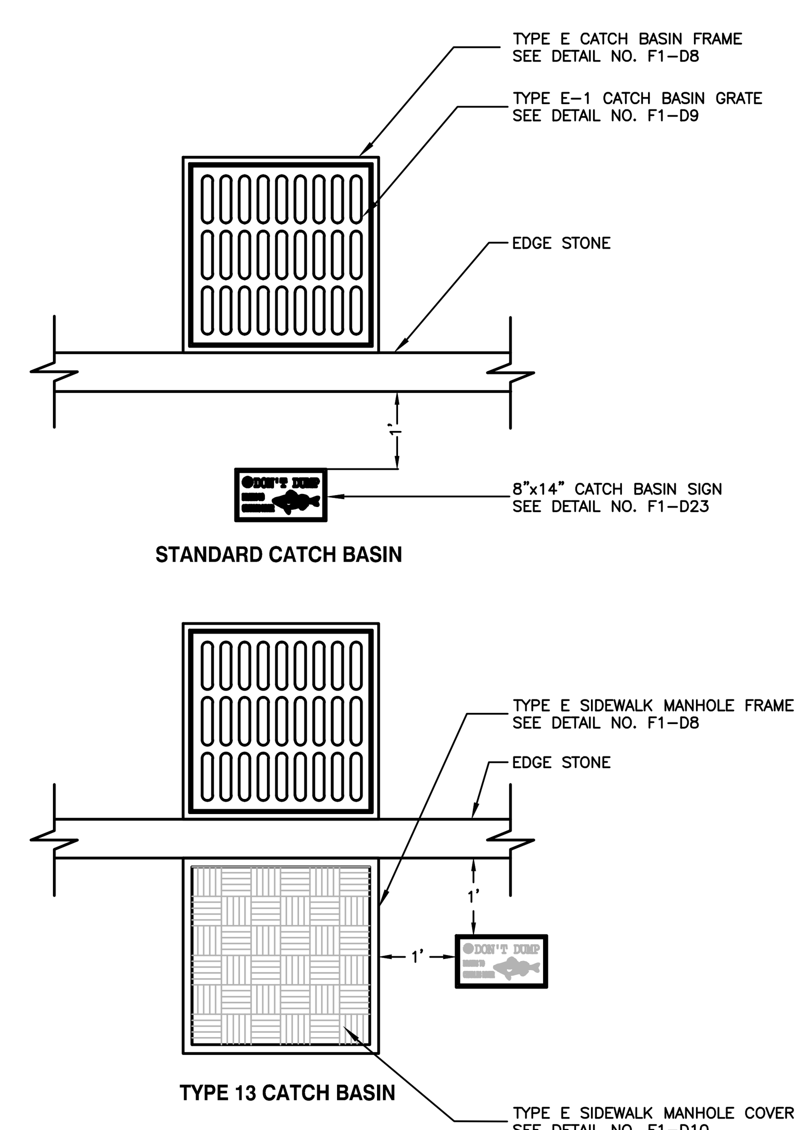
3 8"x14" CATCH BASIN SIGN (F1-D23)
SCALE: NO SCALE



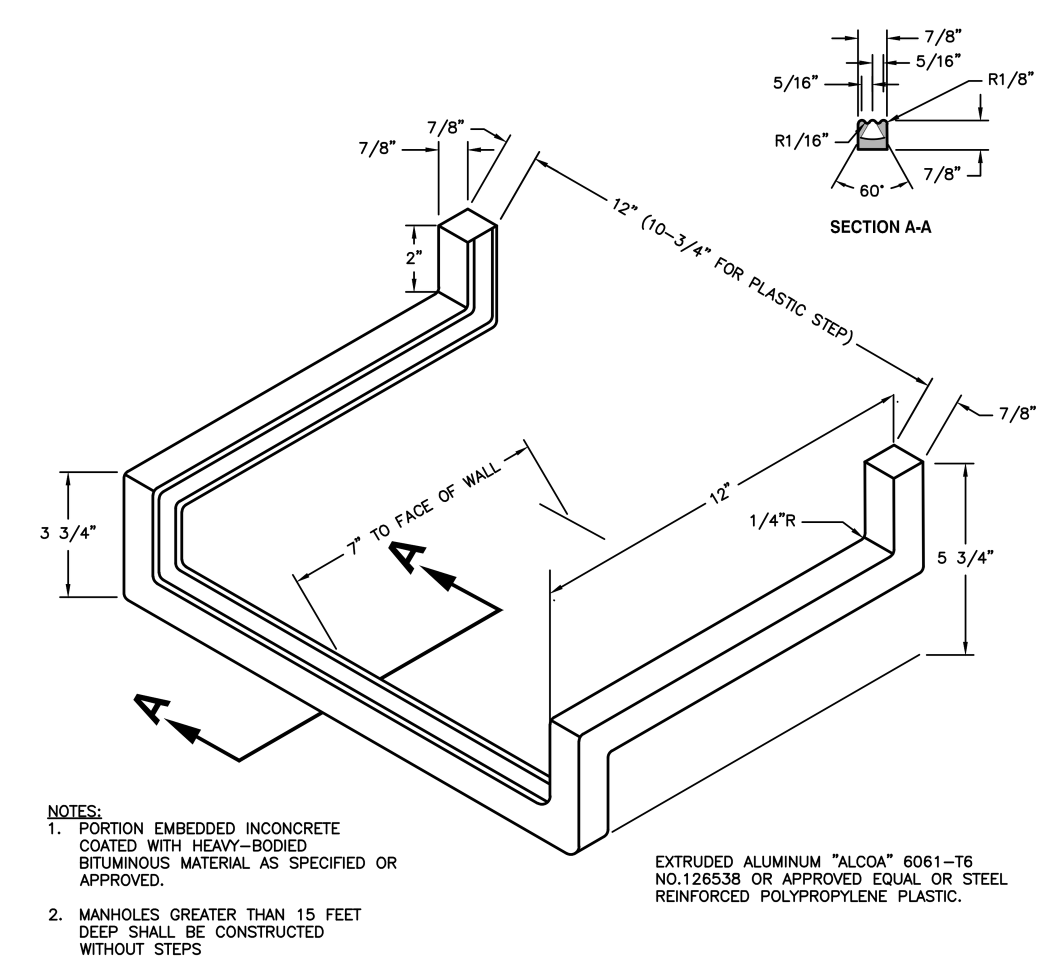
4 STANDARD CATCH BASIN NO.5 (B-01b)
SCALE: NO SCALE



5 SHALLOW CATCH BASIN WITH OIL TRAP OUTLET (B-01d)
SCALE: NO SCALE



6 CATCH BASIN SIGN INSTALLATION (B-01f)
SCALE: NO SCALE



NOTES:

1. PORTION EMBEDDED INCONCRETE COATED WITH HEAVY-BODIED BITUMINOUS MATERIAL AS SPECIFIED OR APPROVED.
2. MANHOLES GREATER THAN 15 FEET DEEP SHALL BE CONSTRUCTED WITHOUT STEPS

EXTRUDED ALUMINUM "ALCOA" 6061-T6 NO.126538 OR APPROVED EQUAL OR STEEL REINFORCED POLYPROPYLENE PLASTIC.

ALUMINUM MANHOLE STEP

7 ALUMINUM MANHOLE STEP DETAIL (B-02f)
SCALE: NO SCALE

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6.9.21

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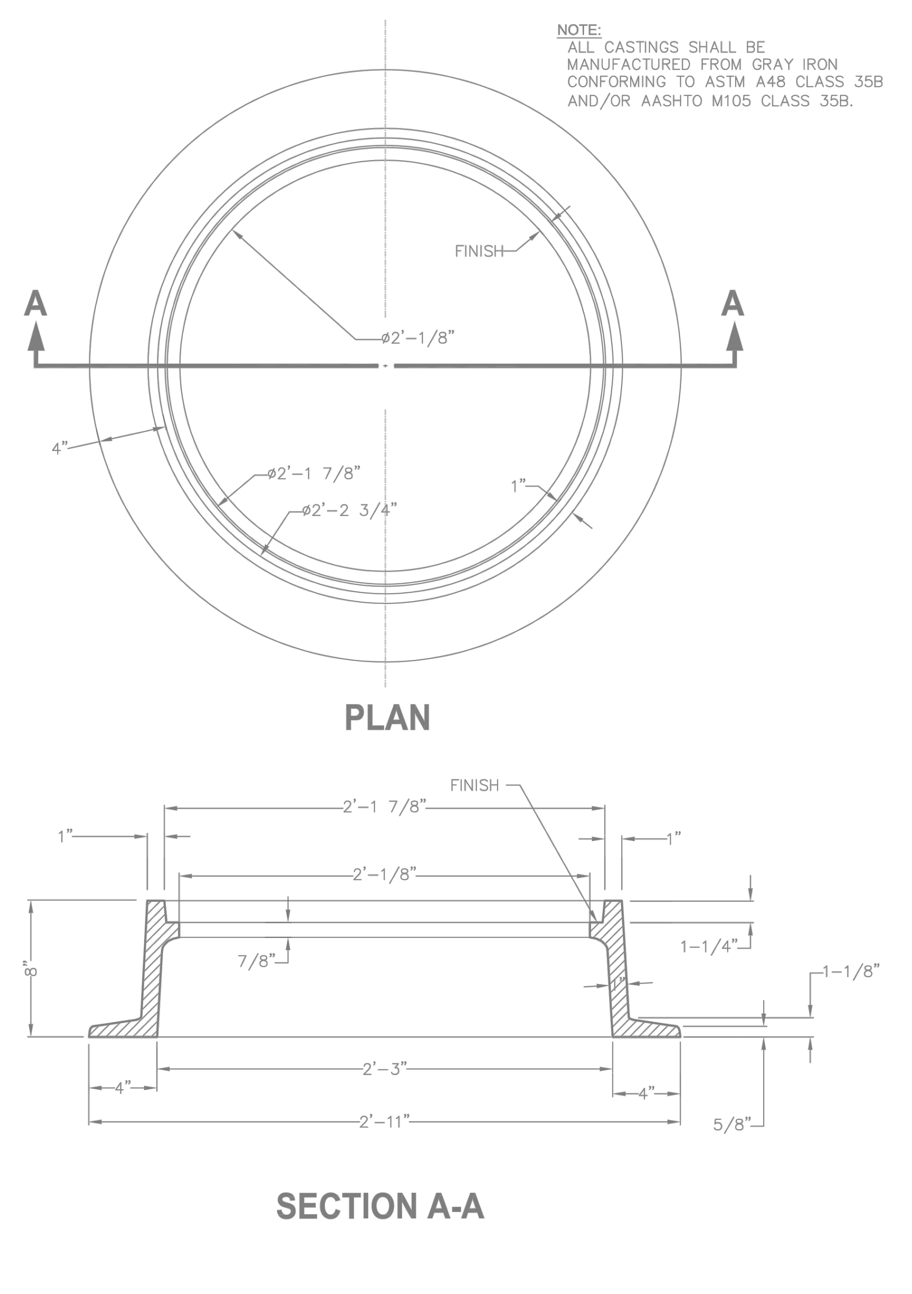
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

DETAILS-3

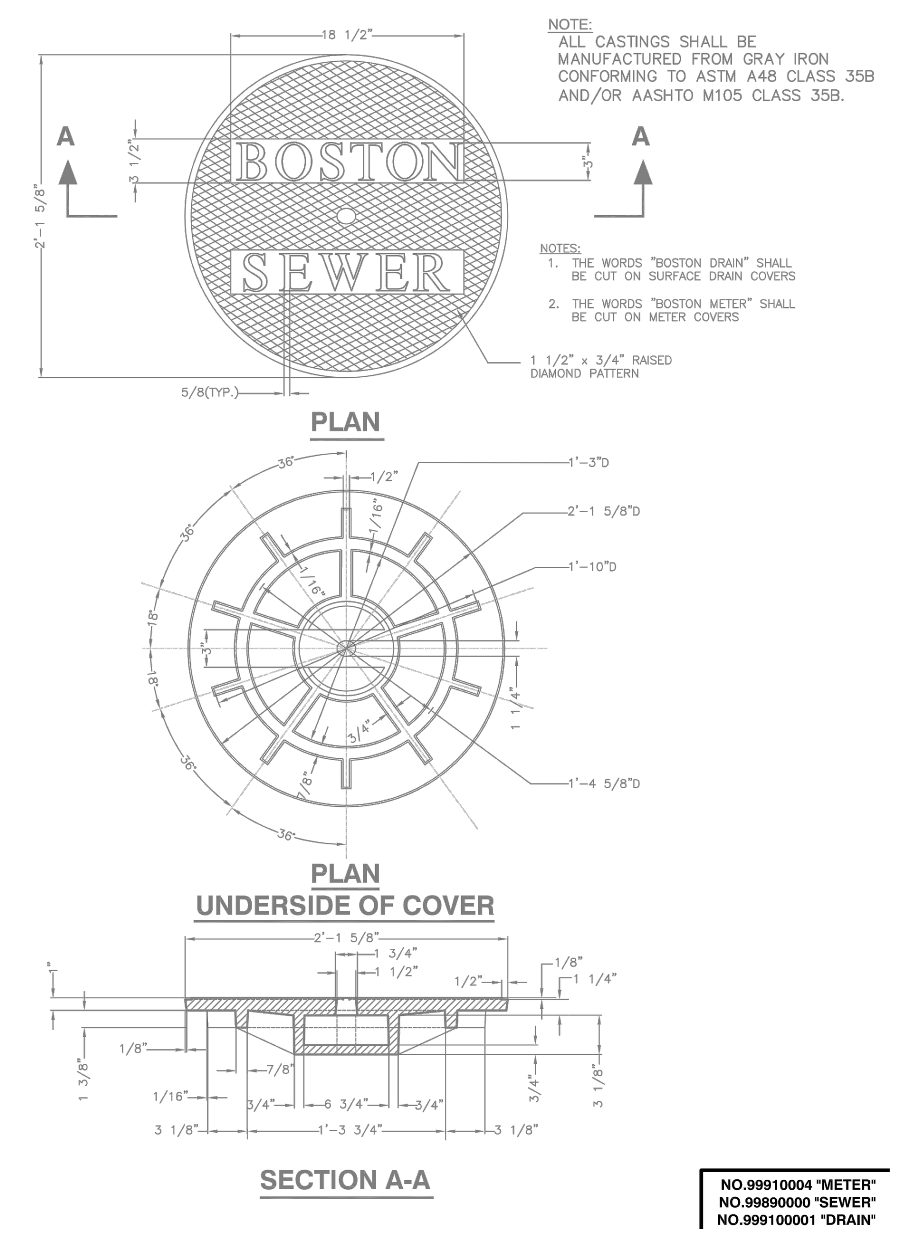
Designed By:	Drawn By:	Checked By:
TK/JM	TK/JM	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: NONE

Drawing No.:

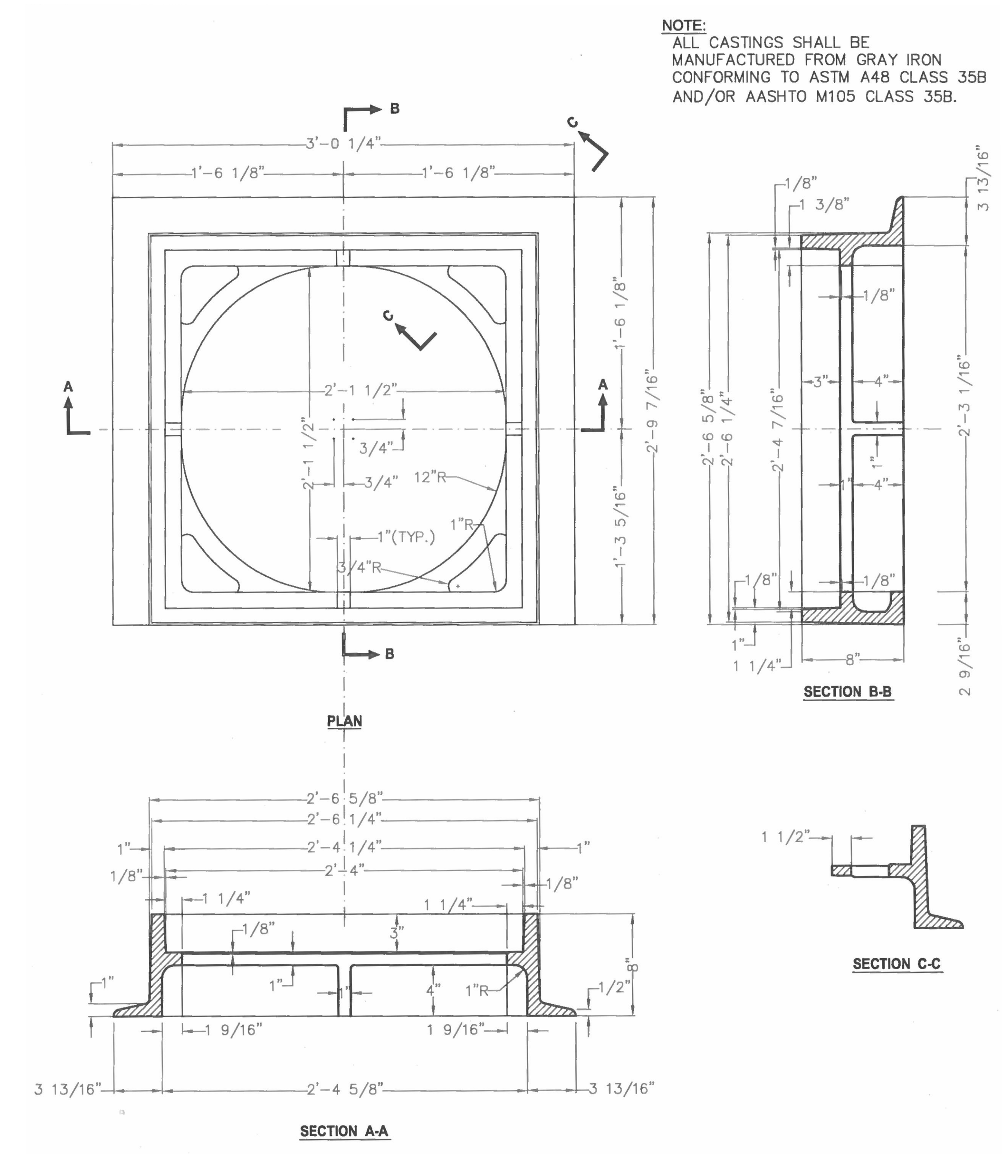
C-603



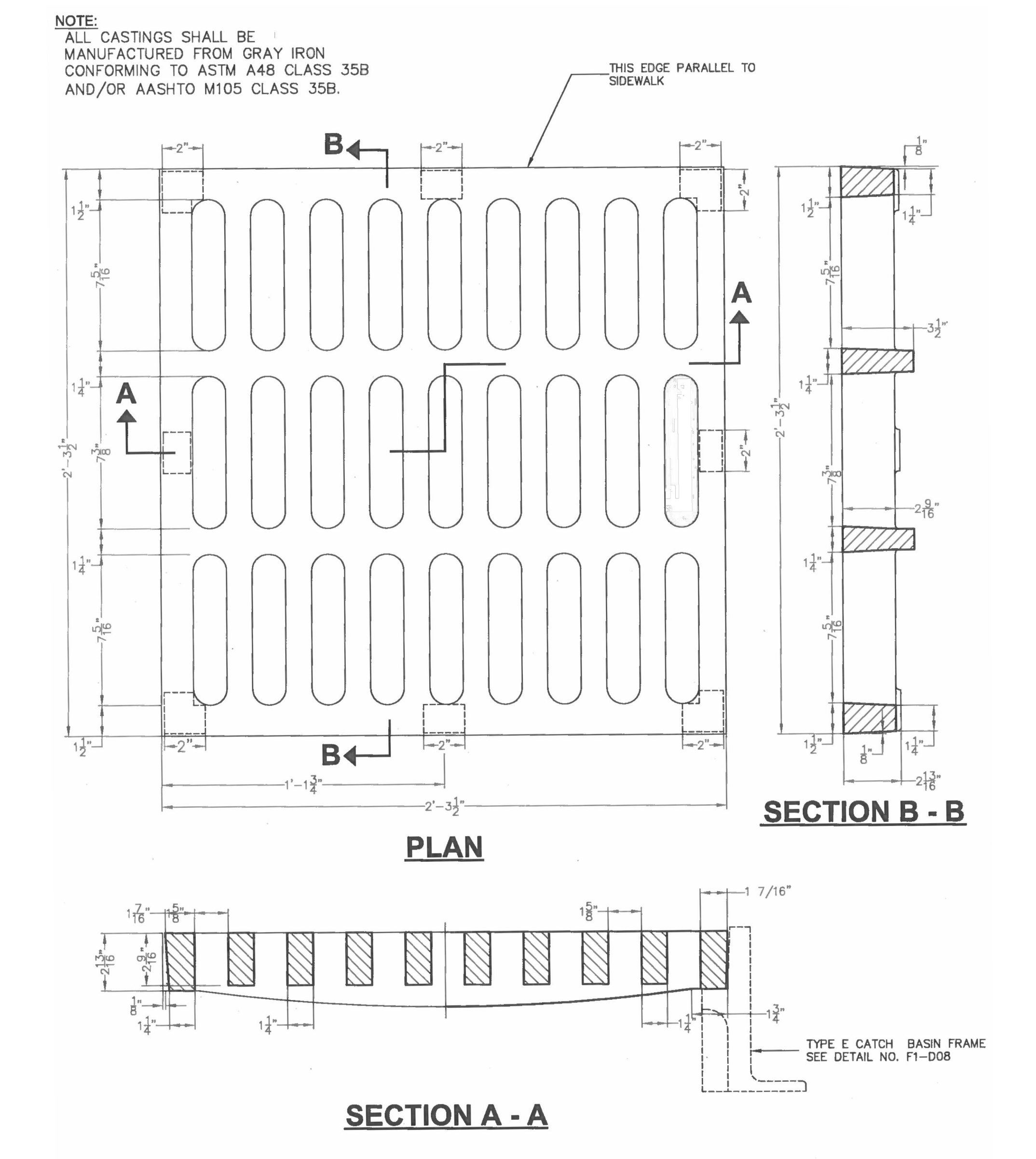
1 TYPE A MANHOLE FRAME NO.99880000 (F1-D01)
SCALE: NO SCALE



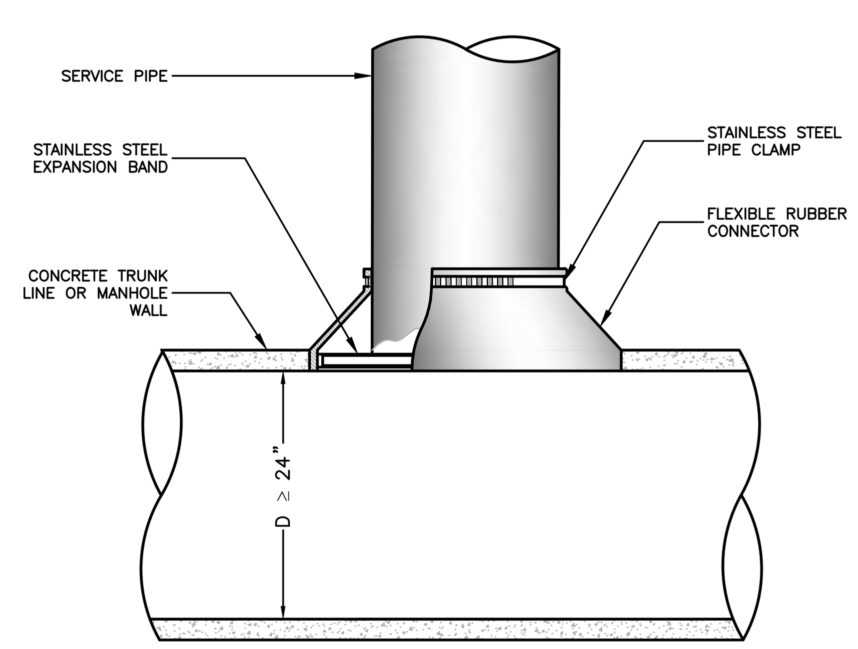
2 TYPE A-2 MANHOLE COVER (F1-D04)
SCALE: NO SCALE



3 TYPE E CATCH BASIN FRAME (F1-D08)
SCALE: NO SCALE



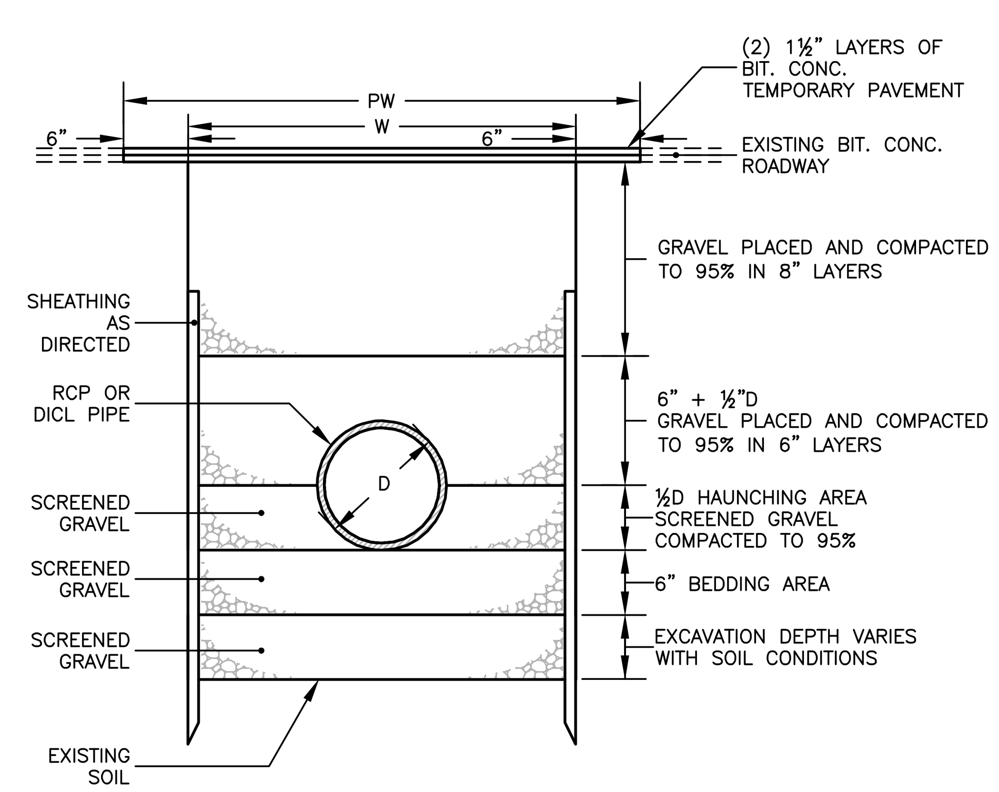
4 TYPE E-1 CATCH BASIN GRATE (F1-D09)
SCALE: NO SCALE



NOTES:

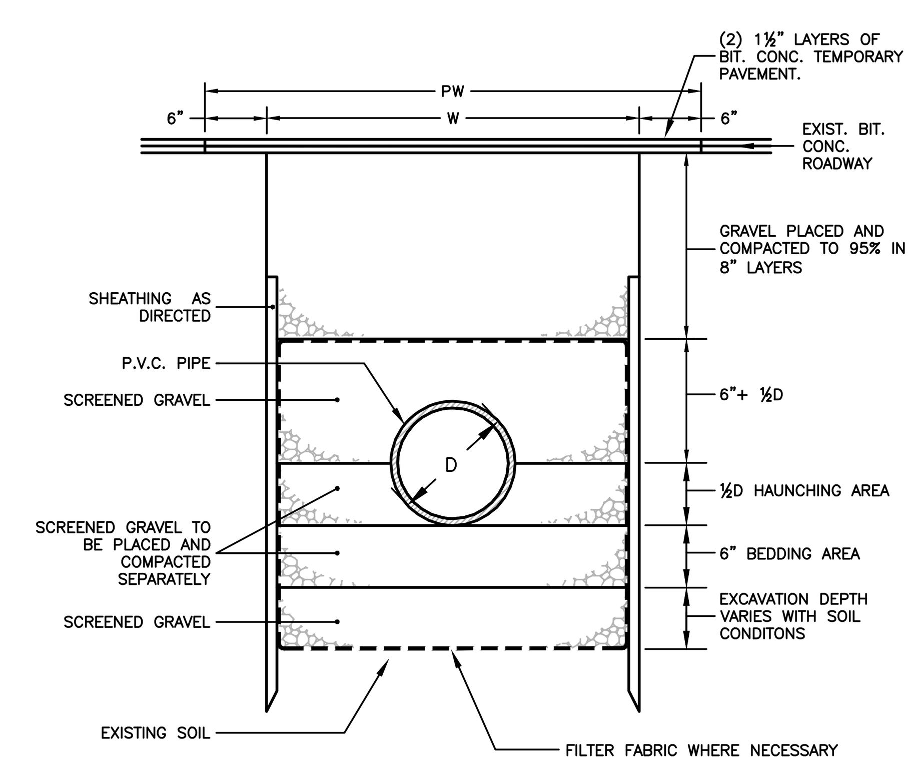
1. OPENING IN CONCRETE WALL SHALL BE CORED USING HIGH SPEED DIAMOND DRILL
2. ALL METAL FIXTURES SHALL BE OF STAINLESS STEEL
3. SERVICE LINE SHALL BE FLUSH WITH THE INSIDE OF THE CONCRETE PIPE OR WALL
4. IF TRUNK LINE DIAMETER IS LESS THAN 24" THEN A SADDLE TYPE CONNECTION WILL BE USED

5 TYPICAL FIELD CONNECTION TO LARGE CONCRETE PIPE OR CONCRETE MANHOLE (B-05)
SCALE: NO SCALE



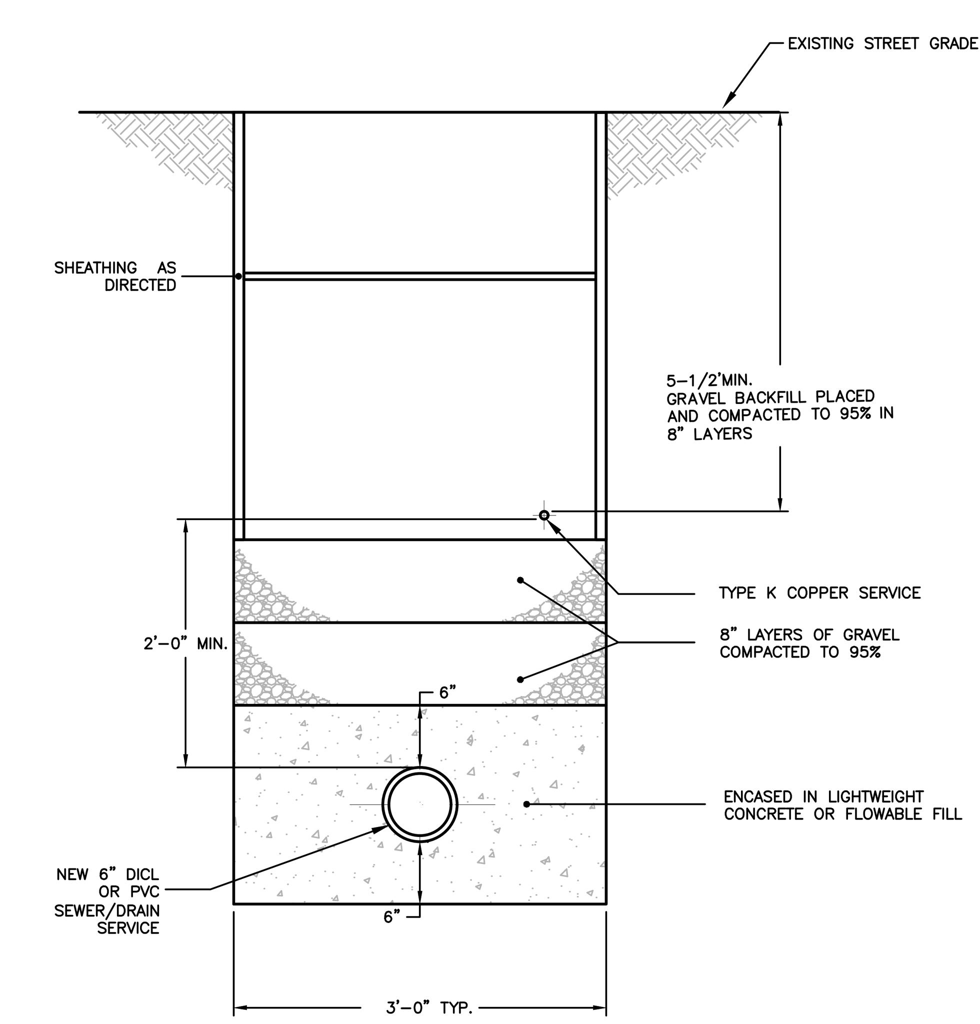
W = MAXIMUM TRENCH WIDTH
PW = MAXIMUM PAVING WIDTH = W+1'-0"
D = OUTSIDE DIAMETER
UNSHEATHED TRENCH: W = D+2'(3'-0" MIN.)
SHEATHED TRENCH: W = D+2'+SHEATHING WIDTH:
4'-2"MIN. W/O WALERS
5'-0" MIN. W/WALERS
TRENCH BOX OR HYDRAULIC SHORING:
W = D+2' + [WALL SHIELD WIDTH ± 8"] + 1' FOR TRENCH BOX

6 TRENCH DETAIL FOR RCP OR DICL PIPE (B-08)
SCALE: NO SCALE



W = MAXIMUM TRENCH WIDTH
PW = MAXIMUM PAVING WIDTH = W+1'-0"
D = OUTSIDE DIAMETER
UNSHEATHED TRENCH: W = D+2' (3'-0"MIN.)
SHEATHED TRENCH: W = D+2'+ SHEATHING WIDTH:
4'-0"MIN. W/O WALERS
5'-0"MIN. W/WALERS
TRENCH BOX OR HYDRAULIC SHORING:
W = D+2'+ [WALL SHIELD WIDTH ± 8"] + 1' FOR TRENCH BOX

7 TRENCH DETAIL FOR PVC PIPE (B-09)
SCALE: NO SCALE



8 COMMON TRENCH FOR WATER AND SEWER SERVICES (B-10)
SCALE: NO SCALE

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HONDA

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GLASTONBURY, CT 06033

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38991
REGISTERED
PROFESSIONAL ENGINEER
6-9-21

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

PROPOSED SITE DEVELOPMENT PLANS
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0	Boston Water & Sewer Comm.	KK	JM	01/31/20

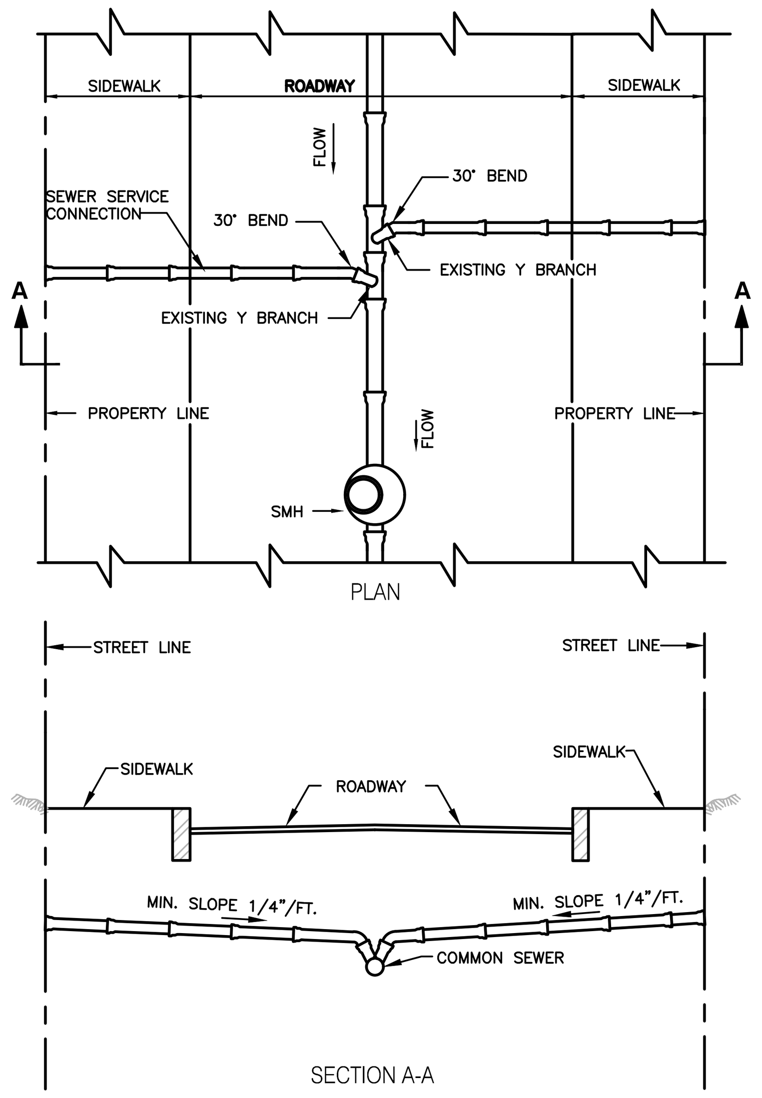
DETAILS-4

Designed By:	Drawn By:	Checked By:
TK/JM	TK/JM	KK
Issue Date:	Project No:	Scale:
01/31/2020	059051	NONE

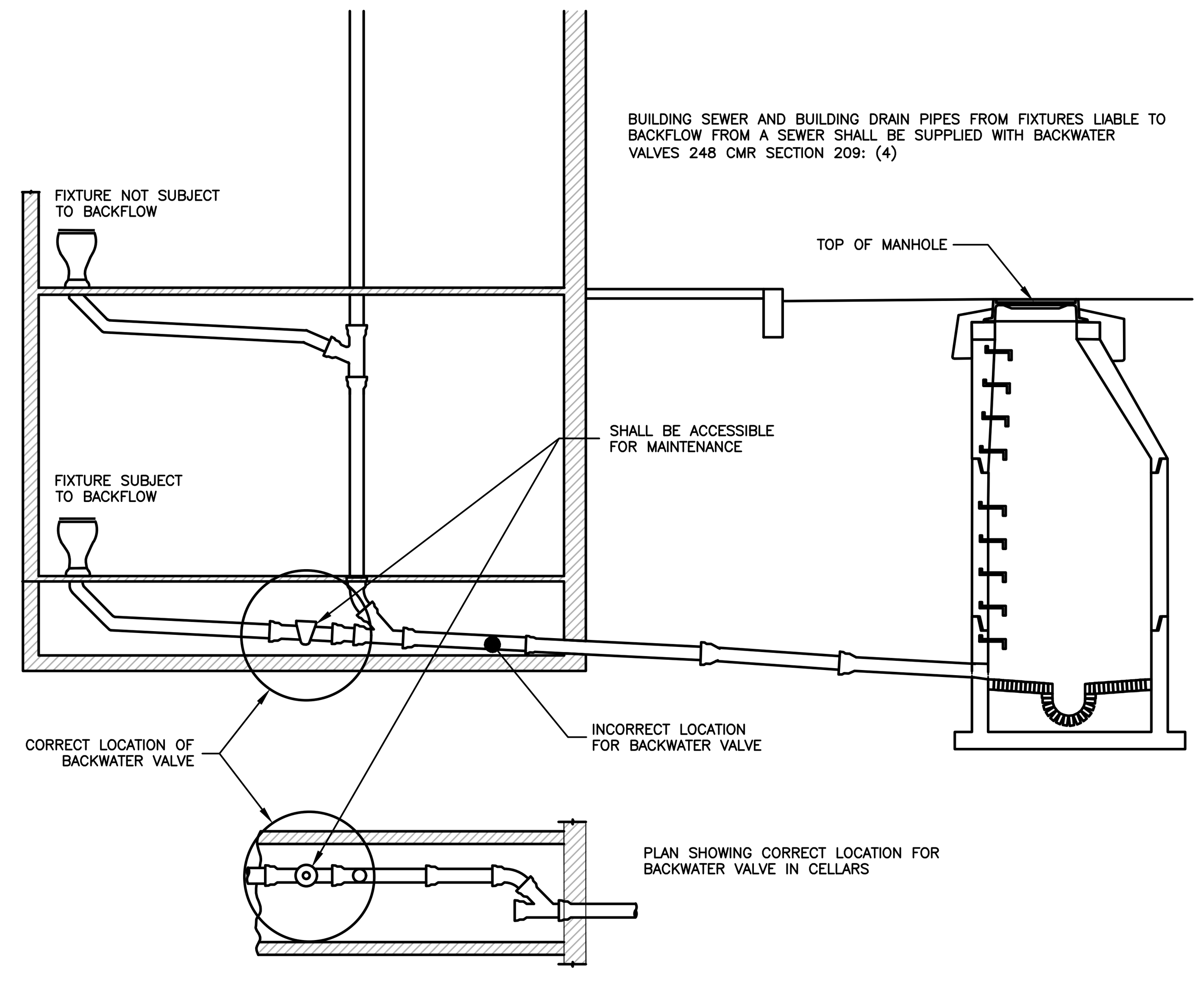
Drawing No.:

C-604

File: \\CHA-LLP.COM\PROJ\PROJECTS\ANY\K5\059051.000\CADD_ACAD\59051_C-601_DETAILS.DWG Saved: 6/9/2021 11:32:04 AM Plotted: 6/9/2021 1:34:05 PM Current User: Taylor, Megan LastSavedBy: 6431

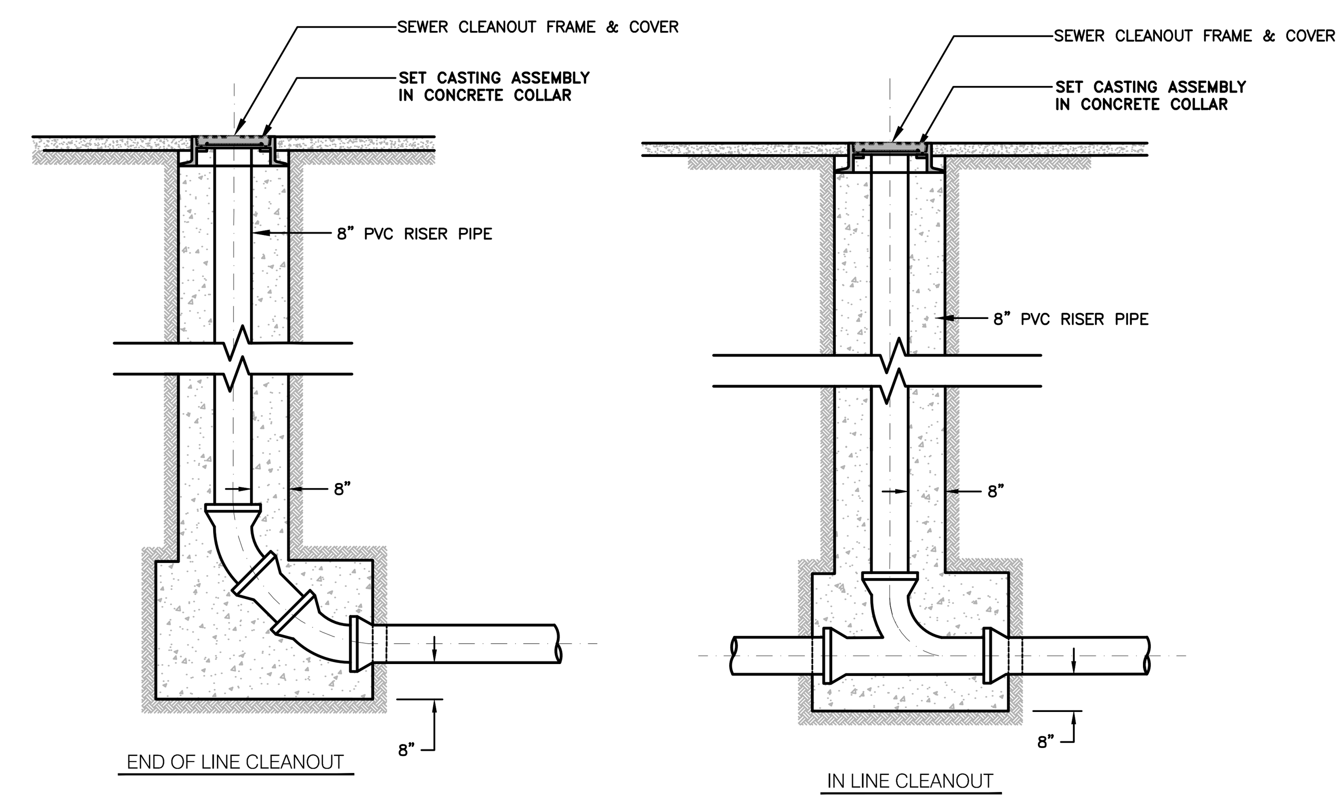


1 SEWER AT NORMAL DEPTH CONNECTION TO PIPE OR EXISTING WYE BRANCH (B-12c)
SCALE: NO SCALE



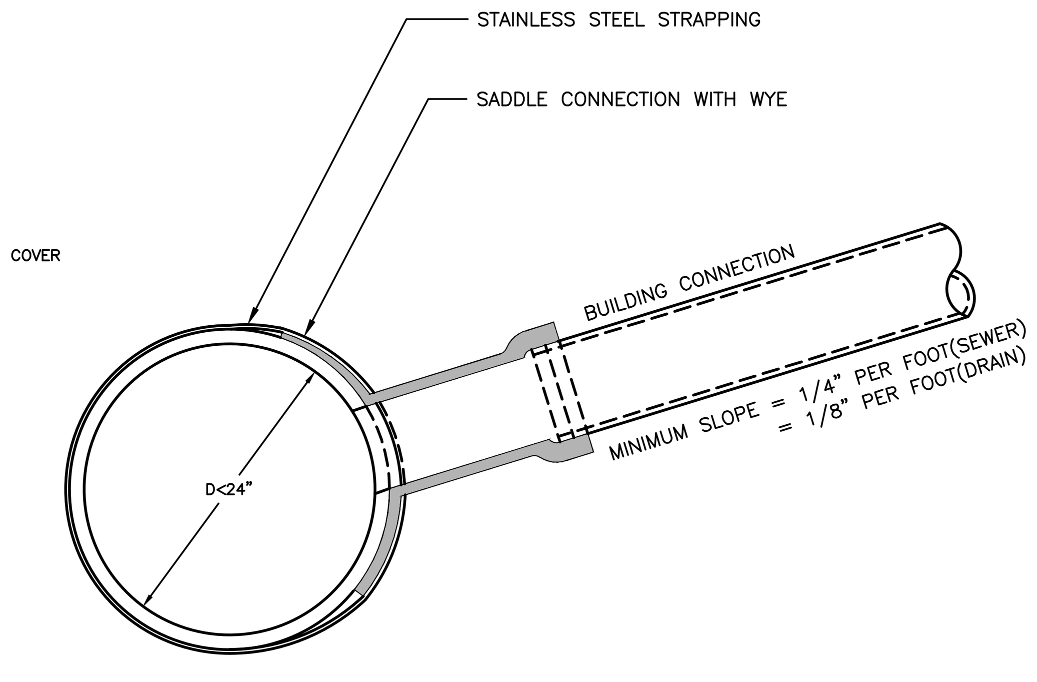
NOTE:
ALL PLUMBING FIXTURES BELOW THE LEVEL OF THE TOP OF THE MANHOLE OF THE SEWER SERVICING THE FIXTURE(S) SHALL BE CONSIDERED AS BEING SUBJECT TO BACKFLOW AND SHALL BE SUPPLIED WITH BACKWATER VALVES.

2 LOCATION OF BACKWATER VALVES IN CELLARS (B-14)
SCALE: NO SCALE



NOTE:
CLEANOUT TOP SHALL BE ENCLOSED IN CASTING AND/OR FABRICATED COVER ASSEMBLY

3 WYE CLEANOUT (B-17)
SCALE: NO SCALE

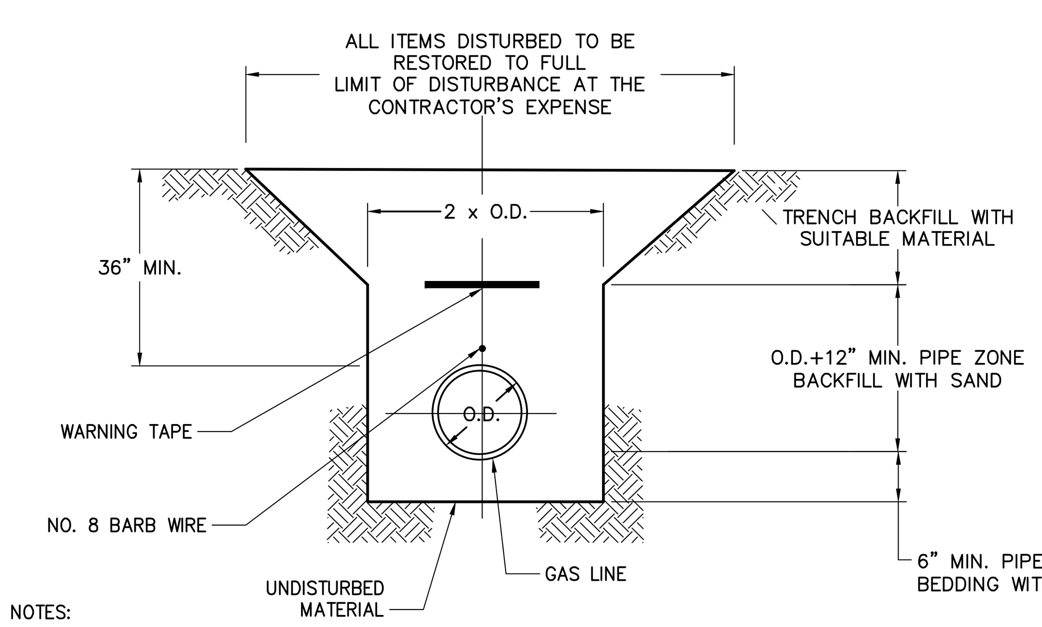


EXISTING SEWER OR DRAIN PIPE

NOTES:

1. FULL PVC OR IRON SADDLE MAY BE USED TO CONNECT TO EXISTING PVC, CLAY, CONCRETE, OR IRON PIPE.
2. SADDLES MUST HAVE RUBBER GASKETS AND SHALL BE TIGHTENED WITH STRAPS. SADDLES WILL NOT BE CEMENTED ONTO THE PIPE.
3. FULL WYE CONNECTION FITTINGS MAY BE USED
4. PIPE SHALL BE CUT TO CONFORM TO THE OPENING IN THE SADDLE.
5. CONNECTIONS DIRECTLY INTO THE EXISTING PIPE WITHOUT A SADDLE OR A FULL WYE FITTING ARE NOT ALLOWED.

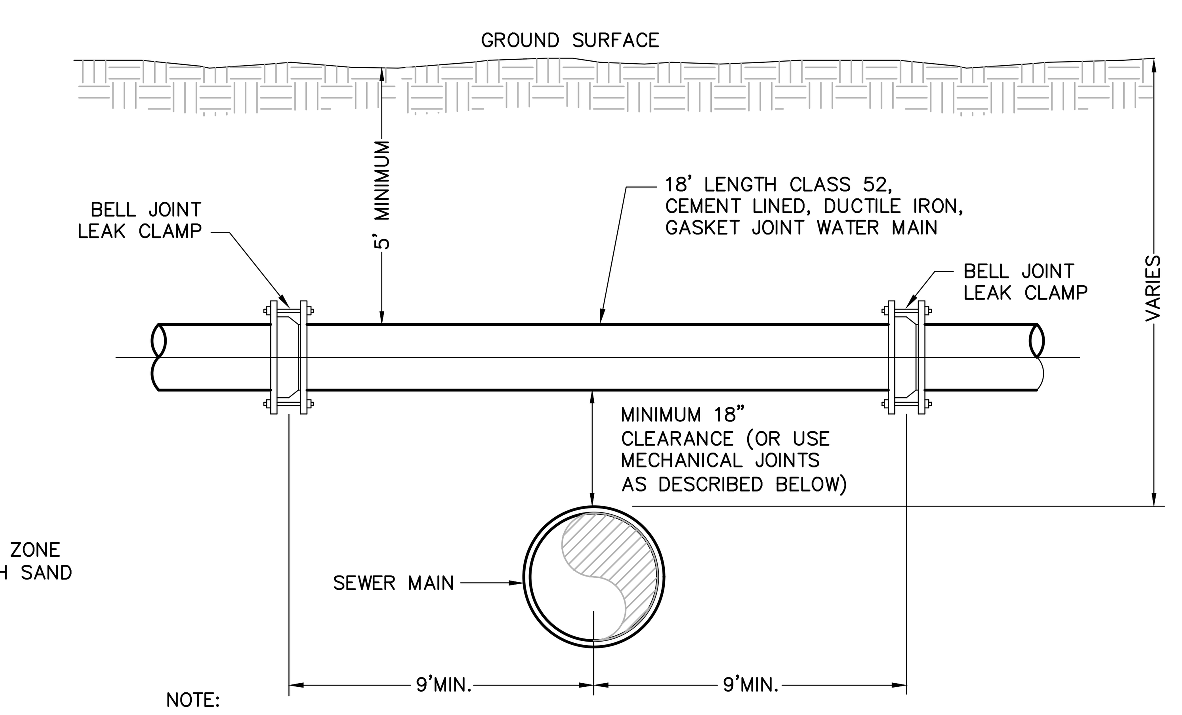
4 TYPICAL SADDLE CONNECTION TO EXISTING SEWER OR DRAIN (B-12b)
SCALE: NO SCALE



NOTES:

1. 12" VERTICAL CLEARANCE SHALL BE PROVIDED TO ANY PROPOSED OR EXISTING STRUCTURE, UTILITY OR OTHER.
2. 36" HORIZONTAL CLEARANCE SHALL BE PROVIDED TO ANY EXISTING OR PROPOSED STRUCTURES, UTILITIES OR OTHER.
3. INSPECTION AND TESTING REQUIRED BY UTILITY PROVIDER BEFORE TRENCH BACKFILL.
4. CONTRACTOR TO COORDINATE WITH OWNER AND GAS COMPANY ON SCOPE OF WHAT WILL BE PROVIDED.
5. CONTRACTOR TO REFER TO NATIONAL GRID REQUIREMENTS PRIOR TO INSTALLATION.

5 TYPICAL GAS UTILITY TRENCH DETAIL
SCALE: N.T.S.



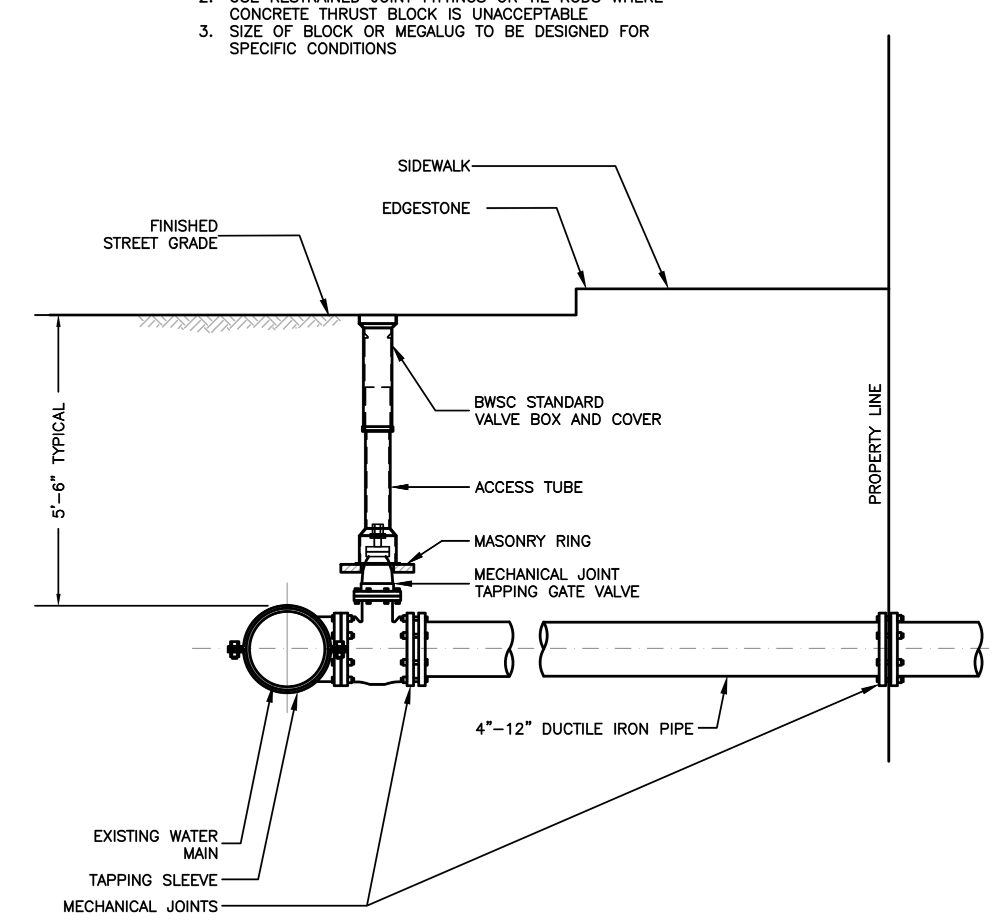
NOTE:

1. WHENEVER SEWERS MUST CROSS UNDER WATER MAINS, THE SEWER SHOULD BE LAID AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER IS AT LEAST 18 INCHES BELOW THE INVERT OF THE WATER MAIN. WHEN THE ELEVATION OF THE SEWER CANNOT BE VARIED TO MEET THIS REQUIREMENT, THE WATER MAIN SHOULD BE RELOCATED TO PROVIDE THIS SEPARATION OR CONSTRUCTED WITH A FULL LENGTH OF PIPE CENTERED TO PROVIDE A DISTANCE OF 9 FEET TO THE JOINTS ON EACH SIDE OF THE SEWER. ONE FULL LENGTH OF PIPE SHOULD BE CENTERED OVER THE SEWER SO THAT BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE. HOWEVER, AT NO TIME SHALL THE CLEARANCE BE ALLOWED TO BE LESS THAN 6 INCHES.

6 TYPICAL WATER CROSSING
SCALE: NO SCALE

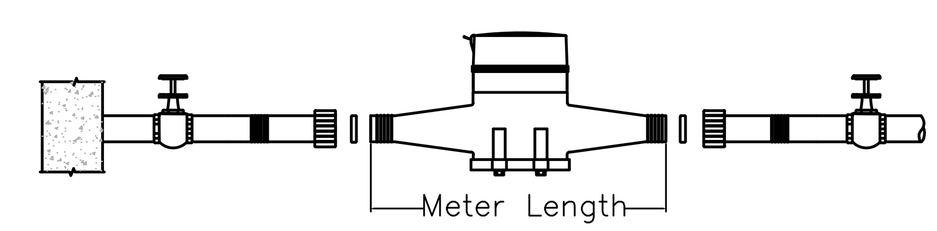
NOTES:

1. CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BEAR ON UNDISTURBED EARTH
2. USE RESTRAINED JOINT FITTINGS OR TIE RODS WHERE CONCRETE THRUST BLOCK IS UNACCEPTABLE
3. SIZE OF BLOCK OR MEGALUG TO BE DESIGNED FOR SPECIFIC CONDITIONS

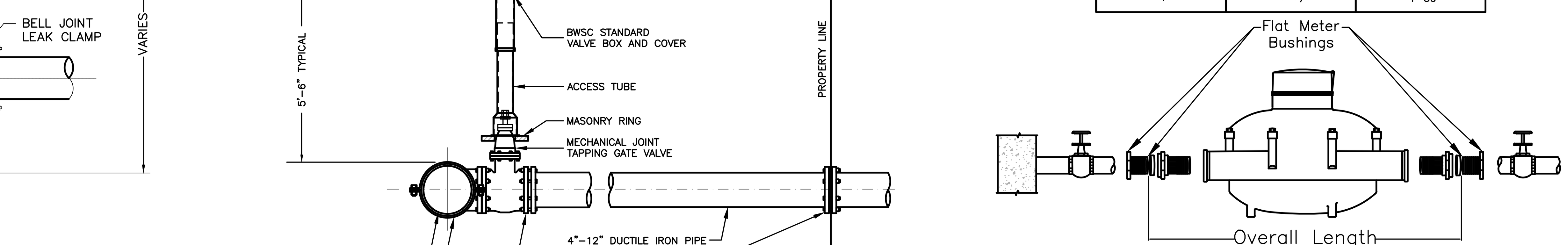


7 TYPICAL WATER PIPE CONNECTION WITH TAPPING SLEEVE & GATE VALVE (A-09)
SCALE: NO SCALE

Note The Direction of The Meter Couplings



SIZE	LENGTH	FLOW GPM
5/8"	7 1/2"	1/2-20
3/4"	9"	3/4-30
1"	10 3/4"	1-50



SIZE	METER LENGTH	OVERALL	FLOW GPM
1 1/2"	12 5/8"	17"	2-100
2"	15 1/4"	20"	2 1/2-160

8 INSTALLATION OF WATER METERS (5/8"-2")(M-03B)
SCALE: NO SCALE

CHA
1 Faneuil Hall Marketplace, South Market Building
Boston, MA 02109-6117
617.451.2717 . www.chacompanies.com

OWNER / APPLICANT:

HONDA

HERB CHAMBERS OF WOBURN, LLC c/o THE HERB CHAMBERS COMPANIES
47 EASTERN BLVD.
GLASTONBURY, CT 06033

COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38991
REGISTERED PROFESSIONAL ENGINEER
6.9.21

PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

DETAILS-5

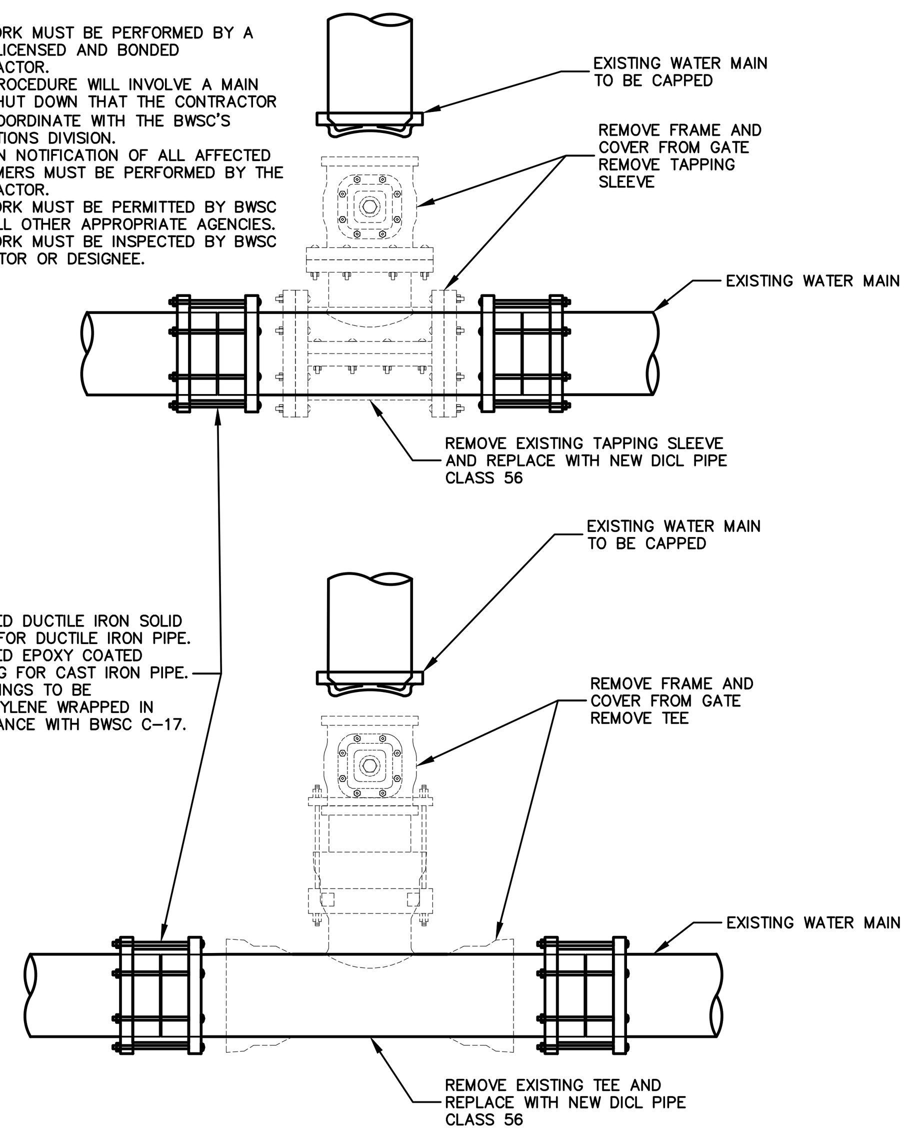
Designed By:	Drawn By:	Checked By:
TK/JM	TK/JM	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: NONE

Drawing No.:
C-605

File: \\CHA-LLP.COM\PROJ\PROJECTS\ANY\K5\059051.000\CADD_ACAD\59051_C-601_DETAILS.DWG Saved: 6/9/2021 11:32:04 AM Plotted: 6/9/2021 1:33:38 PM Current User: Taylor, Megan LastSavedBy: 6431

NOTES:

1. ALL WORK MUST BE PERFORMED BY A BWSC LICENSED AND BONDED CONTRACTOR.
2. THIS PROCEDURE WILL INVOLVE A MAIN LINE SHUT DOWN THAT THE CONTRACTOR WILL COORDINATE WITH THE BWSC'S OPERATIONS DIVISION.
3. WRITTEN NOTIFICATION OF ALL AFFECTED CUSTOMERS MUST BE PERFORMED BY THE CONTRACTOR.
4. ALL WORK MUST BE PERMITTED BY BWSC AND ALL OTHER APPROPRIATE AGENCIES.
5. ALL WORK MUST BE INSPECTED BY BWSC INSPECTOR OR DESIGNEE.



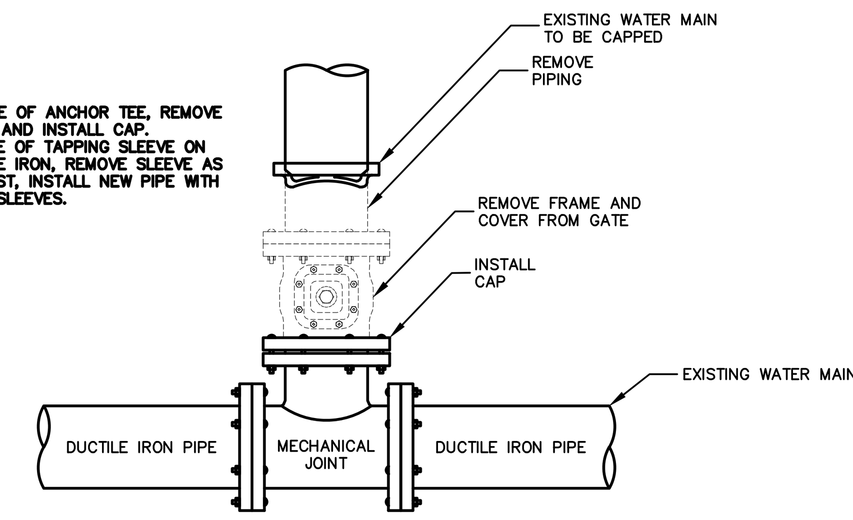
1 DETAIL OF ABANDONMENT OF WATER CONNECTION 3-INCH AND GREATER (A-15a)

SCALE: NO SCALE

NOTES:

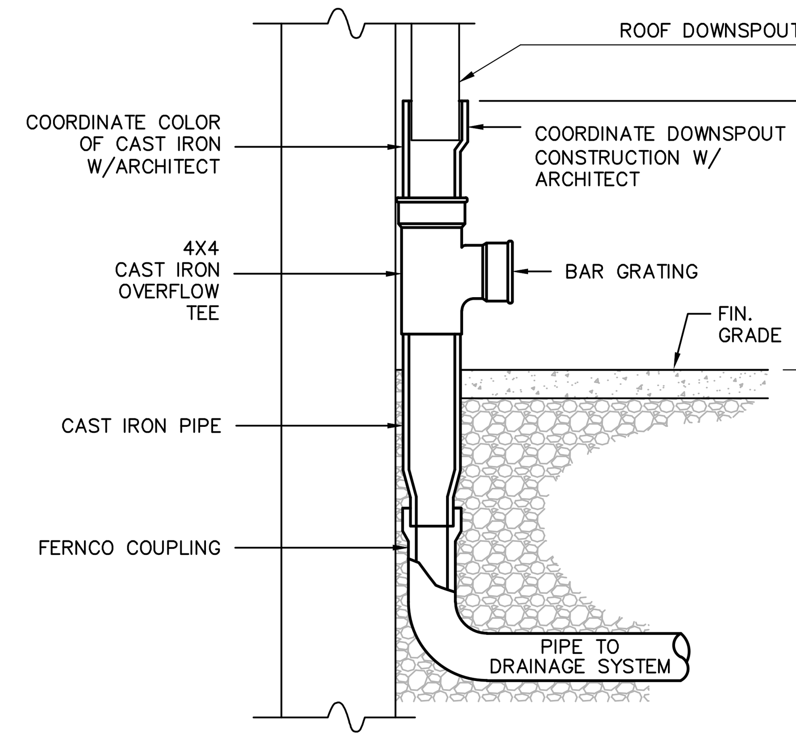
1. ALL WORK MUST BE PERFORMED BY A BWSC LICENSED AND BONDED CONTRACTOR.
2. THIS PROCEDURE WILL INVOLVE A MAIN LINE SHUT DOWN THAT THE CONTRACTOR WILL COORDINATE WITH THE BWSC'S OPERATIONS DIVISION.
3. WRITTEN NOTIFICATION OF ALL AFFECTED CUSTOMERS MUST BE PERFORMED BY THE CONTRACTOR.
4. ALL WORK MUST BE PERMITTED BY BWSC AND ALL OTHER APPROPRIATE AGENCIES.
5. ALL WORK MUST BE INSPECTED BY BWSC INSPECTOR OR DESIGNEE.

* IN CASE OF ANCHOR TEE, REMOVE VALVE AND INSTALL CAP.
** IN CASE OF TAPPING SLEEVE ON DUCTILE IRON, REMOVE SLEEVE AS ON CAST, INSTALL NEW PIPE WITH SOLID SLEEVES.



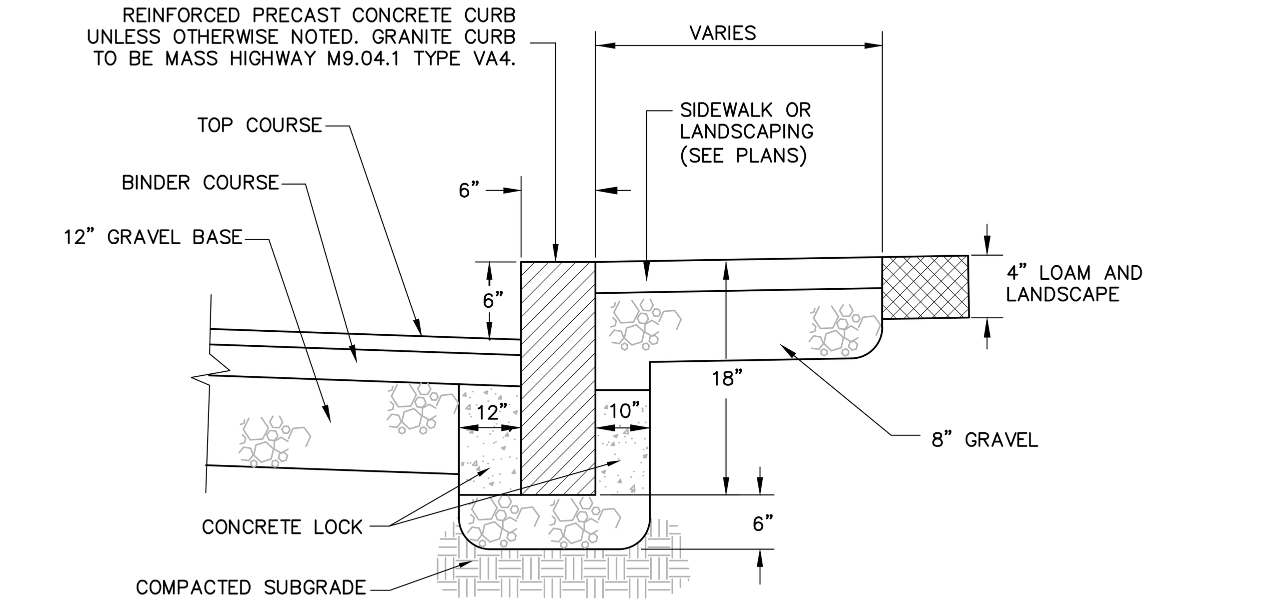
2 DETAIL OF ABANDONMENT OF WATER CONNECTION 3-INCH AND GREATER (A-15b)

SCALE: NO SCALE



3 TYP. DOWNSPOUT CONNECTION

SCALE: NO SCALE

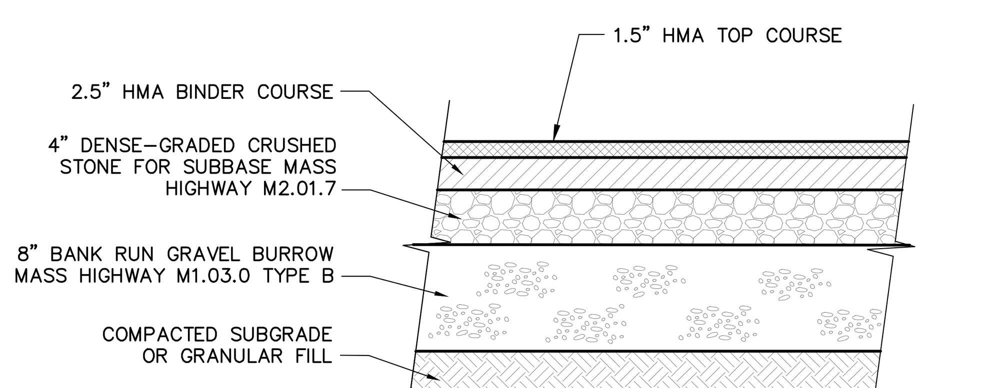


NOTE:

EXISTING SOIL OR ORDINARY FILL COMPACT GRAVEL AND FILL BEHIND CURB TO 95% DRY DENSITY

4 PRECAST CONCRETE OR VERTICAL GRANITE CURB DETAIL

SCALE: NO SCALE

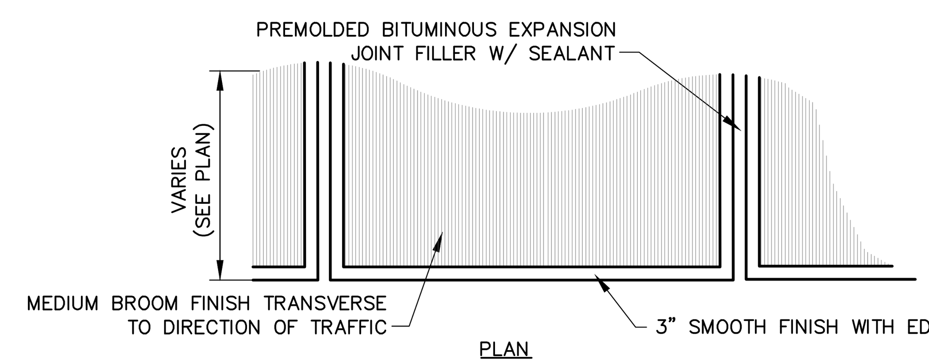


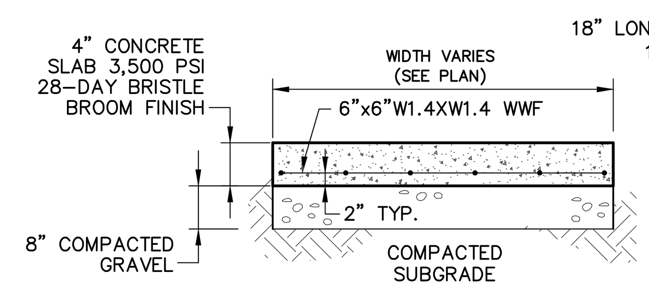
NOTES:

1. COMPACTED LIFTS NOT TO EXCEED 8 INCHES BETWEEN COURSES.
2. CONTRACTOR TO PROOF ROLL SUBGRADE PRIOR TO GRAVEL PLACEMENT.
3. CONTRACTOR TO CONFIRM PAVEMENT SECTION WITH GEOTECH REPORT PRIOR TO CONSTRUCTION.

5 BITUMINOUS PAVEMENT SECTION DETAIL

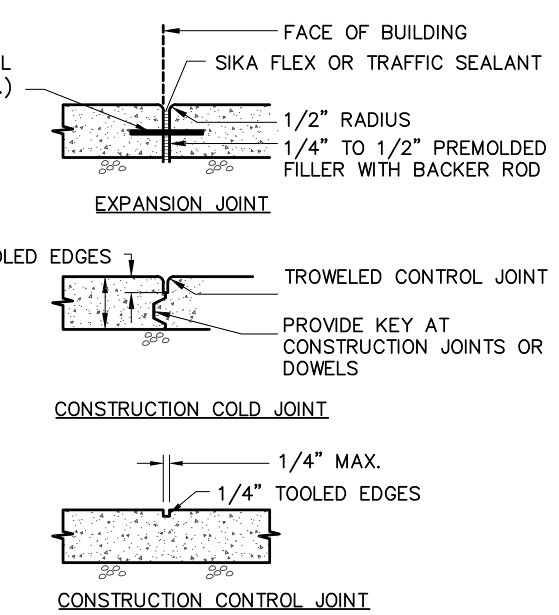
SCALE: NO SCALE





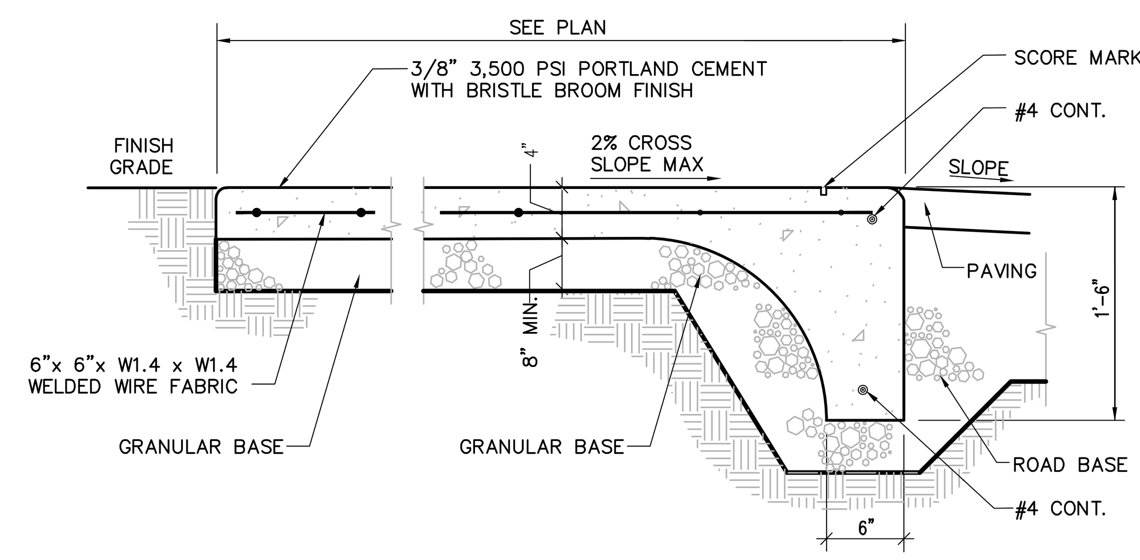
NOTES:

1. PROVIDE CONSTRUCTION CONTROL JOINT EVERY 5' OR AS NOTED ON SCORING PLAN.
2. PROVIDE EXPANSION JOINT EVERY 20' OF 400 SQUARE FEET OR AS NOTED ON SCORING PLAN.
3. PITCH WALK TO DOWN GRADE SIDE AT 2% MAX.
4. REFER TO ARCHITECTURAL PLANS FOR JOINT PATTERN AND FINISH SURFACE IN ENTRANCE AREA WALK.



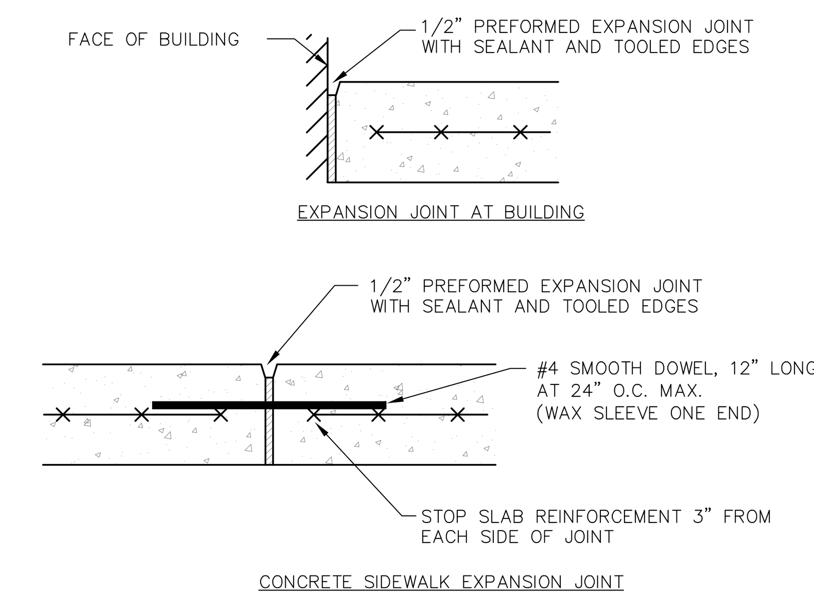
6 TYPICAL CONCRETE SIDEWALK DETAIL

SCALE: NO SCALE



7 INTEGRAL WALK & CURB DETAIL (MONOLITHIC)

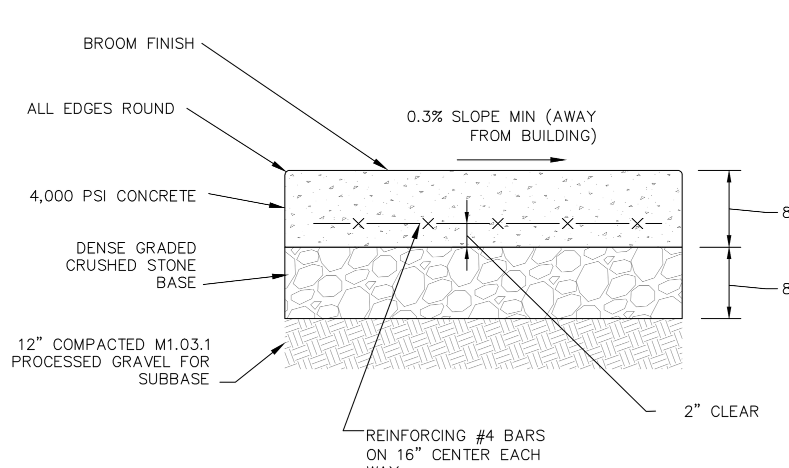
SCALE: NO SCALE



NOTE:
PROVIDE EXPANSION JOINTS AT ALL INTERFACES BETWEEN WALKWAY AND VERTICAL BUILDING SURFACES.

8 EXPANSION JOINT

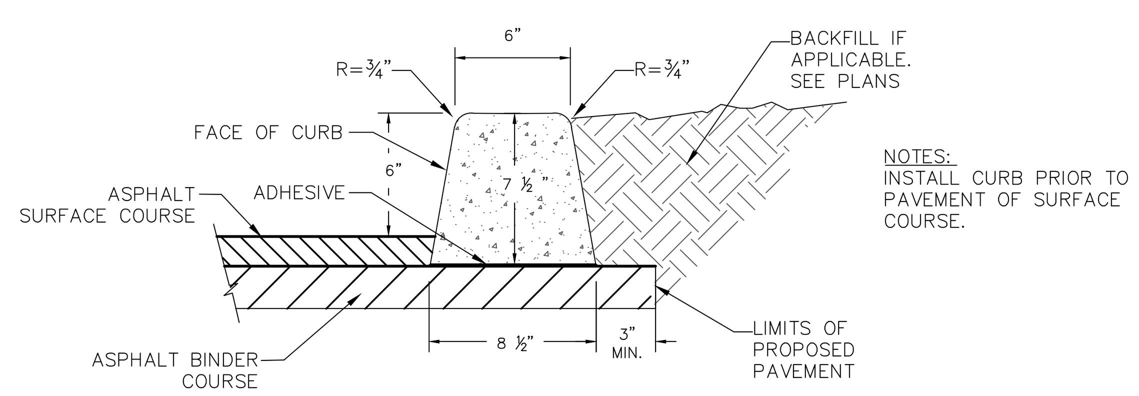
SCALE: NO SCALE



NOTES:
1. INSTALL CONTROL JOINTS @ 20FT CENTER BOTH WAY.
2. INSTALL 1" DOWELS IN DOWEL BASKETS AT CONTROL JOINTS ON 12" CENTER
3. PROTECT FROM FREEZING AND RAIN DURING THE FIRST 72 HOURS.

9 REINFORCED CONCRETE SECTION FOR DUMPSTER/COMPACTOR PAD

SCALE: NO SCALE



NOTES:
INSTALL CURB PRIOR TO PAVEMENT OF SURFACE COURSE.

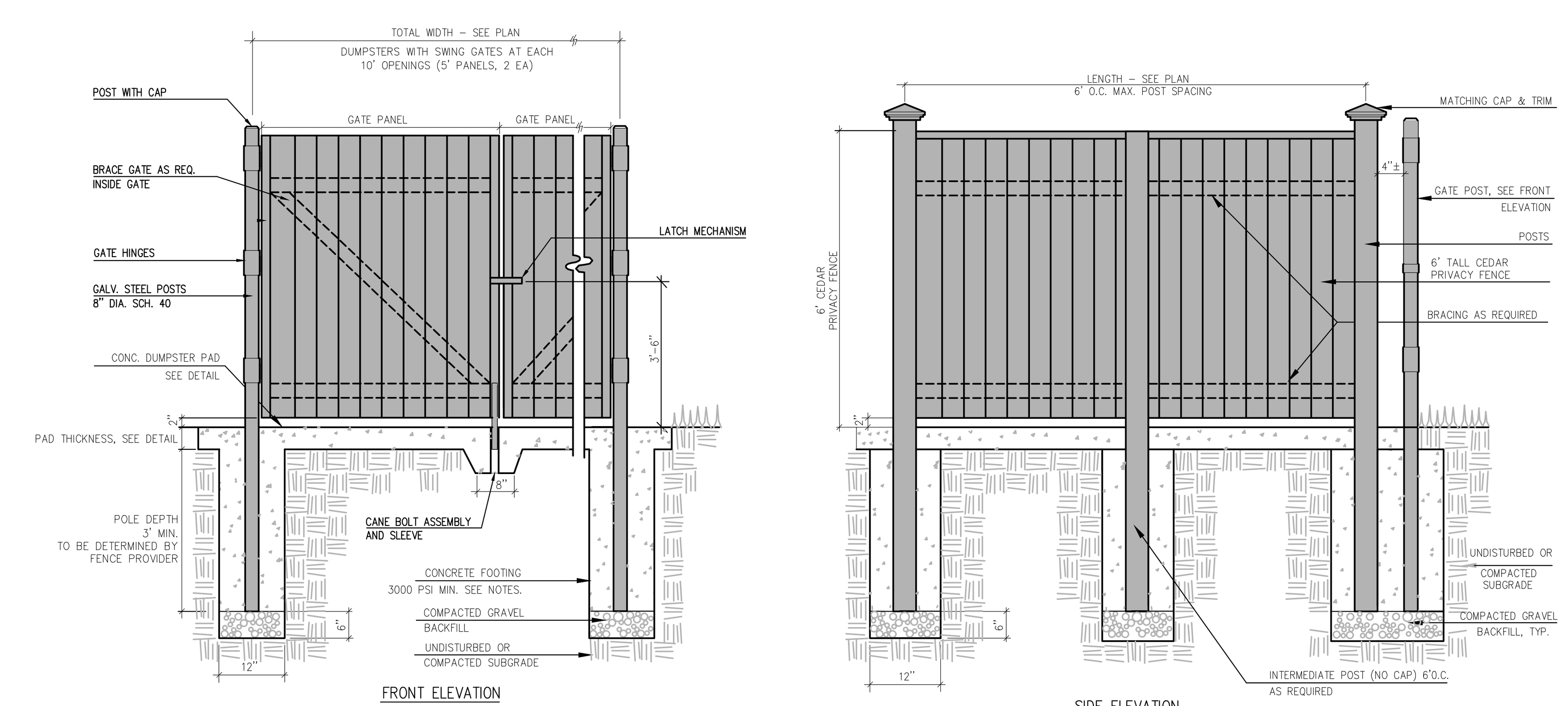
BINDER COURSE STANDARD MOLD 7-1/2"

SPECIFICATIONS:

1. ANY CURB, EXCEPT ON STRUCTURE, MAY BE PLACED BY USING AN EXTRUSION MACHINE, PROVIDED THAT THE FINISHED CURB IS TRUE TO LINE AND THE PAVEMENT IS DENSE AND OF THE REQUIRED SURFACE TEXTURE.
2. THE CONCRETE SHALL BE DESIGNED TO INCLUDE APPROXIMATELY 75% CONCRETE SAND AND 25% 3/8" ROCK. THE CONCRETE SHALL CONTAIN A MINIMUM OF 620 POUNDS OF CEMENT (6.5 SACKS) PER CUBIC YARD, YIELDING A CONCRETE THAT WILL EXCEED 4,000 P.S.I. IN 28 DAYS. THE CONCRETE SHALL BE PRODUCED ACCORDING TO ASTM C94 READY MIX CONCRETE OR ASTM C685 CONCRETE PRODUCED BY VOLUMETRIC CONTINUOUS MIXING.
3. THE GRADING LIMIT SHALL BE FURTHER MODIFIED, IF NECESSARY, TO PRODUCE CONCRETE THAT, AFTER EXTRUSION, HAS WELL DEFINED WEB MARKS OF WATER ON THE SURFACE AND IS FREE OF SURFACE PITS LARGER THAN 3/16" DIAMETER. THE CONCRETE SHALL BE OF SUCH CONSISTENCY THAT, AFTER EXTRUSION, IT WILL MAINTAIN THE SHAPE OF THE CURB SECTION WITHOUT SUPPORT OR SLUMPING. IT SHALL CONTAIN THE MAXIMUM AMOUNT OF WATER THAT WILL PERMIT THIS RESULT.
4. THE CONCRETE SHALL CONTAIN A MINIMUM OF ONE (1) POUND OF FIBER REINFORCEMENT PER CUBIC YARD.
5. IN ADVANCE OF PLACING THE CURB ON THE PAVEMENT, THE SURFACE OF THE PAVEMENT SHALL BE THOROUGHLY CLEANED AND THE ADHESIVE SHALL BE APPLIED. THE PAVEMENT SHALL BE CLEANED IF NECESSARY, BY ABRADING AND/OR HIGH PRESSURE WATER WASHING, SO AS TO ASSURE REMOVAL OF ALL DUST, LOOSE MATERIAL AND/OR OIL.
6. THE EXTRUDED CURB SHALL BE BONDED TO THE EXISTING PAVEMENT BY USING AN APPROVED CONCRETE TO ASPHALT ADHESIVE OR A TWO-COMPONENT EPOXY, DESIGNED TO BOND FRESH CONCRETE TO EXISTING PAVEMENT. THE MANUFACTURER'S INSTRUCTIONS MUST BE FOLLOWED.
7. THE TOP OF THE FINISH CURB MUST BE TRUE TO LINE. THE CURB WILL FOLLOW THE CONTOUR OF THE PAVEMENT. THE CURB MUST BE FREE OF HUMPS AND SAGS. CONTROL JOINTS SHALL BE CUT, AS SOON AS POSSIBLE, THROUGH ONE-THIRD OF THE CROSS SECTION OF THE FRESH CONCRETE. THE JOINT SHALL BE TOOLED AND FINISHED TO A NEAT AND UNIFORM APPEARANCE. THE CONTROL JOINT SHALL BE INSTALLED AT NINE (9) FOOT INTERVALS AND MOVE MORE OFTEN ON RADII, SO AS TO MINIMIZE SHRINKAGE CRACKING.
8. THE FINISH CURB WILL BE COATED WITH A CURING COMPOUND, WHICH HAS BEEN DESIGNED TO SEAL THE SURFACE AND FORM A WATERPROOFING MEMBRANE TO RETARD THE LOSS OF WATER FROM THE FRESH CONCRETE. THE MANUFACTURER'S INSTRUCTIONS MUST BE FOLLOWED.

10 EXTRUDED CONCRETE CURB

SCALE: NO SCALE



NOTES:
1. CONTRACTOR TO SUBMIT SHOP DRAWING FOR APPROVAL PRIOR TO CONSTRUCTION OBTAINED FROM A REPUTABLE FENCE COMPANY WITH EXPERIENCE IN DUMPSTER ENCLOSURE DESIGN.
2. FENCE COMPANY TO PROVIDE DESIGN WITH APPROPRIATE POSTS, PIPES, AND HINGES.
3. FENCE COLOR TO BE APPROVED BY OWNER, ARCHITECT.

11 DUMPSTER PAD ENCLOSURE

SCALE: NO SCALE

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1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

DETAILS-6

Designed By:	Drawn By:	Checked By:
TK/JM	TK/JM	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: NONE

Drawing No.:

C-606

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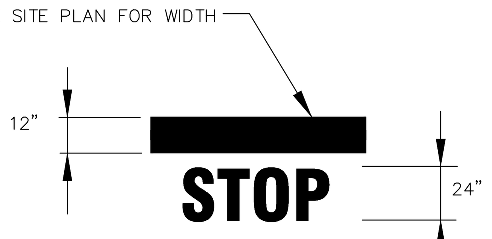
STOP SIGN
R1–1

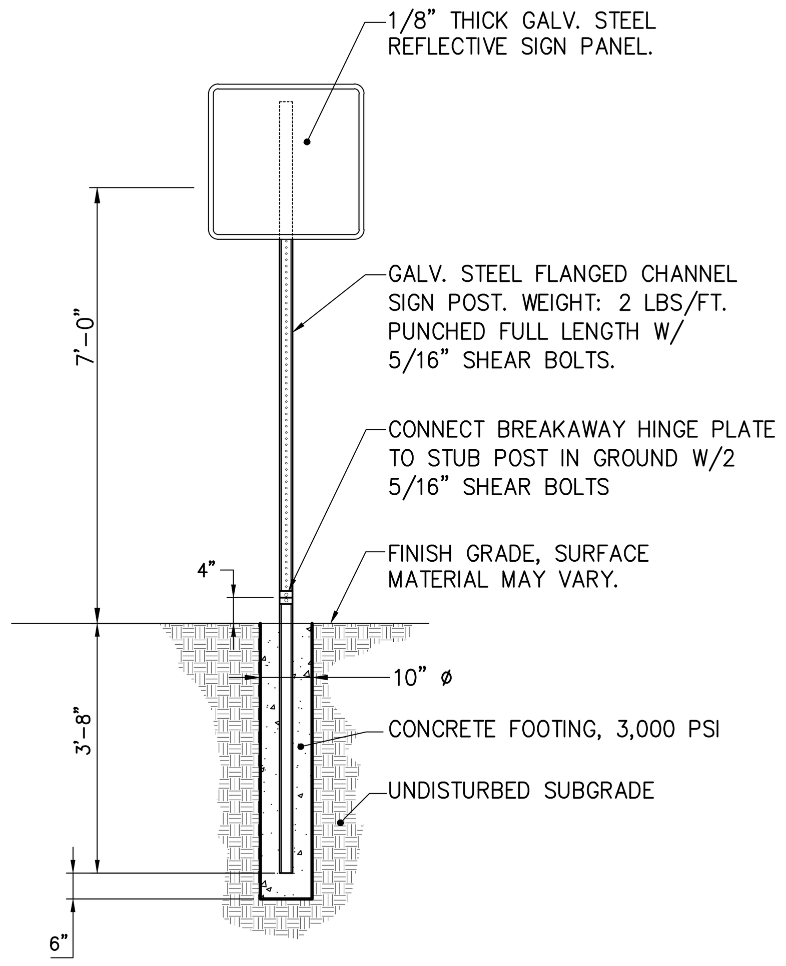
1 SIGN DETAIL
SCALE: NO SCALE



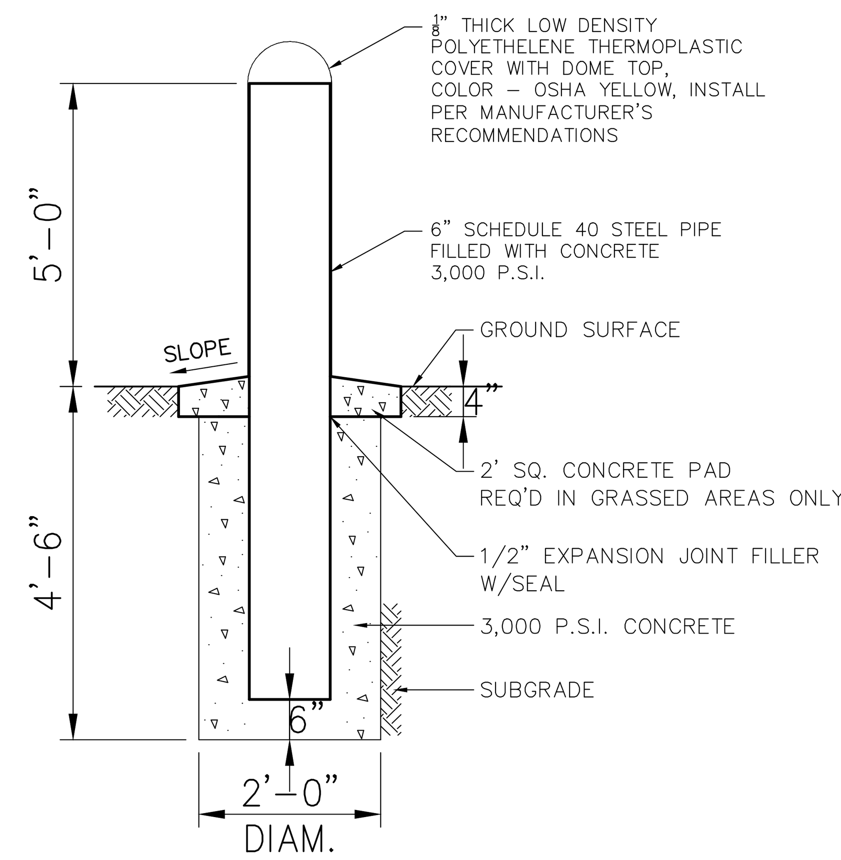
NOTES:

1. ALL PAINT TO BE THERMOPLASTIC.
2. WORDS CAN BE ARRANGED IN OTHER COMBINATIONS THAN THOSE ILLUSTRATED HERE TO ACHIEVE DESIRED RESULTS.
3. PAINTING OF WORDS TO BE AT THE DISCRETION OF THE OWNER. CONTRACTOR SHALL VERIFY PRIOR TO CONSTRUCTION.

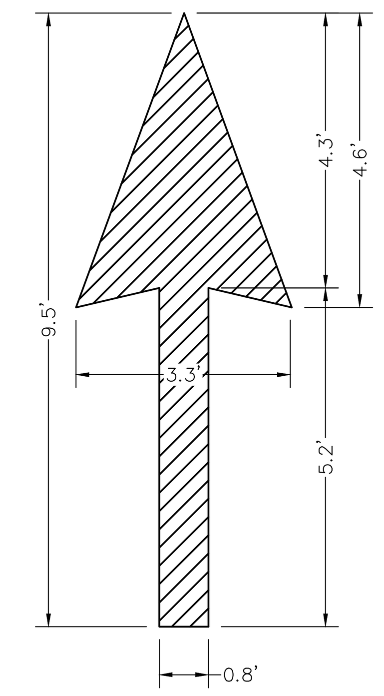
2 PAINTED MARKING DETAILS
SCALE: NO SCALE



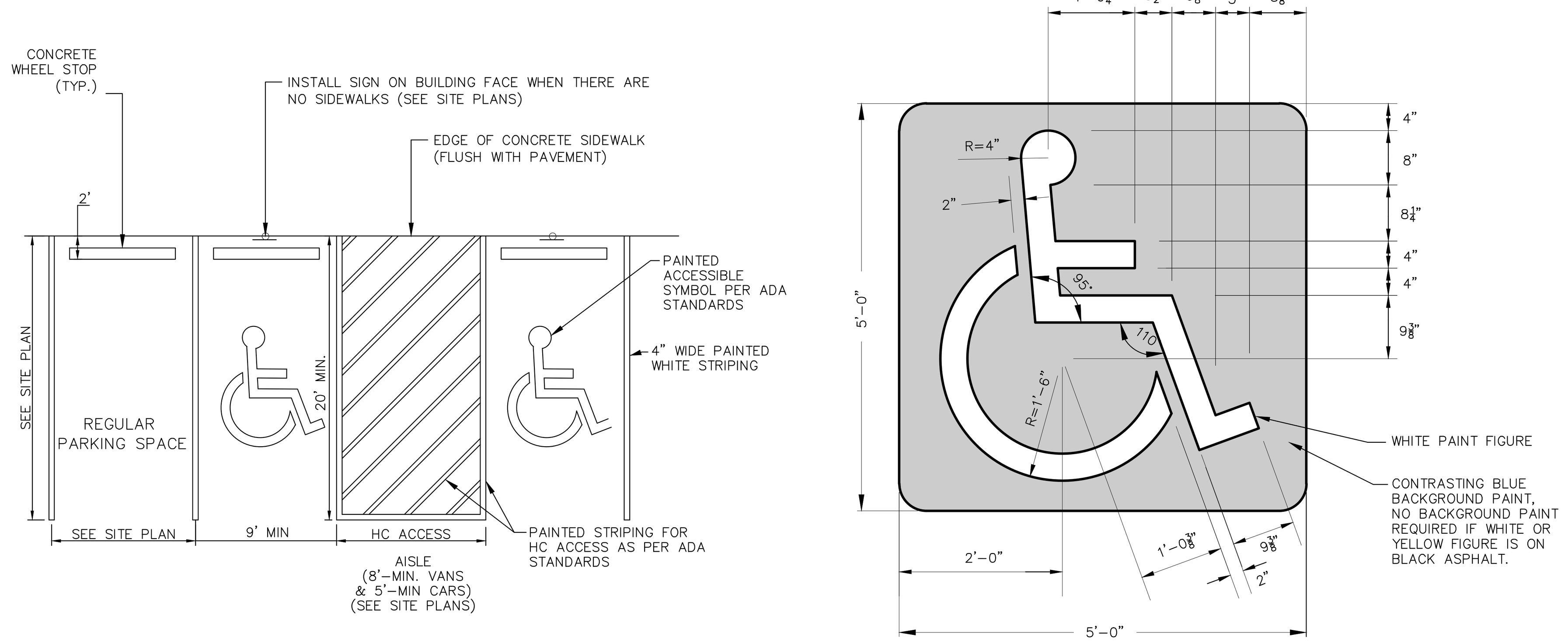
3 ROADWAY SIGNAGE w/BREAKWAY SUPPORT
SCALE: NO SCALE



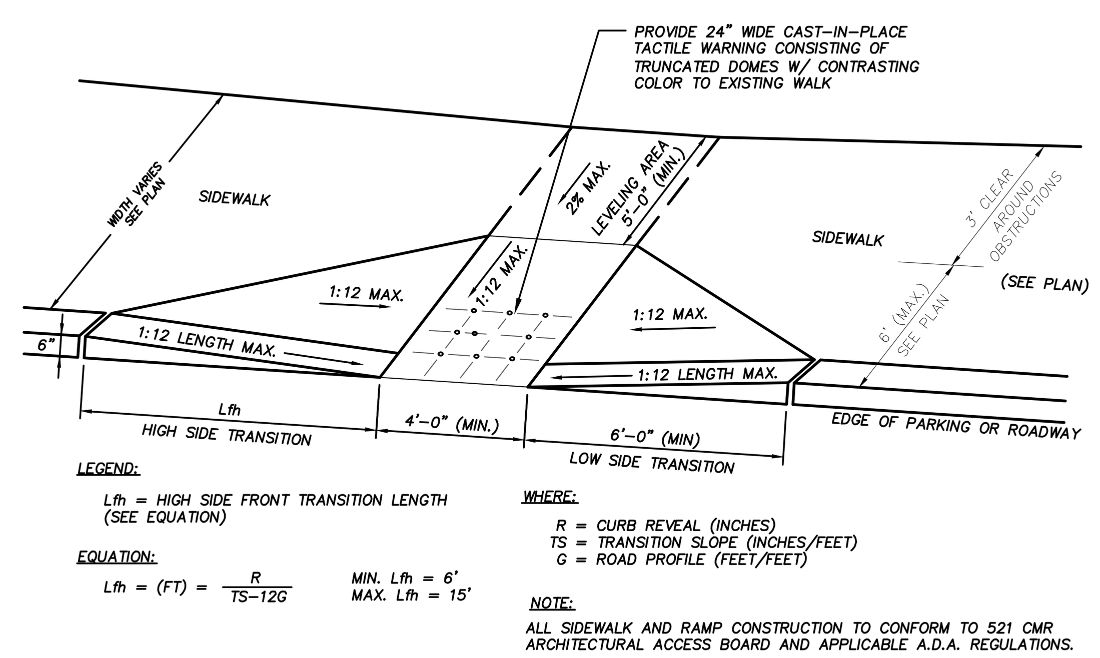
4 PIPE BOLLARD
SCALE: NO SCALE



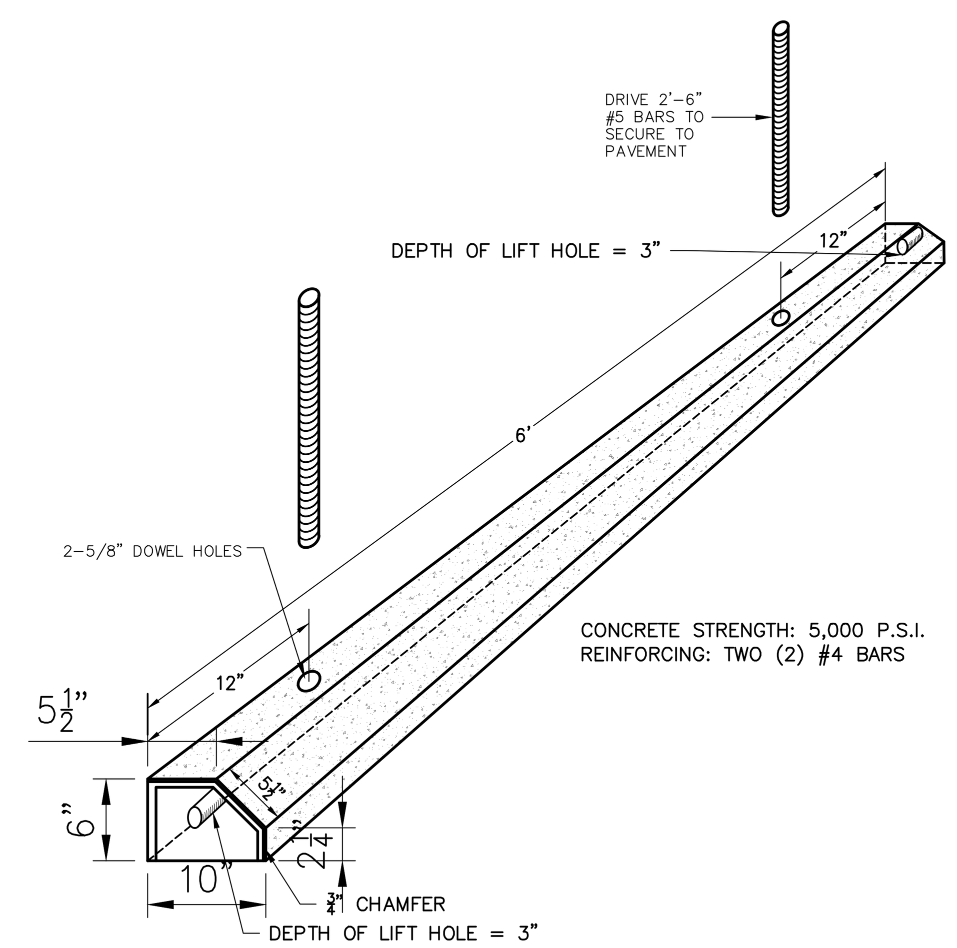
5 TRAFFIC ARROW
SCALE: NO SCALE



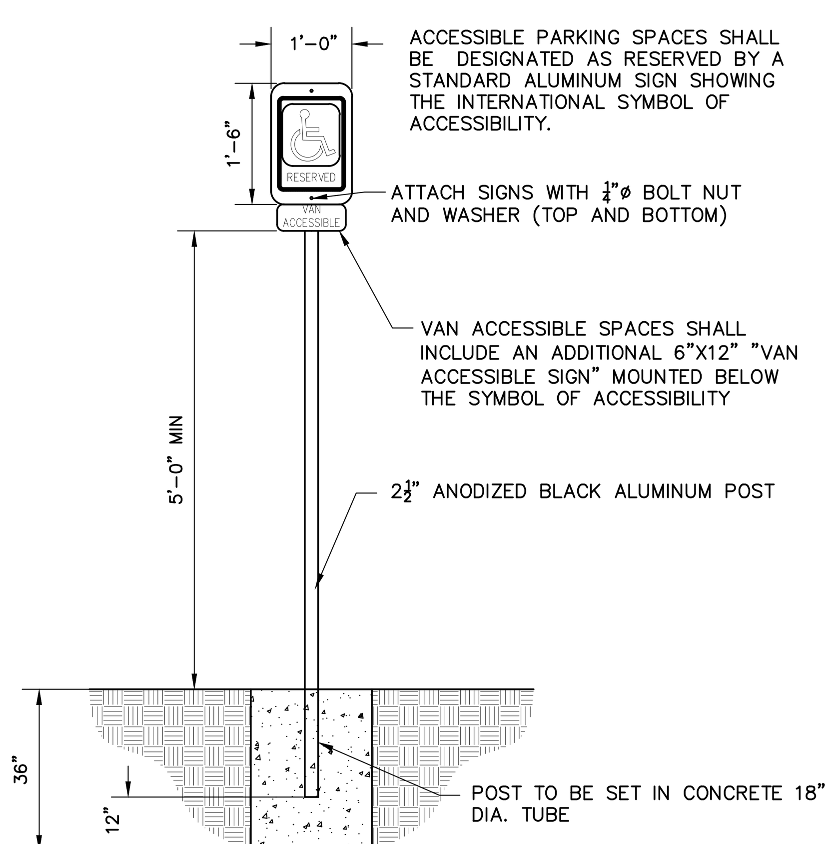
6 ACCESSIBLE PARKING LOT STRIPING & STALLS
SCALE: NO SCALE



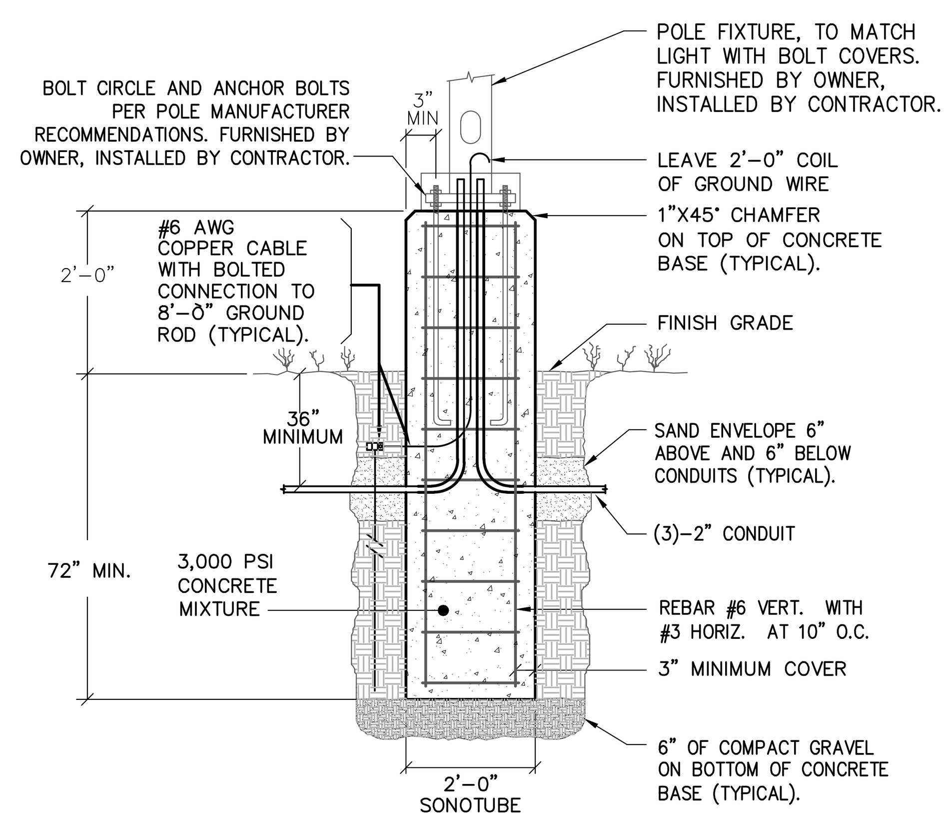
7 ADA CURB RAMP W/ LANDING
SCALE: NO SCALE



8 CONCRETE WHEEL STOP DETAIL
SCALE: NO SCALE



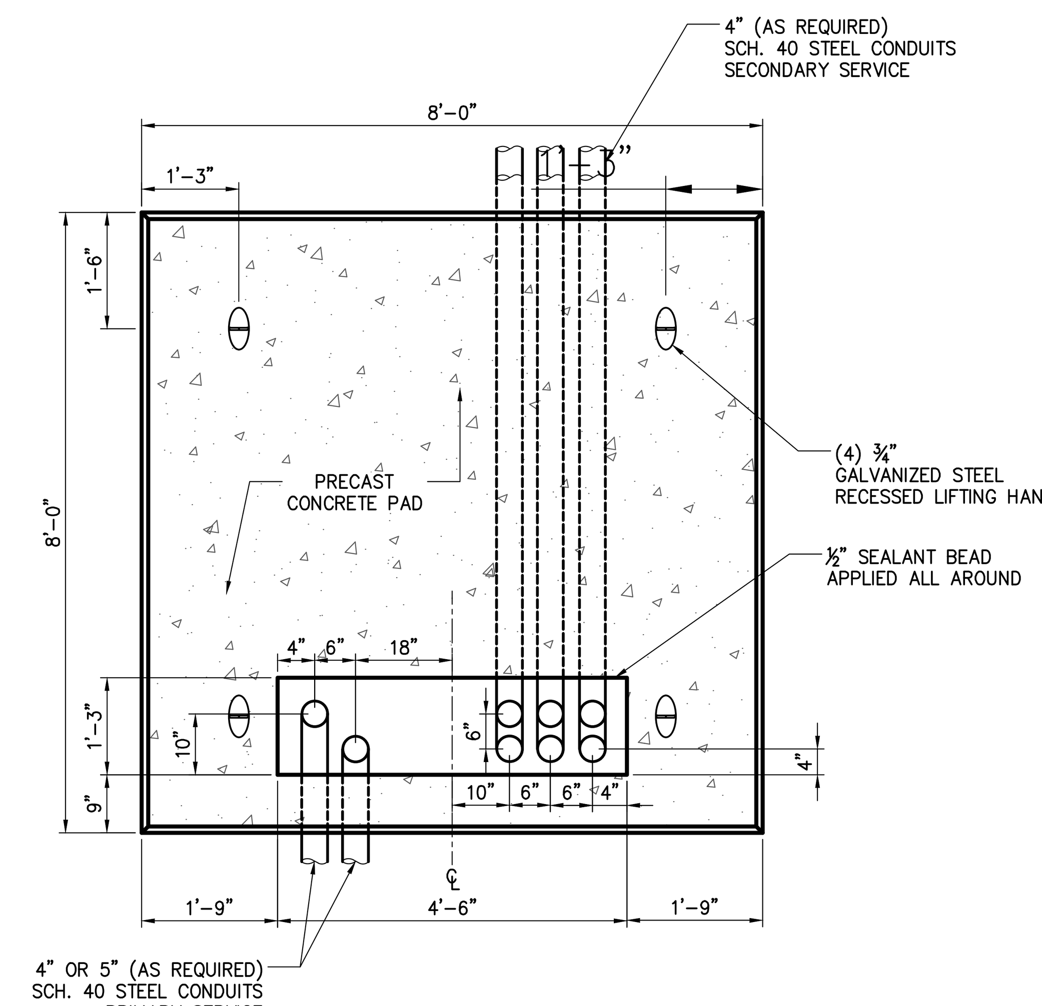
9 ACCESSIBLE PARKING SIGN DETAIL
SCALE: NO SCALE

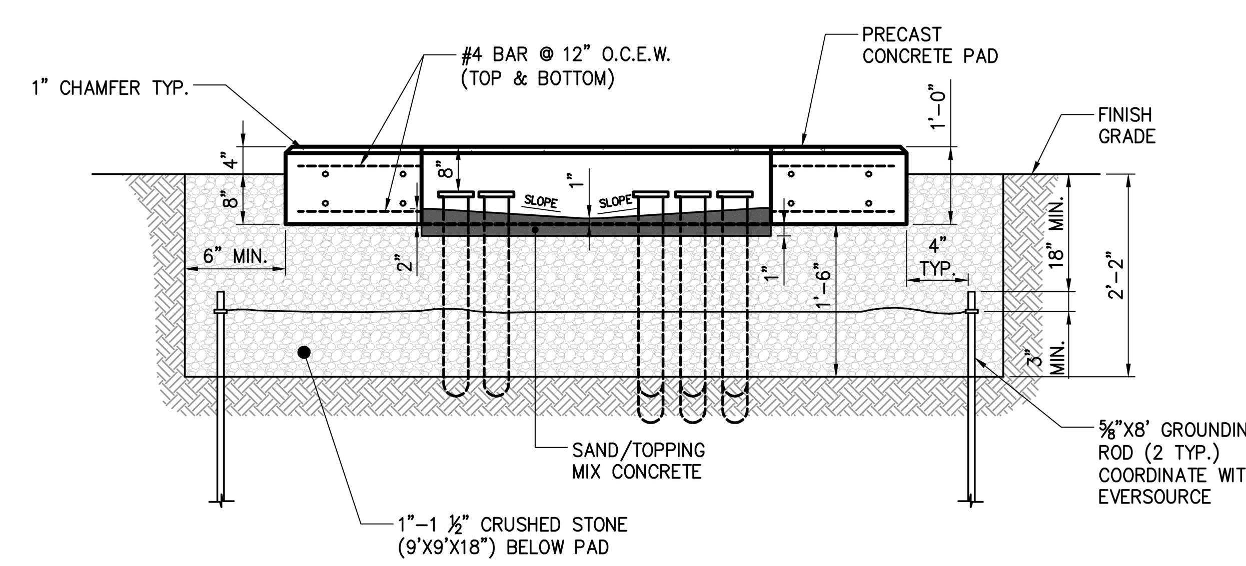


NOTES:

1. TOTAL LENGTH OF SONOTUBE IS A 3–1 RATIO WITH RESPECT TO THE TOTAL HEIGHT OF POLE INCLUDING EXTENSION ABOVE FINISHED GRADE.
2. LIGHTING NOTE: CONTRACTOR IS RESPONSIBLE FOR PLANNING / ORIENTATING THE BASE PLATE MOUNTING PATTERN TO FIT THE SELECTED POLE AND ACCOUNT FOR THE ORIENTATION OF THE FIXTURE HEADS.
3. CONTRACTOR TO SUBMIT SHOP DRAWING FOR APPROVAL PRIOR TO CONSTRUCTION.

10 PRE-CAST LIGHT POLE BASE DETAIL
SCALE: NO SCALE





NOTES:

1. CONCRETE: FC = 5,000 PSI @ 28 DAYS MINIMUM
2. REINFORCING STEEL: ASTM–A615, GRADE 60
3. MINIMUM STEEL COVER IS 1½"
4. DESIGN LOADING: MAXIMUM TRANSFORMER WEIGHT 50,000 LBS
5. EST. WEIGHT: 9,500 LBS
6. CONTRACTOR IS RESPONSIBLE FOR OBTAINING EVERSOURCE APPROVAL PRIOR TO BACKFILLING CONDUITS AND PRECAST PAD.

11 THREE PHASE 500–2500KVA NSTAR TRANSFOMER PAD DETAIL
SCALE: NO SCALE

CHA

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COMMONWEALTH OF MASSACHUSETTS
KELLY KILLEEN
CIVIL
No. 38091
REGISTERED PROFESSIONAL ENGINEER
6.9.21

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

PROPOSED SITE DEVELOPMENT PLANS
FOR
HERB CHAMBERS HONDA OF BOSTON
710-720 MORRISSEY BLVD.
DORCHESTER, MA

No.	Submittal / Revision	App'd.	By	Date
2	Response to BWSC Comments	KK	MT	06/09/21
1	Response to BWSC Comments	KK	JM	06/26/20
0	Boston Water & Sewer Comm.	KK	JM	01/31/20

DETAILS-7

Designed By:	Drawn By:	Checked By:
TK/JM	TK/JM	KK
Issue Date: 01/31/2020	Project No: 059051	Scale: NONE

Drawing No.:
C-607